ACUTE INFLAMMATION
of the
MIDDLE EAR
in general practice.

with numerous original coloured drawings
of the Membrana Tympani
in this Disease.

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Apologia.

It may at first sight seem to savour rather of presumption for a mere general practitioner to write a thesis upon a special subject such as this. A moment's reflection will, however, show that the vast majority of cases of acute "Otitis Media", if seen and treated at all, are seen and treated by the general practitioner, not by the specialist. As Roosa says — "If we were to form an estimate of the frequency of acute inflammation of the middle ear from the number of cases in the statistics of writers on diseases of the ear, we should come to a very erroneous conclusion as to the number of people who suffer from this affection. It is indeed a very common one.

"From the nature of things the general practitioner will see a good deal of this form of disease — if he be on the look out for it."

It is thus really not so much in the specialist's as in the general practitioner's domain. My own experience is that whether arising "here" or in the course of some febrile disease etc., "Acute Otitis Media" is a common disease, and by far the commonest form of ear complaint that
I have met with in nearly twelve years of family practice. From records kept of many such cases, and — in many instances — with original drawings of them made direct from nature, I have endeavoured to depict this affection from the point of view of a general practitioner, who both in Edinburgh, & in Vienna (under Politzer & Beng), has had some training in diseases of the ear.

To quote from Rossa once again — "We are dealing with an extremely practical subject, & one in which every family practitioner is, or should be, very much interested."
The Middle Ear
Anatomical Considerations.

The Middle Ear —

The Tympanum —

" " Its Walls.

" " , their structure.

" " , adjoining structures.

" " , its contents.

" " , mucous membrane.

Vascular supply of Middle Ear.

Innervation of " " .

Middle Ear in Childhood.
(Special points).

Anatomical features from a (possible) pathological point of view.
The Middle Ear

"The "middle ear" includes the drum-membrane, the tympanic cavity and its contents, the mastoid cells, and the Eustachian tube. In its function, it is the more delicate and complicated portion of the transmitting mechanism. "It is the most important part of the ear from a pathological point of view." (Beltzer).

It is not my intention to deal with the anatomy of the Middle Ear to any very particular extent, but only to dwell upon those points, the clinical importance of which will make itself at once apparent.

These points are chiefly:
The walls of the Tympanic Cavity, and the structures in immediate relation to them. The Tympanic contents, or mucous membrane. Some points in the blood-vascular supply and innervation; and certain special points in the middle ear in childhood.

The most important part of the Middle Ear is the Tympanicum. The tympanum constitutes a small somewhat wedge-shaped cavity or recess limited by walls, floor, roof of bone, and the outer aspect. It presents for examination six limiting walls:
walls, which are commonly (though not quite accurately) termed Superior, Inferior, Anterior, Posterior, Internal, and External.

As has just been said, these walls shut in the cavity with a boundary of practically continuous bone, which is absolutely unyielding; the external wall, however, is an exception. This outer boundary of the tympanum is formed chiefly by the delicate and resilient Membrana tympani, with its firm "Substantia propria" forming a strong fibrous septum. — Superior wall.

Even in adults the bone forming the roof of the tympanum is only a thin plate separating the Caverna tympani from the middle cranial fossa (See Fig. 1), and "in the macerated bone the delicate translucent osseous plate is often found to be defective, being pierced by one or more irregular apertures, sometimes a great part of the roof of the tympanic cavity may be wanting." (Politzer).

This is of very considerable importance from the fact that inflammations of the middle ear are a very common affection; that there is often felt tension of inflammatory (products).
The Sympathons.

Products in the Sympathons, frequently elevation of the lining membrane, & necrotic processes in the walls; & extension of the affection to the cranial cavity is favoured by the superior wall of the tympanic cavity being so thin. (Polizer).

Such an occurrence is favoured still more in those cases in which there occurs a defect in the osseous tegmen tympani, the lining membrane of the Sympathons & the dura mater being then in contact: and this might be the case in any person under our care for all that we could tell.

In the Infant:

In the infant in the upper wall of the Sympathons will be found a sutura (petroso-squamosal), through which run processes of connective tissue with blood vessels, which pass from the dura mater into the tympanic cavity. This explains why children suffering from acute tympanitis often exhibit meningeal irritation, the hyperemia in the tympanic cavity spreading by these vascular connections to the dura mater. (Polizer).

Inferior Wall

The bone forming the floor of the Sympathum is likewise thin; in this...
The Sympanum: Floor.

