Some points in the Etiology & Symptoms of Cranial & Intracranial Suppuration

by

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By the study of the seven appended cases. many of the salient characteristics of Cranial & Intra-Cranial suppuration are seen to be illustrated, & they moreover demonstrate to a certain extent, what bearing the Exciting cause has on the anatomical site of the lesion; & what effect the lesion has on the ~~Symptoms~~ variation in the Symptoms. These points are still further extended by the use of recent writings, & cases (in which the diagnosis has been verified by Post mortem examination or operation). reported in the current literature since 1883.

The terms Cranial & Intracranial suppuration, are employed in order to include abscesses in the bone, & in the membranes; as well as in the Brain. (true Cerebral abscess)

These seven cases were observed in General (medical & surgical) Hospital practice, during a period, in which about 1500 patients would have been under treatment; & so among general diseases they may be reckoned as more uncommon — only four out of the seven were cases of "true Cerebral abscess", & although above the average proportion, they still show the relative infrequency of these cases. Hilton Fagge. Hutchinson & Quill & Sutton in their several papers on the subject. state that it is a comparatively rare affection. The last in their Essay in Reynolds system of medicine were only able to bring together

4 b cases, & from their investigations conclude the rarity of this affection.

In studying the Etiology of these cases (the 4 appended) occupation, habits of life, & previous history, cannot be said to have had any great effect: As with the Exception of case 5 who had had venereal disease, & case 6 in which the teeth & scars at the angles of the mouth suggested an inherited taint, the history of each one was in every way satisfactory —— As regards occupation there were 2 soldiers (cases 1 & 5) the former had only recently enlisted, & was on home service; the latter had served in Egypt & suffered from the tropical heat, & dysenteria; for which he had been invalided home; case 3 was a schoolboy, & case 4 a domestic servant: evidently surroundings have little direct effect. Although undoubtedly exposure to extreme variations in temperature, would tend more to such diseases; as well as the liability to injury would render the affection more common in some occupations; but why there is the great preponderance of male over female cases, is a question which has attracted the attention of all writers on the subject, but remains unsolved — In these seven cases there were 5 males & 2 females — Gowers gives the ratio of males to females as 3 to 1; & Hilton Fagge found it more common in men & between the ages of 15 & 30 — Newton Pitt

gives the proportion as 4 to 1 – It is easily understood how men are more exposed to traumatic influences, & from this cause it may thus occur more frequently in that sex; but no one appears to be able to explain the fact of suppuration occurring more frequently in men than women as the result of Ear disease; in No cases except those due to injury are primary (Hilton Fagge). with this exception they are secondary to disease in more or less distant parts e.g. suppurative inflammation of the tympanum –

Thus we may classify the cases observed Etiologically as regards the exciting cause, or anatomically according to the seat of the lesion.

For clinical purposes an Etiological division is the more serviceable, & under such divisions, a subdivision mainly depending upon anatomical considerations naturally results –

The three great divisions according to the cause of the abscess are. –

1 Traumatic. arising as result of an injury –

2. Secondary to disease in adjacent or remote parts of the body.

3 Idiopathic in which the cause is undiscoverable. –

The Anatomical divisions likewise form themselves into three main divisions viz.

1 Abscess in the Bone.

2 Abscess in the membranes.

3 Abscess in the various divisions of the Brain.

The Etiological Divisions

1 Abscess due to injury. is one of the commoner causes of these forms of suppuration, & appeared to be the direct exciting cause of two of the cases observed. (1 & 3) — Gull & Sutton give trauma as the commonest, but whether owing to the improved treatment of wounds, as explained by Hilton Fagge. or to more careful examinations in other cases. it is now only second in frequence as an exciter. Gowers gives it as 24 per cent; out of a percentage of 70 for local causes. thus making it a far less frequent cause than Ear disease —— Suppuration may be set up by an injury although no evidence is visible externally, or again there may be a wound implicating the scalp. membranes. & brain. individually or together - There then are. (a) those cases due to injury without an external wound. (b) those due to injury & with an external wound -

(a) Abscess due to an injury without an External wound occurred in case 3 of a schoolboy aged 14. who was struck on the head by the falling of a window sash; symptoms developed next day. the immediate "stunning" &c was considered as trifling, & so slight was the bruise on "the Temple" that it had disappeared in two days after the accident. when he was admitted into the Hospital, death occurring on the abscess bursting into the ventricles. Here there was a case, running an acute course, arising from what appeared

to be a slight injury - no direct cause for the abscess of the Brain could be found at the autopsy - the suppuration in the Brain + that between the tables of the skull having no direct communication - so, was this an injury to the bone setting up inflammation + spreading inwards layer by layer? as Prescott Hewett states is frequent; + injury of the bone has a greater tendency to the formation of an abscess, whether the injury is traumatic or idiopathic, if allowed to become septic from the nose or antrum of Highmore. or was this abscess set up by an injury to the Brain itself? - "interstitial laceration deeply seated below part struck" (Gowers) or contused areas. where there are punctiform ecchymosis which become the seats of inflammatory new formation (macewan). I believe in all probability the injury to the Brain which set up the suppuration; the injury to the bone taking place at the same time, but the main force of the suppurative process was spent on the Brain. Mr Hutchinson considers it rare for abscess to occur after concussion or laceration without an external wound, + thinks that some extravasation is the focus, + that simple concussion is a most rare cause - no trace of extravasation was found. but the suppuration occurring as a cause of the injury to the Brain itself, is quite in accordance with such writers as Prescott Hewett. who gives injuries to the head, however slight, as a cause of suppuration;

but that injuries to the Brain substance itself e.g. contusion laceration is more liable to result in abscess, which are often large & may follow simple concussion — these abscesses may burrow & burst into the ventricle, & be soon fatal, as in case observed, or may discharge through the nose, as in case reported by Dr Yarr (Lancet April 1884) also one by Gillette (Medical Record) — In the cases collected by Gull & Sutton 6 were due to injury & without an External wound — & Fagge thinks that some of these cases are often misinterpreted, & described as Idiopathic, owing to the injury being so slight & so antecedent to the acute symptoms, as to have been overlooked or forgotten; & this he thinks might have been the case in some of Gull & Suttons "Idiopathic" cases & in that of Luke — The difficulty of tracing an abscess to an old injury is frequently enhanced by the abscess occurring in some remote part of the Brain, is rare. but Gowers quotes a case where a fall on the occiput caused an abscess in the Frontal Lobe, & another where a fall on the forehead caused an abscess in the Cerebellum as well as in the Frontal Lobe.

(b) <u>Abscess due to injury & with an External wound.</u>

As in other parts of the body, so in the head, a foreign body entering it may carry with it the septic material causing suppuration, though probably

owing to the improved treatment of wounds, this is a less frequent cause than formerly - as both in the Essays by Gull & Sutton & by Prescott Hewett. it is again as the commonest cause; whereas now a days Ear disease undoubtedly holds that position -

Case 1 illustrates this cause of suppuration. the patient had recently been enlisted as a soldier when he came under observation; 3 years previously, when at a 5th of November celebration, he was accidently wounded in the firing of a pistol loaded with powder & a brown paper wad. which was supposed to have entered the skull & been removed soon after. along with some small pieces of bone, & later on dead bone was discharged during the illness which ensued, & in which the head symptoms' & fever were the prominent manifestations —

The wound healed up, & during the interval between the infliction of the injury & death. he had other attacks, attended with head symptoms, prior to the fatal one - & it is probable from the condition of the abscess found, that one formed soon after the accident. accompanied by symptoms.

The abscess was found encysted & containing in a more recent formation of pus. & this thickening of the enclosing capsule denotes the age of the abscess formation; if recent it is surrounded by inflamed Brain tissue: while if the abscess has

been formed sometime, the pus is enclosed in a cyst, with walls of variable thickness 1/4 inch or more, in an old abscess, with fœtid + green pus (Gull + sutton) In a case read before the Clinical society by de Haviland Hall noted this formation of a cyst varying in thickness according to its age —
In case 1 as observed the attacks subsequent to the initial one were mainly confined to the meninges, the Brain becoming "anchored" (as Macewan describes it) to the skull. + the encysted abscess would act as a foreign body, as well as the surrounding Brain tissue being defectively nourished, would all contribute to the tendency to suppuration on exposure to any exciting cause, such as in this case. the drilling in a large parade ground, only partially protected from the East winds which were prevalent at the time. The first abscess formed was compatable with life; either owing to the ability of the Brain to accomodate itself to its formation, or the abscess implicated only non vital parts — while in the fatal attack with the Brain greatly limited in its accomodating powers, owing to the restrictions of the former adhesions anchoring it to the skull, unable to stand the pressure from the effusion — or else, which is more probable, the vital parts of the Brain became implicated by the second abscess which

were recent & surrounded the primary one -
Injury with a wound is considered a common
of suppuration by all - Mr Holmes found 15
cases of abscess following injury to the head. in
recorded in St Georges Hospital from 1841 to 1857.
& considers that the cause of intracranial suppur-
ation is more commonly a scalp wound with
exposure of the bone, & contusion of the External
table: inflammation of the bone. formation of
a puffy tumour by effusion between the bone &
periosteum. inflammation of diploë & suppuration
between bone & dura mater, & may pass to the
Brain & Ventricles, or to large Nervous sinuses
& cause pyaemia - Mr Gull & Sutton's cases
11 arose from this cause - & Hutchinson considers
that the best marked & more common examples
of Brain abscess are met with in connection
with compound fracture of the Skull -
a peculiarity noticed in case 1 & in other reported
cases, is the long interval that elapses between
the primary injury & the fatal fatal attack -
in this case it was 3 years. & Mr Demar Harrison
treated a case successfully, when the original injury
had been inflicted 11 year before - a Slight injury
having rekindled the symptoms 8 days prior to
admission to the Hospital, as the exposure to cold
& excited the inflammation in case 1 - a
continuance of the cortical lesion leading to a
Chronic Encephalitis (meningeal) ready at any time

to burst out into activity - This latency is not invariable, Macewan noticed one case of compound fracture of the skull where death occurred on the 4th day - though usually symptoms occur a week or longer after the injury, & we must then suspect the gravity of the affection -
Cases of suppuration arising injury to the head are reported by Mr Bowell in the Lancet of april 24th/86 where the injury was met with 12 yrs before death -
Mr St George. Lancet sept 10th/84 - blow on the head with a stone. scalp wound. bone bare -
Mr Macewan. Brit. med. Journal. aug 11th/88.
Dr Steen - Brit. med. Journal. Feby 1st/89 patient struck on forehead 9 wks before death -
Mr Morgan. Brit med Journ. March 9th/89 fall from a height causing a depressed fracture -
Mr Whitcombe. Brit med Journ. March 23/89 Fracture of base.
Mr G. Williamson. Brit med. Journ. Feby 1st/90. struck on forhead by nail 6 mts previously - not unconscious. wound healed - 5 abscesses in frontal region.

