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PRACTICAL OBSERVATIONS ON THE CEREBRAL DISEASES OF CHILDREN, CHIEFLY BEARING ON THE SUBJECT OF DIAGNOSIS IN HYDROCEPHALIC AFFECTIONS.

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Having often experienced, especially at an early period of my practice, considerable difficulty in the diagnosis of the cerebral diseases of children, and in discriminating between them and other affections which simulate them in their cerebral symptoms, I have, with a view of fixing the attention more strongly and pointedly on those signs which, from experience, I have been led to think are most to be depended upon, put together a few observations in the present communication on the subject, accompanied with several abridged illustrative cases; not, however, with the idea that anything I may have to offer will prove very novel or particularly instructive, but with a hope that by calling the attention afresh to a class of diseases which, in a majority of cases, have hitherto had a fatal termination, some good may result. Whatever induces us to re-consider our former views or opinions, can scarcely fail to be productive of advantage.

M. Rilliet's essay on the "Simple Acute Inflammation of the Membranes of the Brain in Infants," is a valuable contribution to medical science; it will considerably aid the practitioner in his discrimination of this difficult class of diseases. I was led by the perusal of the translation of this work, which appeared in the pages of the Journal of the Society, to turn to my note book, and to the selection of the cases before referred to.

The knowledge and treatment of cerebral disease is, I believe, now confessedly considered the most obscure department of practical medicine. We have it not in our power to employ those physical modes of investigation which we, with so much success, avail ourselves of in the diagnosis of thoracic and abdominal disorders. We are yet left to gather our opinions from general symptoms and functional sympathetic disturbances, such as were formerly our only guides in

searching into the ailments of the organs contained in the larger cavities of the body. The difficulties thus imposed upon us I have not only personally and painfully experienced, but have had some opportunity of witnessing the embarrassments, and I may add, errors of diagnosis in others, and in some who enjoyed long experience, and who had obtained high reputation. The chief source of these errors of diagnosis have, I think, arisen from confounding arachnitis with bilious and infantile remittent fevers, and overlooking that depressed state of the nervous system in infants simulating hydrocephalus, and pointed out with so much clearness and talent by Dr. Marshall Hall, and the late Dr. Gooch.

The division of meningitis of infants into the *acute* and *tubercular* is, perhaps, for practical purposes the best, being based upon correct and obvious pathological differences. The latter variety, which had for many years obtained by common consent the name of hydrocephalus, has been delineated and treated of by many authors of distinguished talent, but has not been more graphically described than by Dr. Fothergill, in the fourth volume of the "Medical Observations and Inquiries." His pathology and treatment, however, will not bear a similar commendation.

Whether the celebrated deduction of M. Louis—that if tubercles be found in the brain they are sure to be met with in other organs, especially the lungs,—be true or otherwise, it matters but little; hydrocephalus or arachnitis of children being with few exceptions essentially a disease belonging to the strumous diathesis. I believe in a majority of instances, this celebrated pathologist's opinion will be found to be correct, even in children, but to whom indeed he does not extend it if under fifteen years of age. I think, however, there are good grounds for doubting the converse of the proposition,—that tubercles being found abundantly in other organs, and the patient dying of hydrocephalus, they must necessarily be found in the brain and its membranes; but whether tubercles be present or not, the excited vascular action leading to effusion partakes of the atonic character of strumous inflammation, and in so delicate an organ as the brain, is little amenable to treatment.

The disposition of miliary tubercles in the lungs and abdominal organs will sometimes take place to a great extent, yet, giving rise to no very prominent symptoms, their existence has not been suspected, but a fatal attack of hydrocephalus having supervened, examination after death has led to their discovery.

The origin of strumous disease, whatever may be its remote or predisposing cause, must mainly be referred to mal-assimilation and sanguification, or what may be called, strumous dyspepsia. In discriminating between tubercular or strumous meningitis and complaints simulating it, the constitution of the patient, and the history of previous ailments, call for our first attentive observation.

