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

by

Lloyd G. Smith, M.B. & C.M. 1883.
By the study of the seven appended cases, many of the salient characteristics of Cranial + Intracranial suppuration are seen to be illustrated, and moreover demonstrate to a certain extent, what bearing the exciting cause has on the anatomical site of the lesion; and what effect the lesion bears on the specific variation in the symptoms. These points are still further extended by the use of recent writings, 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 brain, and in the membranes; as well as in the brain (true central 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; and among general diseases they may be reckoned as most uncommon—only four out of the seven were cases of "true Central Abscess". Although above the average proportion, they still show the relative infrequency of these cases—Hilton, Fourge, Hutchinson, and others in their several papers on the subject. Hence that it is an comparatively rare affection. The last in their Essay in Reynolds' system of medicine were only able to bring together
6 cases from twin investigations conclude the rarity of their affection.

In studying the etiology of these cases (the aberrations) 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, and case 6 in which the teeth indicated a 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 and suffered from the tropical heat. For which he had been invalided home; case 3 was a schoolboy, case 6 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 but remains unsolved. Horton's study on the subject — In these seven cases there were 5 males & 2 females. Grower gives the ratio of males to females as 3 to 1; and Hinton Hughes found it more common in men, between the ages of 15 & 30.
gives the proportion as 4 to 1 — does 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 as primary (Hill
Faye). With this exception they are secondary to disease in more or less distant parts, i.e., supplicative inflammation of the tympanum.

Thus we may classify the cases observed etiologically according to the exciting cause, or anatomically according to the seat of the lesion. For clinical purposes an etiological division is the more serviceable, under such division 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 undiscernible.

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. It appeared to be the direct exciting cause of two of the cases observed. (1+2) - Gulick & Fulton give us an account of the commonest, but whether owing to the improved treatment of wounds, as explained by Hilton for instance, or to more careful examinations in other cases, it is now only second in frequency as an etiological cause. 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 the 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, meninges, or brain, individually or together. These cases 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. He was struck on the head by the falling of a window sash; symptoms developed next day, the immediate "stunning" to was considered as trivial, the slightness was the bruise on the "temples" that it had disappeared in two days after the accident, when he was admitted into the hospital, death occurring on the doctors 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 absence of the brain could be found at the autopsy. The suppurative in the brain that between two tables of the skull, leaving no direct communication. So was this an injury to the bone setting up inflammation spreading downwards slower by slower. As Prescott Hewett states is frequent; an injury often 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 vena cava drain of highmore or was this abscess set up by an injury to the brain itself? "Intestinal laceration deeply seated below point-shock" (by as) or condition areas, where there are punctiform edematous which become the seats of inflammatory new formation (laceration). It was 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 supplicative process was spent on the brain. McHutchison considers it rare for abscess to occur after concussion or laceration without an external wound. It thinks that some suppuration is the focus, but simple concussion is a most rare cause - no trace of suppuration was found. But the suppuration occurring as a cause of the injury to the brain itself, it 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. concussion, laceration is more liable to result in abscesses, which are often large, and may follow simple concussion. These abscesses may burst into the ventricle, to be soon fatal, as in case observed, or may discharge through the nose, as in case reported by Sir James (died at April 1884) also one by Quincke (Medical Record).

In the cases collected by Lyell & section 6 were due to injury & without an external wound. Young thinks that some of these cases are often misunderstood, & described as Idiopathic, owing to the injury being so slight & so antecedent to the acute symptoms, as to have been overlooked or forgotten; & thus he thinks might have been the case in some of Lyell & section 6, "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 Young gives 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.

6. Abscess due to injury & with an external wound.

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 our essays by Fyffe &cation by Prescott Hewett. It is often as the commonest cause; whereas nowadays ear disease undoubtedly holds that position.

Case illustrates this cause of suppuration. The patient had recently enlisted as a soldier when he came under observation; 3 years previously, when at a 5th of November celebration, he was accidentally 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, however 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 final one - it is probable from the condition of the abscess formed, that one formed soon after the accident, accompanied by meningitis.

The abscess was found excepted, & was 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; which 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 scirrhous and green pus (gull and sucker). In a case read before the Clinical Society of St. Hetteland Hall noted this formation of a cyst varying in thickness according to its age.

In cases as observed the attacks subsequent to the initial one were mainly confined to the brain, the brain becoming "anchored" (as heeavenan describes it) to the skull. The incysted abscess would act as a foreign body, as well as the surrounding brain tissue being diffusely nourished, would all contribute to the tendency to suppuration or effusion to any exciting cause, such as in this case. The drilling on a large parapet ground, only partially protected from the last winds which were prevalent at the time. The first abscess formed was compatible with life; either owing to the ability of the brain to accommodate itself to its formation, or the abscess implicated only more vital parts. While in the final attack with the brain greatly limited in its accommodating power owing to the restrictions of the firm adhesion's anchoring it to the skull, able to withstand pressure from the effusion, or else, which is more probable, the vital parts of the brain became implicated by second abscess which
was recent & surrounded the primary one. Injury with a wound is considered a common cause of suppuration by all. Mr. Holmes found 13 cases of abscess following injury to the head, recorded in St. George's Hospital from 1841 to 1857. It considers that the cause of intracranial suppuration is more common a scalp wound with exposure of the bone & contusion of the ethmoid table: inflammation of the bone, formation of a puffy tumor by effusion between the bone & periosteum; inflammation of diploe + suppuration between bone + dura mater, may pass to the Brain + ventricles, or to large Abnormal Sinuses + cause pyemia - 13 Lyell + others cases 11 arose from this cause - & Hulcher considers that the least marked + more common samples 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 final fatal attack. In this case it was 3 years. Dr. Jenner Stannius treated a case successfully. When the original injury had been inflicted 11 years before - a slight injury barely rekindled the symptoms 8 days prior to admission to the Hospital, as the exposure to cold beds excited the inflammation in Case 1 - a continuation of the cortical lesion leading to a Chronic Encephalitis (encephalitis) ready at anytime.
to burst out into activity. This latency is not invariably; Maclean noted one case of compound fracture of the skull when death occurred on the 4th day. Though usually symptoms occur a week or longer after the injury, if we must then suspect the gravity of the affection.

Cases of suppuration arising from head injuries reported by Mr. Powell in the Lancet of April 24th 1886 when the injury was met with 12 yrs before death.


