Infantile Convulsions.

If we look into the Registrar General's reports, or the bills of mortality of an earlier period, or the statistic records of the causes of death of almost any time or country, we will find an enormous number of deaths among children stated to be produced by convulsions; yet, notwithstanding the inference that might thence be drawn as to the probable prevalence of a disease from which such a prodigious loss of life is supposed to result, we find, on enquiry into the literature of the subject, but a very small number of works in which any such disease is expressly treated of by name. It does not however follow that the existence of some form or forms of disease, the fatal consequences of which contribute to swell so largely the records of mortality has been either overlooked or neglected, but the explanation of such apparent discrepancy is obvious, for among the various authors who have devoted themselves specially...
to the consideration of children's diseases, convulsions of infants, however much they may engage their attention, are rarely described as a disease properly so called, but rather as a symptom more or less likely to appear in the course of any of the more severe complaints to which children are liable, and, though now and then we may neither be able to trace their origin, nor observe their connection with other diseases or diseased states of the constitution, still such cases are so rare that we may conclude that we have either failed to detect their cause, or perhaps that the cause has been only transient while the impression made by it on the nervous system has remained.

The only author I have met with who treats of convulsions as a separate disease is Meigs. In speaking of them he describes one as idiopathic or essential convulsions and although he describes the symptoms, nature, diagnosis, prognosis & treatment
of all the other forms of convulsions which he has classified along with them, he gives but little account of the former, and though he admits that he has seen 3 cases in which no cause could be discovered, and which therefore ought to be called idiopathic convulsions, yet he qualifies his statements by saying afterwards that he is "disposed to believe that in most such cases there has been a source of irritation in some of the organs of the body which has acted as the excitant to the excito-motor system, and which, if we could but detect it, would warrant us in placing the case amongst sympathetic convulsions." Also in speaking of their prognosis he says "when the cause has been slight or one which soon ceases to act, or can be readily removed, the prognosis is much more favorable than under opposite conditions." From this small amount of doubtfully expressed evidence I think we ought not rashly to conclude that there is such a thing
as essential convulsions, but rather confess that, in such obscure cases, we have failed to diagnose their original exciting cause.

With regard to the frequency of convulsions and the mortality occasioned by them but little need be said, a few statistical reports will suffice to give one an idea of it. North in his work on convulsions says "that of 17,650 children born in the lying-in hospital of Dublin a sixth part died during the first year of their existence and that 19 out of 20 fell victims to convulsions." West says that "convulsions occasion 74 per cent of all deaths which take place during the first year of existence from diseases of the nervous system." Meigs, in his work on diseases of children, states that in New York during 5 years, 1729 children under 5 years died from convulsions, 1611 from cholera, 1060 from marasmus, 1041 from dropsy of the brain and 772 from
"pneumonia." Dr. Simpson, in his obstetric works, states that "according to the Registrar General's accounts in England and Wales there occurred in 5 successive years about 25,000 deaths from convulsions and these almost entirely among children under 5 years of age, the greatest proportion of cases and deaths being among infants during the first years or rather the first months or weeks of life," and in fact the younger the child is the more likely to be attacked and the less able to withstand it. From the foregoing facts we may plainly infer that there is some great difference between the nervous system of the child and that of the adult, or at least that there must be some greater impressibility. If we compare the relative state of the nervous centres in each we will find what this difference is, but before doing so, it will perhaps be as well to define the term "convulsion" and also to
determine what parts of the nervous system are concerned during the attack of convulsions.

A convolution is a spasmodic contraction of any or all of the muscles of the body and may be continued steadily for a length of time, or may come on at intervals in a jerking manner. The first form mentioned, of which tetanus is a good example, is called by some "tonic," while the other is called "clonic" and is well illustrated in a case of chorea, and, with the exception of what takes place in trismus nascentium, it is in this latter form or something nearly approaching to it that convulsions in infants commonly occur.