2 <u>Abscess consequent upon suppuration in other parts of the body, local or more remote.</u>
is that most frequently met with; Gowers gives the proportion as 40 per cent of all cases - the local causes i.e. the spread of septic inflammation from contiguous parts. e.g. ear. nose. orbit are the commonest - Of remote causes affections of the Lung

(Empyema. Bronchiectasis &c), abscess of the Liver. which are pyæmic or metabolic ~~processes~~. are the ~~the~~ most frequent — Over every cause - Ear disease preponderates — Gull + Sutton + Prescott Hewett place it second to injury; but more recent writers e.g. Gowers. Hutchinson &c give it the first place in frequency - + the cases reported coincide with them — 27 of Gull + Sutton's cases arose from this cause — more than half the cases of cerebral abscess, in the Cerebrum + Cerebellum are, according to Eustace Smith due to disease in the Middle or Internal Ear. Gowers found it in 42·5 per cent of the cases, as a cause; while Mr Barker puts it as 50 per cent — pyæmia being relatively rare in fractures treated antiseptically, it leaves the proportion from Ear disease in the majority — Mr Toynbee records a case following acute Ear disease, this appears to be exceedingly rare — ~~though~~ death may occur from meningitis in recent cases of ear disease (Newton Pitt) + such a case is reported by Prof. Oeglan. when the illness was only of 4 weeks duration, commencing with pain in the Ear. then discharge; at the post mortem examination suppuration over the Right Hemisphere was disclosed — More usually it is the result of chronic suppuration, following on one of the Exanthemata (Scarlet Fever. Measles. Small Pox), cold (Knapp). blow on the head (Eustace Smith) Mastoid suppuration — introduction of foreign body into

the Ear. or removal of a "Polypus"; these latter may originate the acute symptoms in the fatal stage - The Ear disease has as a rule existed for some time, often 'since childhood' - according to Gowers it may exist 5, 10, 15 or even 20 & 25 years before it causes an abscess; for this reason. Hilton Fagge would refuse all candidates for life assurance, who have an Ear discharge, he records a case where the patient lived until 66 with an ear discharge & then died of Cerebral Abscess - an Aural affection starting in early childhood often kills the patient in adult life - the bone is usually diseased, but may be quite healthy - Caries & necrosis occuring more frequently in enfeebled constitutions, E g Scrofulous. phthisical - but the membrana tympani may remain intact, the secretion being retained behind it - more frequently there has been a discharge, which ceases before the onset of severe symptoms, owing to swelling of the internal lining of the Ear & this stoppage setting up the intracranial affection (Macewan), & M^r Toynbee believes that it is only when the free egress of the discharge occurs that the result is fatal. & which again Sir W Dalby attributes to neglect of cleanliness & local treatment of affected Ear - & as Hilton Fagge says the danger is greater when the inflammation assumes a putrid character, & that otorrhœa if long continued always involves a risk of effusion -

the inflammatory action spreading through the thin lamina separating the mastoid cells + dura mater, or inflammation of the bone + septic phlebitis + then abscess of the Brain — It may spread along the veins, the most constant emissary passes through the mastoid foramen + connects the lateral sinus with the posterior auricular — The secondary suppuration thus set up; may occur in (a) in the bone. (b) in the membranes. (c) in the Brain itself. affecting one or more of these at the same time.

(a) Suppuration in the bone depending upon ear disease, was observed in Case 4, in which the ear symptoms had existed during 9 months. along with suppuration of the glands of the neck + side of the face, latterly diffuse Edema of the scalp supervened, but no formation of pus — death occurring from Septicaemia, at the autopsy, an abscess was found in the Petrous temporal bone, containing one large + several small Sequestra, + the Dura mater was thickened over the bone, nothing beyond general congestion was discovered in the Brain: Here it is probable we have ear disease setting up abscess + necrosis in a scrofulous subject. + this necrosis causing pachymeningitis. Macewen notices that this may occur in Caries + necrosis, + the inflammation not spread further than the Dura mater; which becomes more

~~Bone~~ vascular than normal & adherent to bone.

(b) Suppuration occurring in the membranes may depend upon Ear disease - may arise in the adjacent sinus - secondary thrombosis & suppurative phlebitis - Gowers gives a long list of causes for this lesion, but disease of the internal ear is especially a frequent one, & as the superior Petrosal & Lateral are the nearest sinuses, they are the ones most liable to be affected, & as Mr Joynbee says long continued ear disease may set up disease of the Temporal bone & cause death with cerebral symptoms, when along with the bone lesion suppurative inflammation is found in the Dura mater. In case 6 middle ear disease had existed for a considerable time - & two operations at various periods, had been performed for the removal of "polypi" which arose from the tympanic cavity & also as granulations around the perforated membrane, in the later part of the illness a diffuse suppuration occurred below the scalp, pointing to the implication of the External veins, death occurred from septicaemia - the post mortem revealing suppuration & abscess formation in the Lateral & other sinuses — Mr Barker treated a case successfully, where the abscess was extra cerebral in the membranes, between the Temporo Sphenoidal & Frontal lobes, resulting from Ear disease - &

Dr Sinclair records a case arising from chronic suppuration of the middle ear. Tympanic membrane absent - the abscess was over the Petrous temporal between the bone & Dura mater, the middle ear full of pus -

(C) Abscess may form in any part of the Brain from extension from the ear. forming true cerebral abscess. of which it is the commonest cause; in 80 cases collected by Lebert 20 were due to this, 4 in 19 collected by R Meyer- 9 were ascribed to this cause (Hartmann) - Newton Pitt found that 5% of the post mortem inspections out of 9000 in Guys Hospital. were ~~due to~~ cases of Intracranial disease arising from ear affection - The abscess is not always connected with the diseased ear, as healthy Brain tissue may intervene, as a rule a carious process is present, & the septic material passes in some way from the bone disease, although according to Cumberbatch abscess with meningitis may be found in Ear disease without disease of the bone - The abscess is usually found in the Cerebrum, but may occur in the Cerebellum. 12 out of 18 were in the Cerebrum in Newton Pitts cases - Gowers says it is twice as common in the Cerebrum. 4 in Gull & Suttons cases 5 only were in the Cerebellum as against 26 in the Cerebrum - Toynbee thought that the site of the abscess was dependent upon that of the

disease in the Ear.; but as Gowers says, beyond the general rule, that disease of the Tympanum may lead to abscess in the Cerebrum, while that of the mastoid cells leads to Cerebellar abscess, we can lay no law down - & even to this generality there are frequent exceptions - Macewan holds that disease of the mastoid in early life is more liable to affect the cerebrum, while in late life it will affect the cerebellum — In ~~the~~ case 2. the ear discharge had existed off & on since childhood with the formation of "polypi"; an abscess in the temporo sphenoidal lobe was found at the examination - & which communicated directly with the ear - through a ulcerated portion of Dura mater & a carious condition of the petrous temporal bone — The majority of cases recorded arose from this cause -

Mr C S Gillman in Brit. Med. Journ. Feby 13th/86 - extensive necrosis, abscess in Parietal lobe communicating with auditory meatus -

Dr Spicer Brit. Med. Journ. June 19/86. Ear disease caused by exposure to cold. abscess in Temporo Sphenoidal lobe. & brain adherent over Mastoid

Dr W. Boulting Brit. Med. Journ. Nov 6/86. necrosis of Temporal bone - abscess in the Temporo sphenoidal lobe -

Prof Greenfield. Brit. Med. Journ. Feby 12/87. abscess localised in temporo sphenoidal lobe & treated -

Dr Macnaughton. Lancet. July 23/87. Ear disease. abscess in Right lobe of cerebellum —

Mr Macewan. Lancet. March 26/84. septic otitis media; ~~(~~ mouth fœtid otorrhœa; pus evacuated from Temporo-sphenoidal lobe.

Dr Fenwick. Brit med Journal. March 10/88. discharge from ears. 8 to 10 days before admission.

Dr Milligan & Mr Hare. Brit. med. Journ. Dec 21/89. ear disease after Scarlet fever. abscess in Right lobe of cerebellum.

Mr Marmaduke Sheild Brit med. Journ. nov 16/89 long standing otorrhœa, caries of temporal bone. abscess in Temporo-sphenoidal lobe, burst in ventricle.

Dr Sainsbury Brit. med. Journ. nov 16th/89 ear disease, abscess in anterior part of cerebellum.

Mr Watson Cheyne. Brit. med. Journ. Feby 1st/90. chronic suppurative discharge from the ear. 4 to 8 years. pus evacuated from temporo sphenoidal lobe.

Mr Jordan Lloyd. Brit med Journ. april 20/89 chronic middle ear disease, abscess opened in Temporo-sphenoidal lobe.

Dr Dreschfeld. Lancet Jan 22/89. purulent otitis in a scrofulous subject - disease of the Temporal bone - abscess in the Right middle lobe. had burst into the ventricle.

