Chronic Hydrocephalus.

In writing on this subject I thought it would be desirable to refer a little to its early history and have come to the conclusion after having examined various literature that the disease known to us as chronic hydrocephalus was little known to the ancient physicians; the term used no doubt applied to accumulations of fluid outside the cranium. But Celsus in his (De Mensa inst. cap. ii) under the head "Cephalae" has been translated as referring to hydrocephalus, but it is doubtful whether he meant cellular oedema (aneurysm) of the integuments of the head, or internal dropsy.

The Greeks called the disease "Ophelene" and Hippocrates in speaking of the maladies which arise from the head notices one which has a marked resemblance to the symptoms of the acute form of the disease, and at the same time designates water on the Brain (εἴδη τό εγκεφάλον) as its cause. (Alkiviadis lib ii cap. 56: And in London) Rhazes mentions in his book of diseases of children that the head sometimes acquires an increase bulk owing to the collection of fluid within the cranium.
and at a much later date, the chronic form of this malady was described nearly a century before any notice was directed to its acute state. A case is recorded of a remarkable hydrocephalus by Mr. James Moir, Surgeon at Lumphanan in 1782 (in Med. Sang. Scot., vol. iii p. 304) in which the head was 27½ inches in circumference also in the same Sang. p. 303 of a hydrocephalus with remarkable symptoms, by Mr. John Paisley, Surgeon in Glasgow, which is very interesting, but is probably identical with the acute form of the disease.

Dr. Dobson of Liverpool, in 1775, observed the disease, (Med. Ann. Regio. Vol. vii) and advocated the use of quicksilver. Multiple and Laller made observations on the character of the fluid. Dr. Cullen was an early writer and he diagnosed the disease from the acute form, but would insist on calling it "apoplexy hydrocephalica." A case in which the acute form was accurately described but considered as one of the few merely was published by Dr. J. Clair in 1773 (in Edinb. Med. Sang., vol. ii p. 287). Dr. Wootton in 1768 wrote on "Observations on the dropsy of the brain" and made many investigations. Having made a most perfect curative sketch of the history of the disease, I shall now proceed to notice the disease congenitally.

The congenital causes of chronic hydrocephalus, however, are not very obvious. They may proceed
from constitutional vice in the parents, particularly
the mother, e.g. phthisis, tuberculous and
poisonous fevers, and violent fits of angina. accord-
ing to J. Franke whatever mortally affects the circulation
in the uterine organs during pregnancy for example
by causing general inanition. Billard in his
(Des Metas des Enfants, hommep.-des Paris, 1830-45) states
injuries affecting the uterum or its contents, violent
concussion of the trunk & suppression of utric in
the mother may be causes. Tanner in his Protruded
Col. p. 383 says it sometimes follows the smallpox,
e.g. scarletina & measles. Dr. West (Aphorism of Children
6th Edit. p. 121) says it is a morbid condition met with
in children at various ages and coming on in a
great variety of circumstances. Dr. Mose, Good of
Philadelphia says it is a disease of debility
and may proceed from a delayed condition
of the absorbers of the Brain. The late Prof.
Gale of Vienna said that Hydrocephalus occurs
more frequently among the children of unmarried
than of married females, and he also relates
that a Physician of Vienna, an ardent admirer
of Brown, allowed his children wine and other
stimulants from their birth, the all rapidly
became emaciated and died with Chronic
Hydrocephalus. J. Breschet hints that the old age
of the father is an influential cause, he also
States that a drunken man of about 60 years of age was married to a young healthy woman. They had three hydrocephalic children. I am of opinion that old age and drunkenness in the mother are causes as well as a family constitutional predisposition, and a pernicious and milkly deaeth, along with organic changes taking place in the placenta and umbilical cord. Boheme and Wegame believe that an hereditary disposition to this disease exists in some children after birth.