The next point now to be looked into is the part or parts the functions of which are deranged during convulsions. If we asphyxiate an animal and watch its motions, we will observe at first nothing but its efforts to free itself, but these
efforts will gradually diminish and motions of a different sort will be seen; viz., a regular alternate flexion and extension of the limbs which resembles very much the ordinary state of eclampsia or general convulsions. When we divide the spinal cord immediately below the Medulla oblongata and then asphyxiate and apply some general irritation, we produce convulsions at once, and I think that this experiment gives us good reason to infer that in the former case the convulsions did not occur at first while the sensibility was entire, but only when the brain's action was impaired or destroyed by the congestion. If section of the cord be performed lower down the spine we find that we can produce convulsions in the same manner, the irritation being applied to some part below the injury and the convulsions appearing also in those muscles whose nerves come off below the incision.
Having traced the action to the spinal cord if we next divide the nerves as they emerge from the spinal canal or destroy the spinal cord the consequence of this is an entire relaxation of the parts supplied by those nerves, which are divided and no peripheral irritation will excite convulsions. From these observations we may conclude that convulsions are reflex actions and that it is not necessary for the brain to perceive the irritation, nor do the sensory and motor nerves take any more active part in the action than that of conveying the impulse to and from the spinal cord.

In cases of pneumonia attended with convulsions for instance, or any other peripheral irritation the action of the brain is impaired more or less and the irritation is not communicated to the brain but merely brought to the spinal cord by the sensory filaments and reflected by it along the motor trunks.
The difference between the nervous system of the child and that of the adult is the next thing to be considered. The brain and spinal cord are not equally developed at the period of birth and moreover the whole nervous system bears a very much larger proportion to the rest of the body than ever is met with afterwards. Celsian says that "the proportionate weight of the brain to that of the body is greater at birth than at any other period of life, being according to Pedemian about 1 to 5.85 in the male and 1 to 6.5 in the female, he then goes on to say that "this proportion gradually diminishes as the body increases." From this one might conclude that the brain ought to have more control over the body, but it is the reverse. For though it is so much more developed than the rest of the body, the spinal cord is still more so, and also it is undergoing such a change that a slight disturbance to the nutrition of the
body more readily takes effect on it, as it is increasing more rapidly than any of the other organs. We find a table in the book last mentioned to show the rate of increase of the brain from birth onwards and the rapidity of growth is remarkable. It shows that during the first year of life the brain had increased from 10 ounces to 28, while it only acquired about 10 oz. in the next 3 years and during the next period of 3 years the rapidity of increase had diminished to less than a half and it only weighs 14 oz. more than it did at the end of the fourth year; in the next 3 years its increase is still slower and it only acquires 2 more ounces which are all that it requires to bring it to maturity. From this we see that during the first year it undergoes more change than at any other time and as I have before quoted in speaking of the frequency of convulsions during that time, the deaths from
these attacks are most frequent. Thus I am inclined to think that there is a direct proportion between the frequency of convulsions and the development of the brain. Many observers such as Levret, Mauriceau, and Baume have laid down the axiom that children born with large heads or whose heads increase disproportionately to the other parts of their bodies will have convulsions. North takes notice of this and adds "that in sickly children the brain increases rapidly in size, the senses are very acute and convulsions are very frequent attendants of this distressing malady." These observations I have just quoted are mentioned as isolated facts having no connection with any theory, but must have considerable weight when observed thus by so many authors who did not draw any conclusion from them and who wrote before the functions and structure of the nervous system were understood.
But, though the brain is in such an imperfect state at birth, the spinal cord is pretty fully developed and though I am not aware of any direct observations with regard to the relative proportion it bears to the rest of the body, still it may be inferred that it is greater than that of the brain for we find it at birth performing all the most essential functions of life, and also anatomists state that the Medulla Spinalis and Medulla Oblongata at the period of birth present an almost perfect state of development and are in the fulfillment of their important functions whilst the cerebral lobes, less useful at this period, are less advanced in organization. Ziedemann and Reil have made similar observations and have come to the same conclusion. West in his Book on the diseases of children says that "the grand reason of their frequency is no doubt to be found
in the predominance of the spinal over the cerebral system. Besides this predominance there are some other differences which render infants peculiarly liable to convulsions, perhaps the state of the cranium is the most prominent, the bones being soft and ununited, with large membranous spaces between, allowing the brain to be acted on by external influences in a way which could not be done in the adult state. This open condition of the fontanelles permits the brain to be congested or deprived of its blood much more rapidly and thoroughly than in after life when the bones of the head are ossified and firmly united to one another. The structure of the nervous matter throughout the body in the child is also of a different consistency. It is softer, much more vascular and has a much greater susceptibility to impression, its nourishment being much more easily disturbed and as
we know that the violent effects of a stimulus cease, after frequent repetition, we must not expect an infant all at once to become accustomed to the slight deviations from the ordinary conditions of life, which, although they do not incommode the adult might produce most injurious effects in early life.