The symptoms most pathognomonic and those belonging to an early stage, are frequently the simultaneous occurrence of sickness, pain of the head and bowels; the vomiting sometimes, after obstinately persisting for three, four, five or more days, will then generally cease, and a favourable prognosis is not only inferred, but the circumstance is often adduced as a confirmation of an opinion that had been previously given, that the case was altogether one of gastric or biliary disorder, and thus the fatal delusion is completed. I cite the following case as one in point:—

MENINGITIS, SIMULATING BILIOUS REMITTENT FEVER.

On November 30th, 1846, I was called to visit, in consultation with a physician, and the ordinary medical attendant of the family, a child between two and three years of age. I was informed that the indisposition was of nearly three week's duration, that the early symptoms were languor, sickness, and vomiting, slight fever with pain in the bowels, and some headache, and that at the present time, though the sickness and vomiting had disappeared, a functional disturbance of the chylipoietic organs constituted the most prominent features of the case, confirming the view of the gentlemen in attendance, that it was an ordinary instance of the bilious remittent of children, which was alleged to have gone on favourably; and it was stated in confirmation of this view, that the patient was sufficiently well on the day previous to my visit, to have been drawn out for an airing in a child's carriage, but that a change had taken place within a few hours which had made an unfavourable impression on the minds of the parents.

I found the patient lying on a sofa, apparently asleep, but which more particular observation induced me to think was commencing coma. On raising the upper eyelids, (which was not resisted,) the pupils appeared larger than natural, and were sluggish in their movements; there was also a vacant expression of countenance. With these symptoms, slight muscular twichings were observed, and I thought a want of due power in one of the upper extremities. Connecting the present appearances of the case with the early symptoms, especially the vomiting, and the absence of the latter as the case progressed, from the diminution of the sensibility of the brain, I felt no hesitation either as to

the nature of the disease, or on the subject of prognosis. But the gentlemen who had watched the case, one of them from its commencement, and the other nearly so, both persons of considerable experience, felt assured in their own minds, that it was one of fever, and that nothing had occurred to warrant the opinion of the existence of distinct cerebral disease. However, soon after I left the house, convulsions came on, and before the morning the child died.

There is another symptom on which I have been in the habit of placing great reliance, as a diagnostic of arachnitis or hydrocephalus, but which unfortunately makes its appearance at a period when there is little or no hope of recovery, and indeed is itself an evidence of the speedy arrival of an unfortunate issue of the case. I once thought that this symptom was an infallible forerunner of death, but I am now disposed to believe that I have seen one, if not more exceptions to the rule; still I am convinced that these exceptions will occur so rarely, that in giving an unfavourable prognosis, little apprehension need be entertained of loss of reputation from an error of judgment, in any case in which this sign is present, after the occurrence of other suspicious antecedent symptoms, especially the presence and disappearance of vomiting, followed by sighing respirations. The symptom here referred to, is a *highly congestive state of the vessels of the conjunctiva* commencing at the canthus of one or both eyes, more frequently both, generally first noticed at the inner canthus, occurring about eight, ten, or twelve days from the accession of the attack. On first observing it perhaps only one or two vessels will be noticed fuller than natural, taking a direction from the canthus toward the margin of the cornea, but this congestive state once begun, it in general steadily progresses, until the eyes assume somewhat the aspect of ordinary conjunctivitis. Concurrently with this appearance, there is an increased and altered secretion from the Meibomian glands, causing the eyelids occasionally to adhere, and when this secretion passes over the surface of the cornea, it produces that filmy appearance of the eyes, often noticed. Though the congestive condition of the conjunctiva generally comes too late to be of any avail as a guide in a curative point of view, it is, negatively, a sign of great importance as a help to diagnosis in difficult or doubtful cases; as for example, in instances of infantile remittent fever, simulating hydrocephalus, if this symptom does not shew itself after the lapse of twelve or fourteen days from the beginning of the attack, the case may be safely pronounced to be fever, and a more favourable prognosis given. If previously to the occurrence of congestion of the conjunctiva, the pulse has been slow and irregular, which, when it arises, is one of the most characteristic signs of the second stage of the disease, it will now be much accelerated, and frequently become very rapid, ranging from 120 to 160 in the minute.