Wall also defiscences have been observed as in the Superior wall. This thin plate of bone separating the Carotid Sympanum from the Fossa Jugularis.

(See Figs. I. II. III.)

"This proximity of the Superior Wall of the Sympanum cavity to the Fossa Jugularis is worthy of remark, because a fatal phlebitis with thrombosis in the bilateral Vena jugularis is often brought about by Caries of this wall." (Pliiger).

The floor of the Sympanum is also irregular; lying as it does below the orifices of the Eustachian tube & Mastoid Celles, below some points in the External auditory meatus, it is usually (in inflammatory affections of the middle ear) covered with pus; this condition, of course, favours the occurrence of Caries, &c.

(See Figs. I. II.)

Anterior Wall.

The chief point here is the opening through this wall of the "ostium tympani" of the Eustachian tube. In very close relation with it is the Carotid Canal containing the Carotid artery, &c. surrounding (Venous)
The Sphenanum : anterior wall.

The arteries are separated from the tympanum by a thin bony lamella, which is thin and small in the young, and usually absorbed in old age. (Gray: Anatomy). "According to a number of observations, a sudden fatal hemorrhage may occur from cavities of this wall opening the carotid artery." (Brock).

The Eustachian tube, which opens on this anterior wall, is the communication between the sphenanum and pharynx, though which is effected the exchange of air between the outer air and the tympanic cavity. By which is preserved the proper balance of the "membrane tympani." On its permeability then depends very largely the functional activity of the membrane.

Even in the normal condition, under the most favourable circumstances, the cartilaginous part of the tube is a mere potential canal, only becoming patent when the tubal muscles are in action (as in the act of swallowing). "The tube (Eustac)"
Eustachian is normally closed, when the muscles are at rest (Strikes). Thus a very slight swelling will entirely obliterate it, when the muscular action is then insufficient to make it patent.

Posterior Wall:

The posterior wall is chiefly notable clinically for the fact that in the upper portion of this wall there occurs the opening of the mastoid antrum, by which the mastoid cells become continuous with the cavum tympani. A matter this of considerable clinical importance. The mucous membrane lining the antrum & cells is also continuous with that of the Sympanum & its contents.

An important relation of the mastoid cells is that which they bear to the lateral Sinus, from which they are separated only by their internal bony wall, which is very thin though dense. Superiorly the Cortical part of the mastoid cells is in contact with the dura mater. (See Fig. II)

Internal Wall.

The internal wall of the Sympanum is the outer boundary of the Labyrinth; in it there are the openings of the fenestra (ovalis)
The Fenestra ovalis (closed by the foot piece of the stapes & its ligament) communicating with the vestibule; & lower down the Smaller Fenestra rotunda (closed by its membrane) which opens on the cochlea. The most prominent part of the internal wall, the promontory so-called, marks the outermost turn of the cochlea; or immediately in front of this the wall is composed of a very thin plate of bone separating this cavity from the Carotid Artery. This plate is pierced by many small openings for vessels & nerves.

Above and behind the fenestra ovalis is a slight rounded ridge marking the aponeurosis fallopian, in which - except only by this extremely thin plate of bone (in which there may be dehiscences) - runs the Facial Nerve. (Fig. III)

External Wall.
Lastly, very importantly we consider the outer wall of the Eustachian. This is composed largely of the Membrana tympani, with its three layers of fibrous Substantia propria, mucous internal lining, & Anterior External layer.

**Fig. III.**
The handle of the malleus is enmeshed - to speak - between the middle and internal layers.

Though differing in different subjects somewhat in form and size, the Membrana Tympani presents always certain definite practically unvarying characters: - Thus, the angle at which the membranes are set, the curvatures which they present (i.e. the general concavity outward with the umbo at the deepest point; the slight outward convexity at the superior and inferior borders) - These are constant and unvarying in the normal Membrana alike in childhood and adult life.

It is often stated that the inclination of the Membrana Tympani is much more horizontal in the child than in the adult; but it is so spoken of by Gruber and Rosso. However, according to Symington, Obliger, Dench, Pollock and others, this is not really - though apparently the case.

Considerable color has been lent to this idea by the different angle of inclination of the External Auditory Meatus in the child. The direction of the external auditory meatus in the adult is rather upward as it passes inward; while in examining the ear, the auricle must...
be drawn up & back to straighten the cartilaginous portion.

Semi-diagrammatic sections showing the difference in the direction of the of the Ext. Auditory Meatus in the Adult & Infant.