Intracranial suppuration may arise from other local causes, such as lesions in the nasal & orbital cavities, as well as lesions in more remote parts - Of other local causes, although no case has come under my personal observation, numbers are on record. The inflammatory products may be transmitted from the

nose. orbit, or antrum of Highmore. (macewen).
As instances of cases arising from chronic disease of the mucous membrane of the nose. Gull & sutton give 8 & Gowers adds 4 others & says there may be disease of mucous membrane alone, but there is usually bone disease, of nasal. Ethmoid or sphenoid often syphilitic, & as a rule meningitis coexists, the abscess is usually in the frontal lobe. Hilton Fagge says it is a less frequent cause — Dr Percy Warner in Brit. med. Journ. June 13th 85 records a case where the only possible cause, to which it could be ascribed was fetid lymph in the nasal cavity.
1 case arising from disease in the orbit is included in Gull & Suttons. & Gowers collected 2 others arising from abscess in the orbit.
Cases due to malignant growths of the skin of the face are recorded by Gull & sutton & also by Hilton Fagge.
Walsham gives caries & necrosis of bones of skull (not temporal) as a cause — & 1 of Gull & sutton's cases followed on syphilitic disease of the Cranium.
As a rarity Gowers quotes two cases, (1 adult & 1 child) reported as a result of Oidium albicans growing in the mouth. & where the fungus was found in the abscesses in the brain as well as in the mouth.
Of remote causes lesions of the thoracic viscera are not infrequent — Gowers gives 10 per cent as the proportion of cases arising secondary to remote suppuration, but independent of general pyaemia; &

affections of the Lung as the most common focus
Hilton Fagge considers the Lung as generally if not
always the seat of the primary lesion, where
suppuration in the Brain is a consequence of
suppuration in remote parts – about 8 per cent
of Lung cases are able to cause it – The pathology
into the blood
is mysterious, though probably due to entrance of
the constituents of the suppurating cavity, which are
broken down, & so enter the more easily into the
blood stream, & set up abscess by septic Embolism –
Gull & Sutton collected 6 cases – Newton Pitt 8 –
& Hilton Fagge quotes 6 as occurring at Guy's –
among Gull & Sutton's are three due to Empyema.
3. Bronchiectasis, Pneumonia, Cirrhosis of the
Lung – Tuberculosis. abscess of the Lung –
Ziegler adds to these Gangrene of the Lung. Putrid
Bronchitis – Endocarditis as causes – Cases
following Empyema are reported by Dr de Havilland
Hall. Brit Med Journ. Vol 1/84. by Dr Drummond in
Lancet July 3rd/84. Dr & W Finlay Brit Med Journ.
Feby 13th/89 – & as result of stagnation of
secretion in Bronchiectatic cavities by Dr Sainsbury
Lancet oct 12/89 – Dr W Cayley Path. Soc. Trans.
Vol 35 in which he discusses the question of their
originating from Embolism – as does Dr Sibley in
Vol 39, where he reports a case following suppurating
parasitic cavities in the Lung of a sheep –
Abscess of the Brain following lesions in the
abdominal cavity are reported by Dr T Taylor in

vol 35 of the Patho. Soc. Trans. where there was abscess in the Liver + ulceration of the Intestines. Gull + Sutton give a case where dysentery + abscesses in the Liver + lung were found — Cases are also recorded by Gull + Sutton arising from lesions of the most diverse localities. of the body - E.g. from necrosis of the ulna + abscess in the Deltoid muscle; abscess near the Uterus; abscess in the sheath of the Rectus abdominis - phagedenic ulceration after amputation of the Breast; suppuration of the mesenteric glands; after Iliitis; abscess in the Spleen + Kidney - + they quote Dr Ogle as reporting a case following suppuration ulceration of the Cæcal appendix, + Dr Bright as giving one after Whitlow. which is suggested in case reported by Dr Mayne in Lancet of Dec 31st / 58. of cerebral symptoms following a scratch on the finger which sets up blood poisoning — Many of these cases suggest pyæmia. + which may set up abscess in the Brain as elsewhere - it is said to occur in the Brain + not in other parts of the body in pyæmia (Gull + Sutton), but this must be very infrequent, as Gowers considers the Brain as a less frequent seat of suppuration in general pyæmia - he only found 9 cases out of 234 to be due to pyæmia - while Hilton Fagge collected 6 which was half the number he collected of cases due to ear disease - in one case

symptoms only appeared 18 months after an operation; which had produced pyæmic symptoms. Newton Pitt collected 9 cases of pyæmia originating from various causes, & in which the Brain was implicated, he attributes infection to Embolism from the original source.

Hutchinson gives ligature & obstruction of a main artery as a cause of Cerebral abscess, though this is opposed to the views expressed by Gull & Sutton, who hold that Encephalitis & softening the result of plugging of a cerebral artery, or Encephalitis around a hæmorrhagic effusion, or tumour, or old cyst. shows no disposition to the formation of pus or abscess. The Brain may soften disintegrate & a cyst form but no pus.

3 Idiopathic Cranial & Intracranial suppuration is a class formed, in order to include all those cases, whose apparent cause is so uncertain, & history so vague, that they cannot be classified among the preceding groups. It may be contended that these cases are really due to some old forgotten injury. or some ill defined ear disease. Such is Hilton Fagge's view, who says that there is scarcely any case in which one is, absolutely driven to admit as primary & spontaneous, & doubts Gull & Suttons cases, & believes that there is no case, which cannot be demonstrated at the necropsy to have arisen from

some cause - Frankel (Lond med. Record) thinks that often obscure cases are tubercular, & relates one where he was unable to discover a cause until he examined the "pus" & found Tubercle bacilli in it - Still we have such cases as no 4. Of an abscess in the cerebellum, & yet no cause could be discovered at the post mortem examination - the head & organs of body generally appeared to be healthy, & no trace of injury could be detected - also in no 5. where an extensive purulent collection was found in the ventricles, the patient had served in the army in Egypt - Ramskill gives exposure to a tropical climate as a cause of meningitis - but says nothing about it proceeding further; considering the general health & time elapsing between the illness & departure from Egypt, it is highly problematical that this had anything to do with it - Lebert quoted by Gull & Sutton, admits idiopathic cases, but says they are rare, as obscure cases may turn out to be due to an unpregnant cause. e.g. disease of a mesenteric gland, gumboil. whitlow &c: the primary disease so small as to be overlooked - Bowen found 15 per cent of cases in which no cause could be ~~found~~ discovered. at the same time thinking the cause in many may have been overlooked - 6 of Gull & Suttons could be traced to no cause, & 4 of Newton Pitts

In the Lancet Aug 3rd/89 Dr Percy Rendall details a case, when neither history nor symptoms led to any suspicion of a brain abscess, which was discovered at the post mortem Examination - its origin being unexplainable -

Symptoms of Cranial & Intracranial Suppuration. are to a certain extent various, & from a case where there is complete latency of symptoms during the interval between the originating cause & the supervention of acute symptoms, to those cases which progress to a fatal termination without any interval, we find all the possible gradations. The symptoms are according to Hutchinson modified by the stage of the process, seat of the collection & its situation, & above all by the presence or absence of a fistula of relief - Gowers says, cases occur with symptoms so slight as to escape notice, & he divides them according to the symptoms: into those with complete latency, & those with it incomplete, & those which have only an acute or terminal stage - It is often only in the acute or terminal stage, that characteristic symptoms are present - motor symptoms are often absent. owing to the frequency of the lesion in the Temporo-Sphenoidal & Frontal lobes & cerebellum, which cause no motor symptoms when diseased -
An abscess appears to produce less grave symptoms

than a tumour — By the study of these 4 cases, it is seen that the exciting cause & position of the abscess has to a certain extent a modifying effect on the symptoms; all the cases alike had what are described as "Cerebral symptoms" more or less pain in the head, of an intermittent radiating ~~is~~ character; varying in degree, ceaseless vomiting, photophobia, probably due to the headache. temperature sub-normal. Except when the membranes are inflamed - pulse slow & intermittent -
The undefined character of the symptoms more than often leads to an error in the diagnosis, as in case 1 when it was made out to be neuralgia in the early part of the illness - same happened in Mr Barker's case - & case 4 was sent into Hospital as "Gastric disturbance with debility", & cases are reported where the rigors & intermittent temperature led them to be diagnosed as ague. Gull & Sutton say that symptoms so closely resemble continued fever, that we cannot say which it is, with any degree of certainty - Gull & Sutton, & Newton Pitt tabulated the symptoms met with in the cases they collected - & found. as below.

	Gull & Sutton - 43 cases.	Newton Pitt. 18 cases.
Pain in the head - in	39. "	in 15. cases
Epileptiform seizures	" 38 "	" 4 "
Coma	" 30 "	Earache 4 "

Heavypress stupor tetanicypnea	30		5
Paralysis	24		4
		Emaciation 2	?
Rigors	14		
		Aphasia 2	?
Pyrexia	13		
Delirium	13		2
Vomiting	12.		10
		slow cerebration	2
Incontinence of urine or faeces or both	15		?
~~Convulsions~~	8	—	—
Disordered sensibility not including pain in the head	6		
Defective articulation	4		
Defective sight	3		
Apoplectic attack	1		

Taking up the consideration of the symptoms of the various classes of the cases according to their etiology, it is to a certain extent possible to differentiate them — Thus in those arising from Injury. the interval between the receiving the injury, & the incidence of the acute or terminal stage, does not appear to be dependent upon the extent of the injury — for example in Case 1 the injury was a severe one, as were the immediate symptoms, the interval of incomplete latency was 3 years. this quite irreconcilable with case 3 where the injury was supposed to be quite trifling, & there was not interval of latency, the case proceeding to a fatal termination — this early development of an acute stage, is only as a rule in traumatic cases, this ascribed to Powers to the more extensive amount of initial inflammation & the symptoms

may resemble meningitis, which is often co-existent – duration of the symptoms being 10 to 30 days, often described as an acute abscess, in contradistinction to chronic ones – death occurs sometimes at the end of a week, but may be only in the 4th or 5th week – Holmes says suppuration beneath the cranium occurs a considerable time after injury; about 2 weeks is the average – while Duncan gives the time of symptoms occurring as between the 6th & 12th days, & this may be extended – In compound fracture the symptoms are, according to Hutchinson, induced by the exit closing & the abscess filling up –

The symptoms may vary in many respects, some may be wanting, while others one or more may be strongly marked – The more common symptoms are headache localised over lesion which is below injury as in case 1. & radiating over the head: or it may be deep in as in case 3 & generally distributed over the head – in both alike it increased towards night & lessened in the morning – there was muttering delirium becoming noisy at night, both it & the pain in the head were unaffected by sedatives in ordinary doses – vomiting, constipation, some degree of photophobia which was probably due to the pain in the head – slow conbration, a distinct interval elapsing between the reply & the asking of a question – spasm of muscles & may be paralysis – drowsiness & heaviness

becoming replaced by coma towards the end - all or several of these symptoms, together with the history & signs of the accident, led to the diagnosis in these cases.