2 Abscess consequent upon suppuration in other parts of the body, local or non-remote, is that most frequently met with; Graves gives the proportion as 70 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 commoner. Of remote causes affections of the lung...
(Empyema. Bronchiectasis *), abscess of the sinus, which are pyogenic or metabolic.

On the whole, frequent - over every cause. Ear disease preponderated. Gull & Sutton + Prescott Hewett place it second to injury; but more recent writers e.g. Gowers, Hutchinson to give it the first place in frequency. The cases reported coincide with them: 24 of Gull & Sutton's cases arose from this cause - more than half the cases of central abscess in the temporal + cerebellum are, according to Eustace Smith due to disease in the middle or internal ear. Gowers found it in 42.5% of the cases as a cause. While Mr. Barker gives it as 50% pyogenic being relatively rare. Fractures treated antiseptically, it leaves the proportion from ear disease in the majority. Mr. Joffre 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. Ogston, when the illness was only of 4 weeks duration, commencing with pain in the ear, then discharge; at the post mortem examination suppurative 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 (Kuff); blow on the head (Eustace Smith); Mastoid suppuration - introduction of foreign body into

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the ear, or removal of 'Polypus'; these latter may originate the acute symptoms in the final stage. The ear disease has as a rule existed for some time, often 'since childhood.' According to owners it may exist 5, 10, 15 or even 20 + 25 years before it causes an observer; for this reason, Hilton Hagee 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 and died of Cerebral Abscess—an allergic affection starting in early childhood often kills the patient in adult life; the bone is usually dissolved, but may be quite healthy—Purin and necrosis occurring more frequently in debilitated constitutions, e.g. senile, poliurical—but the membrana tympani may remain intact, the secretion being retained behind it—more frequently it 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 (meningitis), as Hagee believes that it is only when the free escape of the discharge occurs that the result is fatal, which again Sir W. Salley attributes to neglect of cleanliness & local treatment of affected ear. As Hilton Hagee says the danger is greater when the inflammation assumes a putrid character, which attends if long continued always involves a risk of extension—
the inflammatory action spreading through the thin lamina separating the mastoid cells from the meninges, or inflammation of the bone and septic phlegm in a thin abscess often breaks. It may spread along the veins, the most constant emissary passes through the mastoid foramen and 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 7, in which the ear symptoms had existed during 9 months, along with suppuration of the glands of the neck and side of the face, butterfly diffuse edema of the scalp, sequestrum, but no formation of pus, death occurring from septicemia, at the autopsy, an abscess was found in the Petrous temporal bone, containing one large and several small sequestra, and 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 susceptible subject + this necrosis causing pachyencephalitis, moreover, notions that this may occur in cases + necrosis + the inflammation not spread further than the bone mater; which becomes more
vascular than normal and adherent to bone.

(b) Suppuration occurring in the membranes may depend upon ear disease — may arise in the adjacent sinuses — secondary thrombosis or supplicative phlebitis. headphone given a long list of causes for this lesion, but disease of the internal ear is especially a frequent one, as the Superior Petrosal and Lateral are the nearest sinuses. They are the ones most liable to be affected, as Dr. Joplin says, long continued ear disease may set up disease of the Temporal bone + cause death with central symptoms. When along with the bone lesion supplicative inflammation is found in the bone marrows, the case of 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 latter part of the illness a diffuse suppuration occurred below the scalp, pointing to the implication of the frontal veins, death occurred from septicemia. The post mortem revealed suppuration beneath formation in the lateral and other sinuses. Dr. Barker treated a case successfully, where the abscess burst cerebral in the membranes, between theZenker, splenoidal and frontal lobes, resulting from ear disease.
Dr. Snellair records a case arising from chronic suppuration of the middle ear. Epiplacine membrane absent. The abscess was over the Pterion temporal junction, the middle ear filled with pus.

(C) Abscess may form in any part of the Brain

form extension from the ear, forming true central abscesses of which it is the commonest cause; in 80 cases collected by debert 20 were due to this, 9 in 19 collected by R. Meyer 9 were ascribed to this cause (Hartmann). Leconton Pitt found that 57 of the post mortem inspections out of 2,000 in Eppig Hospital, were due to cases of intracerebral 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 serious process is present, the septic material passes in some way from the bone disease, although according to Leconton, abscess with meningitis may be found in ear disease without disease of the bone. The abscess is usually found in the tentorium, but may occur in the cisterna. 12 out of 18 were in the cisterna in Newton Pitt's cases. Grower says it is twice as common in the cisterna 14 in 20.5 of the cases 5 only were in the cisterna as against 26 in the Cerebrum. Sommerv thought that the sit of the abscess was dependent upon that of the
dis eased in the ear; but as Gowers says, beyond the general rule, that disease of the eustachian tube may lead to abscess in the cerebrum, while that of the mastoid cells leads to cerebellar abscesses, we can lay no laws down. Return to this quantity then are frequent exceptions. The reason holds that disease of the mastoid in early life is more liable to affect the cerebrum, while in later life it will affect the cerebellum. In case 2, the ear discharge had existed off and on since childhood with the formation of "polypi"; in address in the temporal sphenoidal lobe was found at the examination, from which communicated directly with the cerebrum through a relaxed portion of bone. There was a curious condition of the petrous temporal bone. The majority of cases recorded arose from this cause.


Mr. Maclean. Lancet. March 26/89. Septic otitis media; 1 month preceeding ototomia; pus evacuated from tempo-sphenoidal lobe.


Mr. Watson Cheyne. BMJ. Brit Med Journ. Feb. 15/90. Chronic supplicative discharge from the ear. 7 to 8 years. Pus evacuated from tempo-sphenoidal lobe.


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 the head. These conditions, although not rare, are rare. From my personal observation, however, there are many recorded cases of intracranial suppuration occurring from the intracranial suppuration.
Worse, orbit, or astram of Heghine (Muskau). As instances of cases arising from chronic disease of the mucous membrane of the nose, Gull & Sutton give 2 by Gowers; 4 others + says there may be disease of mucous membrane alone, but there is usually bone disease, of cancer. Ethmoid or sphenoid often supplicative, as a rule meningitis coexists, the abscess is usually in the frontal lobe. Hiltin Fagge says it is a less frequent cause. T. Perry Warner in Brit. med. Journ. June 13th 1886 records a case when the only possible cause, to which it could be ascribed was putrid lymph in the nasal cavity.

1 case arising from disease in the orbit is included in Gull & Sutton's 4 cases; Gowers collected 2 others arising from abscess in the orbit.

Cases due to malignant growth of the skin of the face are recorded by Gull & Sutton + also by Hiltin Fagge.