I cite the following case as one that particularly interested me at the time of its occurrence, and I introduce it here, as my diagnosis and prognosis were solely founded on the condition of the conjunctiva just described. The impression it created on my own mind was the more deep, from my having the misfortune to differ in opinion from the medical gentlemen, all of high character and much experience, who were in attendance previous to my seeing the patient, and two of whom continued to watch the case with me to its termination.

MENINGITIS, WITH CONGESTION OF THE CONJUNCTIVÆ.

The subject of the case was the son of a gentleman living at a considerable distance from my residence, four years of age. It was stated, that previous to this indisposition, he had uniformly enjoyed good health; indeed it was said, that he had never before been ill. He had been complaining nine days when I saw him, which was on the 12th of January, 1834, and had been under treatment seven days; two physicians and a surgeon were in attendance. The case was considered one of infantile remittent fever. I found the patient in bed, lying upon his back, restless, constantly throwing his hands and arms about, and rolling his head; he did not appear to be sensible; the eyes were filmy, and void of expression, with large and sluggish pupils; conjunctivæ much congested, especially those portions of the membranes lining the lower lids, and at the angles of reflexion; there was also an abundant secretion of muco-purulent matter about the edges of the eyelids; the pulse was 140, feeble; the skin scarcely above the natural temperature; he was much teased with a loose cough, but without wheezing or bronchial rattle. There was a blister upon the chest. I was informed that at one period the pupils were contracted to a point. I gave it as my opinion that the case was one of arachnitis, in the last stage.

I was to have visited the patient the following morning, the 13th, but receiving a message that he was dying, did not see him; but this event not happening, I saw the patient in consultation on the 14th, and was told there was some improvement in his situation; he certainly did not appear to be worse than when I first saw him. The following is the report of the 15th:—

Restlessness not so great; the eyes clearer; pupils contracting and dilating readily; more sensible; evacuations from the bowels neither dark nor pitchy, but a little inclined to green, when his attention is not roused the eye-balls are drawn up under the brow, and the pupils become dilated. The dilatation of the pupil under this movement, I considered unfavourable; had the patient been in healthy sleep, the pupils would have been contracted. However, the general improvement of the patient was considered to militate much against the opinion which I had, perhaps hastily, given.

The 16th and 17th were passed with but little variation in the symptoms, but it was supposed, upon the whole, that the case had rather improved, and I did not see the patient on either of these days. My last visit was

made on January 18th. I found the friends and medical gentlemen all cheerful at the improvement that had taken place; the eyes were more intelligent; conjunctivæ less congested, and vision apparently perfect; the patient seemed quite sensible, knew his father, and put his arms about his neck, and put out his tongue when desired to do so; the pulse, however, had not come down, which it ought to have done, to have justified a favourable prognosis. Still appearances were now more than ever against my opinion; all I could say was, that if the patient recovered, I should see what I had never seen before.

I was not to repeat my visit on the next day, but the day after; on this, the 20th, I received a message before I had risen in the morning, to say that the patient had died in the night.

The apparent improvement in this case was very striking, and certainly gave rise to some doubt in my mind as to the correctness of the opinion I had ventured to give. I believe, however, that such partial ameliorations are not altogether uncommon in cerebral diseases. Aretæus, Dr. Cheyne, and Sir H. Hallford, have noticed these spurious and delusive appearances of amendment. It is not to be supposed that the gentlemen who saw these two cases with me were not highly competent observers of disease, but it is clear, however, that they must have been misled by the early symptoms, which in their opinion were dissimilar to those that usually take place in these affections. All I am desirous to adduce from these circumstances is, the difficulty of diagnosis which sometimes arises in the cerebral diseases of children, and the following short case demonstrates this fact in a still more palpable manner.