In compound fracture Hutchinson draws attention to Hernia Cerebri being an important symptom; & Holmes considers a "puffy tumour" with an unhealthy appearance of the wound of great diagnostic value - An abscess may develope quietly until of a large size, as in case 1 where it was considerable. with the older one floating in it - in many of the cases recorded rigors were an early symptom, along with feverishness & in some cases convulsions -

In those cases arising secondary to local or more remote suppuration, there are the symptoms of the primary disease e.g. In ear affections the otorrhea, but even this may be absent in exceptional cases - Newton Pitt found no otorrhea in 9 cases; & in 2 the membrana tympani was intact, & yet Cavtral sinus thrombosis & meningitis proved fatal - it is more usual to have long continued ear disease, & caries of temporal bone, as Sir W Dalby says when dead bone can be detected, this patient is in a perilous condition - he divides cases into those in which symptoms come on soon after the establishment of the perforation, & others where there has been a purulent discharge from the ears

for many years; – with the long continued discharge there is frequently "polypus" formation from the tympanic cavity; or as granulations from the edge of the perforated tympanic membrane – there is tenderness over the auricular region, often Oedema of the scalp – the usual Cerebral symptoms such as headache. (which in a young child is shown by frequent movements of the hand to the head & screaming (Eustace Smith) – drowsyness. vomiting. anorexia. bowels constipated. often ushered in by rigors & feverishness. may be paralysis or convulsions according to the seat of the affection – As Hartmann says these cases may arise without any symptoms, & remains latent a long time; or begins with acute symptoms – & symptoms may vary, & increase & remit. until a final severe attack leads to death –
Gross in american Journal of medical sciences July /73 distinguishes the various sites of the suppuration by the symptoms &c – From the 7 observed cases – it is seen that <u>abscess in the Bone</u> as in No 4. is attended with fetid long continued otorrhoea – tenderness over auricular region – evidence of necrosed bone on probing, Oedema of the scalp & suppuration in the glands of the neck. a very irregular temperature, & death from Septicaemia –
Where the <u>suppuration is in the membranes</u>, in case 6 it was in the Lateral Sinus, & there was

Oedema, + suppuration below the scalp - repeated heemorrhages from the ear, indicating communication with the lateral sinus, + which Hartmann says may prove fatal - the pain in the head was very severe, the slightest movement could not be tolerated, probably due to the inflamed sinus - death ensued from septicaemia, the pulse + temperature undergoing great oscillations during the course of the illness - Lee says that secondary Thrombosis of the sinuses of the Dura mater do not admit of diagnosis, unless there are pyaemic symptoms present, + some obvious cause of the disease E.g caries of the pars petrosa - the Oedema which is characteristic, varies according to the sinus affected (Hartmann) Gerhardt puts the empty condition of the veins of the neck on the affected side, as diagnostic, but other observers have been unable to detect such an apparent difference - It is frequent for the symptoms of the lesion to be masked by the affection causing the thrombosis; or by those of Septicaemia - Mr Balance records two cases in which he found discharge from the ears; one since infancy, + the other for 15 years, pain in the head; vomiting. delirium. fever. Extreme + rapid oscillations of temperature, Swelling + tenderness over the mastoid, but no Optic neuritis, which Newton Pitt considers as frequent in these cases - In Mr Barkers case

of subdural abscess, the chief symptoms were headaches + dullness, rejor - he considers that the temperature + pulse do not oscillate if there is no pyaemia. While there is aching in the temporal region in chronic cases — The symptoms of septicaemia viz rejor, remitting or intermitting pyrexia, + a typhoid aspect, are more prominent than the Cerebral symptoms, which become more so later on, + include headache, somnolence, dullness, delirium + may be motor symptoms, + all these with subcutaneous Oedema, are of the greatest significance (Gowers). The Cerebral symptoms are probably due to the meningitis, + the septicaemia due to the softening of the clot + the Ephemal Oedema -

In abscess <u>situated in the Brain</u> + secondary to local or more remote suppuration, it is found to occur only exceptionally in other than chronic cases, + so the history + the symptoms of the suppuration causing it are added to the Cerebral ones - it is less common than suppuration below the Dura mater + phlebitis of the sinuses - there is headache, vomiting, delirium + may be rejor, the more insidious the onset the greater is the probability that the abscess is in the Brain — In case 2 where the abscess occurred in the temporo Sphenoidal lobe, there was long standing ear disease, with the formation of "polypi" + which had been

at various times – the acute symptoms were headache, worse at at night; delirium, slow pulse. + no fever until the last day of his illness – In Prof. Greenfields case heaviness in the eyes + forehead + a tendency to sleep were the prominent symptoms – Mr Barker gives the Clinical signs as a feeling of malaise, drowsyness, slow pulse, sudden rise of temperature with rigor. gradual fall of temperature to subnormal, most marked in the Evening –

In those classed as <u>Idiopathic</u> the symptoms were very obscure in both 4 + 5 the headache + photophobia were the most marked symptoms; in 5 there was pain down the back + paralysis of the Right side –

In considering some of the more important symptoms in detail – their <u>duration + latency</u> are frequently the most striking characteristics – although in few cases can the distinct time of the formation of the abscess be fixed, still the chronic character of the symptoms is remarkable, + Ending in an acute stage. it is from this peculiarity that Gowers divides the cases into <u>acute abscess</u> with early inflammatory Symptoms lasting 1 to 4 wks – <u>Chronic abscess</u> which may have a complete, or an incomplete latent period. in which symptoms occur pointing

to the presence of the lesion – this latent period varies considerably – from 2 to 3 months to several years, & abscess becomes enclosed in a thick capsule – Gowers believes it may remain for years, in one ~~&~~ & in another 20 years without exciting any symptoms – The cerebral symptoms may be acute then subside, & again rekindle on meeting with some ~~ex~~ternal irritation, & may subside again, & so on, until in one attack the symptoms become stronger than usual, & lead to a fatal ~~result~~. Such was the course in case 1. after the accident the symptoms of Brain trouble were severe. & no doubt an abscess formed then. & was accompanied by meningitis – the meningeal inflammation was probably repeated several times – while the finally fatal attack was the result of the formation of the second abscess around the abscess first formed, & now become encysted – & this formation of a cyst wall may account for the latency of the symptoms as suggested by Bristowe – this appears to be natures effort at healing – by enclosing the results of suppuration in a limited space, & which by thickening tends to become obliterated, & might if patient lived long enough, go on to cure – as suggested by Gull & Sutton, there are no records of such cases, & Lebert opposes the theory – while Ziegler says small abscesses can cure themselves by formation of a cyst & resorption – this effort

would be favoured by the degeneration of the pus in the abscess & which is frequent -
In case 3 & 5 this latency of the symptoms ~~of the symptoms~~ was apparently absent - acute symptoms supervened & went on to death without any remission, & abscess cavities were found large & thin walled - In the cases arising from ear disease, there was nothing pointing to the time at which the abscess formed - but the causative process had existed over a lengthened period - as a rule the ear discharge was said to have existed since childhood - In the seven cases the time elapsing from incidence of the exciting cause to the fatal termination, varied from 3 days to 3 years - while in Mr Harrison's case it was 11 yrs - In the two traumatic cases (1 & 3) the latency varied inversely as the severity of the injury - During the latent period when symptoms are present they are of a chronic nature; headache, occasional feverish attacks with symptoms of cerebral mischief, & in those arising from ear disease, the otorrhoea is of an intermittent character, often suppressed just before the terminal or acute stage, which may last from 1 in Dr Percy Warner's case to 23 days in Mr Barker's - & during this period all the chief symptoms of suppuration in the Brain & its vicinity are present - & on rupturing into the ventricle, as it may do, especially in Temporo sphenoidal abscess, the symptoms are

those of Hemorrhage. & i convulsions, coma. & death— though the acute stage may be of short duration, death occurring suddenly & disclosing no explanation for its suddenness, at the post mortem examination.

On looking for the obvious morbid appearances especially as to previous injury or disease. in the Traumatic cases there is the cicatrix or actual injury — as in case 1 where the White scar was readily seen; but the perforation in the bone could not be felt owing to the temporal muscle & zygomatic arch covering & obscuring it — In case 3 there had been a bruise, but none was visible on admission. Mr Harrison had a cicatrix to aid him in the diagnosis of his case, which he sucessfully treated. as had Mr macewan in one he treated. but the cicatrix here was not over the seat of the abscess. In three cases secondary to otitis, there is as a rule the otorrhoea, often of a fetid, discoloured character; & it has & in many cases been obstructed by crusting & drying of the discharge, or by the insertion of a plug of cotton wool, thus aiding in the spreading inwards of the ~~discharge~~ disease. & hence the popular fear of stopping "a running ear". owing to the fear of it being driven inwards. In Prof Greenfields case it is described as of a dirty brown colour — in Dr Farnie's it was somewhat offensive but slight; & in Mr Barkers it was purulent:

If Extra dural, the abscess may burst through the nose or Ear, & so form a discharge of pus in a sudden gush as in Dr de Havilland Hall's case — Where the veins are implicated, the Oedema of the scalp & side of the face is one of the most obvious morbid appearances as in case 6 — & this with Haemorrhage from the Ear were prominent in 4 —

The attitude & general appearance of the patient, are only slightly characteristic — he usually lies on his back or side, eyes half closed, rolling his head about with pain — later on there is frequently more or less cyanosis, as in case 2. becoming of an earthy pinched look; but with rise in temperature & pulse, the face may be flushed preceding death — Prof Greenfield describes his patient as lying in a torpid condition, on the Right side, with Knees drawn up & thighs flexed, face towards the pillow & face buried in it. While in Dr Ferrier's case the head & other symptoms were so slight that the patient was able to sit up — In case of Cerebellar abscess reported by Dr Macmurray the patient lay with his head hanging over the side of the bed, throwing his arms & legs about & putting his hand to the back of his head —