Walsham gives Carus Auria's 15 cases of asthma (not chronic) as a cause + 1 of Gull & Sutton's cases followed an supplicative disease of the Commune. As a result of Echinus Albicans growing in the mouth, treacle the fungus was found in the abscesses in the brain as well as in the mouth.

Gowers gives 10 per cent as the proportion of cases arising secondary to remote suppuration, but independent of general pyemia; t
affections of the lung as the most common focus. Hutton Yagge considers the lung as generally if not always the seat of the primary lesion, where suppuration in lung abscess is a consequence of suppuration in some part - about 8 percent of lung cases are able to cause it. The pathology is mysterious; though probably due to entrance of the constituents of the suppuring cavity which are broken down, so into the more easily into the blood stream, it set up abscess by septic embolism - lyell + sutton collected 6 cases - Newton Pett 8 - Hutton Yagge gives 6 as occurring at lungs - among lyell + sutton's are three due to embolism.

3. Bronchiectasis, Pneumonic, Carcinosis of the lung. Tuberculosis. Abscess of the lung. Ziegler adds to these lung affections of the lung. Bronchitis + Endocarditis as causes - cases following embolism are reported by & de Haarland Hall. Bart and Jour. vol 1/84, by & Starwood in decant July 23rd 89. & Dr Finlay Bart and Jour. Feb 13th 89 — 4 as result of stagnation of secretion in Bronchiectatic cavities by & 2nd. Lancet vol 12/89. — & W. Legley Patt. Ed. Jour. vol 35 in which he discusses the question of their originating from embolism - as does 8sly in vol 39. Where he reports a case following suppurative parasitic cavities in the lung of a sheep - Abscess of the Brain following lesions in the abdominal cavity are reported by & 7. Taylor in
vol 35 of the Brit. med. J. Trans. where there was
abscess in the liver and elsewhere in the intestines.
Gull & Sutton give a case where dysentry &
abscesses in the liver & lung were found. Case
also recorded by Gull & Sutton arising
from lesions of the rectum above localities of
the body, e.g. from mesenteric abscesses
in the splenic and ileal mesentery; abscess near
the liver, abscess in the sheath of the
Rectus abdominis. Phlegmon of suppuration after
ampullation of the Breast; suppuration of the
mesenteric glands; abscess in the spleen & kidney. They quote a case
as reported by a case following suppuration of the branch of
appendix, T. Bright, as giving one after Whitlow
which is supposed to have been reported by Mayne
in December 1837. Of central symptoms
following a scratch on the finger which set-up
blood poisoning. Many of these cases
suggest pyemia. It is clear that the abscess
in the brain is elsewhere. Is it said to
occur in the brain but not in other parts of
the body in pyemia (Gull & Sutton), but
this must be very rare, as Gowers consid-
eres the brain as a less frequent seat of
suppuration in general pyemia. He only found
9 cases out of 234 due to pyemia, while Hilton
Fugge 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 peri-anemie symptoms.

Newton Pitt collected 4 cases of pyaemia originating from various causes, in which the brain was implicated, he attributes infection to embolism from the original source.

Subclavian gives ligature obstruction or a main artery as a cause of cerebral abscesses, though this is opposed to the views expressed by Tyrell & Sutton, who hold that encephalitis in softening the result of plugging of a central artery, or Encephalitis around a hemorrhagic effusion, or tumour, or old cyst, shows no disposition to the formation of pus or abscess. The brain may soften despite integra to a cyst from hot no pus.

3. Idiopathic Cranial + Intracranial Suppuration

is a class formed in order to include all these cases, whose apparent cause is so uncertain, that, as far as we know, that they cannot be classified among the preceding groups. It may be concluded that these cases are really due to some old forgotten injury, or some ill defined ear disease - such as Hinton Harvy's view, who says that there is scarcely any case in which one is a doctor to admit, as primary & spontaneous, in doubt Tyrell & Sutton cases, & believes that there is no case, which cannot be demonstrated at the necropsy to have arisen from
Some cause. Drankel (Lond. Med. Rec.) thinks that often obscure cases are tubercular, and when he was unable to discover a cause until he furnished the "pus" and found tubercle bacilli in it. Still we have such cases as nos. 4. Of an abscess in the cerebllum, yet no cause could be discovered at the post-mortem examination. The head and organs of body generally appeared to be healthy, no trace of injury could be detected, also in nos. 5. When an extensive purulent collection was found in the ventricles, the patient had served in the army in Egypt. Reuss still 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 and departure from Egypt, it is highly problematical that this head complaint to do with it. Debet quoted by Eyell & Sutton, admits idiopathic cases, but says they are rare, as obscure cases may turn out to be due to an immediate cause. E.g. disease of a mesenteric gland; gumboil; whether in the primary disease so small as to be overlooked? Eyell found 15 percent of cases in which no cause could be discovered. At the same time thinking the cause in many may have been overlooked. E.g. Eyell & Suttons could be found to be cause of Itt & I. Of recutum Petto
Symptoms of Central Intracranial Suppression are to a certain extent various. From a case where there is complete latency of symptoms during the interval between the originating cause and supervision 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 increased by the stage of the process, state of the collection or its situation, and above all by the presence or absence of a fistula of relief. grave cases occur, and, if symptoms be slight, so as to escape notice, the divides them according to the symptoms: into those with complete latency, those with it incomplete, and those which have only an acute or terminal stage. It is often only in the acute or terminal stage, that characteristic symptoms are present—vaccin symptoms are often absent. Among the frequency of the lesion in the temporal, parietal, Sphenoidal, Superior lobes, tegmentum, which cause no motor symptoms when discussed, arsenicals always appears to produce less grave symptoms.
than a tumour — By the study of these 14 cases, it is seen that the exciting cause +
position of the disease have 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 character,
varying in degree, lameness 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 other leads to an error in the diagnosis:
as in case 1 when it was made out to be
meningitis in the early part of the illness; same
happened in Mr. Barker's case—case 4 was
sent into Hospital as "gastric disturbance with
diabetes", + cases are reported when the
vomiting + intermittent temperature led them
to be diagnosed as acne. Gull + Sutton say
that symptoms as closely resemble continuous
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 — as found, as below:

Gull + Sutton — 73 cases. Newton Pitt. 18 cases.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Gull + Sutton</th>
<th>Newton Pitt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain in the head</td>
<td>39</td>
<td>15</td>
</tr>
<tr>
<td>Epileptiform seizure</td>
<td>28</td>
<td>4</td>
</tr>
<tr>
<td>Coma</td>
<td>30</td>
<td>4</td>
</tr>
</tbody>
</table>
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—those in those arising from injury. The interval between the receiving the injury and the incidence of the acute or terminal stage, does not appear to be dependent upon the extent of the injury — for example, Case 1, the injury was a severe one, as were the immediate symptoms, the interval of incomplete latency was 3 years. This quite reconcilable with cases where the injury was supposed to be quite trifling, or even was of an interval of latency, the case preceding to a fatal termination — the early development of an acute stage, is only as a rule in traumatic cases, as ascribed to powers to the more extensive amount of initial inflammation; the symptoms
may resemble menigitis, which is often co-
existent - duration of the symptoms being 10 to
30 days, often described as an acute abscess. In
corona distinction to chronic ones death occurs
sometimes at the end of a week, but may be
only in the 15th or 30th week. Holmes says
suppuration beneath the cranium occurs a
considerable time after injury; about 2 weeks is
the average - while Harvey gives the time of
symptoms occurring are between the 8th and 12th
days, and may be extended. In compound fractures
the symptoms are, according to Hutchison, induced by
the exit closing or 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 localized over lesion which is below
injury as in case 1. radiating over the head;
or it may be deep in, as in case 3 or generally
distributed over the head - in latter alike it
increased towards night & lessened in the
morning. There was nothing definite becoming
noisy at night, but 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 liberation, a distinct interval sleeping between
the reply + the asking of a question - spasm of
muscles + may be paralysis - drowsiness & incapacity.
becoming replaced by cart towards the end. All or several of these symptoms, together with the history and signs of the accident, led to the diagnosis in these cases.

The compound fracture Hutchinson draws attention to. Hernia cerebri being an important symptom; and Holmes considers a "puffy tumour" with an unhealthy appearance of the wound of great diagnostic value. An abscess may develop quietly until of a large size, as in Case 1 where it was considerable. With two other ones floating in it - in many of the cases recorded, it was an early symptom, along with pus in the brain. 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 affection the otitis media, but even this may be absent in exceptional cases. Newton Pott found no otitis media in any of cases; in 2 the membrane tympani was intact, yet lateral sinus thrombosis and necrosis proved fatal - it is more usual to leave long continued ear disease, e.g. Herpetic temporal as Sir W. Talfy says, bone, when dead bone can be detected. Patient is in a perilous condition - he divides cases into those which come back symptoms come on soon after the establishment of the perforation, mostly when there has been a purulent discharge from the ear.
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, (as with a young child is shown by frequent movements of the head to the head and screaming (Eustace Smith).) Drowsiness, vomiting, anorexia, bowels constipated, often induced by rigor and feverishness, may be paralysis or convulsions according to the seat of the affection. As Hartmann says, these cases may arise without any symptoms, and remain latent a long time; or begin with acute symptoms, and symptoms may vary, increase and recur, until a final severe attack leads to death.

Gross in American Journal of Medical Science July 73 distinguishes the various sites of the suppuration by the symptoms to. From the 7 observed cases it is seen that abscess in the bone, as in this, is attended with hectic long continued attendance, tenderness over auricular region, evidence of removed bone on probing, oedema of the scalp, suppuration in left glands of the neck, a very irregular temperature, death from Septi-

ecemia.
Adema, suppuration below the scalp - repeated hemorrhages from the ear, indicating communication with the lateral sinuses. In 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 sinuses - death occurred from septicemia. The pulse, temperature undergoing great oscillations during the course of the illness - Gee says that Thrombosis of the sinuses of the same nature do not admit of diagnosis, unless there are septicemia symptoms present, or some obvious cause of the disease e.g. cancer of the men petrosa - the edema which is characteristic, varies according to the sinus affected (Hartmann). Gerhardt gives the empty condition of the vein 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 septicemia - Mr. Balfour records two cases 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, no optic neuritis, which Newton Pitt considers as frequent in these cases - in Mr. Barker's case
of sub-dural abscesses, the chief symptoms were headaches + dullness, & it is considered 
that the temperature + pulse do not oscillate 
it there is no pyrexia, while there is 
acting in the temporal region in chronic 
cases –. The symptoms of septicaemia 
with headache, vomiting or intermittent pyrexia, 
the typical aspect, are more prominent 
than the cerebral symptoms, which become 
much so later on, included headache, som- 
notice, dullness, delirium + may be motor 
symptoms, all these with subduralaneous 
eldema, 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 external eldema. 
In abscesses situated in the Brain + secondary to 
local or more remote suppuration, it is found to 
never occur only exceptionally in other than chronic cases, 
are thus history + the symptoms of the suppuration 
causing it are added to the cerebral ones – it is 
less common than suppuration below the dura 
Mater + plebitis of the sinuses – there is headache, 
vomiting, delirium + may be jacons, but more 
abnormal the onset, the greater is the probability 
that the abscess is in the Brain – the case 2 
where an abscess occurred in the temporal ephemeral 
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 night; delirium, slow pulse, two fever until the last day of his illness. Dr. Gurney’s case showed in the eyes & forehead & a tendency to sleep were the prominent symptoms. Mr. Barker gives the clinical signs as a feeling of malaise, dizziness, slow pulse, sudden rise of temperature with rigor, gradual fall of temperature to subnormal, most marked in the evening.