The cause of this morbid state is difficult to ascertain, yet in some families the predisposition is without doubt, since the malady occurs in so many of the children in succession. Having succurated many of the congenital cases. The congenital effusions of fluid are found in the ventricle or between the membranes of the brain, and according to Dr. Copland in his "Disp of Man," Tod's congenital hydrocephalus arises at various epochs of fetal existence at the earliest period it interferes more or less with or entirely arrests the brain formation and cranial bones; at a later epoch or that most nearly approaching parturition, the brain
and its involutions may be not merely fully formed co-existent with effusion in the ventricle but even more than usually developed for the period of existence. Whether the fluid effused be in the general cavity of the arachnoid or in the ventricles in considerable quantity, it matters little as ossification is interrupted, and generally towards the future, but occasionally in other parts, and in these situations, the membrane are often protruded to a greater or less extent forming with the scalp a watery tumour, which may be rather scarcely perceptible at birth or very large.

This year (January) I met with a case which I think is a good example of arrested cranial development in foetal life. I was called in to attend a case of labour (multihæmorrh.) on St. Agnes. I found the external parts prepared and the os uteri fully dilated, the bag of membranes protruding which only required the slightest touch to evacuate the lig. Amnii, then I found however instead of the usual cranium a second bag presenting, like the first, but of former resistance, the patient had a few strong pains and a male dead child was born, perfect in every respect except the cranium which was to a great extent misshapen, the distended scalp
and membranes was the second bag which I had felt, the child's head was very much larger than natural, but no other malformation was evident. On section I found the cranial cavity occupied with about 3/4 pint of pale clear serous fluid, and the brain lying at the base of the skull was of small dimensions although the convolutions were considerably developed. I examined the ventricles, but they were very much dilated, but with no appearance of inflammation, the white matter however was much softer than normal, only a female portion of the posterior inferior angles of the parietal bones was ossified and very little of the frontal and temporal bones in front. The occipital seemed more proper ossified. I took the Chorion Placentae home, examined them, found the latter in a fatty degenerated condition which was very evident under the microscope, the umbilical cord was found to be torn. The child had probably been dead winters four or five days. The mother's history showed that she had had miliary symptoms for years back and she had had three miscarriages. The children they have had a decided 3Dens and appearance. Dr. Good of Philadelphia says that miliary phthisis is often connected with a venereal habit and has sometimes resulted in fatal consequences. It is the exception of being intercourse is healthy.
In this case that the arrested development causing Mr. Hyssephalus was probably due to
The combined cause of constitutional atheisis, and
fatty degeneration of the placenta. Goelis of Vienna
stated a circumstance where a mother had big
dead born hydrocephalic children in succession
at the sixth month, and three which became
hydrocephalic after birth. J.P. Frank mentions
also a case of a woman who had seven children
similarly diseased. Dr. West of London states that
a very large proportion of cases of chronic hydrocephalus
occur before birth; the effusion slowly increasing
and expanding the cranium after this period.
Muckle supposed that all cases of the chronic internal
hydrocephalus occur before birth; I agree with
him. I attend annually between 200 to 300 labours and
I think I may safely say that I have met with
two or three cases of the disease; which origination
after birth, having having been quite unable to
trace satisfactorily any of the supposed congenital
causes both constitutional and otherwise to the
production of the disease. Some met with one
of the disease case having talarp varus associated with it, the patient
died in a few at the age of four months. One case which
I delivered two years ago with forceps developed
into hydrocephalus and died at the sixth month. End,
An interesting case of Hydrocephalus occurred at
The Hull General Infirmary - a boy aged 12 was admitted on Feb 17, 1698, his previous history was not very easily obtained. His head had been large all his life. On admission, he was in a comatose state, he was greatly emaciated; his nostrils and upper lip were a mass of black scab. His hair, full of pediculi, he was constantly grooming his teeth, and when awakened, began crying and moaning. His head moved to and fro, his eyes protruding and rolling about, he was put on no nourishing diet and a small dose of calomel giving him every day. His bowels, being very constipated, he seemed to improve for a few days when he gradually got worse and died on the 10th. On making a post-mortem I found