The Temperature varies within a considerable

range, in true cerebral abscess it is as a rule subnormal, more marked in the evening according to Mr Barker - In the cases observed, fever was only marked, when meningitis was found at the examination - Powers says pyrexia is one of the most important symptoms outside the nervous system, & is frequent in the terminal stage; while Macewan says it as pretty constantly elevated at the commencement & becoming subnormal, but may rise to 104 or higher before coma & death. - Mr Hulke noticed a low temperature in 6 cases. & considers it as a characteristic of Cerebral abscess - Dr Jenner says that 'no rise in the temperature, does not exclude encephalitis going into abscess. In none of the cases observed were rigors noted, but in those collected by Gull & Sutton they occurred in several - & in 4 of Hewlett Pitts - they may occur regularly & so resemble ague (Hilton Fagge) - In case 1 the temperature was subnormal, & the meninges showed no recent affection, only old & thickened adhesions - In case 2 the temperature was subnormal until the last day when it rose to 100 - No meningitis was discovered at the examination - the lesion being confined to the Brain & the petrous temporal bone - In case 3 there was fever which gradually lessened, although at one time as high as 103° F, it

fell to normal on the last day – the Dura Mater was found to be thickened & recent pus outside & over the convolutions; & in 4 it was similar, rising to low. then falling to normal on the day of death – here also there was effusion at the base & congestion of the meninges — In case 5 & 4 where death occurred from Septicaemia, the temperature fluctuated considerably – in the early part it was generally high with morning remissions. In those cases reported by Dr Cayley, Prof Greenfield, Dr Ferrier, Mr Harrison, Dr Percy Rendall, the temperature was subnormal – in Dr de Havilland Hall's case it rose in the late stage of the illness – in Dr Drummond's case sudden fever & rigor were followed in two days by a convulsive attack, when the temperature became normal.

The Symptoms most frequently met with in the Digestive System were retraction of the abdomen, to a greater or less extent, furred tongue, anorexia, sickness, which may be the first symptom, especially frequent in Cerebellar abscess. although absent in Dr Mackenzie's case of Cerebellar abscess – there was in many of the cases slight constipation — Thus in Case 1 the nausea & vomiting were the initial symptoms, the constipation was relieved by a saline draught, the bowels acting normally later on — In case 2 the tongue was furred

constipation continued for 3 weeks. with anorexia. no vomiting, but the abdomen was slightly retracted, sordes formed on the teeth on the 2nd day after admission — case 3 was similar but with vomiting — In case 4 so prominent were the gastric symptoms of brown furred tongue, irregular bowels + sickness, that they quite obscured the other Cerebral symptoms — in Case 6 there was furred tongue + constipation, with in ly the appetite which was good at first, failed towards the end, + diarrhoea + sickness (septicaemic ?) supervened — + so in most of the cases reported by Dr Cayley. Dr De Havilland Hall. Mr Barker. Mr Harrison. Prof Grimfield &c. vomiting was a chief symptom, although Dr Jones's case showed an exception to this

On the <u>Circulatory System</u> the most evident effect was an acceleration of the pulse in the early period of the illness, becoming slower + irregular towards the end — In case 1 the pulse was 70 full + regular but fell to 60 on the 5th day, again rising to 120, + becoming feeble on the day before death — In case 2 it was 60 + regular, but became 66 + irregular the day before death, the Heart's action becoming tumultuous — In case 4 the pulse was regular 120 to 140 + strong — Thus none of the cases had a very distinctive pulse, but it is usual to meet with slowing + irregularity of the pulse at some time of the illness, + so it is recorded

in the cases reported by Dr Cayley. Prof Greenfield. Dr Garrison. Mr Barker, Mr Hamson – the pulse in cerebral abscess is considered more persistently infrequent than in Tubercular Meningitis – Gowers says it is frequent if meningitis is present + when there is fever. but towards the end, + sometimes throughout the illness, it may be infrequent, falling to 50. 40. or 30 – Traube observed it fall to 16, + Wreden (quoted by Hartmann) + Huguenin (quoted by Fagge) observed cases in which it was only 10 per minute – According to Macewan the early characteristic is an accelerated pulse, later on falling even to 40 with occasional intermission, probably due to the development of Suppuration –

Although none of the cases observed arose from a primary lesion in the Respiratory System giving the symptoms of it, as well as of the secondary affection- state symptoms affecting this system were noted in 4 of the cases – in two the respiratory ~~system~~ centre appeared to have become implicated in the Brain affection, in the others the recumbent position + low vitality would favour ~~vitality~~ hypostasis – No symptoms connected with respiration were observed in case 2. until the last day. when the breathing was in long gasps, with intervals, attended with considerable cyanosis – in case 4 the respiration became temporarily suspended, only returning after long continued

artificial respiration. appear to become paralysed & the heart gradually failed – In case 6 there was a dry cough, but no distinct physical signs – & in case 4 râles were heard posteriorly towards the bases – as in Prof. Greenfields & Mr Harrisons cases – In these cases arising secondary to chest affections, as in those reported by Dr Cayley & Dr Drummond the symptoms of Pneumonia along with the original empyema were present, as well as the usual symptoms – In suppuration of a sinus thrombosis it is the chest affection which it produces that is fatal not pyæmia alone (Newton Pitt) –

In the Integumentary System – the emaciation, often rapid, is a characteristic feature of the illness, as in case 4 – where it was rapid & attended with anæmia – Prof Greenfield & Dr Percy Rendall & Mr Barker noticed it in their cases – the last describes the skin as becoming dirty yellow & earthy looking – Gull & Sutton lay stress on this symptom, when setting in rapidly – it was marked in several of the cases they collected – as in those by Newton Pitt. especially in those with sinus thrombosis –

It was only in exceptional cases that abnormal Urinary Symptoms were observed, in case 3 a trace of albumen was found – & this occurred in Dr Sinclairs & Dr Cayleys cases, along with excess of

phosphates - In the Lancet of sept 17/84 an elaborate analysis of the urine from two cases. is given - & shows that a status febrilis exists without an elevation of the temperature; inflammation & exudation shown by a diminution of the chlorides; a great destruction of nerve tissue going on. shown by the increase of phosphates, & the high colour & high Specific Gravity with the diminication of phosphates show it is in the nervous system of the Brain, in one of the two cases there was a slight trace of albumen. There is often a tendency to retention of urine, was noted in Prof Greenfields case - also in case 4 - is frequent during comatose. though in Mr Barkers case there was involuntary micturation.

In the Nervous System - the Sensory Functions were to a greater or less extent implicated - The most frequent & almost invariable symptom was Headache. to the patient it was his one great symptom, often of an agonising character - the constant moan of "Oh my head" & in the children the tossing & tossing of the hand to the head. with an occasional loud cry, which the patient was quite unable to retain, indicated the severity of the suffering - this symptom often increasing towards the latter part of the day & during the night, preventing sleep; & ordinary treatment was quite unavailable, as in those headaches described

as "Organic" by Dr Day. colour with this there was tenderness over parts of the head, especially over part where pain is described as originating. The pain is paroxysmal, radiating, remitting or intermittent or continuous. like being knocked on the head with a hammer - not necessarily localised over the seat of the abscess, but may be quite general over the head - Hull & Sutton give a case of abscess in the Cerebellum & pain in the forehead - & another with pain on the ~~Right~~ Left side & abscess on the Right - Newton Pitt says that the pain is more severe in those cases arising from Ear disease, but tension of retained pus may cause more or less intense headache - Bristowe holds that the pain is due to the bone or Dura mater being affected - In only 1 of the 5 in which pain was complained of, in the Cases observed, was it localised over the seat of the disease - Thus in case 1 the pain was over the side of the head on which the abscess was - & with giddyness was the first symptom - Its paroxysmal & radiating nature, with tender points over the trifacial, led to the diagnosis of neuralgia. when first seen - a similar error occurred in Mr Barkers case, where a provisional diagnosis of neuralgia in an acute Ear disease was made - in both these cases the symptoms were in many ways similar, the pain radiating in front of the Ear, through the left Temporal, Parietal &

Frontal regions - tender points were present but disappeared on the 6th day. In case 2 where the abscess was also in the Temporo sphenoidal lobe, the pain was not localised over the seat of the disease, but was described by the patient as being "deep in" in the frontal region, & of a dull aching character, not altering & kept with a tendency to a nocturnal increase, it began suddenly & without apparent cause about 1 months before death; no tenderness on pressure — In case 3 the headache was complained of the day after the injury, & persisted until the patient became unconscious — In case 4 the pain in the head & the side, were with the gastric symptoms - the most prominent; there was constant crying out with the pain - which was described as general — after the attack of apnoea, it was again complained of — Similarly in case 5 the early symptoms were diffuse headache & pain down the back, with extreme pain in the neck on moving the head; & so also in case 6 the headache which was not localised was ~~was~~ an early & constant symptom, & with tenderness in the Temporal region — Both Macewan & Prescott Hewett consider Cephalalgia localised or diffuse as a constant symptom, on the same, or the opposite side to the abscess, & cases recorded by Cayley. Drummond Grunfeld. Ferrier. Barker. Harrison &c &c. Whether

arising from injury or disease. the headache of varying intensity was present; though the tenderness over the cranium was as often absent as present.

Of the more frequent symptoms connected with the eye - it was observed that there was slight photophobia, this intolerance of light may be only an accompanyment of the headache - the eyes were partially closed, pain in the eyes + irregularity of the pupils - In case 1 there was bloodshotness of the left eye, sight unaffected, no squint, on the 5th day some photophobia - In case 4 there was photophobia, eyes kept closed - + during the attack of apnoea the ocular reflexes were absent + the pupils contracted: becoming dilated on the return of respiratory function + unequal before death. In case 5 there was double vision - pupils equal + photophobia slight - The ophthalmascopic examination is rarely possible in a thorough manner, owing to the restlessness of the patient - Optic Neuritis is said to be often present but is by no means constant. McBride lays great stress on it, as a sign of the spread of suppuration from the ear. Gowers says it often precedes the onset of acute symptoms - it is similar to that met with in Cerebral tumour, but not so constant; due as Bevor says to the rapidity of the formation of the Abscess not being so favourable, as the slow growth

of a tumour – Newton Pitt found that out of 4 cases examined, 3 had normal discs, & in the other it was probably due to either old or recent sinus thrombosis. Mr Barker found it in phlebitis of the lateral sinus – In Prof Greenfields case the condition of the disc & eye symptoms are most fully recorded. there was double optic neuritis, pupils equal but slightly contracted, slight ptosis; after the evacuation of the pus the neuritis disappeared & the pupils varied – Optic Neuritis was present in Dr Hensen's case – it may cause total loss of vision as in cases reported by Mr Bryant. Dr Cayley – in others it was absent as in cases of Dr Cayley. Mr Barker. Mr Hamson.

