A Treatise
on
Subcercar Meningo-Cerebritis
During Childhood
by
Harry Ludovico Deulofte, M.B.
From the earliest ages, like the present time, this disease has attracted more or less attention from the medical profession: but the ideas with regard to its causes, symptoms, and morbid anatomy have undergone so complete a change, that the disease as recognised by us at the present day, bears little, if any resemblance to that understood by the ancients.

Consequent upon this transition, the name of the disease has undergone similar changes, and in these, perhaps more than we are accustomed to find in the multiplied increasing literature of other diseases, we can trace, step by step, the change of views with regard to its etiology and pathology.

As those fresh views in the course of time became confirmed, the old name have dropped into disuse, for if retained, they would only tend to cause needless confusion and misunderstanding.
this conception
of the true nature of the malady,
whether or not the disease known to
the ancient under the name of "water
in the head" had any analogy to that
under consideration is very doubtful,
although it is evident that many of
the symptoms described by Hippocrates
were typical of meningitis.
Hippocrates, Celsus, Galen, Helius, all
wrote upon the subject, but there
seems to have been great confusion
of ideas on the matter amongst them,
and no clear distinction drawn be-
tween fluid within, and external to the
brain, even the "epulon succedaneum"
being included in the same category,
until its true nature was described
by Harvey.
Hippocrates in his book "de morbis,"
refers probably to water on, instead
of to water within the brain, as he
proposes to evacuate it by making a
perforation in the upper part of the
brain. Yet, alius Andreas is
is due the credit of first hinting at there being a collection of fluid within the ventricles, but he does not attempt to describe the symptoms which accompany such a condition. In 1718 Dr. Petit observes that in one of the post mortem examinations which he had made, he never found fluid elsewhere than in the ventricles, and he thinks that the other conditions must be rare. From this time the disease was recognised under the name of "Hydro cephalus."

It was not however, till 1769 that a description of the symptoms accompanying the affection was given by Robert Wright of Edinburgh.

In his treatise on the subject of "Acute Hydro cephalus, or Dropsy of the ventricles of the Brain" he furnishes us with a most lucid and graphic account of the clinical signs, from the pneumo-vitreous symptoms, up to the closing scene, which even at the present day...
day

has been little improved upon. Had this been accompanied by a more correct pathology, we should have little left to desire. Unfortunately however, he thought that the key to all the symptoms was furnished by the ventricular effusion, and he regarded it as the cause, and not the result of the malady. The deposition of lymphat at the base of the brain seems entirely to have escaped his notice. He further remarks that he had never met with fluid between the dura mater and the brain, or above the corpus callosum. Some of the causes to which he attributes the disease show also how far his idea with regard to the etiology were at fault. Thus he says, that it may be due to a suppression of urine, clearly showing that though he had treated no fewer than twenty cases, he had evidently no idea of the true nature of the
the disease. "Acute Hydrocephalus" in time gave place to the term "Meningitis" which change was effected owing to the investigations of Göös, Courdet, and Reffy, who abandoned the idea of the ventricular effusion being the main consideration, and pointed out that it was secondary to inflammation of the membranes.

The next step in the onward march was the discovery by Le Guerant in 1824, of the granules which are met with in the fissures, and at the base of the brain, and hence the assumption of the term "granular meningitis." This however was no new discovery, for in 1632, Thomas Willis in his work "De Anima Brutorum" alludes to those granules in the following terms: "Res minus a phlegmonoe et abscessu, quam ad lupus, modi meninginis, cordis et tuberculis.
Tuberculosis

acon quorum capulaginae cellularis
et incurrabiles orientur" thus,
clearly proving that he was aware
of their existence, but his discovery
had probably been forgotten.
The term "tuberculose or Tubercular
Meningitis" was adopted in 1844
when L. L. Ruffy and Pavine pointed
out the tubercular nature of these
granulations, and further showed
that when they settled in the
membranes of the brain, they were
almost always accompanied by
tuberculosis in other organs.

Up to comparatively recent times
little effort had been made to
separate inflammation of the brain
substance from inflammation of the
membranes, but all case in which
Spasms of the limbs occurred were
attributed to cerebritis, and those
in which delirium took place to
meningitis. Trouseau pointed out
that meningitis is generally
generally accompanied by a certain amount of asthma, or inflammation of the substance of the brain, and hence arose the name "Tubercular meningitis cerebri" which seems to me to be the most comprehensive term we can adopt.

The division of the malady into two classes, viz., one in which tubercles were present, and the other in which they were absent, first began to attract attention at the commencement of the present century, when Hoffmannstein in 1802 wrote on the subject. Guérin also in 1827 showed that he was cognizant with the two varieties, but it was not until 1852 that the matter was finally put at rest both from a clinical and pathological point of view by Pilet and Barthelé's "Traité sur la Tuberculose infantile." They showed that in simple tuberculous meningitis the effusion of lymph is over
over the vertex, that there is seldom tubercular effusion that it is never accompanied by tubercles in other organs, whereas in the tubercular form, the deposit is chiefly at the base, tubercular effusion occurs, and tubercles always exist in other organs.

Since the time of Billiet and Martin, the existence of the two varieties has been pretty generally recognised by all writers on the subject, although the relative frequency of the two forms has given rise to some discussion, some averring that the one variety and some that the other is the more frequent.

I think, however, that the weight of evidence all goes to prove that tubercular leucæma corditis is indeed the commoner affection.

Before concluding this part of our subject, I would like to allude to the condition known as "chronic
"Chronic Hydrocephalus". Here again we see how misleading is the term hydrocephalus, when applied to meningitis.

By making use of the same term for these two conditions, we are naturally led to believe that they are two forms of the same disease, only differing in intensity. When in truth they bear no relation to one another.

Acute meningitis is essentially an inflammatory disease, being an inflammation of the membrane of the brain, in the same manner as pleurisy is an inflammation of the lining membrane of the lung, and though it may be accompanied by ventricular effusion, this is by no means essential.