1. Enlarged cranium somewhat thinner than normal, fluid was lodged between the dura mater and cranium; probably from rupture of fine joints of fluid were collected, on removal of the dura mater, which was a little adherent to the brain along the superior longitudinal fissure. The whole column appeared distended and congested on the surface. The convolutions had lost their regularity. The pia mater exhibited opacity and small patches of purulent plethora. Squamation were observable in many places around the vessels, especially in the neighbourhood of the Vena Galeni at the base. The arachnoid membrane was tougher than normal. The lateral ventricles were much distended and
Commenced freely with the third and this with the fourth, the whole forming one general cavity, distended with fluid; the surfaces of the optic thalamic and corpora striata were slightly thickened and hyperemic; the choroid plexuses were also congested as well the brain tissue exhibited the "Prunus Crea" very visibly all over. Then cut into the whole substance of the cerebrum was softer than normal (which might have been partly due to post mortem autolysis in the hydrocephalic fluid). The cerebellum appeared normal not being so soft as the cerebrum. The bronchial glands were normal, the right lung was entirely and firmly adherent to the pleura. The heart was united firmly to the pericardium which formed a fleshy covering and this again was adherent to the diaphragm. The mesenteric glands were not enlarged. The descending colon contained nodules of hardened yellow masses which were very like gall stones in appearance.

The history of this case probably points to this having had when young an attack of acute meningitis from which he recovered. The hydrocephalus acting probably from the chronic epidural compressing the vessels and causing dropy. As far as I could make out, there was no tubercular complication, the lungs, bronchial glands and glands of abdomen being
normal. The pathology of chronic Hydrocephalus appears to be best with a considerable amount of
difficulty, and its domain also includes those
encircumscribed and partial bulging of the vent-
ricular Cavities and of the central canal of the
Spinal Cord which are known as Hydrorachis
and Spina bifida of which disease, I shall not enter
into. But if we enquire into the cause of the effusion
in Hydrocephalus or into the essential nature of
the disease, we must admit that we are ignorant
of having a theory which explains all the
phenomena. When after death we explore the
physical causes of these singular deviations
from the natural figure and bulk of the
cranium, we find that they proceed from the
pressure of accumulated water. The complaint
in fact is manifestly a dropping.
Virchow assigns an inflammation origin to the
process. Dr. West (in his 6th edition of Miasmatics) say
old however, that although inflammation of the
Ventricular lining is as he believes. But by far the
most frequent cause of Chronic Hydrocephalus; there
can be no doubt but that the effusion
of fluid is occasionally a purely passive dropping
due to the accidental pressure of some morbid
growth upon the Vena Galeni, or upon the lateral
Dience. Dr. Edward Simplicius of Bonn University, also
bases his investigation on acute hydrocephalus. As he says, the effusion in Acute Hydrocephalus is due to the interference with the circulation in the choroid plexuses. Whatever be the cause of this interference it suffices to explain the occurrence of effusion; it is our duty then to examine the choroid plexuses in chronic hydrocephalus also in the hope of discovering in them the source and seat of the disease. In the seven post-mortems which I have made during the last four years I have examined the choroids carefully, and I have observed the remarks of Bridgman to be correct in nearly every instance viz. a more or less intense state of hyperemia of the choroid plexuses and under the microscope I have been able to demonstrate the very vascular papilla with their epithelial and endothelial secreting cells which he describes so ably. And from these facts I am greatly in favour of believing that a progressive accretion of fluid in the ventricles of the brain is due to any hyperemia of the plexuses whether active or passive and at the same time believe also that any pressure on the veins Galeni and Cingulate causes the quite sufficient to a cause to account for the equation which produces chronic hydrocephalus and therefore believe that in all cases of chronic hydrocephalus could be brought under two classes—One a kind of decay of the brain from
direct obstruction analogous to ascites from obstruction, the other due to inflammatory changes in the lining of the ventricles and so effusive - corresponding to chronic catarrh of the peritoneum, we should have no difficulty but cases are constantly occurring where no such condition can be traced to account for the increase in ventricular pressure. Chronic hydrocephalus may be defined as an effusion of a liquid fluid in the ventricles of the brain commencing previously to, or soon after birth, frequently with enlargement of the cranium and generally either accompanied by acute symptoms, or supervening gradually, with signs of ataxia. According to the site in which the fluid collects chronic hydrocephalus has been divided into external and internal chronic hydrocephalus; the former term is applied to cases where the fluid is found in the case of the arachnoid the latter, where the fluid accumulates in the ventricles of the brain. The two conditions, however, can exist at the same time, then a diagnosis must be very difficult and I am inclined to think from my own experience of brains that the difference between the two kinds is more apparent than real, as the two conditions are in every respect identical, only that, in the one case the solid brain matter that lies around the ventricles gradually expands as the fluid keeps on
slightly collecting, while in the other case the
commotions which unite the cerebral hemispheres
rupture or are malformed, so that the whole of
the fluid which the continued escapes into the cavity
of the cranium, the ventricles and the arachnoid
are then from one immense cavity.