In those classified as *Flehmen* the symptoms were very obscure. In both 4 & 5 the headache & florificches 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 duration & latency are frequently the most striking characteristics - although in few cases can the distinct line 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 acute abscess with early inflammation symptoms lasting 1 to 4 weeks - chronic abscess which may leave 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. An abscess becomes enclosed in a thick capsule—Towers believes it may remain for years, in one, or in another 20 years without exciting any symptoms. The central symptoms may be acute then subside, and again reappear on meeting with some external irritation, and may subside again, and so on, until in one attack the symptoms become stronger than usual, and lead to a fatal result. Such was the course in Case 1. After the accident the symptoms of brain trouble were severe. No doubt one abscess formed then, and was accompanied by meningitis—the meningeal inflammation was probably repeated several times. While this finally fatal attack was the result of the formation of the second abscess around the abscess first formed, it now became evacuated. The formation of a cyst will may account for the latency of the symptoms as suggested by Bristow. This appears to be nature's effort at healing by enclosing the results of suppuration in a limited space, and which by thickening tends to become obliterated, and might if patient lived long enough go on to cure, as suggested by Lyell's section, there are no records of such cases. Yet inappositeness the theory, while Ziegler says small abscesses can cure themselves by formation of a cyst and resorption. This effort
would be favoured by the degeneration of the
joints in the abscesses, which is frequent.
In case 3+5 this latency of the symptoms of
symptoms was apparently absent - acute symptoms
supervened and went on to death without any
remission; abscess cavities were formed large
and thin-walled. In the cases arising from
ear disease, there was nothing pointing to the
time at which the abscess formed, but causative
process had existed over a long 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. Hannen's case it was
11 yrs. In the two traumatic cases (14, 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 pain, attacks with symptoms
of central mischief, and those arising from ear
disease, the ottersness is of an intermittent
character, often suppressed just before the terminal
or acute stage, which may last from 1 to 8 days.
Warner's case to 23; in Mr. Barker's. During this
period all the chief symptoms of suppuration
in the brain of its vicinity are present - and one
muttering into the ventricle, as it may do, especially
in temporal sphenoidal abscesses the symptoms are
three of hemorrhage: i.e. convulsion, coma, + death; through 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 ecchymosis 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 & buccinator arch covering it - in case 3 there had been a bruise, but none was visible on admission. Mr. Harrison had a ecchymosis to aid him in the diagnosis of this case, which he successfully treated, as had Mr. Wiseman in one he treated, but the ecchymosis was not over the seat of the abscess. In these cases secondary to others, there is, as a rule, the attenuation, often of a fetid, discoloured character; it has in many cases been obviated by cleansing + drying of the discharge, or by the insertion of a plug of cotton wool, thus aiding the spreading inwards of the discharge; hence the popular fear of chugging "a running car" owing to the fear of it being drowned upwards. In Prof. Greenfield's case it is described as a dirty brown colour - in Mr. Furniss it was somewhat offensive but slight; in Mr. Barker's it was pungent.
If extra dorsal, the absence may burst through the nose or ear, or from a discharge of pus in a sudden spurt as in 5th Howland Hall's case, where the skin is implicated, the abscess of the scalp & side of the face is one of the most obvious newborn appearances as in case 3 – this with hemorrhage from the ear were prominent in 3.

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 petrified look; but with rise in temperature & pulse, the face may be flushed proceeding 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 St. James's case the head & other symptoms were so slight that the patient was able to sit up – the case of umbilical abscess reported by St. Veeris. Murray the patient lay with his head hanging over the side of the bed, throwing his arms keeps 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. Bowers says pyrexia is one of the most important symptoms outside the nervous system, is frequent in the terminal stage; while Macawen says it as pretty constantly elevated at the commencement becoming subnormal, but may rise to 104 or higher before coma and death. Mr. Hulke noticed a low temperature in a case, and considers it as a characteristic of central abscess. St. James 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 Pell and others they occurred in several. Mr. F. M. Dutton-Pitts says they may occur regularly in so resembling aseptic meningitis. 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. Meningitis was discovered at the examination, the lesion being confined to the brain and the petrous temporal bone. In case 3 there was fever which gradually lessened, although at one time as high as 103°F.
felt to normal on the last day— the dura mater was found to be thickened and recent pus outside over the convolutions; in it was similar, rising to 100, then falling to normal on the day of death—here also there was effusion at the base. Congestion of the meninges—In case 3, where death occurred from septicaemia, the temperature fluctuated considerably— in the early part it was generally high with morning remissions. In three cases reported by Dr. Cushing, Prof. Greenland, Dr. Tenney, M. Harrison, Dr. Pacey, Wendell, the temperature was subnormal— In the Hamilton and Halls case it rose in the late stage of the illness—In Dr. Hammond'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 were retraction of the abdomen, to a greater or less extent, fever, tongue, anorexia, sickness, which may be the first symptoms, especially frequent in Cerebellar abscess. Although absent in Dr. Meachum'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 furled.
constipation continued for 3 weeks, with anorexia, no vomiting, but the abdomen was slightly retracted, sores 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 tarry tongue, irregular bowels & sickness, that they quite obscured the other central symptoms — in case 6 there was formed tongue + constipation, with in the appetite which was good at first, failed towards the end, diarrhoea + sickness (septicemic?) supervened. So in most of the cases reported by Dr. Bayley, Mr. Harrison, Mr. Pryse, Eynield &c., vomiting was a chief symptom, although 3 or 4 cases showed an exception to this.

On the Circulatory System, 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 feebler on the day before death. In case 2 it was 60 + regular, but became 65 + irregular the day before death, the heart 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, as it is recorded.
in the cases reported by Dr. Langley, Prof. Vearnott, Dr. Barker, Dr. Hamilton — the pulse in central abscess is considered more persistently infrequent than in tubercular meningitis. Towers says it is frequent if meningitis is present, and then that is fever. But towards the end, sometimes throughout the illness, it may be infrequent, falling to 50, 40, or 30. Duschen (quoted by Hartmann) & Haezgen (quoted by Jagge) observed cases in which it was only 10 per minute. According to Macan the early characteristic is an accelerated pulse, later on falling even to 40 with occasional remissions, 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, these symptoms affecting this system were noted in 4 of the cases. In two the respiratory center appeared to have become implicated in the brain affection, in the others the recumbent position and intensity would favor respiratory symptoms. 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, again, to become paralyzed. The heart gradually failed. In case 6 there was a dry cough, but no distinct physical signs. In case 7, rales were heard posteriorly towards the bases — as in Prof. Greenfield's two humain cases. In those 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 local symptoms. In suppuration of a candid thoracitis it is the chest affection which it produces that is fatal, not pneumonic alone (Hartocollès, etc.)

In the intercostal septum — the inflammation, often rapid, is a characteristic feature of the illness, as in case 8, when it was rapid & attended with empyema — Prof. Greenfield & Dr. Percy Blandall the surgeon noticed it in their cases. The last describes the skin as becoming dirty yellow & nearly looking Gull & Sutton say estrus with 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 cases thoracitis —

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. Sicelove's two Dr. Cayley cases, along with traces of
phosphatic - In the Lancet of Sept. 12th an elaborate analysis of the urine from two cases, is given. It shows that a state of perspiration exists without an elevation of the temperature; inflammation is indicated shown by a diminution of the chlorides; a great extraction of nerve tissue going on; shown by the increase of phosphates, the high colour & high specific gravity, with the diminution of phosphates shows 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 noticed in 308 typhus fever cases, also in case 4 - is frequent during convalescence. In the Buxton case there was involuntary urination.