Fig. IV

Slightly modified from Randall.

In the infant the direction of the meatus is downwards; & to straighten the Canal to get a view of the Membrana Tympani—the Auricle is best held by the Tragus & drawn downwards & outwards. This latter is a point not noted in most text-books, but one which the practical Surgeon soon finds out for himself.

The minute anatomy of the Membrana Tympani does not here concern us; it is sufficient to note the firm & unyielding though delicate nature of the middle layer (with its radiating & circular fibres). This is covered externally with the articular layer, which is the direct continuation & prolongation of the lining of the External auditory meatus—"forming a "cul-de-sac" resembling the finger of a glove." (Gruber.) In certain inflammatory conditions the whole of the epithelium (Covering)
Covening of the theatre & the Membrana may
expidite in one piece, when this glove-finger
appearance is exactly represented. (See Case XIX.)

The inner aspect of the Membrane
Sympani has the malleus handle firmly
attached to it, & is lined by the internal
mucous layer, which is continuous with
the mucous membrane investing all the rest
of the middle ear & the structures contained
within the tymanum cavity.

At the upper part of
the malleus, the
fibrous layer is de-
fective. "Hence the
Membrana tympani is
looser in this situation
being composed only of
the integumentary & mucous layers." (Druzer)

This part is appropriately named the "Membrana
tympani," or it forms the outer wall of what
is known as "Rinn's Space." (Figs. V. & VI.)

its loosest part corresponds to the tip of
the short process of the malleus.

In this membrana tympani is sometimes
found an opening — thought by some to
be a normal condition, & termed the "Foamen
Rivini." This is now believed to be really a
pathological condition — the result of
inflammation of the Membrana tympani;
In cases of suppuration of the upper part of the tympanic membrane, the meatus is a very likely spot for the pus to point. (See cases II. & XIII.)

Looking at the Membrana Tympani from the External Auditory Meatus, the chief points noted are: A. its nearly circular (impossible of accurate reproduction in a drawing); B. the malleus handle shining through, with the tip of its short process prominent above (from which pass the anterior and posterior folds of the membrane), & the "umbro" marking the centre of the "crater"—so to say—of the membrane below.

From the tip of the umbo springs the beautiful, characteristic "pyramid of light," passing to the antero-inferior aspect of the semicircular.
Contents of the Labyrinth.

Within the cavity of the Labyrinth, thus incompletely (but sufficiently for the present purpose) described, are contained:

1. The jointed mobile chain of ossicles;
2. The various connecting and supporting ligaments;
3. The tendons of the muscles which act upon them;
4. The Chorda tympani nerve enclosed within a duplication of the mucous membrane which invests them all.

On the free and unhindered action of the chain of ossicles depends the free transmission of the sound waves from without to the labyrinth within. If then anything occurs to stiffen the joints between them, to render rigid the ligaments which support them, or by thickening or stiffening the mucous membrane or its folds interfere in any way with the normal physiology of this part of the ear, serious or perhaps permanent interference with hearing may result.

From interference with the blood-supply (which may occur from swelling of the mucous membrane &c.) the ossicles may be the seat of carious or septic processes. Their blood supply being easily impaired, such a result is easily bought about.
Mucous Membrane.

The whole of the middle ear — Mucous Membrane, Tympanum, Mastoid antrum, & Cells, & Eustachian tube — is lined by a continuous covering of mucous membrane.

This is, through the Eustachian tube, continuous with the mucous membrane lining the naso-pharynx, which is thus made intimate by continuity of tissue with all the middle ear.

The mucous membrane in its deeper layer forms the periosteum of the bony structure, and hence a deep inflammation affecting it is of the nature of e Periostitis.

The structures contained within the Tympanum (ossicles, ligaments &c) all receive a completely investing covering of this mucosa. It presents, also, especially in the upper tympanic vault, numerous folds & reduplications, which constitute in part so many pockets, & at others "hang downwards, somewhat like a curtain." (Dench.)

Blood Vessels of the Middle Ear.

The middle has a very rich vascular supply from numerous different sources.

"The blood vessels of the Carven tympani anastomose through the Membrana tympani with those of the external auditory meatus." (Also)
According to Russat, the terminals of the arteries of the tympanum often pass directly without anastomosing into the veins, without the intervention of a capillary network. (Arbantoschitzky &)

Veins.