It is my opinion of great importance to
discover the symptoms associated with the
disease at the very onset, as it can be as slight
as to be entirely overlooked both by the doctor
and nurse—the indication of its commencement
are marked cerebral disturbances, which soon become
apparent. The nervous system becomes unusually
excitable, convulsions vicissiously commence. The
hearing is at first mortally acute. Some of young
child 8 months old under treatment, where between eight
to ten weeks old, its hearing became so mortally acute that any
sudden noise was sufficient to induce convulsions
which were evoked by nothing more than slight
groanings and a rolling of the eyes, and such
leaving nothing but the lower part of the sclerotic
visible. The cornea were covered by the upper eye lid.
The child is now much less sensitive but is dull and stupid.
its eyes are generally red and watery from continuous thing
opening. Yet, muscles have lost their tonicity its appetite
to occur. Hence it need not be touched, but it is much prevalent or it is not uncommon. The brains are
commonly constituted, though sometimes, diarrhea
sets in and lasts, for a day or two. The urine
is often scanty and full of phosphates, sleepiness
or stupor is a common day symptom whilst in
the night as tolerance of light, piercing cries, and sleeplessness
are invariably. The nocturnal symptoms. The
size of the head has been steadily increasing, the
sutures and fontanelle constantly expanding.

The distance from the inferior curved line in the
occipital bone to the root of tongue
was 18.72 inches, whilst the distance from
ear to ear is 16.72 in. The child's head has quite an
angular & square appearance. The veins of the neck
and head have become very blue and visible,
at times the unmodified cranial is tense hot and
fluctuating. The rate relation of the cranial bones
is altered. The os front is assuming perpendicularity.