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 alarming character - the constant moan of "Oh my head" with the children the tossing & raising of the head to the head with an occasional loud cry, which the patient was quite unable to restrain, indicated the severity of the suffering - these symptoms 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" in 5 days. Along with this there was tenderness over parts of the head, especially over part where pain is described as originating. The pain is paroxysmal, radiating, retching or intermittent or continuous, like being knocked on the head with a hammer—not necessarily localized over the seat of the abscess, but may be quite general over the head. Gull & others give a case of abscess in the temporo-lateral & pneumo in the forehead. Return of pain on the left side + abscess on the right. Newton Pitt says that the pain is worse even in those cases arising from ear disease, but tension of retained pus may cause more or less intense headache. Brodie holds that the pain is due to bone or demyelination being affected. In only 3 of the 9 in which pain was complained of, in the ears observed, was it localized over the seat of the disease. Thus in case 1 the pain was over the side of the head in which the abscess was, with dysphagia was the first symptom—its paroxysmal, radiating nature, with tender points over the temporal, led to the diagnosis of neuralgia. When first seen a similar ever occurred in M. Barker's case, when 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. Painful
Frontal region - 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. It had a dull aching character, not altering except with a tendency to a nocturnal increase, it began suddenly and without apparent cause about 1 month before death; its tenderness increased on pressure. In case 3 the headache was complained of two days after the injury, and persisted until the patient became unconscious. In case 4 the pain in the head and side, even with the gastric symptoms - the most prominent, there was a constant crying out with the pain which was described as general - after the attack of apoplexy, it was again complained of. Similarly in case 5 the early symptoms were diffuse headache and pain down the back, with extreme pain in the neck on moving the head; so also in case 6 the headache which was most localised was an early and constant symptom, with tenderness in the Temporal region. Both Macconnell & Prescott Heward consider cephalalgia localized or diffuse as a constant symptom, on the same or the opposite side to the abscess, & cases recorded by Czegli, Monrard, Lynnfield, Trenier, Barker, Hammon & W. Whitlaw.
arising from injury or disease, the headache of varying intensity was present; though the tenderness over the region 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 accompaniment of the headache; the eyes were partially closed, peculiar to the eyes, & irregularity of the pupils - In case 1 there was paralytic palsy of the left eye, sight unaffected. no sign of on the 5th day some photophobia -

In case 4 there was photophobia. eyes kept closed - during the attacks of suaue the vascular 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 ophthalmoscopic 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 these symptoms - it is similar to that met with in central tumour, but not so constant; due as

Raynor says to the rapidity of the formation of the abscess not being so favourable, as the slow growth...
of a tumour—Hawton Pitt found that out of 47 cases examined, 3 had normal discs, 4 in the otters it was probably due to attar old or recent sinus thrombosis. Mr. Barker found it in phlebitis of the lateral sinus.

In 1878 Groomfields case the condition of the disc and symptoms were most fully recorded, there was double optic neuritis, pupils equal but slightly contracted, slight ptosis; after the excretion of the pus the neuritis disappeared and the pupils varied—optic neuritis was present in 5 Heness's case. It may cause total loss of vision as in cases reported by Mr. Bryant. S. Caughey—in otters it was absent as in cases of S. Caughey. Mr. Barker. Mr. Haman,

The Cerebral and Mental Functions are almost invariably affected—the mental faculties are blurred, 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 incontinence and disinclination to speak. Answers in monosyllables—there is "slow construction" reaction. Pitt. The interval between asking a question and reply to it, being greatly prolonged; the articulation is imperfect; memory becomes impaired, unable to calculate, forgets messages &c. Hall + reaction as well as reaction Pat + gives noticed aphasia in cases. In some cases
mental disturbance with attempts at suicide
have been reported. Moodley says that
obsesses - i.e. do not directly produce mental disorder,
which is often absent, but if they do it is indirectly
by reflex or sympathetic action. In Mr. Berkners case
the patient was noticed to leave a tendency to magnify
his troubles; this was considered as unfavourable.
ax 26.74
Mr. Moodley says there is fretfulness, sleeplessness,
but a late stage delirium, but a state of passing into
drowsiness + coma. In case 1 there were 3 attacks
attended with delirium – in the 4th & 6th one he
was observed to roll his head about, muttering
incoherently, at intervals heaving out, on asking
him a question, he answered shortly, after an
extremely long pause, & often had to be repeated; the
answer was usually “yes” or “no” incoherently & not
always relevant to the question put – at night
the delirium was quieted + woebegone, at its height on
the 8th 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 alternation in
his behaviour, since the original injury he was
described as “proud 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 noticeable at times of delirium - to cause his rejection.
In case 2 on the 3rd day after admission he was restless and 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 woken to eat. Gradually passed into coma. In case 4 the delirium was of a noisy character with crying out, but night worse. Until the attack of apoplexy, 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 sepsis which was present besides two fever. Her intelligence had always been defective. In case 9 irritability and fretfulness were prominent symptoms. Dr. Cawley describes his patient as having confusion of thought. In case 7 of Pressman, the Rushian cases there was delirium in the early stage giving way to a torpid state without delirium. The symptoms of mental symptoms may be seen in different cases.
e.g. coma may be the first \& only symptom, fatal in 3 days (reaction fit) - or only dullness of expression, or change of disposition from cheerful to morose, melancholy, a disinclination to speak, apparent loss of memory & inability to speak (Hill's term) - clouded intellect was the most marked of mental symptoms in the cases reported by Dr. Hewitt & Hall, Mr. Haines & Percy Rendall.

In only two of the cases observed were there motor disturbances - in case 1 chronic spasm was present in the muscles of the face & the 2\textsuperscript{nd} 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. Dr. Greenside & Dr. Haines cases there were no motor disturbances, while in others there was paralysis - thus in cases by Mr. Haines, weakness of legs - in case by Dr. Percy Rendall - convulsions occurred in that reported by Mr. Barker, Mr. Haines, & Dr. Hewitt. Dr. Haines, Dr. Cayley & Dr. de Havilland Hall-Greens says convulsions are frequent, usually grand resemble Epileptic fits - occur at beginning \& terminal periods. Paralysis is associated with abscess below the motor regions of slight, merely absente, \& 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! Bows acted involuntarily - there an not at all constant - in case 1 even when almost totally unconscious, he could still be moved to swallow.

Mr. Barker noticed an increase of the knee jerk tactile elusions, but very little plantar reflex. 

Mr. Forward noticed the same, without tactile elusions, with abdominal reflex was diminished.