One of the least equivocal signs of the existence of a serious morbid lesion of the brain is a *loss or diminution of motor power*. Excessive or irregular muscular actions, as convulsions, are less to be relied upon, as these often occur, to a great extent, in the diseases of children, and may portend little or no danger, but the slightest indication of paralysis must always be regarded as a fearful symptom.

ARACHNITIS; LOCAL PARALYSIS.

September 6th, 1838. I was sent for to see the son of a gentleman, three years and a half old, who was said to be slightly indisposed; he was left under the care of an aunt during the absence of his mother, who had gone a journey into Lancashire. It was more on account of the responsibility felt by the former relative, than from the supposed existence of any alarming disease, for which my assistance was required. There was some feverishness, gastric disorder, and constipation; for these, the usual remedies were prescribed. Time passed on until the 16th without much variation in the symptoms, the patient apparently neither getting better nor becoming worse; but on the following day I had no doubt of the existence of arachnitis, and that it had been insidiously progressing from the time that I was first called in, and which more attention and care might possibly have enabled me to have detected earlier.

The hair was removed from the scalp, and a cold lotion applied; leeches were put upon the temples, and a blister to the nape of the neck; calomel was exhibited internally. These remedies were persevered in with little or no amelioration until the 19th, when a physician residing in the town was requested to see the patient with me. He appeared to concur with the opinion I originally entertained, and stated that there were now no evidences of the existence of arachnitis; the lotion, however, was continued, and calomel, with powdered kino, (the latter to prevent the former passing off by the bowels,) was given every three hours, and an opiate at night. I visited the patient with this gentleman (who still gave a favourable prognosis,) on the 20th, 21st, and 22nd. On entering the room on the morning of the last day, I observed that the right eyelid was closed, and on careful examination, that the power of the levator palpebræ was lost. I pointed out this circumstance to my coadjutor in the case, but it did not appear to produce any change in his views. I, however, felt assured that the function of the right motor oculi was interfered with, either by the pressure of effused fluid in the areolar structure of the pia-mater at the base of the brain, or that softening of some portion of the medullary matter of the right hemisphere or crus cerebri had taken place, and consequently I predicted a fatal issue. At eight o'clock in the evening of the same day, convulsions came on, and only ceased with the child's death, which occurred before midnight.

In estimating the value of symptoms indicative of the cerebral diseases of children, the state of the pupils and the appearances of the alvine discharges ought not to be overlooked. Much importance was formerly placed upon the size of the pupil in these affections, and if found not dilated, a favourable prognosis was generally given. I have often been amused at the formal and ceremonious manner in which a lighted candle has been made to approach and recede from the eye, in order to discover its condition; beyond the influence produced on the minds of anxious parents and attendants on the sick, little advantage can accrue from the experiment. This opinion I ventured to give in the year 1819, in a paper published on this subject in the *Edinburgh Medical and Surgical Journal*. In the early stages of hydrocephalus, in which alone treatment will commonly prove of any avail, the pupils will frequently be found contracted, and if the eyes are examined during sleep, even after dilatation has commenced, this will sometimes be the case; and moreover, strange as it may appear, when unequivocal and real dilatation of the pupil has been established, it will sometimes further enlarge on the near approach of a strong light. The condition of the pupil is no sure guide apart from other symptoms. In delicate children, even in health, it is often large and sluggish in its movements, and much more so when such subjects are labouring under any indisposition. When, from the progress of the case, the pupil is really dilated, it is

obvious enough, and did not other concurring unfavourable symptoms sufficiently point to the probable fatal termination of the case, I still admit that some reliance might be placed upon it as a guide both to diagnosis and prognosis, especially if the dilatation be confined to one iris. The considerable restoration to a normal condition of the iris, in the second case above recited, is strikingly calculated, if other experience were wanting, to lessen confidence in a symptom which has hitherto been so much relied upon.