In addition to this general predisposition to convulsions, we have now to consider their special causes. At the moment of birth or a few hours afterwards, convulsions very frequently happen and in general are caused either from the pressure the head is subjected to during labour especially when it has been tedious or difficult; or, perhaps, when there has been some time lost between cessation of the foetal and the establishment of the pulmonary system of circulation in which case the venous blood will both act as a poison and cause congestion of the brain. The retention of the meconium
and the suppression of urine from inactivity of the Kidneys are also fruitful sources of convulsions, for though some affirm that the Kidneys are so can be in action before birth, still in many cases they are not so for a day or two after. The process of dultition which follows soon after is the next natural cause which is likely to produce convulsions and in many cases, even without any other complication, it is followed by the most serious consequence. Soon afterwards and often while dultition is actively going on the child is weaned and if not supplied with proper nourishment and the effects of its food not carefully watched the digestive system is very liable to be deranged. This derangement usually takes on the form of some disease such as diarrhea or constipation with vomiting, and if the food be not changed or better regulated, it is very likely that convulsions will ensue. If on the other hand, the
child is kept at the breast too long or is nursed by a woman who has for a considerable time previously been nursing a much older child or if the nurse be not in good health the milk is unsuitable for it and the bowels may become disordered; in general, when this unsuitable nursing is persisted in the child becomes atrophic and this atrophy along with the diarrhoea is almost always complicated with convulsions before it proves fatal.

Having now gone over the most prominent natural causes, if they may be called such, the next point to be taken into consideration is the morbid states of the body which are likely to produce such attacks. These may be divided into two kinds namely the "Centric" and the "Peripheral"; the centric bring those which proceed from some lesion of the nervous centres themselves, such as hydrocephalus, or meningitis, either of the brain or of
the spinal cord and other diseases of the same sort. The eccentric or peripheral causes of convulsions are those which proceed from some disease not of the nervous system, but of any part of the body and perhaps diseases of the respiratory organs are the most dangerous of any that can be mentioned, but there is scarcely any disease to which children are liable which may not, if severe enough, produce convulsions. But though the latter form of convulsion has for its cause some peripheral irritation, still the brain must be affected at least for the time, and we find in most cases that this change is a state of congestion either active or passive according to the nature of the disease. For instance in the beginning of some of the exanthemevous diseases we find the brain in an active state of congestion owing to the disturbed state of the circulation. In laryngismus stridulus and in hooping
cough we have cerebral congestion, not active as in the former case but passive caused by the obstruction to the circulation during the paroxysm of the disease.