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Cases observed.

Case 1. Abscess in Temporal Sinusoidal lobe due to an injury 3 yrs previously.

William Davies - 19 years of age, private in the Royal Welsh Fusiliers. Enlisted 2 months ago.

Admitted into the Depot Hospital at Oxshott Oct 3rd 1852. Complaints of pain (shooting) 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, and epigastricness. Habits are steady - being sober & of a studious disposition. History as given by the parents, shows that 3 yrs ago, on a 5th of December.
celebration, he was shot in the temporal region by a pistol loaded with brown paper and powder only, & he was ill for some time after with local symptoms & some pieces of bone came away during the healing of the wound; since then he has had two attacks of illness attended with central 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 whilst sleeping – He was average height, well developed & muscular. His enophthalmia of left eye, painful points on pressure in the left temporal, frontal & parietal regions. A small white cicatrix is seen over the root of the left temporomandibular arch, is of the size of the small finger nail, no marked condition of the bone can be made out. Weight 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 passing over the auricular area caused him to cry out.
Bowel acted after the administration of a saline
solution, refused normal.
no. 425, temperature normal.
pulse full, regular. 90. During the night
had been in a morose delirium only partially con-
scious, sleeping in an irregular fitful manner.
Oct. 8. He had sapped less delirium during the
night, owing to the administration of sedatives.
Oct. 8.15. Night quieter, is drowsy, took his breakfast.
Bowel acted, still complains of great shooting pain
in the head, slight photophobia, other symptoms
unchanged.
Oct. 9.15. Morose delirium during the whole night,
unaffected by sedatives, quieter towards morning
when he became more drowsy, pulse regular 60.
Temperature sub-normal, no pain exhibited on
pressure over above mentioned tender spots.
Left side of face is contracted at intervals, the wound
heavily—cannot be roused to answer questions,
but takes liquid nourishment.
Oct. 8.15 could not be roused to answer intelligently.
In shooting loud he answered "yes" or "no" indiscrimi-
nately, with a long interval between the answer+
to the interrogation—still mows. Forses about,
eyes half closed, conscious when wishing to
urinate—pulse feebler 120—no regular stop.
Oct. 9.15 quite unconscious since midnight, mows.
Works left side of face, cannot be roused—no
symptom of paralysis—became gradually comatoso
and died at 5 p.m.
Post mortem Examination. 40 hrs. after death, head alone examined. Sura mater adherent to skull cap, but no recent opening; 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 fringe nail was found at the junction of the Petrous & squamous temporal, on level above posterior to the external carotid. & separated from the skin by the posterior part of the zygomatic arch, thus observing 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 Limbus sphenoidal lobe, the convolutions being obliterated, a gelatinous fluid flowed through the Sura mater, by a small opening which had been made accidentally in it, the whole lob was in a state of white & red degeneration, partly diffusely broken down into pus, the centre containing an abscess the size of a small nut, in a thick, felt-like wall, contained pus, yellowish green, pearly, & with a peculiar fetid odour, excreta of fluid in the left cerebral ventricle, left choroid plexus congested, left optic Thalamus softened in its posterior part.
Case 2. Abscess in left temporal suprarenal lobe, due to ear disease since childhood.

Charles Long aged 15 years - works in pottery works admitted to Tottenham Hospital under Dr. Rasch 18/3/86 complaining of pain in the head, also otorrhoea. Ill 1 week - 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 left frontal region. Has been suddenly and without cause.

Status on admission: alimentary system - tongue furred. Bowels constipated for the last two or three weeks. Appetite small - no sickness or indication after food. Abdomen slightly retented.

Examination: liver, kidney organs show no physical signs of disease. Respiratory and circulatory systems appear normal. Pulse 80 regular. \\

20/3/86. Bowels on teethe, tongue very furred. Bowels acted copiously after an enema. Pain no better during the day.

21/3/86. Restless during the night, morning 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. lived. Breathing in very long pauses at intervals - face deeply cyanosed; heat tumultuous & irregular.

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<th>Name</th>
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Post-mortem examination made on March 24th, 31 hours after death - no abnormal mental appearances; pupils equal & medium - on removing skull cap, brain cavity showed congestion of vessels - no evidence of meningitis - but there is 1 wound over left petrous temporal bone, which is also dark & necrosed. Brain weighs 500 gms.

The left temporal sphenoidal lobe is one dark difference mass, with pus spreading from it - on section contains fetid pus in a large cavity. Puncta venosa lora marked - lateral ventricles dilated - contain fluid - left more than right - deep choroid fringes deep purple - rest of brain + cerebellum are more or less congested - left internal car contains fetid pus - petrous temporal necrosed - Sympathetic vessels absent - granulations around
the site of the tympanic membrane - the external auditory meatus contains a mass of inspired pus - right ear normal - with the exception of some old gliotic tissue adhesion over the right drum the other organs appeared quite healthy.

Case 3 - Abscess in right temporal sphenoidal

Copy, due to injury

Henry Harbor aged 14 yrs - schoolboy in a Reformatory school, admitted under Rassch into the Gothamium Hospital 12/6/1856 - died 18/6/1856

Complaints of drowsiness + general feeling of ill health. Two days before admission he was struck on the forehead by a window sash, the day following he had headache + sick-bowels confined - tongue formed - feverish - on admission drowsy. No physical signs of disease in the heart or lungs - urine contains a slight trace of albumen.

17/6/1856. Bowels ceased after an appetizer, has to be induced to take his food. Stomach increased % he died commence on the 18/6.
Post-mortem on 21/6/86 - 6.5 hrs after death.
No abnormal external appearances e.g. of injuries to skull.
No fluid in any sinus.

Skull cap bone fracture 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 - darkgy pustules subperiosteal fluid - smell of pustules in
the Right fossa of the skull, no necrosis of the temporal bone, nor disease of the con-
but adjacent parts to Right wing of the sphenoidal + Right Temporal bones darkened +
contains 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 temporal sphenoidal lobe contains
a large abcess 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 calcification over the Left Pleura, other organs healthy.

Case 4: Abscess in Left lateral lobe of cerebellum.