In the paper just referred to, in the *Edinburgh Journal*, I also ventured some remarks on the discharges from the bowels. I believe it is now generally admitted, that nothing is more easy than to produce, what were then called, hydrocephalic stools. A few grains of calomel, and sometimes any irritating purgative, will prove sufficient. Such evacuations are observed in many of the diseases of children, even apart from the action of medicine, when the chylopoietic organs, and especially the large intestines, are much excited. Dr. Fothergill, I believe, was the first person to direct attention to these peculiar alvine excretions as pathognomonic of hydrocephalus, and by him, as well as by subsequent writers, their peculiarity was supposed to arise from some particular morbid condition of the bile; but in many *post-mortem* enquiries which I have made in reference to this matter, I have failed to find the green oily-looking stools in the small intestines, I have therefore inferred that their appearance is due to some change effected in the bile in the tract of the colon.

The insidious character of the meningitis of children, especially in individuals having a well-marked strumous diathesis, should never be lost sight of; in such cases, for many days, there are often no very prominent symptoms; frequently the head is not complained of; listlessness, languor, a disposition to be alone and lie down and doze, with or without an occasional tendency to sickness, may alone have been noticed, when all at once, the most grave and alarming symptoms, as strabismus, dilated pupils, and convulsions, make their appearance, to the dismay of the medical attendant, and the consternation of the friends of the sick.

If in the doubtful circumstances here referred to, sickness and vomiting should be present in any degree, and not obviously and unmistakeably arising from other causes than those which might be referred to the head, it will be safest to consider the disease as seated in the brain.

As far as my experience has enabled me to judge, vomiting is a symptom highly pathognomonic, and most to be relied upon; but, unfortunately when it has arisen, the disease, in a majority of instances, may be considered as fully established; therefore the great desiderata to become acquainted with, are the antecedents to this state of things, and these probably will be found to be very different in different cases. A further consideration of the subject in this direction would lead

to observations on those conditions of the system which have been supposed to mark a predisposition to the disease under review, and to the subject of prophylaxis; and I fear to the acknowledgment that we are more likely to be successful in the prevention than in the cure of hydrocephalus. But this not coming within the object of my communication, I pass on to a condensed recital of some additional cases, illustrative of my remarks and conclusions, diagnostic of arachnitis. The first is an example of genuine tubercular meningeal inflammation, and well contrasts with the last case, which was an instance of the acute disease, unconnected with struma.

TUBERCULAR MENINGITIS.

The subject of the following case was a little girl, whose age was unfortunately omitted to be noted, the child of poor parents. I visited her for the first time, October 5th, 1828, and found her labouring under well-marked symptoms of hydrocephalus. I learnt that she had been seriously ill about a week. The disease was at this time passing into the second stage; pulse slow and irregular; pupils dilated, with a tendency to coma; she had previously had persisting sickness, with headache. It appeared on further inquiry, that for several months previous to the present attack, she had been out of health, having complained besides of abdominal pains and tenderness, of a dry cough, and some difficulty of breathing. These symptoms were attended at times with fever, having afternoon paroxysms; but notwithstanding these indications of serious disease, the appetite kept up, and she did not lose much flesh. It was also reported that when the head symptoms became decidedly developed, the cough and difficulty of breathing disappeared.

The remedies which the circumstances of the case then called for were prescribed, but the bad symptoms succeeded each other in their usual mode of progression, and the patient expired on the 16th, eleven days after my first seeing her, and twenty-three from the date of the attack, being about the average period of the duration of these cases.

On dissection, granular tubercles were found abundantly scattered over the surface of the meninges; the arachnoid in many parts was thickened and opaque, and beneath it was an abundant serous effusion, especially at the base of the brain, where, in the neighbourhood of the optic nerves, it put on a gelatinous appearance. The ventricles were distended with fluid; the foramen of Munro unusually large; the parietes of the ventricles, more especially the fornix, were very soft, and easily torn. The lungs collapsed on exposure to the air; there were no pleuritic adhesions, but miliary tubercles were abundantly dispersed on the pulmonary pleura, and in the parenchyma of the lungs; there were also a few tubercles of larger size, in which a process of softening had commenced. The peritoneal coat of the liver was inflamed, and small tubercles, about the size, and having the general appearance, of mustard seeds, were seen on its upper surface, and on the corresponding face of the diaphragm, where they were of larger dimensions, and more numerous. Recent

and very delicate cellular adhesions subsisted between the liver and diaphragm;* the spleen was also in a tuberculated state, indeed much more so than any of the other viscera.