Again acute meningitis may be either to be spoken of acute or chronic, lasting in the one case
Case

only a few days, and in the other several weeks.
Chronie Hydrocephalus on the other hand is analogous to ascites, and in it the effusion of fluid into the ventricles is the main feature.
It arises from any condition impeding the flow of blood from the brain, or from an enfeebled circulation in the brain due to an exhausted state of the Sep Epit.
I would therefore suggest that the term "Hydrocephalus" be reserved exclusively for the latter condition, while the term "Meningitis" would apply to the disease in which the meninges themselves were affected.
Pathology and morbid anatomy
In an immense majority of cases, tubercular meningos cerebritis manifests itself chiefly at the base of the brain, and on removing the skull cap the only thing that attracts attention is an unnatural fulness of the vessels, and some streaks of lupus in the sulci at the vertex, differing from simple acute meningitis, whereas the morbid product is present in greater quantity over the surface of the brain. The main features to be noted in post-mortem examinations are:
1st. The changes in the cerebral membranes.
2nd. The deposit of lupus and tubercles at the base.
3rd. The alterations in the brain substance.
4th. The ventricular effusion.
5th. The condition of other organs.
Let us now examine these points in detail, and we shall first refer to the morbid appearance, which are to be met with in the membranes.
membrane.
The dura mater occupying more
the position of the pericaraneous than
of a cerebral membrane, partakes
of the nature of a fibrous apon-
ecrosis, and is the least liable of
the three membranes to be affected.
It is seldom affected, although it
is frequently adherent to the three
epi, and occasionally to the arach-
oid lea, owing to an increased
growth of its connective tissue
elements.
The arachnoid mater is nearly al-
ways glossy on its surface, and
dirty to the touch. Its whole
surface is smooth, generally free
from adhesions, and it is transparent,
unless the disease is complicated
with a true arachnitis, which is
a rare occurrence, when it becomes
opaline. Tubercles are never found
in its middle layers.
The pia mater is gorged with
blood, and is closely adherent to
to
the surface of the brain, and on
trying to separate it we tear out
little pieces of the brain tissue along
with it. In this it differs from
a simple meningitis, where the
pia mater can always be easily
stripped from the brain substance.
At the bottom of the sulci, and of
the fissure of Sylvius, the membrane
is thickened, of a fibrous consistence,
difficult to tear, and adhering
Closely to the vessel walls, it sur-
dounds, and to the brain substance.
It is in these situations, and also
at the base, that we find the
deposit of tubercles, and lymph in
the vessels, of the pia mater.
The convolutions of the surface are
either depressed or obliterated, ac-
tording to the amount of fluid in
the ventricles. If the effusion be at
all considerable it distends the
ventricles, and forces the brain
substance forming their roofs against
against
the cranium, and thus cause the
convolutions to become effaced.
The same effect according to
Quaront, may be brought about
in cases in which there is great
cerebral stercoraneous, independent
of the ventricular effusion.
The tubercles are situated in the
walls of the pia mater, and are
to be found in greatest number
at the bottom of the fissure of
Lytton, and in the sub-arachnoid
space at the base of the brain, ex-
tending from the optic commissa-
ture to the medulla oblongata.
They are however by no means
entirely confined to those situations,
for I have frequently seen accumu-
lations of them along the side
of the great longitudinal fissure,
and also, though in smaller
numbers, lying at the bottom of
the sulci on the surface.
There are two varieties of these
these
granulations, the one kind being
large, of a greyish color, and
resembling grains of sand, hence
called "sand grain granulations.
The other varieties are the true tub-
circular granulations, and are
smaller, being about the size of a
pin's head, of a somewhat firm
consistence, and white or color.
Later they become softer, breaking
down easily, and assume a yellow-
ish tint, owing to their having
undergone a casrous transformation.
Robin altogether denies the tuber-
cular character of these granulations,
and declares that they are merely
fibro-plastic formations, or compos-
et of amorphous matter.
While admitting that many of
the larger granulations are mere-
ly overgrowths of the tissue elements,
composed of some granular amor-
opre cells, and some osteoblasts, sur-
rounding a central capillary, and
and

Having no true organised lining, I am prepared to assert that after frequent microscopical examination of these granulations, I have never failed to discover some of them, bearing all the characters of the true tubercular corpuscle, and having in their centre a large multinucleated cell. No doubt these cells are frequently very indistinct, and in many of the granulations I have failed to discover them, but this was probably due to their having undergone a caseous tissue formation.

Apart however from microscopical examination, we are led to the conclusion that they are of tubercular origin, when we recollect that in every case in which we find these granulations, tubercles are also to be found in other parts of the body, especially in the lungs, and in the bronchial glands, and in many cases large tubercular nodules are
are

to be found in the brain substance itself, natural inference would lead us to the belief that they were of a tubercular character, bearing as they do, to close resemblance to the tubercles found in other organs. Further their position, lying as they invariably do along the course of the vessel, would tend to strengthen this belief, when we remember the close relation which exists between the lymphatics and the vessels of the brain, forming as they do their periarterial sheaths, and it is probable that these inflammatory products, or tubercle, owe their origin to infective material carried by the lymphatic vessels from some caseous mass, situated either in the lungs, bronchial glands, or in the brain substance itself.
itself.

From the foregoing it will be seen that I consider the tubercles, the starting point of the inflammation of the membranes.

Irouseau says: "Tubercles are produced in the membrane, as the result of frequent congestion, in the same way as bronchopulmonary pneumonia is developed, and to retrogressive change in the inflammatory deposit." My opinion is that the granulations in the meshes of the pia mater, at first press on the vessels which they surround, impeding the current of the blood which they contain and as they increase in size, that they altogether obliterate the lumen of the capillaries. This throws the stress of the circulation on the collateral vessels, and the pia mater, in which they are distributed becomes...
intensely hyperaemic. This is
soon followed by an escape of the
liquor lanae and blood
corpuscles, accompanied by a cer-
tain amount of proliferation
of the cells of the membrane itself
which forms a false membrane
composed of plastic lymph.
The lymph is of course found in
the same situations as the gran-
ulations, viz. in the Tissue of
Rhinos, and at the base of the
brain, in the subarachnoid space,
obliterating the depressions and
convolutions. It extends from
the optic commissure, over the
pons varolii, frequently cover-
ing the cerebellum and its
peduncle, uniting together the
tissues between the cerebellum
and the medulla oblongata, and
involution most of the cranial
nerves. Frequently it extends a
considerable distance along the
the
Spinal cord, Byrom Brauer observed
nearer than is generally supposed
and say, that though it may
not be visible to the naked
eye, it is frequently evident under
the microscope, and that here
also there is a commenceing de-
posit of tubercles around the
base. In one case which I had
under my charge, almost the
whole cord was imbedded in
lymph, for on lifting up the
membrane, and cutting into the
cord, about 1/8 of an inch of lymph
was found surrounding it.
Some streaks of lymph may
also be found in the sulci or
the ventricles, but rarely in any
quantity. Turning now from
the membranes, to the substance
of the brain we find that it is
also the seat of pathological
changes.
changes.
On cutting into it, substance we
find that it is more vascular
than usual, of a brighter color,
and picked out with red points,
and usually somewhat softened.
The parts most affected by this
softening are the fornix, septum
lucidum, and optic thalami,
which are sometimes of a pale
color, owing to pressure of the fluid
in the ventricles, preventing the free
circulation of blood through
them. They are of a less firm
consistence, sometimes even being
semi-fluid. One cause of this
softening is to be found in the
spread of the inflammation
along the pia mater, through the
great transverse fissure to the
bulla interpositum, which be-
come infiltrated with lymph
and blocks the veins of Gasseri,
causing congestion of the surround-
ing tissue, or the same effect.
effect
may be brought about by a
little plaque of lymph, situated
at the point where the veins
of Green enter the straight sinus,
while not denying that this
is a frequent cause of the inflam-
mation, and consequent softening
of the brain substance, I am in-
clined to believe that it is
just as frequently, if not more
so, caused by a development of
tubercles round the vessels in the
brain substance coincidently with
or even before they are deposited
in the membranes. This view is
strengthened by the fact that we
often find large tubercular mas-
ses in the brain substance which are
merely aggregations of minute
tubercles. From their size, and also
from the amount of retrogressive
change which they have undergone,
as well as from their sometimes
giving evidence of their presence.
presence
by symptoms long before any of the characteristic meningitic
symptoms appear, they are evidently of earlier formation than the
deposit in the membrane, and as I have already attempted to
prove, are sometimes the starting point of the meningitic.
If this be true of these larger circumference lesions, we can
take it for granted that the
same is true with regard to the
smaller disseminated tubercles,
as the larger, are merely aggrega-
tions of the smaller.
It thus appears to me, that fre-
quently the central change pre-
cedes the inflammation of the
membrane, and regard the
pathological change in the brain
substance as important if not
more so, than the eosin, met
with in the meningitis, and hence
the name which have adopted
adopted for the insane.