Having divided the morbid causes of convulsions into two classes we shall now detail the symptoms of the most important of the first of these two classes. The most remarkable disease which presents itself and which never runs its course without convulsions, appearing at one time or another as a most prominent symptom is hydrocephalus. The pathology of this disease had been for a long time unknown, and until the beginning of this century physicians were in the habit of considering the fluid contained in the cavity of the ventricles or around the substance of the brain as a dropping effusion, but it is now almost universally considered to be an excudation resulting from some
inflammatory process going on either in the brain or its membranes. The course of acute hydrocephalus as it is described by many is divided into three pretty distinctly marked stages. In the first or premonitory the child, though apparently not seriously ill, evidently feels that something is wrong, is restless and uneasy, its attention is easily diverted, its appetite is gone, or if it does ask for food it is perhaps some unusual article of food. When it does eat, it either eats enormously or sparingly, but almost always vomits part of what it has taken. It becomes drowsy but does not sleep well, rubs the back of its head constantly on the pillow, and awakes with a start at the slightest noise. These are the symptoms which are described as constituting the premonitory stage of hydrocephalus, but in many instances only a few and sometimes not even one of them are observed. The next stage
however is a more strongly marked
one. The child's countenance wears
an anxious expression which is
most characteristic of cerebral un-
easiness and which was not
previously visible. It refuses to be
amused in any way and prefers
to be left alone and lies in a confused
state boring with its occiput on
the pillow. The pulse which before
was slightly accelerated is now much
quicker and irregular and is very
much increased in rapidity on the
 slightest excitation. If the fontanelles
are open the pulsation in them is
seen to be strong and they are
raised above the level of the sur-
rounding parts. If this continues
and the child gets worse the third
stage of the disease is now developed
and it becomes almost comatose
the ordinary symptoms of compression
of the brain being now manifest.
The head is covered with a cold per-
spiration, the eyes are almost always
distorted more or less one or both being turned inwards or upwards, the pupils unimpressed by the action of light, and one or both either dilated or contracted. It can scarcely be roused from this state but even though it cannot be roused it can swallow any liquid introduced into the mouth. This state of affairs may last for days without any change except that the child is getting weaker and weaker, but in general convulsions come on at intervals, getting more and more violent as the strength decreases and finally the patient dies in a fit of convulsions. Though this is the ordinary course of acute hydrocephalus the various symptoms described do not come on always in the same regular order, and convulsions may be either frequent throughout the disease or not apparent until the end when it proves fatal. The two last stages of this disease cannot
well be mistaken for any other malady, but the first stage is often so slightly masked as not to be easily recognised, and by the time the second stage has set in the prospect of recovery is very considerably diminished. It very often happens that the parents suppose, when the child is seen going about in a drowsy listless manner with a short dry cough, which frequently occurs in hydrocephalus, that the child has caught cold, and impressed with this idea unintentionally by their description mislead the practitioner; and even if this is not the case, when he finds the child in a feverish state, vomiting, with its bowels disordered, he may possibly conclude that it is a case of remittent fever, and unless on his guard he may not discover till too late that the child is suffering from a much more serious disease. The points to be remembered in a case of this sort
are first that the pulse in remittent fever is much quicker and more regular than in hydrocephalus, also that the exacerbations of the disease are more marked, the child being in general much better during the day and becoming much worse at night, while in hydrocephalus the remissions are not so marked and are more irregular; the child seldom complains of its head during this gastric disorder, and, while we may have vomiting in both, the dislike for both food and drink is present in hydrocephalus, while in remittent fever the patient is always suffering from an insatiable thirst. The bowels also give one a very good guide as to the real state of the case, for whatever their state may be in remittent fever, the motions can never resemble the dark coloured evacuations which are passed in hydrocephalus. The state of the tongue may also be a very good
guide, for in hydrocephalus it is almost always moist, whilst in remittent fever it is never so. Pain and tenderness in the abdomen are generally present more or less in remittent fevers, and unless it occurs as a complication in hydrocephalus we can scarcely expect to find it present. Notwithstanding all the characteristic symptoms (which may be described as appearing in the course of the two different diseases) they are in many cases so obscure as not to be recognised at first, and the one may be mistaken for the other, but only in the incipient stage, for often the gastric symptoms are the only ones which may seem of any importance or are at least so prominent as to throw into the shade any drowsiness or other slight head symptoms which may appear, and even when these are most prominent, they may be
supposed to be in some cases the consequence and not the cause of the gastric disorder. Hydrocephalus may also occur in the chonic form as well as the acute, and if it does so we have a different train of symptoms, which, instead of lasting for about three or four weeks, as it does when acute, may be spread over an indefinite number of months and even years. Such cases are of frequent occurrence, and the premonitory signs are generally not very well marked, and often the first indication of cerebral disorder is a violent attack of convulsions. Sometimes the form and size of the head is the first thing which attracts attention long before any other indication of serious disturbance had appeared, but in general the child shows some uneasiness which is perhaps difficult to describe. Strabismus is a very common indication and either one
or both eyes may be distorted, or we may observe the child rolling its eyes about as if it had lost all control over them. The anterior fontanelle is raised and pulsates strongly, indicating fulness of the cerebral vessels; the child is restless and starts at the slightest sound; the uneasiness gets worse at nights and though the child may appear drowsy in the day time, it does not sleep at night; the appetite is variable and though ravenous at times it shews in general a distaste for food. The bowels are usually constipated and even if not so, the evacuations are of an unhealthy character. The child wastes away to a mere skeleton and thus the increasing size of the head becomes more and more apparent every day. The increasing weight of the fluid causes displacement of the eyes and convulsions become gradually stronger and more frequent.
Such is the usual course of the disease, and the child is usually carried off by a fit of convulsions, but in other cases the wasting of the body may go on for a long time and the patient may die from simple exhaustion. It often happens in the course of the disease that the child may be attacked by some other disease having no connexion with what it is already suffering from, and in that case it generally sinks under it.