The eyeballs are becoming very much protruded
owing to the pressure within the cranium, such is the
normal progress of the disease, especially when it has
seemed to have commenced after birth. Another
Case I have under treatment is one having an
immense head, aged ten months. The mother was
on her feet when the child was expelled with great
force on to the bare floor. The child subsequently
had convulsions and four or five weeks after birth.
the disease set in, the parietal bones are quite four
inches apart, the os frontis is almost perpendicular.
The eye lids are generally closed, the child being most of
its time in a semi-comatose condition.
The size of the cranium is sometimes enormous.
Thistle observed a case where the bones of the face
kept pace with the cranium, the face resembling
a granite. Meddel has in his museum the skeleton
of a hydrocephalic fetus of seven months, the horizontal
diameter of whose cranium is sixteen inches, and the
vertical diameter from the occipital bone to the
vertex, fifteen, being a circumference of 48 inches.
The late
Prof. Bennett records a case in his practice of medalion
measuring fifteen inches across the head from ear to ear and eighteen
from the frontal bone to the occipital protuberance.
Dr. David Murr relates a case where the head measured
two feet four inches in circumference.
With regard to the diagnosis of this malady, from the
stupor, hydrocephalus, or Hydrocephalus Disease of Marshall
Hall, in latter we have the fontanelle sunk below the
level of the cranial bones instead of being tense and pulsating.
The duration of the disease varies very much, whether
it commences previous to or after birth, its duration may
last from weeks to numbers of years. Know a case
in one of the principal hotels of this town who is
Hydrocephalic kidnaps 30 years of age an intelligent man, the boy whom I examined at the Lunatic asylum at 12 years of age at least. Hartell, Miller and Gales give instances of patients having lived seventeen years. Another mention, one aged twenty two. Formerly an old friend of mine in practice here, knew a man who died last year at the age of 40. Such hydrocephalic people seem to be carried off more by supervening disease e.g. pneumonia, than the disease itself. Frank gives the history of two men, one 72 years of age, and the other 73 who were hydrocephalic from birth. Showman says even then the disease is stationary for a very long period. There is arrest of mental development, the intellect fades, and this failure generally passes into nearly complete idiocy, and therefore the prognosis with regard to these cases is of the most serious character. The prognosis of the disease is very bad, especially if it be congenital or comes on soon after birth for most likely the disease is then due to arrested development of the Brain. But if this it is either obviously or very doubtfully not congenital and if we see the case early and it be uncomplicated then I believe it often admits of cure. Gales and most writers agree that some advantage accrues from spontaneous elevation and these, particularly those behind
the ears, the discharge giving relief probably in
the same way as the discharge from a chronic
ulcer pleuras the system. If the disease occurs
in those of a bronchial, phthisic or oestrous
character, along with cough and bad respiration
then I think from what I have seen, hardly
any hopes of recovery should be given.

The treatment of chronic hydrocephalus admits
of both internal remedies and of external
mechanical means or of both being employed.

There is a lack of remedies, almost every kind
of surgical appliance and pharmaceutical
having had its trial and it would be an almost
endless task for me to mention their comparative
value. Some cases of this disease we must admit
as being totally incurable for instance those decent
from congenital malformation, and when we
are positively aware of the condition, then we can
do nothing more than use palliative measures.

Then again at birth although having large
heads and ossification of the cranium very deficient,
we must not regard as hopeless and incapable
of treatment. I must say that in the cases I have