Amelia child, aged 18 yrs, general servant, admitted into the Tottenham Hospital under Dr Rush
16/2/86 - complains of pain in the head + side.
sent in as a case of "deceased stomach & general debility" - Family history of pleurisy - On admission face coated with brown fur - nothing abnormal found in the abdomen or throat - bowels irregular - eyes closed - because light causes pain - 5 minute could not give much history of herself - cutaneous irregular 4 to 5 weeks, with deep monochrome -三星 acted well, large stool

10/2. Sick occasionally, semi-conscious - bowels constipated, evacuated once during clay only

10/2. Noisy delirium, crying out with pain in the head, apnoeic + sedatives administered

10/2. Matters vomiting out during the night, at 10 a.m. breathing became atonious, the sister of the ward supposed patient had a fit, mouth foamed, gradual cyanosis, breathing ultimately ceasing.

Heart action regular + strong 140 - Bowels acted involuntarily artificial respiration relieved the cyanosis - only slight gurps on dis-dcontinuing - pupils contracted - incontinence insensitive, at 11 a.m. pupils dilated - breathing continued on dis-continuing artificial respiration - at midday the pulse was 120. full regular, reassuring in the lymph, but sleeping quietly.

In 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 a.m. pupils were unequal at 6 a.m. Attempts were made at voluntary respiration or discontinuing artificial —

![Graph Image]

The post-mortem showed no evidence of previous injury or dis ease. The brain was congested as were the meninges. Serous effusion at the base. An absence of a line 2 1/2 x containing green pus in the left lateral lobe of the cerebellum. The other organs were healthy.

Case 5. — Penetrate effusion into the ventricles.

Francis Beauty, aged 23, a discharged soldier admitted into Tottenham Hospital under Dr. Rendall 16/2/1868 died 21/8/68. Complaints of headache, double vision, always steady ill of days taken suddenly ill wrote 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 sciatica of the leg. Had been in hospital with
vomital disease also noted on admission.


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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 brain were 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 oz.) Peritoneum periauricular very marked - lateral ventricles enlarged and distended with purulent fluid - cerebrum not so congested as the brain - bones of the skull healthy.
Case 6. Abscess in the Lateral Sinus.

James Jackson, 12 years of age, admitted into the Toledovvm Hospital under 5. May 12/4/87 died 9/3/87 attended as an outpatient on 30/3/87 when she complained of great pain in the head, a feeling discharge from the ear, fever, ill 5 days.

Had a “polypus” removed from Right ear a few days ago.

Hospital some time back - family history good.

Admission. Tongue firm, Bowels confined, no physical signs in the chest or lungs - Health somewhat depressed; irregular, icterus at angle of mouth.

Slight oedema - Swine dullness extends from 5 1/2 to two inches below the ribs.

26/4. Tongue but no physical signs in the chest.

Membrane to appear about on the Right side.

no spasmations seen in the ear would not allow an ophthalmoscope 

17/5. More pain in the head, with feverishness + increase of discharge great pain on moving this head; tenderness over left temporal region.

27/5. Hemorrhage last night, from the Right auricle, repeated 10 day “polypus” seen protruding through tympanic membrane - veins on Right side of neck greatly distended.

28/5. Rather quieter no paralysis - Tongue very firm.

Immobility behind the ear & the Temporo-sphenoidal done explored but no pus detected.

5/6/87 no pus found of the Right side of the head.

A large abscess was opened behind the right ear
over the nostril, & a quantity of fetid pus excreted; after which edema of the face became gradually less - enquiring & moaning all night. 8/6/34. Difficulty in swallowing, increased weakness; some puffiness of the scalp over the occiput - became drowsy & finally died enuresis.

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**Graph 1:**
- **Name:** Tommy Jacobs
- **Age:** 12 yrs
- **Disease:** Absent due to illness
- **Result:** Died

**Graph 2:**
- **Name:** Tommy Jacobs
- **Age:** 12 yrs
- **Disease:** Absent due to illness
- **Result:** Died

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**Graph 3:**
- **Name:** Tommy Jacobs
- **Age:** 12 yrs
- **Disease:** Absent due to illness
- **Result:** Died
Post mortem examination, showed suppuration below scalp over left side of the head, back of the skull, temple and frontal parietal. Brain facts generally presented, 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 angular fornix, with a small abscess at the Dorsal part of the Communication formed by nerveso between the hypophyseal, left lateral sinus, just internal to the mastoid process, pus in the mastoid cells, bone main thickened.


Beatrice Cawson, 14 yrs, admitted into the St. Luke's Hospital under S. Lichtenberg, 2/2/86. Discharged relieved 2/6/86. She then had an abscess behind the ear, at the posterior border of the temporal mastoid over the neck, and the last 6 weeks has had a discharge (fetid) from the right ear. Abscess first noticed two weeks ago. Family history good. She is one of five children. On admission, unstable, anemic, appetite good. Abscess discharged from the ear was treated, she was discharged with this condition, will some spread of the right side.
often weak. Behind this pain remained enlarged on 25/1/81. She was again admitted with increase of the purulent discharge from the right ear; glands on the right side of the neck enlarged ; suppurating; with a thin watery purulent discharge through a small sinus; very febrile 25/1/81. Necrotic cells appeared and an opening made into external auditory meatus 1/12/81. Not so well, right side of face swollen.

17/12/81. High temperature; cough; redness and tenderness behind the left ear; discharge from the ear less; nausea at night.

20/12/81. Oedema of scalp, posteriorly and laterally; also of left eyelids - was put evacuated on increasing scalp.

23/12. Oedema had disappeared; kept a small quiet over occiput - Bronchial rales heard posteriorly at bases.

31/12. clearness & sickness, coldness of extremities.

7/1/82. Oedema of lower limbs, best in hands, diminution less.

28/1/82. clearness almost ceased; no oedema, discharge from ear purpure; fastid; small ulcer above ear on side of head - great lassitude + fetidness.

gradually ended from feverishness.

The temperature varied considerably in August & September evening rise to 101; this morning returning to normal - becoming normal
In the early part of October - on Oct 14 rose to 100.4.
In the evening, 10X on Oct 19th, after opening into
the mastoid there was normally an elevation to
100 or 101 only normal for two days till
the morning rising to 103 + 103.5 some evenings
until June 22nd when it fell to normal, until
death on June 26th.
Post-mortem examination slight excess of fluid in
the subarachnoid space. Clots in the lateral
sinuses. Brain generally congested - Emin
mattar somewhat thickened over the Petrous
Temporal bone, on removing the dense matter
a cavity was found 1.5 in long, wide dark columns
walls occupying most of the Petrous Temporal
bone, containing two sequestra, a large and
small one, embedded in granular dotted pus.
Cavity communicated with ethmoid and auditory
spaces behind the bone - often organs show
general congestion. Especially at bases of other
drugs.

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