The Cerebral & mental functions are almost invariably affected – the mental faculties are blunted, which may be due to the extreme pain. there is a low muttering delirium, but the patient can be roused to answer questions, but shows an irritability & disinclination to speak – answers in monosyllables – & there is "slow enunciation" Newton Pitt. the interval between asking a question & the reply to it, being greatly prolonged; the articulation is imperfect; memory becomes impaired, unable to calculate – forgets messages &c. Hall & Sutton as well as Newton Pitt & Powers noticed aphasia in cases – In some cases

mental disturbance with attempts at suicide have been reported – Maudsley says that abscesses &c. do not directly produce mental disorder, which is often absent, but if they do it is indirectly by reflex or sympathetic action – In Mr Barkers case the patient was noticed to have a tendency to magnify his troubles; & this was considered as unfavourable; as a similar case had been seen which proved fatal – Mr Macewen says there is fretfulness, sleeplessness. & at a late stage delirium, the excitement passing into drowsiness & Coma – In one of these 3 attacks attended with delirium – in the 4th & fatal one, he was observed to roll his head about, muttering incoherently, & at intervals shouting out, on asking him a question. he answered shortly. after an extremely long pause, the question often had to be repeated; the answer usually "yes" or "no" incoherent & not always relevant to the question put – at night the delirium was excited & noisy, at its height on the 5th night – Sedatives in moderately large doses had little or no effect – two days before death the delirium subsided into a constant moan. there was little sleep, & such as it was was irregular & fitful – his friends had noticed an alteration in his behaviour, since the original injury – he was described as "fond of reading" yet his memory had become greatly weakened – he forgot messages on which he was sent; was unable to calculate money correctly; all quite different to his previous mental

state, but not sufficiently noticable at time of entering - to cause his rejection -
In case 2 on the 3rd day after admission he was restless + moaning during the night - with short intervals of sleep, at times shouting out - the delirium gradually subsiding into coma towards the close - he was far from intelligent; but his usual surroundings were in no way conducive to a high state of mental development - In case 3 the drowsiness was more marked than any other symptom, he had to be roused to eat + gradually passed into Coma — In case 4 the delirium was of a noisy character, tossing + crying out, + at night worse - until the attack of apnoea, after which it did not return - She was extremely irritable. + the clouding of her intelligence prevented her giving a clear account of her illness — In case 5 the low muttering delirium was continuous from admission into Hospital until death - The delirium noted in case 6 might be ascribed to the ~~delirium~~ septicaemia which was present + also the fever - her intelligence had always been defective - In case 7 irritability + fretfulness were prominent symptoms —
Dr Cayley describes his patient as having 'confusion of thought' - In Prof Greenfields + Mr Barkers cases there was delirium in the early stage giving way to a torpid state without delirium - The phases of mental symptoms may be seen in different cases.

E.g. coma may be the first & only symptom, fatal in 3 days (Newton Pitt) - or only dullness of expression, or change of disposition from cheerful to morose, melancholy a disinclination to speak, apparent loss of memory & an inability to speak (Hilton Fagge) — Clouded intelligence was the most marked of mental symptoms in the cases reported by Dr de Havilland Hall. Dr Fenwick - Mr Hanson - Dr Percy Rendall -

In only two of the cases observed were there motor disturbances - In case 1 clonic spasms were present in the muscles of the face, on the 5th day - but no paralysis - In case 5 there was paralysis of the Right side — The only paralytic condition in case 4 was that noted in the Respiratory Centre, which appeared to become paralysed & cause death. In Prof Grenfell's & Dr Fenwick's cases there were no motor disturbances, while in others there was paralysis - thus in cases by Mr Macewan. rigidity of legs - as also in case by Dr Percy Rendall — convulsions occurred in those reported by Mr Barker. Mr Hanson - Dr Drummond. Mr Macewan. Dr Cayley - Dr de Havilland Hall - Gowers says convulsions are frequent, usually general & resemble Epileptic fits - occur at beginning & terminal periods, paralysis is associated with abscess below the motor regions of slight, rarely absolute, & occurs in about half the cases —

The organic reflexes were observed to be affected in some of the cases - case 2 had some difficulty in swallowing - in case 4 the Bowels acted involuntarily - these are not at all constant, as in case 1 even when almost totally unconscious, he could still be roused to swallow - Mr Barker noticed ~~noticed~~ increase of the knee jerk + ankle clonus. but very little plantar reflex - Mr Hamson noticed the same, without ankle clonus + the abdominal reflex was diminished -

Cases observed.

Case 1. Abscess in Temporo sphenoidal lobe due to an injury 3 yrs previously -

William Davies - 18 years of age - private in the Royal Welsh Fusiliers - enlisted 2 months ago - admitted into the Depôt Hospital at Brixham oct 3rd 1884. Complains of pain (lightning) in the left side of the head. passing to the middle line of the forehead - its chief seat being in the Temporal region - nausea, vomiting + giddyness - Habits are steady - being sober + of a studious disposition - History as given by the parents, shows that 3 yrs ago, on a 5th of november

celebration, he was shot in the temporal region by a pistol loaded with brown paper & powder only. He was ill for some time after with head symptoms, & some pieces of bone came away during the healing of the wound; since then he has had two attacks of illness attended with cerebral symptoms, one of them lasting several weeks; during two weeks he was delirious, on recovering it was noticed that he was peculiar, memory somewhat impaired. forgot messages on which he was sent, unable to count change - this impairment of memory continued up to the last illness - though nothing peculiar noticed when enlisting — He was average height, well developed & muscular - Has Cacchymation of deft type - painful points on pressure in the left Temporal, Frontal & Parietal regions. a small white cicatrix is seen over the root of the left Zygomatic arch - is of the size of the small finger nail - no morbid condition of the bone can be made out. sight unaffected. Temperature & pulse normal — He was supposed to be suffering from simple neuralgia by the Regimental Surgeon. On the 3rd day after admission I found him lying on his back, moaning, in great pain. rolling his head from side to side & eyes half closed; When spoken to answered hurriedly & rather ~~quickly~~ indistinctly, he described the pain as shooting, intermittent, & radiating in front of his ear - pressing over the auricular area caused him to cry out.

Bowels acted after the administration of a saline draught, reflexes normal, no squint, Temperature normal, pulse full regular. 70. during the night had been in a noisy delirium - only partially conscious, sleeping in an irregular fitfull manner.

Oct 5 1/2 hr: Had suffered less delirium during the night, owing to the administration of sedatives(?)

Oct 6 hr. night quieter, is drowsy, took his breakfast; Bowels acted, still complains of severe shooting pain in the head, slight photophobia, other symptoms unchanged -

Oct. 4.1/2 hr noisy delirium during the whole night, unaffected by sedatives, quieter towards morning when he became more drowsy. pulse regular 60. Temperature subnormal, no pain exhibited on pressure over above mentioned tender spots - left side of face is contracted at intervals, the moans heavily - cannot be roused to answer questions - but takes liquid nourishment.

Oct 8. 1/2 hr could not be roused to answer intelligently; on shouting loud he answered "yes" or "no" indiscriminately - with a long interval between the answer & the interrogation - still moans. & tosses about, Eyes half closed, consciousness when wishing to urinate - pulse feebler 120 - no regular stupor -

Oct 9 1/2 hr Quite unconscious since midnight, moans. works left side of face, cannot be roused - no squint nor paralysis - became gradually comatose & died at 5 p m -

Post mortem Examination - 40 hrs after death. Head alone examined, Dura mater adherent to skull cap, but no recent meningitis - over Left temporal bone it was firmly adherent, by old adhesions which could not be separated, except by dissection, when a perforation the size of a small finger nail was found at the junction of the Petrous & Squamous temporal, on level above & posterior to the External cicatrix - & separated from the skin by the posterior part of the zygomatic arch, thus obscuring it in life - the edges of the perforation in the skull were irregular, with a growth of bone projecting all around, externally & to a greater extent internally - The Brain was flattened over the Left Temporo sphenoidal lobe, the convolutions being obliterated, & a glairy pus exuded through the Dura mater, by a small opening which had been made accidentally in it - the whole lobe was in a state of White & red degeneration, partly diffluent & broken down into pus - in the centre contained an abscess the size of a walnut in a thick cyst like wall - contained pus, yellowish green - glairy, & with a peculiar fetid odour - Excess of fluid in the Left Lateral ventricle - Left Choroid plexus congested - Left optic thalamus softened in its posterior part -

Case 2. Abscess in Left Temporo Sphenoidal Lobe, due to ear disease since childhood.

Charles Long aged 15 years - works in Pottery Works - admitted into Tottenham Hospital under Dr Rasch 18/3/86 - complaining of pain in the head, also otorrhoea, ill 1 month - Family history is good. Has suffered from discharge from the left ear since childhood - has never been treated - says pain in the head is deep in, in the frontal region began suddenly without a cause -

State on admission - alimentary system - Tongue furred - Bowels constipated for the last two or three weeks - appetite small - no sickness nor indigestion after food, abdomen slightly retracted. Examination of Lungs & other organs show no physical signs of disease - Respiratory & circulatory systems appear normal, pulse 60 regular & compressible - no tenderness behind the ears, nor in any part of the head - light does not cause discomfort -

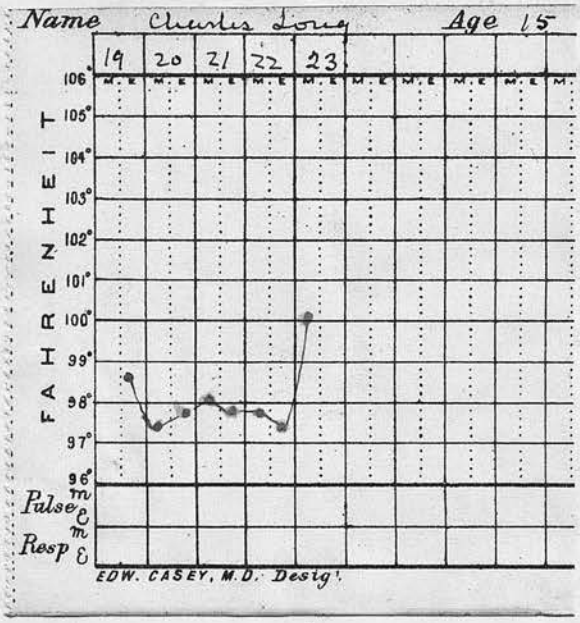
20/3/86. sordes on teeth, tongue very furred. bowels acted copiously after an Enema - pain no better during the day -

21/3/86 - Restless during the night, moaning, with short intervals of sleep - at times shouting -

22/3/86 Quieter during the day, pulse tends to be irregular. 66 full.