shown, I have not found the violent remedies
and rough measures which many of the early
physicians associated were of much use.
A case of hydrocephalus a month old which I attended four years ago did very well under the regimen treatment and strapping with strips of elastic plaster according to Franzee's rules. The mother was phthisical and the father belonged to a rheumatic family. Early experience tends me to confide more in Hesperta than in calomel in treating this disease. Icing was administered every night and morning 1 grain of hydrargyrum. Prolong, for a period of six weeks, the bowels which were irregular soon became more regular. Styphepin came on but not specifically. At the same time I gave 3 g. R. morphina three times a day, when the head seemed hot and hence cooling lotions were applied. The diet consisted of egg and goat milk (the child never had had the breast milk brought up on the bottle) and lime water (3 p. c. Calcis to 3 x of milk). I also directed them to put 1/2 g fresh beef tons correctly pulverized along with two quarter y cold water into a pan and kept at a temperature of 180°F for two days. Two teaspoon full of this was given to the child twice or thrice daily. The child began to improve. The disease appeared to be checked, I thought. However, retin and the Hesperta was left off. The vital powers of the child were reduced to a minimum, and nothing but death was expected. The child however after remaining some day in a state of copro came round and brightened up a little after a fortnight. I small doses of Potassium carbonate were
given, two grains, three times a day and continued for
three months, the mother had orders to give the powders
whenever the bowels became irregular. The child contined
to improve, the head got no larger and as time had
brought with it signs of ossification, it seemed advisable
to leave off the compression on the head
with the plaster, as it removed at which the parents
were not sorry; the head continued to close in, the muscles
became firmer at the end of fourteen months, the
child seemed like other children, the teeth cut through.
In grains without trouble and at present there is no
evidence of any return of the disease. The fluid effused
in this case was probably of smaller amount than in
other cases, but I am convinced that if this treatment had
not been adopted, the child would have died from
pressure or would have soon become a confirmed
hydrocephalic, unless inflammation had supervened
to carry it off, and I believe early treatment in his instance
would have largely to the successful result. Several cases
however which have had during the last three or four
years have not gone on so well, having either died in
fits of convulsions or gradually died from exhaustion of
being carried away by some of the exanthema. Another case
have under treatment at present, and one which is very
similar to the above in its history is being treated with
two grain doses of Chloral Hydrate along with Potumillis.
The case seems to be doing well, the right symptoms having much improved under its use. I was talking
The other day at our Med. Association meeting to my friend Mr. King, he stated that he had given the Chloral
Hydrate in some cases, resulting in considerable amount
of success. With regard to the removal of the fluid,
this too has been recommended from the time of
Hippocrates down to the present time, but it has only
been practised with success until within the
last thirty years. Even at the present day
however opinion is very much divided as to
the propriety of this practice. According to
West out of 56 cases which he subjected to a rigid
analysis; only four were recorded with suf
sufficient accuracy and with a sufficient interval
of time being allowed from the operation as to
warrant admitting them as permanent cures.
But I think that after medical treatment has
been appropriately, sufficiently and successfully
tried, this operation as it is not attended by
any immediate danger, ought to be resorted to
I have removed the fluid from two children
by puncture. The first a male child 12 months
old, had a very large head, but seemingly a
suitable subject for the operation. All previous treatment
being of no avail. Accordingly I punctured the large
tiger needle of Smillie aspirator instead of the
bougie and cannula, which answered admirably.
Into the coronal suture and withdrew seven
ounces of colorless fluid. When strapped the
head round with strips of sticking plaster
and dressed the puncture with the gauge dressing
of Prof. Lecher, the puncture was quite healed in
three days — the operation certainly relieved symptoms.

After a week's interval, I punctured again in the
same way and withdrew the ounces of the same character
of fluid. The child brightened up a little, but died
on the 10th day from the first operation. The total
amount of fluid removed was 176 oz. Round the
membranes inflamed and the brain was soft
and distended into a sac.

This case I operated upon this year, five times.
The case was one in which the other treatment seemed
to do no good. The child, aged 10 months, was operated
on March 3rd, 10 oz. of pale fluid was removed. Head softened
the days after removed (Nebitis) boy and repeated the
wrapping on the 23rd. Again removed 10 oz., and on
March 20th removed boy, reapplying the wrappings
as before. I have not operated on it since as the
parents wished to take it to the ten ride, putting
30 oz. of fluid with画mon. The humor is a small
quantity compared to what he read of in various,
authors. From my own experience and the experience of some of my colleagues I believe that inflammation of the brain and its membranes does not follow the operation in some instances. I believe it experienced in the 2nd operation of my first case, probably the time between the first operation and the second was not long enough. Some years of opinion that not less than an interval of ten days should elapse before the operation is repeated and then not too much fluid should be taken away at once. I found that vector drains were not required on the small amount of air which entered caused no appreciable disturbance. I think it proper to continue the hypodermic and the Potassium lodide along with the Osmal Hypoderm which I am pursuing.

Being fully engaged in practical duties now entering further into the detail of this subject at the same time believe this plea will meet your approbation.

I remain

[Signature]

To Wellington Terrace
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Gentlemen

James McLeay
J. J. nineteenth
M.B. & C.M.