1. The veins open partly into the Middle
   cervical Vein; partly into the venous
   pleurae about the Eustachian tube; to
   about the maxillary articulation.
   Little venous trunks pass also to the venous
   sinus surrounding the Internal Carotid.

2. There is also very evident communication
   between the Veins of the Tympanum and
   the Superior Petrosal Sinus. (von Tröltzsch)

Eustachian tube

3. The veins of the Eustachian tube
   empty, or through the facial, lingual, or Superior
   thyroidea Veins.

Vessels of the Membrana Tympani.

In inflammatory conditions of the
middle ear, the Membrana Tympani is the
outward visible index of what the internal
Condition is; as the vessels in the articular
layer of the membrane are sometimes markedly
prominent, a special word on them may
not be here out of place.

The Membrana Tympani receives its

(Vessels)
Vessels arise from the external auditory meatus as well as from the tympanum—the cutaneous layer exhibits distinctly more capillary network than the mucous. From various points of the periphery, little branches run towards the centre; whilst from the upper wall of the external meatus several strong branches run towards the umbo, whence they give off little branches to the periphery of the membrane.

In cases of natural injection of the vessels, these spring from the upper wall of the meatus, especially behind the handle of the malleus—more seldom in front of it—while a somewhat broad band of vessels, which commonly makes with the handle of the malleus an obtuse angle running upwards & backwards. (Braunisch, cit.) (See Case No. V, Fig. XIX)

Vessels of the Membrana Tympani:-

The vessels of the cutaneous layer open into the external jugular vein. The root of the Membrana Tympani can—according to the dictum of MOOR—by three ways reach or return from the Membrana to the External Auditory Meatus, viz. by the whole periphery of the membrane; along the handle of the malleus through the Rem. facialis; or finally through the perforating branches
of the substantia propria" (Wurtzschiedt).

These various points in the vascular supply of the middle ear have their importance clinically - alike in their influence on the production of inflammatory conditions, in the practical service to which they may be turned in reducing the same congestion and inflammation, so relieving the attendant constitutional phenomena which these produce.

"The free anastomosis of the veins which return the blood from the deeper portions of the conducting mechanism is of particular importance from a therapeutic point of view, since the intercommunication between the various channels is comparatively superficial, and enables us to relieve deep-seated congestion by phlebotomy." (Dench).

Nerves of Middle Ear: - are derived from the Sympathetic (through filaments from the Carotic plexus), the Trigeminal (in its sensory fibres), and most particularly - from the glossopharyngeal. In the Symphatetic itself is formed a network called the Sympathetic plexus, composed of filaments of the Sympathetic.
Sympathetic & Jacobson's nerve from the glossopharyngeal (sympanic branch).

The Middle Ear in the Child.

There are certain slight variations in the middle ear of the child, as compared with that of the adult, which are worthy of notice.

1. The Eustachian tube is relatively wider in the child, "& is more easily expanded." (Graeber) It is more straight & horizontal, the pharyngeal opening is less, but the tympanic orifice is comparatively larger.

2. The Tympanum. The mucosa of the tympanum is much thinner & more vascular than that of the adult, especially on its inner wall. The Eustachian passage is relatively wider. In the roof of the tympanum there exists a minute, though which processes of connective tissue & blood vessels pass from the dura mater. (Rheinsh. Squamosal Suture)

3. "The membrana tympani in the child is exceedingly thin, & yields easily to outward pressure of fluid." Denck.

4. Adjacent structures: The post nasal space is much smaller. Children are more subject to "Adenoids," & to enlargements of the tonsils.
Anatomical considerations from a (possible) pathological point of view.

Of all parts of the ear, the middle ear is by far the most frequently affected by inflammation; summing up the anatomical points—which have been glanced at—from the point of view of possible inflammatory mischief, we find:

I. Albeit by continuity of tissue and similarity of blood-supply &c. this part is exposed to the incursions of inflammations attacking adjacent & connecting structures, as well as to those primarily affecting itself.

II. Even in the normal state, the Eustachian tube is a mere chink; hence a very slight swelling will obliterate its lumen with consequent rarefaction of the air in the tympanum, indrawing of the pericranium, & chain of ossicles, increased pressure in the labyrinth, with symptoms thereon attendant.

III. We are dealing here with a cavity shut in by dense unyielding walls. Given a blocking of the only exit (the Eustachian tube), inflammation & co. cease; i.e. secretion; hence we have the conditions for producing tension in...
the highest degree. This causes, of course, intense pain. When the tension becomes excessive, something must yield, that is - of course - usually the Membrane tympani, which is the weakest wall, which is now still more weakened by the inflammation.