23/3/86. Quiet during the night becoming unconscious towards the morning - not able to swallow

at 10·30 a m. livid. breathing is very long gasps at intervals - face duply ecchymosed; Heart tumultuous & irregular -

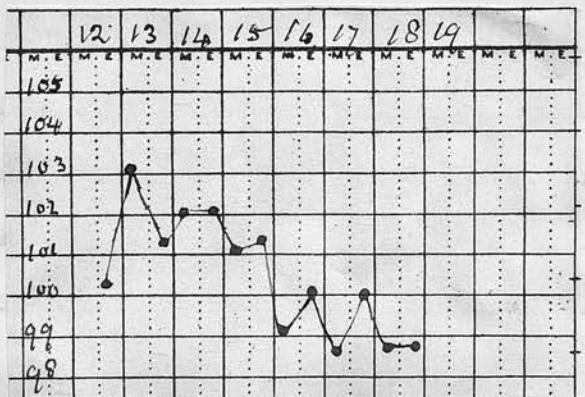


Post mortem examination made on march 24th 31 hours after death - no abnormal external appearances; pupils equal & medium - on removing skull cap Dura mater showed congestion of vessels - no evidence of meningitis - but Dm is necrosed over left Petrous temporal bone, which is also dark & necrosed - Brain weighs 50 ozs. The Left Temporo sphenoidal lobe is one dark diffluent mass, with pus exuding from it - & on section contains fetid pus in a large cavity - Puncta vasculosa marked - Lateral ventricles dilated & contain fluid - left more than right - left choroid frings dup purple - rest of Brain & Cerebellum are more or less congested - left internal ear contains fetid pus - petrous temporal necrosed - Tympanic ossicles absent - Granulations around

the site of the tympanic membrane - the external auditory meatus contains a mass of inspissated pus - Right ear normal — with the exception of some old pleuritic adhesions over the Right lung the other organs appeared quite healthy -

Cas 3 - <u>Abscess in Right Temporo sphenoidal lobe - due to injury</u>

Henry Hales aged 14 yrs - schoolboy in a Reformatory school, admitted under Dr. Rasch into the Tottenham Hospital 12/6/86 - died 18/6/86 complains of ~~pain~~ drowsyness + general feeling of ill health — Two days before admission he was struck on the forehead by a window falling. the day following he had headache - sick - bowels confined - Tongue furred - feverish -
On admission drowsy. no physical signs of disease in the heart or Lungs - urine contains a slight trace of albumen -
17/6/86. Bowels acted after an aperient, has to be roused to take his food - stupor increased. & he died comatose on the 18th -



Post mortem on 21/6/86 - 65 hrs after death - no abnormal external appearances e.g. of injury &c.
Right pupil larger than Left - on removing skull cap dura mater was seen to be of a dark colour, thickened & with pus beneath it. over the Right Temporo sphenoidal lobe - surface of the Brain greatly congested - dark grumous sub-arachnoid fluid - small quantity of pus in the Right fossa of the skull, no necrosis of the temporal bone, nor disease of the ear-but adjacent parts of Right wing of the sphenoid & Right Temporal bones darkened & contain a small quantity of fetid pus - some effusion at the base - Brain weighs 42 ozs - on section Right hemisphere is darker than the Left & Right lateral ventricle full of fetid pus & debris - Right temporo sphenoidal lobe contains a large abscess cavity, the size of an orange. Contents are fetid pus & debris - & it has ruptured into the lateral Ventricle - Brain is generally congested - The Heart shows several milk spots over the Right ventricle, extensive old adhesions over the left Pleura, other organs healthy -

Case 4. <u>Abscess in left lateral lobe of cerebellum - cause ?</u>

Amelia Childs. aged 18 yrs. general servant. admitted into the Tottenham Hospital under Dr Rusch 16/2/86 - complains of pain in the head & side.

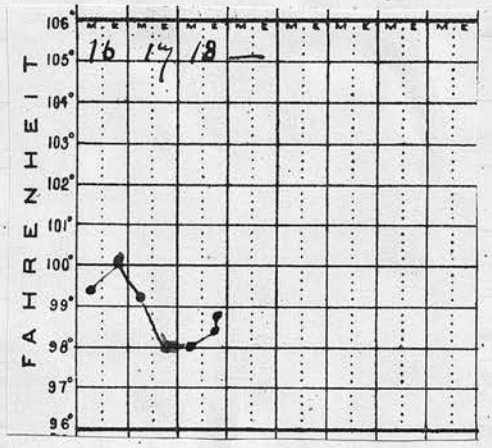
sent in as a case of "deranged stomach & general debility" - Family history of phthisis - On admission Tongue coated with brown fur - nothing abnormal found in the abdomen or thorax - bowels irregular. eyes closed, because light causes pain - is irritable - could not give much history of herself - Catamenia irregular 4 to 5 weeks, with dysmenorrhea - Enema acted well, large stool -

17/2. sick occasionally, semi conscious - bowels constipated, micturated once during day only -

18/2. noisy delirium, crying out with pain in the head, aperients & sedatives administered -

19/2. restless crying out during the night, at 10 a.m. breathing became stertorous, the Sister of the Ward supposed patient had a fit, mouth protruded, gradual cyanosis, breathing ultimately ceasing - Heart's action regular & strong 140 - Bowels acted involuntarily - artificial respiration relieved the cyanosis - only slight gasps on discontinuing - pupils contracted, conjunctivae insensitive, at 11 a.m. pupils dilated. & breathing continued on discontinuing artificial respiration - at midday the pulse was 120. full regular, murmurs in the larynx. but sleeping quietly. on awaking complained of pain in the head, able to sit up & take milk - at 4 p.m. symptoms returned, she became unconscious, face cyanosed, respiration ceased, while heart beat regularly - artificial respiration was kept up for 3 hrs, but cyanosis gradually passed into lividity - Heart gradually

failed. death occurred at 8 p.m. pupils were unequal at 6 + two attempts were made at voluntary respiration on discontinuing artificial -

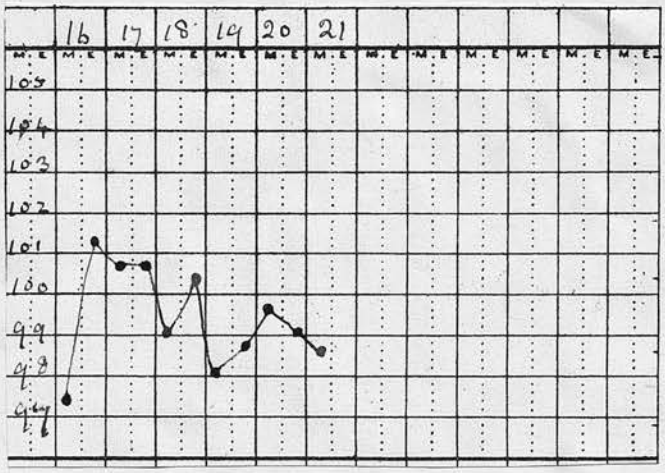


The post mortem showed no evidences of previous injury or Ear disease: the Brain was congested as were the meninges - serous effusion at the base - an abscess size of a pigeons egg + containing green pus. in the left lateral lobe of the Cerebellum - the other organs were healthy -

Case 5 - <u>Purulent effusion into the ventricles -</u>

Francis Butler. aged 23. a discharged soldier - admitted into Tottenham Hospital under Dr Rasch. 15/8/86 died 21/8/86 - Complains of headache. double vision - always steady - ill 9 days - taken suddenly ill - with paralysis of Right side, able to talk, but not to articulate distinctly, not able to raise Right foot - Bowels constipated - He returned from Egypt 12 months ago, when he was serving in the army. he was discharged with Eczema of the leg - Had been in Hospital with

venereal disease, also boils &c. On admission. low muttering delirium. Bowels constipated - Tongue furred (thick brown coating) pain down the back. pupils equal - slight photophobia, great pain in the neck on moving the head - urine normal. 18/8 - Delirium continues, sedatives had little effect - Bowels acted voluntarily. he became more drowsy, & then comatose & died -



Post mortem Examination made 40 hrs after death. on 24/8/86. no evidence of injury or ear disease, on removing skull cap, vessels of Dura mater seen to be distended, subarachnoid fluid in excess. Base of Brain covered with a thick layer of adherent yellow lymph - Brain weighs 2½ lbs - (40 ozs) Puncta vasculosa very marked - Lateral ventricles enlarged & distended with purulent fluid - cerebellum not so congested as the Brain - bones of the skull healthy -

Case 6. Abscess in the Lateral Venous Sinus.

Fanny Jacobs. 12 years of age. admitted into the Tottenham Hospital under Dr May 12/4/84. died 9/6/84. attended as an outpatient on 30/3/84 when she complained of great pain in the head. + foetid discharge from the ear, fever. ill 5 days. Had a "Polypus" removed from Right ear. at St Marys Hospital some time back. Family history good. On admission. Tongue furred, Bowels confined – no physical signs in the heart or lungs – Teeth somewhat projecting; irregular. eicentrics at angle of mouth. slight oedema – Dull dullness extends from the 5th rib to two inches below the ribs.