HYDROCEPHALUS; PUPILS NOT DILATED.

In March, 1812, I was called to attend with my late partner, Mr. Bell, a female child, (Martha Best,) two years of age, whose health for the last three months had been considered good, but before this time, she had been thought weakly, and was frequently ailing. She lived only ten days from the supposed commencement of the attack, which began with vomiting. The sickness continued to harass the patient with but short intervals, for five days; there was then an intermission of three days from sickness and vomiting, when it returned and did not cease until the child's death. The pulse was first slow and intermitting, afterwards very frequent, but the circumstance that most attracted attention, was the natural condition of the pupils, there being no dilatation; the contractions and dilatations on the approach and withdrawal of light were normal.

The following is the account of the autopsy:—The anterior fontanelle not closed. Nothing unusual was observed. In the membranes or on the upper surface of the cerebrum, but on a horizontal section being made in the usual manner, an undulation of fluid was visible in the ventricles beneath, which on being opened, were found to contain a considerable quantity of limpid fluid. The commissura mollis was torn through, and the thalami separated and some distance apart, by the distending action of the fluid in the third ventricle; the anterior and posterior commissures appeared longer than natural, as if from a process of stretching, and the apertures opening into the third ventricle, were much larger than their natural size from the same cause.

Though the ordinary duration of hydrocephalus is from two to three weeks, it occasionally runs its course in a few days, the disease in its progress leaping, as it were, from the first to the last stage, passing over altogether the second stage of the complaint, and should the third stage happen to be of short duration, and the early symptoms have failed to have made a proper impression on the minds of the friends, the medical practitioner may only be called to witness the death struggles of his patient, as in the following case. But how important is it in the alarm and consternation which cannot fail to arise in the minds of the attendants, both for his own reputation and the satisfaction of parents, that he should be able to give a correct diagnosis and prognosis. This, perhaps, it will not always be easy to do, still the necessary information may generally be obtained from the history of the occurrences of the previous two or three days, and from facts that may be collected respecting the constitution of the

* This is a lesion opposed to the experience of Dr. Budd, who, in his recent very excellent work on "Diseases of the Liver," remarks,—“I have never met with an instance in which they (tubercles,) seem to have caused adhesive inflammation of the liver, or its capsule.”—Page 167.

patient; this information, collated with the symptoms present at the time of his visit, will generally enable him to form a tolerably correct opinion of the nature and probable issue of the case he is called upon to treat.

ARACHNITIS RAPIDLY FATAL.

Feb. 8th, 1813. My assistance was desired for the relief of a little girl, nine years of age, whom I found with the following symptoms:—Insensible; tonic spasm of the voluntary muscles; limbs extended and rigid; joints immovable; mouth firmly closed; eyes wide open; left pupil remarkably dilated, but not entirely insensible to light; pulse 160; heart beating with great force; skin cool. These symptoms came on suddenly, preceded by headache and sickness for a few days only, and which had not caused any alarm for her safety. The child died in three hours from the time of my being called in, without any material change having taken place in the symptoms.

I learnt that the patient had not enjoyed robust health, and was frequently the subject of headache, and she had also been much troubled with ascariides. Her eyes were dark; complexion pale; her person tall and thin. I was permitted to examine the head, but the chest and abdomen were not allowed to be opened.

The following were the morbid appearances presented on dissection:—The dura mater adhered with great firmness to the cranium; the longitudinal sinus was unusually free from blood or coagulum; the arachnoid opaline, and somewhat thickened, having a considerable effusion of fluid beneath it, occupying the interspaces of the convolutions; about two ounces of fluid were found in the ventricles; the foramina of communication were considerably enlarged; the sides of the third ventricle a quarter of an inch asunder; a similar effusion existed beneath the membrane in the ventricles, analogous to the arachnoid, as was observed on the surface of the cerebrum; there was an abundant effusion at the base of the brain; the vessels of the plexus choroides were extremely turgid, and those of the velum interpositum in a similarly congested state; the medullary substance of the brain was soft.