The anterior portions of the brain are little affected by these changes, their chief seat being the posterior part of its substance. The walls of the ventricles are generally softened and inflamed, and their lining membrane loses its transparency, becoming tougher and thicker, and in long continued cases of a bloody, fibrous consistency, owing to a deposit of organised lymph on its surface. Sometimes, however, the lining membrane is completely broken down, and the septum lucidum between the two ventricles destroyed.

The amount of fluid in the ventricles varies greatly, and as a rule the longer the duration of the disease, the greater will be the amount of fluid. In one case of a very rapid type, lasting only
four or five days, which I attended, not a trace of fluid was to be found in the ventricles at the autopsy, although all the other post mortem appearances of tubercular meningitis cerebritis were present. The fluid is contained in the lateral, the third, and fourth ventricles, and measure from two, to twelve ounces. It is clear, of a greyish color, and very rarely turbid, but if it be so, there is according to Guerard inflammation of the choroid plexus. Schmidt made an analysis of the fluid, and found the chlorine reaction alkaline, and that there were only trace of albumen present. He found that the fluid secreted by the pia matter, and the arachnoid matter were the same as that secreted by other serous membranes, whereas, that secreted by the choroid plexus contained more
more

salts of Potassium and Phos plume.

Pokitausky believe that an being
secreted the fluid is turbid, but that
owing to certain of the elements
having separated, and fallen to the
bottom as a granular sediment, the
upper part is left clear.

This sediment is easily overlooked
owing to the resemblance it bears
to the part on which it rests, viz.,
the optic chiasma, the of
Corpus striatum, and the posterior
Corona of the lateral ventricles.

It consists of the elements of fibrous
endotine, nucleated cells in various
stages of development, and some
pus cells.

As already mentioned, tubercular
masses are of very common oc-
currence in the substance of the
brain, notwithstanding the assertion
of Louis that they are rare, and
well. In the records of twenty eight
post mortem examinations which
which I have collected, and find that they were present in twelve of them, in the brain substance.

This represents it as occurring much more frequently than is usually stated. As a rule these tubercles lie latent in the brain substance, but they occasionally do give rise to symptoms nearly exclusively over the functions of movement, and as I shall afterwards point out, these symptoms may be of some use in diagnosing the nature of the case, before the membrane are affected. They thus differ from the tubercles in the membrane, which always give rise to serious symptoms, and this is undoubtedly due to the extreme sensibility of the membrane, as soon as they become the seat of any irritation.

These tubercular tumours originate from the fusion of two or more.
more
separate tubercles, and as they increase in size due to the deposition of fat, tubercles on their external aspect, they commence to calcify and break down in the centre. They vary in size from a pea to a hen's egg, and may be found in any part of the brain substance. They are therefore more common in the substance of the cerebellum than in any other situation. It is seldom that calcified tubercles exist, to which I have referred, they were present in eight of these, in one or other cerebellum. They are however rarely single two or more being usually present, where one occurs, and sometimes they are to be met with in great number, but as a rule one is considerably larger than the others. It is seldom that they calcify. Billet 108 occurring only two cases out of thirty-seven, and in the
the record of my case. This condition only existed in one of them, but I suspect that this is due to death generally taking place before they have time to undergo calcareous degeneration, either from the presence of tubercle in other organs, or from their being the origin of tubercula meningoo-cerebritis. They are rarely encapsulated by any fibrous membrane, being simply cases surrounded by softened brain tissue.

The smaller masses generally exist near the surface of the brain, and the larger ones are found deeper down in its substance.

Dr. Papavoline first drew attention to the condition of other organs in tubercular meningoo-cerebritis, and said that the disease was almost invariably accompanied by tubercle in other parts.

Since this time the presence of tubercle in other organs has been
been

universally admitted, and even further it has been stated that if tubercle occur in any part of the body, whether or not they are detected in the brain or meninges, nevertheless the disease is of a tubercular nature.

Guernaut asserts that the bronchial glands are always softened on the lungs tubercular, and that he does not know a single exception to this rule, and his opinion is backed up by Constant and Fabre.

Louis makes the statement that if tubercle occur in any part after puberty it is certain to be found in the lungs, and with emphasis this assertion by saying that it is true with regard to any age, and that it occurs in ninety-nine cases out of a hundred

without going so far as this
I would say that tubercles are present in some part of the body, very generally in the lungs and bronchial glands, but if not present in those situations, that they are invariably found in some of the abdominal organs.

In twenty-five post mortem examinations of which I have preserved the records, and in which an examination of other organs was permitted, I have found that they were tuberculous in the following proportions.

Lungs...19
Spleen...6
Lumbarine glands...10
Kidneys...5
Liver...10
Peritoneum...5
Bronchial glands & intestines...14

In addition to the tubercle, we frequent find some of the organs congested. The gall bladder is usually filled with a dark greenish bile, which accounts for the tarry motions which are passed.
Causes.

In this, as in many other diseases, there seems to be a hereditary tendency, and we frequently find several children of the same family succumbing from this affection. These children are as a rule the offspring of tubercular parents and have previously given signs of their tubercular inheritance, for as has already been stated, tubercles are invariably found in other organs at the post mortem examinations. Hence in this, as in the aforementioned cause, the tubercular disease is the determining or predisposing cause.

The tubercles may lie for a long time latent, but any slight cause which may determine a flow of blood to the brain, may set a light to the fire, already prepared at any moment to be kindled. Thus in speaking of the following as cause, we only use them in this acceptation,
acceptation

remarking always that the
granulations are already deposited,
and would, without any exciting
cause, sooner or later start the in-
flammation, and it is also in this
sense alone that it is to be regarded
as hereditary.