26/4. cough but no physical signs in the chest. Membrana tympani absent on the Right side. no granulations seen in the ear. would not allow an opthalmascopic examination.

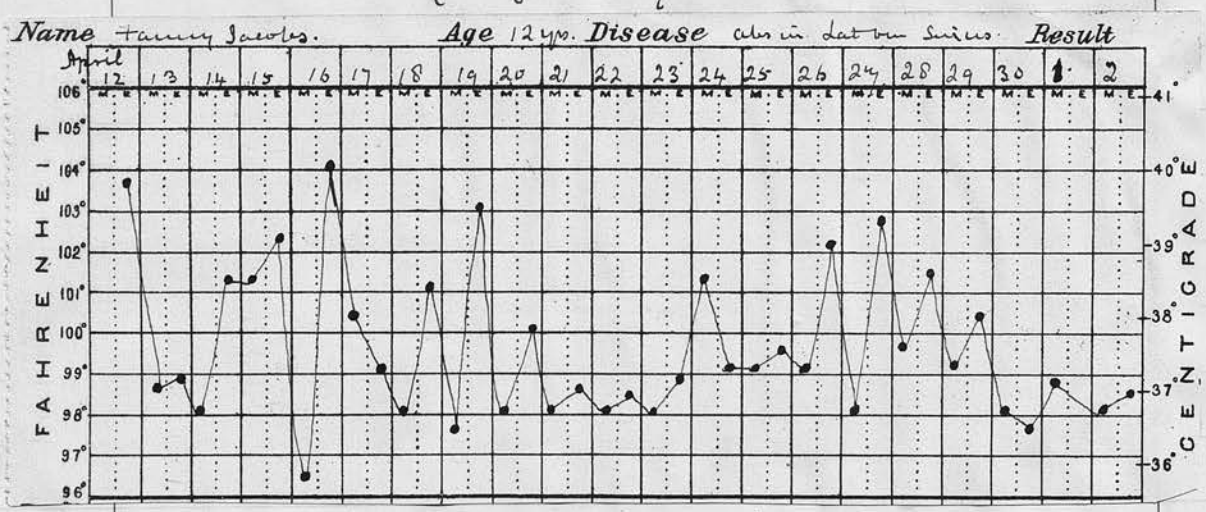
17/5. more pain in the head. with feverishness + increase of discharge – great pain on moving the head; + tenderness over the Left Temporal region –

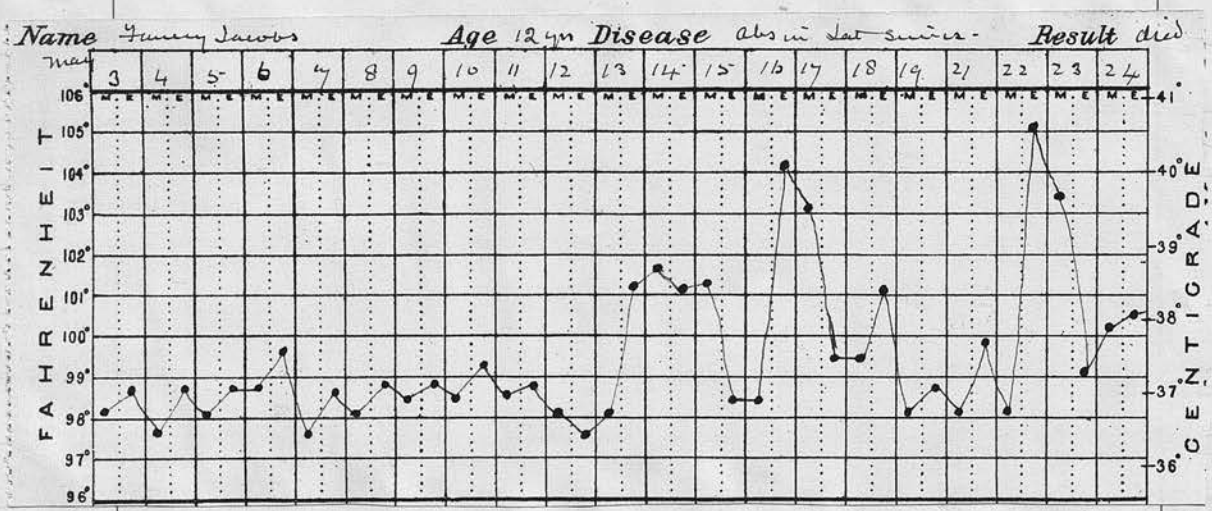
22/5. Haemorrhage last night. from the Right auricle, + repeated to day – "polypus" seen protruding through Tympanic membrane – Veins of Right side of neck greatly distended –

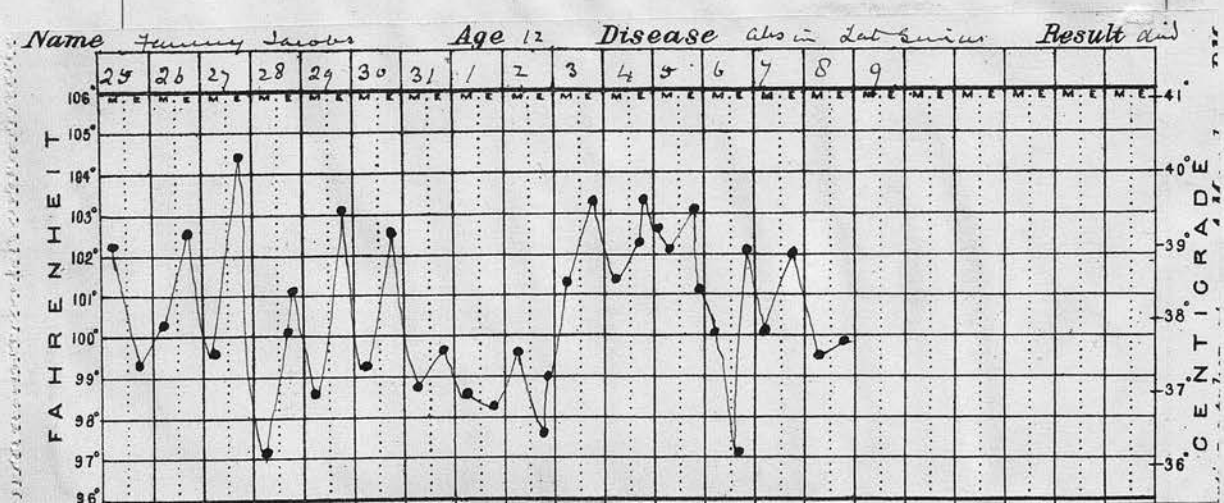
26/5. rather quieter. no paralysis – Tongue very furred. Tenderness behind the ear + the Temporo sphenoidal Lobe explored. but no pus detected –

6/6/84 pain + swelling of the Right side of the head. a large abscess was opened behind the Right ear

over the mastoid, & a quantity of fetid pus evacuated; after which Edema of the face became gradually less - crying out & moaning all night. 8/6/84. difficulty in swallowing, increased weakness; some puffyness of the scalp over the occiput - became drowsy & finally died comatose -







Post mortem examination, showed suppuration below scalp over left side of the head & back of the skull. sloughs + foetid pus formed - Brain generally congested, with increase of subarachnoid fluid, small quantity of fluid in the ventricles. some meningitis at the base of the Brain - suppuration throughout the whole of the left Lateral sinus + down to the Jugular Foramen. with a small abscess at the Zygomatic Hypsophilli. Communication formed by necrosis between the tympanum + left Lateral sinus, just internal to the mastoid process - no pus in the mastoid cells - Dura mater thickened -

Case 4. Abscess in the Petrous temporal bone - from Ear disease

Beatrice Carsberg. 1 yr 4 mts - admitted into the Nottingham Hospital under Dr Lichtenberg. 28/3/86, discharged relieved 9/6/86 - she then had an abscess behind the Ear, at the posterior border of the sterno mastoid over the neck, + debility - ill 4 months - for the last 6 weeks has had a discharge (foetid) from the Right ear. abscess first noticed two weeks ago - Family history good. she is one of five children — On admission irritable, anaemic, appetite good - abscess & discharge from the ear were treated + she was discharged with these comparatively well - some glands of the Right side

of the neck, behind the jaw remained enlarged —
On 25/8/84. she was again admitted with increase
of the fœtid discharge from the Right ear; glands
on the Right side of the neck enlarged & suppu-
rating; with a thin watery & purulent discharge.
through a small sinus; very ~~fœtid~~ fœtid -
25/11/86. Mastoid cells explored & an opening
made into Ext. auditory meatus -
1/12/84. not so well, Right side of face swollen.
anorexia -
17/12/84. High temperature; cough; redness & tender-
ness behind the Left Ear; discharge from the Ear
less; restless at night -
20/12/84. Œdema of scalp, posteriorly & laterally. &
also of Left Eyelids - no pus evacuated on incising
scalp.
23/12. Œdema had disappeared, & exp to small extent
over occiput - Bronchial râles heard posteriorly
at bases.
31/12. diarrhœa & sickness, coldness of Extremities -
4/1/88. Œdema of both hands, hectic flush, diarrhœa
less -
22/1/88. Diarrhœa almost ceased, no Œdema, discharge
from ear profuse & fœtid; small ulcer above Each
ear on side of head - great emaciation & prostration,
gradually sank from Exhaustion -
~~Post mortem~~. The Temperature varied considera-
bly - in august & September evening rise to 101,
the morning remitting to normal - becoming normal

in the early part of October - on Oct 14 rose to 100.4 in the evening, + also on Nov 19th - after opening into the mastoid there was usually an evening rise to 100 or 101; only normal for a few days in the morning - rising to 103 + 103.5 some evenings until Jany 22nd when it fell to normal. until death on Jany 26th.

Post mortem examination - slight excess of fluid in the subarachnoid space - clots in the lateral sinuses - Brain generally congested - Dura Mater somewhat thickened over the Petrous Temporal bone, on removing the dura mater a cavity was found, 1½ ins long, with dark coloured walls + occupying most of the Petrous Temporal bone, + containing two sequestra, a large + a small one, embedded in greenish fetid pus - cavity communicated with External auditory meatus + with sinus behind the ear - other organs show general congestion - especially at bases of both lungs -

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