M. Rilliet, in his account of "Simple Acute Inflammation of the Membranes of the Brain in Infants," divides it into two forms,—the "convulsive" and the "phrenitic." The case I am about to relate comes under the former denomination. It would appear, that these forms of meningitis are distinguished from the tubercular by the suddenness of the seizure, the greater violence of the symptoms, and the shorter duration of the disease, not often lasting beyond the third day; and also from the apparent absence of the strumous diathesis. These affections do not differ less in their morbid anatomy than in the circumstances adverted to; whilst in the tubercular division of these cerebral affections, the violence of the disease would seem to exhaust itself upon the base of the brain. In the simple acute inflammation of the membranes in infants, the meninges of the convexity suffer most, and in the latter there is always an entire absence of tubercles.

The notes of the following case, taken many years ago, and of course without reference to any particular pathological opinions, would appear to support, as far as it goes, the views propounded by M. Rilliet:—

CONVULSIVE MENINGITIS.

On Tuesday morning, March 12th, 1833, I was requested to visit a child six months old, who, previously to the commencement of his present indisposition, was remarkable for robust health. I was informed by his mother, that on the Sunday previous, (March 10th,) the child did not appear in his usual spirits, cried, and was fretful when played with as heretofore; he passed the Sunday night in a restless manner. On Monday morning he was manifestly indisposed, and vomited, throwing up a bilious-looking fluid; he also was noticed to be distressed when moved, and the eyes had a heavy appearance. The symptoms noted on my visit were the following:—Skin hot; frequent pulse; countenance pale; expression idiotic or vacant, evidently devoid of intelligence; frequent vomiting. Leeches were applied to the temples, and a cold lotion to the head; to these remedies some medicines and a tepid bath were added. Convulsions came on early in the afternoon, and continued the whole of the night, and the two following days and nights, with only very short intermissions, until the patient's death, which took place on the 14th, three days after I first saw him.

The following is the account of the examination of the body:—Dura mater somewhat more vascular than natural; the longitudinal sinus contained a large pale coagulum, with processes stretching into some of the veins of the pia mater. On raising the dura mater, a most extraordinary appearance presented itself: the convolutions of both hemispheres were nearly obscured, and the natural aspect of the pia mater lost by an abundant deposit of yellow lymph into its cellular structure, occasioning that membrane in many parts to be a line and a half in thickness. This effusion around the veins of the pia mater gave them the appearance of small cords, which when cut across preserved a rounded figure, with a small red point in the centre, indicating the situation of the former cavity of the vein, but which was now obliterated by the pressure of the lymph: a few veins escaped this change. The arachnoid was thickened, and raised in some parts by a watery effusion. The state of the pia mater above described, though more apparent upon the upper surface of the hemispheres, also existed on the greater portion of the inferior parts of the cerebrum, and on some portions of the cerebellum. The velum interpositum also was similarly affected. The ventricles contained a considerable quantity of fluid. The substance of the brain was unusually soft and vascular. The viscera of the chest and abdomen were carefully examined, but no disease discovered.

In the above citation of cases and observations on the symptoms of arachnitis or hydrocephalus, which I have thought might facilitate the diagnosis of cerebral diseases in children, no particular order has been followed beyond that which a reference to my own case book suggested; it is therefore likely that many

circumstances and symptoms may have been passed over or slightly touched upon, which by others, may be supposed important.