Thus we find the disease sometimes
becoming developed during the
first or second dentitions, at
which time the brain is in a pecul-
arily irritable condition, and ready
to become the seat of local congestion
and during this period we ought to
be on our guard, as the symptoms
are apt to be attributed to teething
alone. It has been often asserted,
on what grounds I am not aware,
that it is very liable to appear after
the disappearance of a longstanding
eczema or impetigo of the scalp,
and if this is the case, it is probably
due to the eruption having weakened
and debilitated the patient's system,
system
which would lead to the quicker development of tubercle. Any over-
section of the brain, such as severe mental work, or too great anxiety
with regard to the preparation of school
lessons, is occasionally the starting point
of the disease. The attention of our
Government has of late been drawn
to this cause, as unfortunately several
children attending Board Schools,
have fallen victims to the disease,
and during their delirium they have
made continual reference to their school
books, and availed great anxiety with
regard to them.
Consoliation and intestinal worms is
frequently regarded as another xciting
cause, probably acting in the same manner
as delirium, and in warm countries,
a powerful foe is assigned to
another reason for the onset of the
heated; it being much commoner during
the warm, than during the cold
months.
Age and Sex.

Tubercular meningitis-cardiosis is essentially a disease of children, for although we do from time to time meet with cases in adults, still the great majority of victims are children.

In eleven years in Scotland there were 9185 deaths from this cause, and of these 8093 were children under five years of age, 1056 between five and twelve, and the remaining 56 cases were above twenty years old.

The following table gives the age of 54 patients suffering from this malady admitted into the Royal Hospital for sick children Edinburgo, from 1873 to 1883.

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<th>Under one year</th>
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<tr>
<td>&quot; nine &quot; ten</td>
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It was at once be seen from the above table, that an immense majority were between the age of two and five. Thirty-four, out of the fifty-four patients, that is more than three fifths, were between these ages.

There were sixteen cases above five years, and only four below two years. No reliance however, if the frequency of the disease below the age of two can be placed on these figures, as it is quite exceptional for a child below that age, to be admitted into this institution.

In referring to other source, I found that it is of comparing rare occurrence during infancy, although most authors cite several cases, generally occurring during teething, but as a rule they seem to be cases of acute meningitis. But of 48 cases reported by Cere, five
five
only were only below one year. In the H. Pictet & Bartlett Record of
mutil. eight cases 39 were below
one year, 51 between one and five
years, 38 between five and ten,
and 4 between ten and fifteen.
Wright also thought it rare in
young children having only one wet
with a single example under one
year.

Sex.

There seems to be little difference
in the susceptibility to be attacked
by the maelony between the two sexes.
Out of the fifty four cases, already
referred to, 32 were boys, and 22 girls.
But these numbers are too small
to be of any statistical value.
Linder collected 209 cases of
"acute hydrocephalus", and found
that 104 were boys, and 105 were
girls.
Symptoms

That the symptoms of tuberculosis meningitis cerebri are varied may be taken for granted, after what has been said with regard to its pathology. Although most cases follow a certain sequence, in the onset and continuation of their symptoms, yet no two are exactly alike through out their whole course, but this may easily be understood when we recall the principal seat of the morbid product, viz., the base of the brain, which is the nervous centre for so many of the important systems of the body, and where the cranial nerves have their roots of origin. In one case a certain set of nerves may be more implicated than in another, thus giving rise to the predominance of different sets of symptoms in the two patients. In some again, the cerebral softening or ventricular effusion may be less pronounced, than we find in others.
and the symptoms arising from their origin to such a condition, undergo a corresponding variation.

Little difficulty is experienced in explaining the cause of many of the symptoms. The irregularities in the respiratory, and circulatory systems, the vomiting, the strabismus, the dilated pupils, and many other symptoms, all owe their origin to the multiplication of the nerves at the base of the brain.

Again the inflammation at the surface of the surface of the brain gives rise to delirium, passing on to unconsciousness, and as the fluid accumulates in the ventricles, coma becomes established. If the brain substance be much softened we may have paraplegia, more generally hemiplegia, due to destruction of the central ganglia, or to the ganglia on one side only.

Many attempts have been made to
to divide the disease into stages, according to the predominance of different symptoms, at different epochs.
From the time of Hippocrates, most authors have divided it into three stages, according to the condition of the pulse. That there are most remarkable modifications in the state of the pulse during the course of the malady, every one who has studied the materia medic, admits, but I think any division founded on one symptom alone is somewhat arbitrary, and if we are to divide it into stages, we should take into account the progression of the united symptoms, instead of relying on one alone, which is always liable to lead us into error, in judging of the advance which the disease has made.
Thus, the centre governing the circulation may be less interfered with, than the nerves or centres governing many of the other symptoms, and if
If we were to rely on the pulse alone we would infer that the disease was in an early stage, whereas many of the other symptoms might indicate a speedy termination. I do not deny that the pulse is of great value, especially as an aid to diagnosis, for if it remain slow, while the fever and delirium continue high, it will aid us greatly in forming an opinion.

The following division, proposed by Eustace Lutin, appears to me to be the best yet brought forward, and I shall therefore adopt it in the following description.

1st Stage. Granulations being deposited in the brain symptoms of tubercular constitution.

2nd Stage. Nerve at base commence to be irritated. Symptoms of rallied activity in parts supplied by these nerves.

activity.

The first or premonitory stage varies greatly, both in the disturbance which it gives rise to, and in its duration. It may be called the chronic stage, during which all the symptoms are latent, in contrast to the acute period which comes on later, and during which the symptoms rapidly grow from bad to worse.

As a rule, the stage of invasion supervenes in a child of tubercular or heropulous constitution, and the meningitis is merely the last stage set in the trajectory of what would otherwise have been a more lengthy, but not less fatal illness. It is very exceptional to find the disease manifesting itself in a child that has not previously shown signs of tubercle in other organs, but according to Charcot Bastian we may have it arising as the first symptom in an otherwise tubercular child, before any other sign has manifested itself. More
usually they have for some time been losing flesh, had slight fever, and cough, or have suffered from some\ngastric derangement, causing probably diarrhoea.
Rickett and Barlow say, that if during this period they die of\nsome other affection, we find on opening the body, no secretion\nof lymph, but simply a deposit of\ngranulations.
There are many signs heralding the approach of meningitis, all of\nwhich need not be present, but when one persists, and does not\nyield to treatment, we should be cautious in giving an opinion.
As a rule chills appear, languid, dull, and pallid, with a vacant, heavy\nexpression, and cannot fix its attention for any length of time on any\nsubject. The character and temper\nundergo singular change, the child\nbecoming cross, petted, and prevalent, and
and
giving way to fits of temper which
is all the more noticeable in a
child that has previously been of
an amiable disposition. It sometime
stops suddenly in the midst of its
play, and runs to its mother in a
pansy of tears. There is little
or no headache, but the complaint
of bright lights and loud noises,
and from time to time experience a
certain amount of dizziness.
At night they may lie with their
eyes half open, are restless, keep
bad, and grind their teeth.
There is generally come fever and
tubercle in other organs, the ap-
petite is poor, and the bowels ir-
regular. During this stage also, we
may have symptoms manifested due
to to the presence of tubercular waste
in the brain, of which mention has
already been made, and which may
lead us to diagnose their presence, and
if any occurs with regard to the pathology.
If the matter be correct, to foretell the probable onset of meningitis, I have observed several cases in which unusual symptoms occurred at this stage, in children who afterward died of tubercular meningo-cerebritis, and at the autopsy their cause was explained by the discovery of tubercular masses situated in the brain substance.