IV. "The intricacy of the tract also hampers the escape of the secretions & degenerated products; & retention of these maintains & increases the disease at its focus." (Dench.)

V. The lining membrane (mucosa) in its deeper part is really the periosteum of the bony walls. An inflammation affecting this is thus of the nature of a periostitis, (with the intense pain and distress accompanying that malady.)

VI. It follows from this (V) also that the underlying bone readily shares in the inflammatory process. "What would elsewhere in the air-passages be a mere superficial mucous ulcer, may here lay bare the bone to carious or necrotic processes." (Dench)

VII. This may in turn cause invasion of very important or vital parts, with which the middle ear is surrounded; from which an even fatal result may follow.
Thus—

1. Through the roof of the Sinus maxillaris, an acute inflammation of the middle ear may give rise to Meningitis or Carbitis (this more readily in the child.)

2. Through the floor, Phlebitis of, or hemorrhage from, the Internal Jugular Vein.

3. Through the inner wall, fatal hemorrhage has occurred from the Carotid Artery: Suppurative inflammation of the labyrinth, or extension to the Cavity of the skull. Even a non-suppurative inflammation may cause paralysis of the facial nerve, sneezing as it is in its passage by only a very thin plate of bone.

4. Through the mastoid there may be Phlebitis of the Transverse Sinus; its consequences of Pyaemia, Metastatic abscesses &c. &c. &c. Death.

And so forth.

It will thus be seen that a study of the anatomy of the middle ear & its surroundings is of great Clinical importance, that acute or dangerous symptoms may arise directly or remotely from an affection attacking it.
In the promptness with which such affections are recognised, grasped, and treated may depend not only the patient's relief from intense suffering in the present, preservation of hearing and absence from permanent discomfort in the future, but even his very life.

And of such cases the general practitioner meets with many.

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Part II

Acute Otitis Media

Chap. I. Aetiology.
Acute Otitis Media: Actiology.

On the following pages will be found a complete summary—in tabular form—of all the causes (Predisposing & Exciting) of Otitis media acute that I have been able to collate from all the authorities I have consulted on this subject. I have classified them under the following heads—

I. Predisposing Causes.
   A. General.
   B. Local. From nose, pharynx.
      " Tympanum.
      Ext. Auditory Meatus.
   C. Reflex.
   D. Climatic.

II. Exciting Causes.
   A. General Physical.
   B. Local. Action on.
      " Tympanum.
      Ext. Auditory Meatus.
   C. Reflex exciting Causes.
   D. Effect of Drugs.

Note.
I do not pretend that all the causes here set forth are likely to be seen or recognised by the general practitioner, but the majority of them may be so seen. In the case of those causes which are of a more exceptional nature, I have appended the names of the authorities from whom they are drawn.
I. Predisposing Causes.

1. Childhood
   1. Inflamed General Health
   2. Syphilis
   3. Thymus
   4. Rheumatic & Gouty diathesis
   5. Cataractal diathesis
   6. Brights disease (Pelliger, Poow&others)
   7. Diabetes (Tuchn, McCulie)
   8. Familial predisposition (Broeb)
   9. Alcohol drinking (Gruher)
   10. Menstruation (Urnabuchschild)

A. General.

   1. Acute Rheumatic & Pharyngitis (General Stain)
   2. Enlargement of tonsils
   3. Adenoid vegetations
   4. Mouth breathing
   5. Nasal Polyp
   6. Ozena
   7. Snuff-taking
   8. Disorders of the Eustachian muscles
      (Paralysis Rhinomeningitis Defective Adenoid)
      (By Störpair)

B. Local

   1. Pre-existing ear disease (Eustachian tubes)
      (The Cataract, Che Che)
      (The Cataract, Che, Suppho)
      (Previous attacks)
      (Symptoms)
      (Attacks in one ear lead to attacks in the other)
      (Previous attacks, Eust. tubes, keeping scratching the ear)
      (Keeping scratching ears, irritating means by picking it)