The cure of such a disease is almost impossible, and we can seldom hope for more than a cessation of its progress, and in a few cases the fluid may cease to be thrown out, but I scarcely think it has ever been known to be reabsorbed.

The two diseases I have just described, have very similar post mortem appearances, the difference is only in the quantity of fluid thrown out, and the time they take
to run their course. In both cases the fluid produces a compression of the brain which causes all those distressing symptoms, and this fluid is a product of an unhealthy tubercular inflammation of the brain and its membranes.

On opening the cranium in such cases we find the fluid either in the ventricles of the brain or in the surrounding cavity, and in some instances where the foramen of Monro has been closed by a false membrane, which is often thrown out and covers the whole of the inner surface of the ventricle, we find the fluid only in one cavity producing that want of symmetry sometimes seen in some cases of chronic hydrocephalus; but more commonly we find the fluid in all the ventricles, and in some instances we find that the fluid has forced apart the commissures and made its way out and is
effused through the whole cavity of the 
cranium. If the fluid is only found 
in the outer subarachnoid space the 
inflammation has in general been found 
to proceed from the base of the brain, 
and it is seldom that we find the 
upper part of the brain to be affected 
alone. The membranes of the brain 
are in both cases found to have been 
inflamed and are opaque and covered 
with yellow masses of tubercular 
granulations. The substance of the 
brain is frequently softened and at 
one time it was thought that the 
softening was the result of imbibition 
of the fluid thrown out, but since 
then it has been ascertained that 
the softening is the direct result of 
inflammation of its substance. 
Atrophy of the brain is also another 
consequence of chronic hydrocephalus 
and is not unfrequently met with. 
Although it may also happen during 
the course of the disease that the 
child has more or less paralyzed in
Some parts of its body, yet the lesions of the nervous substance are so numerous and so varied in situation that we cannot trace any connexion between them and the symptoms thus manifested. The granular masses which are distributed over the membranes gave rise to great discussion at one time, some affirming that they were peculiar to the brain, while others seeing that they always existed in subjects in whom tubercle was visible in other organs of the body, concluded that they were of tubercular origin. An inquiry into the nature of tubercle has pronounced this view to be the correct one. From this last mentioned fact we must infer that these maladies are essentially of a scrofulous character. Cases of healed inflammation (if we may call it so) of the brain occur less frequently. West quotes a case from Dr. Albrombrie's work on the disease of the brain and another from Gölis; the symptoms were the same in both.
cases. Violent convulsions were the evidences of this disease and then the patient became comatose, the pulse was frequent and the face was very much distorted in one of these instances: opisthotonos and then hemiplegia succeeded and the child died exhausted. In the other case, convulsions followed one another rapidly for a whole day, and in the evening of the fourth day the child died. On examination both cases showed that acute inflammation of the membranes of the brain had been the cause. Exposure of the head to the heat of the sun may bring on an inflammation of this sort, and it is sometimes seen after scarlatina, but it as frequently comes on without any assignable cause. Injuries of the head or neck and inflammation of the internal ear may also induce a similar affection.