Case I. When first brought under notice the only symptom was strabismus which had lasted some time. The child took meningitis and died, at the post-mortem examination, a tubercular mass was found in the left thalamus.

Case II had been subject for a considerable time to a constant rotatory movement of the head. Meningitis supervened and at the autopsy a tubercular tumour was found in left cerebellum.

Case III. Aphasia gradually developed itself, and the child was almost totally deprived of speech. Some time later meningitis
Meningitis developed itself, and at the post mortem a tubercular mass was found in the left frontal convolution.

Case IV. Suffered for some months previous to the onset of meningitis from severe convulsions. In this case, a tubercular tumour was found in the cerebrum.

Case V. Patient for some months had been becoming unstable in his movements, accompanied by staggering gait, paralysis of left arm. Became successively unable to walk, stand, or sit; ultimately developed meningitis, and died, and at post mortem a tumour the size of a walnut was found below left optic thalamus.

Case VI. The symptoms were tottering gait, unsteadiness in movements of arms, legs, and feet. Right side most affected. Died of tubercular meningitis cerebri, and at autopsy a tubercular tumour was found in the floor of the 4th ventricle.
ventricle.

Many more examples might be quoted, but it would merely be a useless repetition.

This period may last from a few days to some months, and is the most irregular in its duration of all the stages.

As soon as the nerves at the base of the brain commence to be irritated by being pressed upon, then the symptoms of irritation commence.

As a rule this stage is ushered in by vomiting, which is very persistent and unyielding to treatment. This is accompanied by a certain amount of dyspepsia, which is increased by touching the patient, and they now begin to complain of headache, not at first of a severe character, and seem to desire to be left alone.

The intolerance of light complained of in the premonitory stage is intensificed, and causes them to keep their eyes closed, but if the eyelids be
be separated there is generally contraction of the pupils.

The breathing is sometimes hurried, the pulse rapid, the temperature from 99° to 101°, and there may be choric movements of the face.

As the pressure on the cervix increases, the severity of all the symptoms become aggravated. Sometimes, however, at this period a cure occurs, and a diminution of all the symptoms takes place, soon to be followed by an intensity of them. The headache rapidly becomes more violent, and is referred to the crown of the head, sometimes accompanied by pain in the neck and down the back, and the child cries out in pain. The pulse fails to or below the normal, sometimes being as low as forty, or fifty beats per minute, and becomes irregular and intermittent, as does also the respiration. The face flushes, from time to time,
time
and in the intervals may either be of a dusky hue, or deathly pale,
and it is now that the cerebral muscles described by Trouseau
become decided. Convulsions continue till near the end of this period,
when as a rule it suddenly cease, and does not return. The
bowels are obstinately constipated, requiring for their movement
the use of strong purgatives, and when moved very dark,Larry
motions are passed. The abdomen is retracted, the pupils are dilated, but
the contract sluggishly on the application of light, and very often we have
strabismus setting in. They roll
their head from one to the other, seek
at the bed clothes, and toss their
arms about. It is also at this
stage that the hydrocephalic cry
commonly make its appearance.
They sleep little, gnaw their teeth
and chew as though the head
had something in their mouths and towards the end of this stage deliberation generally sets in. If you question them they take a long time to answer, and then only in a monosyllable, merely saying "yes" or "no" and immediately again lapse into indifference and never speak except in answer to questions. They judge distances with difficulty, and seize objects with a trembling hand, and take little notice of anything.

This is the longest stage lasting, as a rule, from six to ten days. From this stage of excitement, they gradually merge into the drowsy and comatose state of the third stage. The headache which has been so severe may now cease, but the delirium continues, alternating with stupor. They appear to be quite blind, the pupils are dilated, and
And

perhaps both eyelids may remain open, but more commonly one is open, and the other closed. In con-
junction with a nutritious secretion, and in some cases, ulceration of the corneal surface. The sense of hearing seems
to be longer preserved than that of sight, but this also in time becomes impaired. The pulse gradu-
ally gets quicker and weaker. Life near death, when it becomes difficult to count. This is ac-
companied by rapid breathing, and a gradual rise of temperature, like a few hours before death, when it commences to rise
more quickly, and at the end
may reach as high as 108°F.
The breath has a most sickening
and offensive smell, the tongue
becomes dry, the mouth aphthous,
a frothy mucus secretion collects
on the lips, there is difficulty in
in swallowing especially liquids, and the fluid runs out of the mouth. The abdomen now becomes distended, but the bowels remain constipated till near the end, when a few loose motions may be passed. The cheeks are brightly flushed, and sometimes retention of urine takes place.

Paralysis frequently supervenes, and may affect either the superior or inferior extremities, but it is more commonly confined to one side of the body. Sometimes one side is paralysed, while the other is very restless, and convulsed from time to time. The convulsions may either be general or local.

In the former case they affect merely portions of the body, such as the the face or extremities, being generally more pronounced in the superior than in the inferior extremities. They are of a very rapid
description, and flexion and extension
follow one another hurriedly, and
are quickly repeated.
In the other type particular groups
of muscles are affected, such as the
extensors of the whole body, and in
this case the convulsions are slower
and more lethargic. Between the con-
vulsions there is generally a degree
of rigidity of the muscular system,
which is well seen in the hand,
where the thumb is pressed on the
palm, and the fingers firmly clenched
over it, the whole hand being pro-
ducted, and more or less fixed on
the forearm.
In the midst of this distressing state
a very strange amelioration of all
the symptoms sometimes takes place,
which has been called "the lighten-
ing before death," the little patient
regaining consciousness, recognizing
those around him, answering questions
intelligently, and taking down food.
food
Raising the hope in the minds of his parents or friends, that their little one "has got the turn," and is about to be restored to health, the improvement, however, is but transitory, and the dreams of his parents are quickly dispelled, when again in a few hours the commence-ment of the disease, the temperature commences to rise, violent convulsion of the whole body take place, and death closes the sad scene either during a convolution, or due to failure of the heart.

Before concluding a description of the symptoms, let me take a rapid survey of the separate symp-toms, viewed independently of the others, and point out the abnor-malities which occur in it, from the commencement of the malady till the conclusion.
Conclusion.

There is usually a certain amount of disturbance of the circulatory system in the first stage, due no doubt to the tuberculous condition of the other organs, the pulse being faster than normal from 100-120 per minute, but strong and regular.

As the nerves commence to be irritated, it becomes intermittent and irregular, and sinks below the normal, sometimes as low as 40 or 50 beats in a minute. In the third stage it again rises, becoming weak and rapid, and towards the end can only be counted with difficulty, due to the action of the inhibitory nerve being paralyzed.