C. Reflex Causes
   1. Teething
   2. Carious teeth
   3. Naso-motor

D. Climatic
   1. (Damp or cold climate or houses)
   2. Spring or Autumn of year
Exciting Causes.

A. General Physical Exciting Causes.

1. Tuberculosis (Barnett, von Frölich, etc.)
2. Pyaemia + Sphyphicmie Infection (Donch)
3. Malaria (Weber, Siek, etc.)
4. Relapsing Fever (Auchan)
5. Rheumatic & Spondylitic (Harmy, Fentz)
6. Scurvy, gas poisoning (Casleal)
7. Burden's (Burke) Disease (Urbanthistulic)
8. Cold, Coryza, chill (from damp fences)
9. Pneumonia + Bronchitis
10. Syphilis

   a. Scarlet Fever
   b. Measles
   c. Typhus
   d. Typhoid
   e. Smallpox
   f. Diphtheria
   g. Erysipelas
   h. Whooping-cough
   i. Peritoneal Fever
   j. Meningitis (Jimomy, Rome)

B. Acute Naso-pharyngeal Catarrh.

Exciting Causes acting through the Naso-pharynx.

1. Throatitic (Inflammatory, ulcerative, etc.)
2. Adenoids (Dolby, others)
3. Ozema (Greig)
4. Nasal Donche (Potts, Burnett, others)
5. Operations on Naso-pharynx (""")
6. Water entering Eust. Tuba (lung breathing)
7. Foreign bodies in Eust. Tuba + Naso-pharynx (Plumber)
8. Smoky + dusty air, or air charged with irritating vapours (Fribrr)
Exciting Causes (Continued)

1. Impacted Cerumen (Roosa, Randall)
   - Organic
   - Inorganic
   - Mechanical
   - Thermic
   - Chemical
   - Animating (e.g., Reede)

2. Foreign bodies
   - Foreign bodies; attempted, unsuccessful removal of

3. Rupture of Membrana
   - Direct
   - Indirect

4. Cold draught of air
5. Cold water entering meatus
6. Blow on ear or side of head (without
   rupture of Membrana)

Other dental irritation (Cario re.)

Effect of Drugs
   - Quinine, been known to cause
   - Otitis media

(Carico re.)
Of all the causes (inducing or exciting) that lead to this affection, the most frequent are those which directly or indirectly affect the nose-pharynx.

**Predispousing Causes:** There is no doubt that there are many causes that predispose to an attack. Thus—children are more commonly attacked than others, partly because they are more subject to the rheumatic and diseases, partly because of the local conditions—already mentioned—which prevail at that age.

A delicate (e.g. System, syphilitic, ataxical) constitution also predisposes from the increased liability to "Cold," acute atarhal conditions; atonal inflammation once induced is more apt to be severe, & to become chronic in such cases.

Climate & general conditions of life may have a predisposing influence;—thus, a cold damp & raw atmosphere; cold damp ill-ventilated dwellings; deficient nourishment & inadequate clothing; immoderate use of alcohol & tobacco;—all these tend (chiefly through the medium of atarh) to give greater susceptibility to the individual.

The nose-pharynx is the most frequent source of local predisposition. All chronic conditions affecting nose & pharynx—keeping the mucous membrane in a more or less unhealthy & relaxed state—
by continuity of structure are a source of danger to the middle ear.

The pre-existence of some form of ear disease may make the tendency greater and the prognosis graver. A chronic catarhal condition may lead to a most acute inflammatory one, and as in the chronic catarhal, the membrane tympani is in all likelihood thickened and indurated, less liable to rupture spontaneously. An acute suppurative inflammation is likely in such a case to be fraught with danger to life. Mastitic disease and all its consequences is very liable to be a serious element in such a case.

A pre-existing chronic suppuration also makes the prognosis more serious. While the previous occurrence of similar attacks to the present may have a very similar influence.

Exciting Causes.

Of all the exciting causes ordinarily met with, the greater number by far act through the naso-pharynx. The carcinomatous disease, & common "cold" — which form the most common exciting causes — act most frequently through this medium.

Scarlet fever, measles, & diphtheria cause perhaps the most rapid & destructive
forms of acute otitis media that are met with.

Small-pox also causes a very violent form, but is comparatively more rare, & should be always becoming still rarer.

Measles, from its great catarhal tendency, is very apt to cause severe inflammation of the middle ear; but in my experience such an attack is comparatively amenable to treatment (more so than Scarlet Fever, in which the onset is more sudden & severe), if early treated; but if untreated its consequences may be very serious.

**Scarlet Fever**

This is perhaps of all causes the most to be dreaded. In fatal cases the disease often runs a terribly severe, rapid, & destructive course; extensive ulceration of the membrane tympani may result in a few hours even.