Hypertrophy of the brain is another morbid state which may
cause convulsions and its diagnosis is in general a matter of great difficulty; its symptoms are the same as those of chronic hydrocephalus excepting that the head is found increasing posteriorly and that in its advanced stage the anterior fontanelle is depressed instead of elevated. Its symptoms also take a longer time to develop themselves than is usually found in hydrocephalus and in cases of hypertrophy the head is not quite so large. The fact of these differences being slight and only in degree, makes the accurate diagnosis of such cases very doubtful. When the sutures of the brain close too early we may find a different condition of the brain, namely, that of atrophy. When the brain begins to increase the firmness of the bones of the head retards its natural growth and convulsions ensue. Such cases are not common and their cure is hopeless. After a long continued illness
the nutrition of the brain is frequently disturbed and atrophy is the result. In such cases, recovery is frequent, the mental powers returning when the health improves. Convulsions frequently occur in such cases and stimulating treatment may be followed by the greatest benefit. Dr. Marshall, Hall and Gough have pointed out a state of the brain occurring under similar circumstances. After reunion or bleeding or some wasting illness symptoms not unlike those of inflammation of the brain may be developed proceeding not from an obstruction of the blood but from a state of anemia. Marshall, Hall says "its origin is chiefly in diarrhoæa or colic" and also ascribes it to bleeding for some complaint; but Dr. Gough affirms that he has observed it in cases where there has been no former illness and where the bleeding has not been had recourse to except where the symptoms had already become
manifest. Marshall Hall divides the disease into two stages, - first, that of irritability, and the second that of torpor. In the first stage he considers the symptoms which are visible due to a feeble attempt at reaction, while in the other he considers the vital powers to be in a state of prostration, and these he says resemble the two latter stages of hydrocephalus. "In the first stage the child becomes irritable, restless, and feverish, the face flushed, the surface hot, and the pulse frequent; there is an undue sensitiveness of the nerves of feeling, and the little patient starts on being touched, or from any sudden noise; there are sighing and moaning during sleep, and screaming; the bowels are flatulent and loose, and the evacuations are mucous and disordered. If, through an erroneous notion as to the nature of the affection, nourishment and cordials
"be not given, or if the diarrhoea continue, either spontaneously or from the administration of medicine, the exhaustion which ensues is apt to lead to a different train of symptoms. The countenance becomes pale and the cheeks cool or cold, the eyelids are half closed; the eyes are fixed and unattracted by any object placed before them, the pupils are unmoved on the approach of light; the breathing, from being quick, becomes irregular and effected by sighs; the voice becomes husky; and there is sometimes a husky, teething cough; and eventually if the strength of the patient continue to decline there is a crepitation or rattling in the breathing; the evacuations are usually green, and the feet are apt to be cold. Such are the usual cerebral symptoms which are caused by exhaustion and in these cases as well as in hydrocephalus convulsions are very frequent, and often carry off the patient. If the convulsions do not prove fatal, death by exhaustion may follow, the patient sinking from
gradual waste of the vital powers.

Having now mentioned the most important cerebral diseases which are likely to cause convulsions, I shall next describe the different varieties of forms in which they occur, for it is needless here to enter into a description of the second class of diseases which I have enumerated as eccentric or peripheral, as the treatment in those cases is almost entirely devoted to the primary disorder which if removed will stop the cerebral disturbance.

In an ordinary convolution caused by congestion we find that the child in general changes color, starts up, the vessels of the head and neck becoming distended with blood, the face flushed and a bluish color appearing around the mouth; the muscles of the face twitch violently and the eyes are turned up towards the upper eyelids. Strabismus is often present, the eyes rolling inwards with an unsteady wavering motion; the child seldom sees in this state and is apparently unconscious; the muscles
of the arms and legs are alternately relaxed and contracted producing a sudden flexion and extension of the limbs, the flexion motion considerably prevailing over the extension; the hands are clenched, the thumbs bent across the palm of the hand and covered by the fingers; the toes are affected in a similar manner, the muscles of the trunk are rigid; those of respiration become involved, and it is only during a moment of relaxation that the patient can breathe. If this lasts long the congestion of the brain is increased by the embarrassed respiration and the child may die, or the fit may pass off leaving the patient in a comatose state or it may disappear entirely, the patient returning to a state of consciousness. This is the usual form of convolution which ushered in an eruptive fever or appears during a paroxysm of hooping-cough or laryngismus, but in the former case it is seldom that the fit provokes fatal or leaves the child in a state of
coma, while in the two latter cases death at the time is a frequent result, and we also frequently find them lapsing into a comatose condition from which they never awake; the same may happen after a long continued illness with great prostration. In hydrocephalus the convulsions vary very much, paralysis of some of the muscles being present; also we may have convulsions in only one side of the body, the other being paralysed or perhaps not affected at all; this frequently happens in chronic hydrocephalus. If the spasm of the body takes on a tetanic form the child being bent backwards, we generally find that the membranes of the cord as well as those of the brain are affected. Many authors in speaking of convulsions have described certain premonitory symptoms which are said to precede convulsions, but I do not think that they can be depended on. Most of them are enumerated in the description of the premonitory stage of hydrocephalus.
and though not so marked perhaps in all cases, denote not so much convulsions as a general feeling of uneasiness which may precede any severe illness or which may never go any further.