There has been considerable discussion with regard to the cerebral medulla first described by Brodie. If the finger nail be lightly drawn across the skin, it is followed almost immediately by a deep blush over the part thus irritated, which quickly deepens in color,
Color

and spreads over the skin adjoining the involved part, lasting a consider-
able time. It is most readily obtained on the anterior aspect of the thighs, abdo-
men, and face. Bogel places no reliance on it and says that it is by no means peculiar to meningitis and that it is of common occurrence in other febrile conditions. He believes that it is due to the irregularities of the pulse and attendant disturbed course of the circulation. Trouseau explains it as a deep modification of the vascularity of the skin. He admits that it may occur in other diseases, but says that in them it is only occasional, and temporary, whereas in meningitis it is invariable, and continuous from beginning to end. And he denies that it is constant in febrile. So far as have yet been able to judge, I am inclined to agree with Trouseau, as in many of the cases of typhoid fever in which I have
have tried for it, I have failed to obtain it, and when it was present, it was not nearly so pronounced, whereas in rubefaction it has so far found it present in every case where I have examined.

The frequent flushing of the face is another modification of the circulatory system which deserves notice, and is probably due to the stimulation of the sympathetic system.

The temperature is at first normal, or slightly elevated, then rises to 100° or 101°, and at the end of six hours it may be even elevated to 108°. If, however, death be due to failure of the heart, it may fall a degree or two below normal.

The respiration in the first stage may be normal, or slightly hurried, but it becomes slow and irregular in the second stage. There may be one or two hurried respirations, then a slight pause, followed by a deep sighing breath, which is succeeded by a long pause.
<table>
<thead>
<tr>
<th>Date</th>
<th>Pulse</th>
<th>Temperature</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>100</td>
<td>86</td>
<td>Faintness of right arm, felt pain in right side.</td>
</tr>
<tr>
<td>16</td>
<td>90</td>
<td>98</td>
<td>Face flush, rest, no other symptoms.</td>
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<tr>
<td>26</td>
<td>88</td>
<td>104</td>
<td>Fainting.</td>
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<td>14</td>
<td>104</td>
<td>88</td>
<td>Fainting.</td>
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<td>20</td>
<td>88</td>
<td>104</td>
<td>Fainting.</td>
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<td>22</td>
<td>88</td>
<td>104</td>
<td>Fainting.</td>
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<td>26</td>
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<td>26</td>
<td>88</td>
<td>104</td>
<td>Fainting.</td>
</tr>
</tbody>
</table>

Temperature Fahrenheit Scale:

<table>
<thead>
<tr>
<th>98</th>
<th>100</th>
<th>102</th>
<th>104</th>
<th>106</th>
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Temperature Centigrade Scale:

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<tr>
<th>38</th>
<th>39</th>
<th>40</th>
<th>41</th>
<th>42</th>
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pauses lasting from twelve to fifteen seconds, and then again one or two rapid respirations, and so on. Trouseau records a case in which the long pause lasted 57 seconds. In the third stage the breathing is rapid but regular till the end when it becomes stertorous and rattling.

The accompanying chart from a well-marked case, displays some of the abnormalities to which we have referred, and calls for no comment. The tongue is at first moist and coated, and then becomes dry, and coarse, accumulate in the mouth, and a frothy, mucous secretion gathers on the lips. Bowing up is a pretty constant symptom. It was only absent in four out of the twenty-eight records of cases which have been collected. It usually marks the first day of the disease, and lasts till the end of the second stage, when it suddenly ceases, and rarely returns.
again. The stomatae seem with very little peristaltic action simply to reject all food, especially liquids, as there is very little itching, and merely a few minute fuls of fluid thrown up when swallowed, or when the patient sits up.

Constipation is always present, except when the disease is complicated with tubercular ulceration of the intestines, in which case diarrhea occurs. It is exceedingly obstinate and requires careful persistence to overcome it, and when the stools are passed they are dark and tarry, probably due to the dark color of the bile found in the gall bladder. The bowels sometimes undergo violent contractions, and even cases have been found in which intussusception had taken place. The shape of the abdomen is another patent giveaway sign. Early in the disease it is boat-shaped, owing to the contractions of the
the abdominal muscles, while later on it becomes distended, due to the muscles having become paralyzed, and simply overlying the intestines, which are filled with gas.

Hyperesthesia is almost constant in an early stage, and the patient shudders when touched, but as the fluid accumulates in the ventricles complete absence of sensation ensues.

The headache generally sets in along with the vomiting, and soon becomes very severe and unbearable. It is usually confined to the forehead, sometimes in one temple only, and very rarely at the back. It continues after delirium lets in, indicating intra-cranial inflammation, and causes them to cry out.

The hydroceplastic cry was first described by Coinnet of Geneva, and is another very characteristic sign. It is a short, heartrending scream, and when once heard
heard
it cannot well be mistaken. It
may occur in either the first, second,
or third stage of the disease, and is
one of the most painful features
of the malady to those watching the
patient.
The pupils at the beginning of the
illness are contracted, but this
state is very transitory, as they
soon commence to dilate, and
continue dilated till the end.
At first they contract on the ap-
lication of light, but later on
this seems to have no effect on
them. They are often irregularly
and unequally dilated, and the
eyelids are paralyzed. Due to this,
and also to the implication of
the trophic fibres of the 5th nerve,
a mucous secretion occurs from
the lacrimal gland, and covers
the conjunctiva, and occasionally
there is ulceration of the cornea.
Strabismus is another common
accompaniment of the disease. Bracket says, that dilated pupils may contract on the application of light, and after a minute or so they will again dilate, and continue dilated, though they are submitted to a stronger light than before.

Convulsions precede paralysis and may either be general or local. Drayfoot believes, that many of the convulsive attitude which occur in the disease, such as the rotation of the head, and the position into which the upper and lower extremities are thrown during the convulsion, are due to irritation of the Pons Varolii, and he supports his theory by many experiments which he has performed on animals. Convulsions appear as a rule at the end of the second stage. In the majority of my cases, regular convulsions
Convulsive
first occurred from the ninth to the thirteenth day, although previous muscular twitchings were common enough.
Paralysis appears to shift from side to side, but this is more apparent than real, as one side of the body may be noticed one day to be slightly paralyzed, and the next day paralysis of the other side makes its appearance, while the side first affected seems improved. In reality, however, this is not the case, as the paralysis still continues on the side first affected, though it may not be so noticeable owing to the intensified paralysis of the other side.
Duration

The duration of tubercular meningitis cænuerae is very variable, some cases running a rapid and acute course, while others again are slow and chronic. As a rule, the disease is of longer duration than simple meningitis, but this rule is not without exceptions, for as I have already mentioned, Iattur and a case in which no symptoms of any kind manifest themselves, like four or five days before death, but in this patient the convulsions were exceedingly violent.