I believe, however, that even in Scarlet Fever, if the case is seen at the very outset, prompt & energetic treatment may have an amazing effect in mitigating, or even cutting short, what would otherwise prove a most destructive inflammation.

In my opinion acute otitis media may occur in Scarlet Fever at different stages of that disease, & the type of the otitis differs somewhat according to the stage of the fever in which it occurs.
Acute Otitis Media: In Scarlet Fever.

I. In the Eruptive Stage:— & c., often, especially where there is severe throat affection. This is the most severe form of the disease; & also—associated as it is with an already pyrexial general condition—often gives rise to very grave physical symptoms.

II. In the stage of comparative convalescence, after the eruption has disappeared, the physical symptoms are somewhat abated. In my experience an otitis media occurring at this stage is a more gentle (though also sometimes a little intractable) form of disease than No I. I believe that this form is often due to the direct action of cold (e.g., a chill draught of air) upon the ear, the weakened condition of the patient favouring and maintaining the inflammation.

III. In the stage of desquamation; I have seen several instances in which a patient, in the desquamating stage, pungent in the air, was seized with an acute otitis media. This has seemed invariably to be due to the direct action of cold through the meatus, both serous & membrana being probably then more susceptible to its influence.

Such cases are usually of a comparatively benign character.
Chilis Media Acuta. in Influenza.

Spire an example of each of these Variations. e.g. Cases VII. VIII. IX.

Influenza.

In this part of the world, the Influenza epidemic was a very frequent source of acute chilis media. Such cases were usually associated with intense pain, severe general physical symptoms; and very often (though not invariably) went on to acute suppuration, in some cases the quantity of discharge being enormous.

In my experience, however, even though these cases were of exceptional severity at the time, their final results were much better than one would have expected from the initial intensity.

In some cases (e.g. Case III. No. C-) which seemed as if they would run a most disastrous course, natural healing occurred in a surprising fashion.

I am glad to find that so high an authority as Dr. Pride states his opinion of these cases in very similar terms.

Cases acting through the External auditory meatus. In a sea-bathing locality (as this is) one sees in summer time cases in which sea water driven into the ears acts as an exciting cause of this disease.

These cases invariably do well. Foreign bodies of all sorts in the ear are
Otitis Media Acuta: Acetiology

Foreign bodies very frequently met with; usually any resultant inflammation is due — not so much to the foreign body itself — as to clumsy or ignorant interference therewith. (Preceded two interesting examples: Case XI. & XII)

Inflammations of the Ext. Auditory Meatus.

— especially in its ossae potion are very apt to involve the tympanum also: indeed in many cases it is difficult to decide which was the primary — which the secondary affection.

The croupoid malady occasionally act by the Extrem Auditory meatus, when the tumour of very severe may cause an otitis externa, secondarily involve the tympanum.

Erysipelas of the face may involve the auricle, the external meatus, secondarily the tympanum as well. (e.g. Case XIII.)

Rupture of the Membrana Tympani.

— as a cause of otitis media I have only met with once, & I doubt not now that my own (well-intentioned) interference was the cause of the inflammation which resulted in this case. (Case X, Sec I. —)

Teething — is in young infants a very common cause. In them the real disease is apt to be overlooked, it is not at all easy of diagnosis; "teething" being a rather • comprehensive •
"Comprehensive" term as a diagnosis. An otitis from this cause is apt to recur with the eruption of subsequent teeth, and readily prove fatal from meningeal inflammation.

(Case VI.)

Syphilis. In the eruptive stage, accompanied by sore throat, is a not very uncommon cause met with in the course of general practice. There seems no distinguishing characteristic in which this otitis differs from that occurring as the result of a simple pharyngeal affection.

The otitis media, which is found as a result of Typhoid Fever, is in my experience of an asthenic type; generally the symptoms are not very acute (not nearly so much so as in Scrofula and measles). There is great deafness - as a rule - in this form, which seems to me to be due to labyrinthine causes - a process of poisoning from the condition of the blood in the febrile condition.

In Otitis, there sometimes occurs a very rapidly perforating inflammation of the middle ear, often without pain or acute symptoms. The suppuration is severe however; the destruction of the membrane often extensive; the tendency to become chronic is very marked.
Acute Otitis Media

Classification
- Mild Type
- Severe Type

Diagnosis
- Symptomatology
- Semeiology

Treatment

Illustrative Cases
(Contains drawings of the Membrana: original)

Course

Complications

Results
Acute Otitis Media

Classification.