The treatment of convulsions comes next under our notice, and though in most cases we ought to remove the exciting cause, and to cure or mitigate the diseased state on which the convulsions depend, still something may be done during the time of the attack which may relieve its severity or prevent it proving fatal at the time. In many cases the cause is transient and may be easily removed, as for instance, the presence of some indigestible food in the stomach, or obstinate constipation, or the pressure of a tooth in the gum, and the treatment is obvious; but where the origin is of a more lasting nature we must allay the spinal irritation while we are doing what we can for the disease which causes it. A warm bath with cold applied to the head
will give great relief in most cases, and where the cause is not very evident, sinapisms to the occiput and along the spine will often relieve the congestion. We must also remember in regard to the general treatment that there are two types of the disease, and that while the one may be much benefited by bleeding, the other will be much the worse, and that where bleeding will not suit, stimulants and tonics may have a most beneficial result. In many cases chloroform has been known to quiet the nervous system and if the irritation is one which can be thrown out of the system, the child can be kept under its influence until it has passed away.

The convulsions which arise from organic disease of the nervous system cannot be benefited permanently by this last mentioned remedy, but it is possible that the danger of the impending paroxysm may be lessened. Counter-irritation will apply equally
well to all cases. The use of the saccharine carbonate of iron has been found beneficial in some cases even where the anemic condition of the body was not apparent, and its action is accounted for by some who say that it is a nerve tonic and has a special action on the nervous system. A description of the treatment of Hydrocephalus in all its various forms and stages would lead me much beyond the limits I had proposed to myself in this dissertation. In the first stage of its acute form antiphlogistc measures of the most decided character must be had recourse to, and in proportion as these mitigate the symptoms, the chance of convulsions occurring to any extent is diminished, but when it is too often the case the disease runs on to the second stage, the power of medical treatment over it is far less perceptible and the hope of averting convulsive attacks necessarily becomes fainter. Even, if in the first
stage the patient has been very much weakened without the course of the disease being stayed the tendency to convulsions may be increased by the debility, and then stimulants cautiously administered may be of some use as palliatives, though with scarcely any hope of producing ultimate recovery. In the third or last stage the use of stimulants becomes the chief indication, and hopeless as the case may have become, should be persevered in while the power of swallowing remains. In reference to the administration of liquids, however, it is always to be kept in mind that during the convulsive paroxysms and in the state of complete coma, the power of swallowing is almost annihilated, and attempts to force medicine or nourishment into the mouth produce violent coughing or even complete spasm of the glottis, increasing thereby the congested state of the cerebral system and the convulsive tendency. In febrile diseases, along with the treatment of the convulsive
paroxysm already described, the treatment appropriate to each must be followed and need not here be detailed. In cases where the debility induced by long continued disease has terminated in convulsions, the treatment must be much the same as in the last stage of hydrocephalus; but if the disease itself which has been the predisposing cause has been removed there is some hope of the stimulant treatment leading to a favorable issue.

I trust I have made it apparent in the course of these observations that the connexion which subsists between convulsions as a symptom and the many serious and important diseases in which they are liable to occur, as well as the immediate dangers of any convulsive paroxysm terminating fatally before the nature of the disease itself is made out, sufficiently accounts for the large share which they occupy in the returns of mortality. I have also
endeavoured to show that the difficulty of the diagnosis of the early stages of some of the most important of those diseases, that being the only period at which there is much probability of treating them with success, demands the utmost vigilance on the part of the practitioners; while the opposite state of the constitution which produce liability to convulsions, and the alarming nature of the attacks when they take place, call at once for the nicest discrimination and the greatest promptitude of decision in determining the course of treatment to be adopted. Taking all these things into consideration, I do not think I am overestimating the subject I have chosen, in stating it to be one that requires the greatest possible share of the attention of the physician, and that in actual practice it is one that is likely to call into exercise all the appliances his skill can devise.

Andrew Maleis.