In the consideration of this subject, it is necessary that the mind of the practitioner should be duly impressed with the value of premonitory symptoms; they will efficiently assist him in appreciating those signs on which his diagnosis is subsequently to be founded. The premonitory symptoms are for the most part made up of some of those phenomena expressive general malaise,—such as languor; listlessness; erratic pains in various parts of the body and limbs; mental irritability; a tendency to constipation, with some form of gastric disorder, leading to imperfect assimilation of food, and frequently to its sequence—loss of flesh. The complaint is often ushered in with pain of the head, heaviness, and a disposition to lie down and doze, and generally with a great dislike to motion of every kind, fretting when disturbed. A due attention to the state of the pulse is of the first consequence; on this symptom, as is well known, Dr. Whytt bases his division of hydrocephalus into three stages, the first and last being marked by a frequent pulse; the second by a slow and sometimes an irregular one. But all who are practically acquainted with the disease, know that the symptoms of arachnitis are by no means uniform, and that the stages are often remarkable for the great diversity in their duration; in some cases, the early stage of excitement is not observed, whilst in others it may last several days; occasionally the second stage does not appear, or is so slightly marked, as to escape notice. In the discrimination of hydrocephalus from the infantile remittent fever, the observation of the pulse may be made very available, as in the latter disease it is rarely ever slow, and never below the normal standard, even in the remissions from fever. In the slow pulse accompanying diseases of the brain, there is a peculiarity which I do not remember to have seen noticed,—which is, that it is *remarkably quickened by the slightest exertion, as turning in bed, &c., immediately resuming its former frequency, as soon as a state of quiescence is obtained.* This state of the pulse exists after concussion of the brain. The respiration in an early period of the disease is sometimes quick and irregular, but its general character is that of alowness and inaudibility, with occasional or frequent sighing. Strabismus and double vision are common symptoms; but the former is rarely noticed before the case is passing into the third stage, and the patient all but in a hopeless condition, and the latter, either from the tender age of the patient, or the state of the intellect, can seldom be availed of as a means of diagnosis.

The one great and important symptom in distinguishing hydrocephalus from other diseases of children is sickness and vomiting. This symptom is not only important as being more pathognomonic than any other individual one, but occurring at a period when it may

be hoped the morbid action within the cranium has not made a fatal progress, the idea may be entertained that by the timely use of appropriate means, it is still possible to avert the threatened danger; but in too many instances, it is to be feared, that when this symptom has made its appearance, irrevocable injury has been sustained by the brain or its membranes. Sickness and vomiting being such common occurrences at all ages and particularly in childhood, and known to arise under very different circumstances, and from such a variety of causes, it is not perhaps a matter of surprise that its value in these cases should not have been duly estimated. With care and attention, however, to all the existing symptoms, and the previous history of the patient, it cannot be very difficult to distinguish the persisting sickness and vomiting of the early stage of hydrocephalus, either from that which occurs from teething or from ordinary gastric and intestinal disturbance. In all doubtful cases, it is safer to assume the existence of cerebral disorder, since no evil can result from such an error of diagnosis. In the bilious remittent fever of children, the complaint most likely to be confounded with hydrocephalus, vomiting, though occasionally occurring, is not a prominent symptom. Whenever sickness takes place in a child, no trouble or time should be considered too great in investigating or searching after its cause or origin. We know that vomiting is one of the first symptoms that follow injuries of the head. It often happens, when a child falls on its head from a chair or table, that the accident is almost immediately succeeded by vomiting, after which it goes off into a heavy sleep, and this is so exactly like what happens in hydrocephalus, that the inference is abundantly clear, that the brain must be suffering either from congestion or more advanced disease.

The high interest with which the subject of the diagnosis of the cerebral diseases of children is invested, is scarcely more important with reference to the safety of the patient than the character of the medical attendant. Unhappily, as has already been observed, a great portion of these cases has a fatal issue, and should he be misled by the too frequently insidious progress of complaint, and thereby have failed to acquaint the parents with the precarious situation of their child, he has not only lowered himself in their opinion, but will have the mortification to reflect that he has let pass a rare opportunity for establishing his reputation for tact and discernment. Next to the kind feelings which are awarded to successful practice, the friends of the sick feel most grateful by being forewarned of the trouble that is to come upon them, and by shewing that no care or skill has been wanting, that might have brought about a more happy result.