The average duration is between two and three weeks, Ribbert and Bartle giving it at 22 days, and last at 20 days, but we sometimes meet with cases lasting much longer. In twenty-eight reports of cases which I have collected, the average duration was 19 days. In eight cases death took place before two weeks, while sixteen died between the 14th and 21st day, and the remainder lived beyond the third week. Guernay gives the duration of 117 cases as follows, 80 died in 14 days, 31 in 20 days, and 6 lived beyond 20 days.
Diagnosis.

The diagnosis of a fully developed case of tubercular meningitis cerebri is as a rule a simple matter, and a mistake seldom occurs when it has advanced to the second or third stage.

Unfortunately it is far otherwise in the early stages, at the very period when treatment to be of any service must be promptly and energetically employed. There are few diseases requiring a greater strictness of diagnosis on the part of the physician, than that now under consideration.

The difficulty are almost insurmountable, and it is universally admitted that an early diagnosis is best with every obstacle and hindrance. The malady is so exceedingly insidious in its commencement, and we must further recollect, that the presence of tubercle in other organs leads to direct special attention to them, at the very time when the granulations are being deposited...
deposited
in the pig water, so that it frequently
by happens, that we have not sus-
ppected the onset of the disease, till
we find ourselves face to face with
it in a somewhat advanced stage.
It is thus necessary to employ the
greatest care and discrimination
in the treatment of tubercular chil-
dren, who evince any symptoms,
which may in the least degree
lead us to suspect cerebral mischief.
We are sometimes, however, apt to
err in the other direction by diag-
nosing cases of fever and other
ailments, for tubercular meningop-
cerebritis, so that any clue which
may aid in the solution of this
problem must be most welcome.
I think such an aid has been de-
fined to us by Boulelib's discovery
of the value of ophthalmoscopic
examinations in such doubtful cases.
Although I am not sufficiently
expert in the use of this instrument,
As I have said, a sufficient number of cases to make any testimony of any value, none in those which I have examined, have generally been able to detect the presence of some of the changes to which he refers. The most common marked appearances are, marked hyperemia of the retinal vessels, which are swollen and tortuous, and accompanied as a rule by optic neuritis. These changes are, of course, more evident, the nearer the inflammation or deposit of lymph is to the anterior surface of the base of the brain, in the neighbourhood of the cavernous sinuses, or optic nerve.

Bouret in his description classed the intraocular changes which are to be met with, under the three following heads.

1st. Changes in the circulation —
- Congestion of the papilla and dilatation of the retinal veins.
2nd Lesions of secretion — Adeum of Retina
3rd Lesions of nutrition — Granulation and white spots on the retina. Abscess of the papilla. Tubercle in the choroid.

He only failed to find these conditions in three out of eighty-six cases, and thinks that many of them may be seen early, before any of the symptoms indicative of the disease arise, and that treatment may be of service.

Clifford Allbutt, who has made similar investigative, arrives at the same conclusions, but thinks that the changes vary according to the part pressed upon by the affection. Thus, according as the cavernous sinus, the optic nerve, or its sheaths are involved, we find respectively, oedema, ischaemia, optic neuritis, and optic pachymeningitis, and these conditions are generally followed by atrophy.

He found these changes in every one of the 25 cases which he examined and he believes that many idiots.
in whose eye above changes are present, have been the victims of a mild attack of tubercular meningitis, or of a simple meningitis.

Charlton Bastian, who has made a microscopic examination of the blood of patients suffering from this malady, states that he has found the following conditions:

1st. The white blood corpuscles are more numerous than usual, and especially those cells of amoeboid movement, by the development of vacuoles within them, and by projections from their surface.

2nd. Groups of protoplasminic materials are also to be found scattered amongst them, as well as emaciated pigment granules.

3rd. The red blood corpuscles do not seem to form definite rouleaux.

He further remarks that these conditions do not occur in other cerebral affections nor in typhoid fever.
fever.
If further investigations bear out the truth of these statements, we have another aid in the diagnosis of the malady. Should either of the foregoing conditions exist, and be accompanied by headache, vomiting, intolerance of light, heaviness of respiration, or any of the other initial symptoms already mentioned, I think we are justified in regarding the case as one of tubercular meningitis cerebri.
When the disease has advanced as far as the second stage, should there be a continuance of these symptoms, accompanied by a face of the pulse, irregular respiration, and retracted abdomen, while the fever and delirium continue, no doubt can longer be entertained as to the nature of the malady.
We shall now consider the diseases which most closely simulate tubercular meningitis cerebri, and which
which
are most generally confounded with
it, and we shall attempt to show
in what particulars they differ
from one ano some.
Typhoid fever is undoubtedly the
disease which is most usually mis
taken for it, and in many partic-
ulars they very closely resemble one
another during their onset.

Have again and again seen cases,
sent into hospitals, which had been
diagnosed as typhoid and which
eventually proved to be tubercular
meningo cerebritis.
The points of difference were best
be displayed by constructing two
tables under the headings of typhoid
and tuberculous meningitis cerebritis.

I. These names.
I. Rare under five years. I. Most usual under five
II. Headache not so II. Headache is intense
severe and cease, and does not cease on the
when delirium sets in

supervision of delirium
Typhoid Fever

III. Theophile almost always does not have intraocular changes.
IV. Patient does not object to be touched, and seems to be satisfied.
V. Patient cries when touched, is feverish, and questions of what is wanted.
VI. Patient is examined and usually asks to see the doctor in the examination.
VII. Cerebral menses are present from beginning but not always to end. They are invariable and persistent.
VIII. Bounding is uncommon but if it occurs, it only lasts a short time.
IX. Pulse is weak and rapid.
X. Respiration is hurried but regular.
XI. There is great thirst all through the illness.
XII. Temperature is high and characteristic.

Tuberculosis

I. There are marked changes.
II. Patient does not object to be touched.
III. Patient cries when touched, is feverish, and questions of what is wanted.
IV. Patient is examined and usually asks to see the doctor in the examination.
V. Cerebral menses are present from beginning but not always to end. They are invariable and persistent.
VI. Bounding is uncommon but if it occurs, it only lasts a short time.
VII. Pulse is very irregular.
VIII. Respiration is quick and irregular.
IX. There is little thirst even when fever is high.
X. Temperature is rarely much above normal.
XI. Bowel movements are watery.
Gastric catarrh may occasionally simulate meningitis, commencing as it does with fever, vomiting, constipation,
toulation
and headache, but as a rule the
expression is less anxious, the
symptoms are neither so severe
or persistent, and they yield quick
er to treatment.
Cerebral tumours sometimes give
rise to symptom, which may
be mistaken for meningitis, but
usually the onset of symptom
is sudden, and we have frequently
beforehand had evidence of their
presence by the occurrence of some
persistent symptom.
It seldom commences with vomiting
or constipation, nor is there the
same acute anxious expression, char-
acteristic of tuberculosis meningitis.
More usually it begins with violent
frequent, and long continued convul-
sions, and if the patient does not
immediately succumb to these, par-
alysis is generally ensuing.
Lastly we have to distinguish be-
tween Encephal and tubercular
Tubercular meningitis

In the tubercular form there are
premonitory signs, the commencement
is insidious, the symptoms
do not to rapidly assume a
severe form type, and the illness
lasts from one to three weeks;
whereas in the acute form,
the illness commences suddenly,
frequently by convulsions, with-
out prodromata, in a child
that has previously been healthy.
This is followed by severe head
ache, and violent delirium.
and the
duration of the malady varies
from three to six days.

L.L. Rilliet & Barthéz draw
drew a complete picture of
the diagnostic signs separating
the two diseases. That I can
not do better than append
their description, and here again
Isaac makes use of a tubular
form.
Simple meningitis

I. Phrenomena of debut

Headache intense
Agitation and delirium
Severe, and accompan-
ied by acute crisis, pre-
ceded or followed by
prolonged delirium.

II. Appearance of malady is trifling

III. Commencement gradual

IV. Progress rapid. Ag-

Gravation progressive

V. Duration may be pro-

longed from 4 to 40

days.

Subjective

I. Phrenomena of debut

Headache intense
Agitation and delirium
Severe, and accompa-
ied by acute crisis, pre-
ceded or followed by
prolonged delirium.

II. Appearance of malady is trifling

III. Commencement sudden

IV. Progress rapid. Ag-

Gravation progressive

V. Duration. Death may take place in 24 hours. Rarely, prolonged beyond the 4th day.
Prognosis.

There are few diseases in the whole history of medicine that present a poorer prognosis to a medical man, than tubercular meningitis cerebritis, and in no other disease can we more readily pronounce all remedies, as useless, lawyer naming, it the immediate victim, author after author has the same melancholy admission to make, and case after case bears out the sad truth that the malady is hopeless, and that death invariably comes as a welcome relief to the sufferer.

Occasionally, we find high isolated cases of cure reported from reliable sources, but these cases are of so very rare occurrence, as almost to verify our statement, by acting as the exception which proves the rule.

So seldom is this happy result arrived at that these cases are invariably reported, and when we view the exceedingly small numbe, which are to be found scattered through our
Our medical literature seems to have almost come to the conclusion that in these cases we are powerless to act, and that we must merely stand by, following the plan adopted at l'Hôpital de l'Enfant Jésus in Paris, where so many cases once diagnosed were left to their fate, treatment being abandoned, having been found quite useless.

In making the above statement, I only refer to fully developed cases, for I repeat that there may be many in which the disease is arrested during the stage in which the granulations are being deposited, owing to a check being put on the free formation of tubercle, by suitable treatment, but fortunately this is unexpletable of proof, from the very fact of a cure being established.

Some authors it is true take a very different view of the matter, chief amongst them being Duran, who in his "Theory of Medicine" says that he finds it quite as satisfactory as any other physicians...
disease and its effects. This is done by recognizing the disease early, and treating it with anti-typhoid medicines. This statement cannot, however, be seriously entertained, for it is just at the very time when it is impossible to diagnose it from other tubercular affections, that he discovers it, and at best, it is but a theory which he does not confirm.

Amongst others holding similar opinions are Clifford Allbutt, Hallw. Göös, Steer, and Fonney, all of whom assert that the disease is frequently cured. Clifford Allbutt thinks that it does not always occur in a severe form, but that there are many mild cases which deceive. Some of opinion that those who record too many successful cases must be mistaken in their diagnosis, and confound cases of acute typhoid meningitis and typhoid fever with tubercular meningitis cerebralis. I believe that Guerant is nearer the truth in saying that it may occur wholly be cured in the first stage, but that the diagnosis
diagnosis
is then always doubtful. In the second stage one escapes out of a hundred, and perhaps
one of the same trouble later; and that in the
third stage recovery is impossible.
Rilliet and Barthé only record one case of
true which died later of the same affection.
Trousseau had two cases of recovery, and
in one of them he had afterwards an oppor-
tunity of verifying his diagnosis. He
had tried every line of treatment, and failed
with all, and he believed that his two
successful cases, owed their recovery to
nature, and not to art. Vogel had one
case which could not be saved, but the died of same disease later.
After statements such as these statisties
are hardly needed, but I append the results
in the 54 cases, treated at the Edinburg
Dicks Children's Hospital, to which I have
already referred.
50 cases died in hospital, 3 were removed
after diagnosis was made, 1 cured.
In this case of cure a query is put after
the diagnosis in "the Register" showing that
the case was doubtful.
Treatment.

From what has already been said, with regard to prognosis little requires to be added under the heading of treatment.

Remembering the complete hopelessness of the disease once fully developed, our single and only must be in a prophylactic line of treatment. If a case be of a chronic nature, leave tubercular parents, or if any of the same family have already succumbed to the malady, we should be on our guard, and while putting the child under a strict antituberculous regimen, we should on the very slightest indication heralding the onset of the initial stage, add to these every resource which we possess to prevent the onward march of this dire and terrible malady.

By placing such a child in the most favorable circumstances, surrounding it with an abundance of fresh air, supplying a plain and nutritious diet, and combining with
with
these cod liver oil and the leptin of the
iodine of iron, we may hope to prevent the
further development and dissemination of tuberculosis
in such children. Everything that may tend in
the least degree to give rise to cerebral congestion
should be avoided, and the very slightest
suspected cause, while in an otherwise
healthy child might with impunity be overlook-
ed. In them, in them, be jealously guarded against
this ascension, constipation, and intestinal
complaints, which by their irritation tend to
cause cerebral disturbance should receive
careful attention, and be immediately treated
even on its own separate lines. All mental
work, both at home, school, or any other
place, ought to be of the very lightest description and
the parents should be cautioned against allow-
ing the child to exert or over-fatigue itself
during play or in any other manner.
Should the symptoms lead us to suspect the
onset of meningitis, even though our diagnosis
be incorrect, we can do no harm by giving
the child the bromide and iodide of potash, keep-
ing it entirely at rest, and regulating the bowels.
lows, if they be constipated, by enemas, colonic being in any opinion of too depressing a nature to be used for this purpose.

Once the disease has become established, believe that no curative treatment is of any service, and our indication for treatment must now lie in the relief of the more alarming symptoms, as far as lies in our power.

Trousseau says that our only object in persevering in treatment is for the sake of the friends, of the elixir, so that they may have the consolation after death that no stone was left untried, and that every remedy that art could suggest had been adopted.

The bromide of potash, however, I think be continued to the end, as it undoubtedly tends to check the convulsions, quiet the uneasiness, cause the little sufferer to be less restless.
Restless

leeches, blistering and blood letting only tend to increase the discomfort of
the patient, and would, I think, be dispensed with, and I would rather be
inclined to alleviate the distress by
small doses of opium, than adopt
such measures.

It would, I think, be of little use to
tally rate all the remedies which
have been used at different times
in this disease, suffice it to say,
that nearly every drug contained
in the Pharmacopoeia has at one
time or another been tried, and
then having been found of no
avail, has been condemned as
useless.