Of all diseases in which there is
disagreement of opinion + non-agreement as to
classification, Acute Inflammation of the
Middle Ear seems to be a striking example.

It has been classified (Barr) according
as to whether there is perforation or non-perforation
of the Membrana tympani. Barr considers
Non-perforative inflammation as representing
a simple catarrhal process, perforation as
being necessarily a result of suppuration.

This classification is a very artificial
one, as there are many cases purely catarrhal in which there is perforation of the membrane
(with escape of Serous, mucous or Sero-mucous
exudation), which usually closes again very
rapidly. And then, many leading authorities
(e.g. Pickles) state that even a suppurrative
process in the Tympanum may discharge
itself by the Eustachian tube – or become ab.
Sorbed – without perforation of the Membrana.

Again, Gruber classifies under
the varieties – 1. Exudative & Plastic –
with various subdivisions. This – while
no doubt a very accurate pathological division
is not satisfying from a clinical point of view.

Schwartz classifies as –

(however)
Acute Otitis Media: Classification.

Absolutely differentiate those forms, as they run so much the one into the other. The proposed bacteriological classification of Potter is, according to the micro-organisms found present--to quote beyond the scope of this present essay. Von Höltich, Dench, Mose, etc. a number of others employ the classification of Catarhal and Suppurative; and it insists that to produce the latter, there must be infection from without.

I cannot myself see that a hard and fast line can be drawn between Catarhal and Suppurative; and I believe it quite possible that a case Catarhal may pass on to an Acute Suppurative, or that a case which would otherwise have gone on to Suppuration may, by prompt and skilful treatment, be cut short and not go beyond the milder stage.

Agree with Randall that "the types of Catarhal and Suppurative, which are distinct and strongly contrasting in the chronic inflammations, are with less certainty distinguishable in the acute." In fact that "it passes the wit of man to distinguish between a severe case of acute Otitis and a mere case of acute Suppuration." (McBride) A simpler and more nearly clinical classification is that of (Wormanstëich)
Mr. Kuntzschke's classification divides these inflammations into two groups:

1. Superficial (oberflächliche) inflammations
2. Deeper (tiefer greifende) inflammations

These again he subdivides, with considerable minuteness.

To my mind the only really satisfying classification from the clinical standpoint — certainly from the standpoint of the general practitioner, is that advocated by P. Bride, which I shall here adopt, viz. into a Mild Form, and a Severe Form.

These forms will be dealt with on the succeeding pages.
Acute Otitis Media: Mild Form

This is usually the result of the extension of some inflammatory process from the nasal-pharynx, or from the direct action of cold air or water upon the ear or head. The exanthematous may also only produce this milder form, than usually by extension of the process from the nasal-pharynx. Teething is also a frequent cause in infants.

Symptoms. The patient has usually had some previous symptoms of catarrh of nose or pharynx—a stopped-up feeling in the nose; thickness and meagerness behind the palate, often also at the root of the tongue; tickling and itching in the faucets with probably somewhat similar sensations in the ear.

Sometimes these catarrhal symptoms are little marked, or again the general condition may have been somewhat lowered, so the extent of Catarrh from or Swallowing with a feeling of pain shooting up towards the ear affected at that time. —

There may be slight rise in temperature, or general symptoms of "Cold in the head." The patient now has probably some feeling of meagerness, or slight pain or heat in the ear; a sense of "Fullness" (in).
in the ear, a feeling of pressure or "pressure" in and about the ear side of the head, which is in itself a distressing feeling to the patient, causing him to feel dull, stupid, incapable of any serious mental effort, especially if the condition is bilateral.

This may give the patient the feeling as if there were something blocking the external meatus, indeed it is often a difficult matter to persuade patients that this is not the case. So relieve this sensation the person often inserts the finger-tip into the meatus and works it about; sometimes on withdrawing the finger a temporary sense of relief is felt — due to the suction forwards of the membrana tympani caused by the sudden withdrawal of the finger.

There is probably some increase of symptoms now — real pain in the ear of an aching character, which is aggravated by the act of swallowing, or coughing, or blowing the nose, and, the movements of the lower jaw may also cause an increase of the pain; or there may be also a sense of throbbing in the ear with each pulse.

There are probably some subjective sounds in the ear of a ringing or "buzzing" character; the patient's voice
Pharyngitis.

Acute, Ears.

To himself sounds unnaturally loud & "booming" in the affected ear.

There is deafness in the affected ear. The tuning fork comes louder by bone-conduction in that ear than in the other.

The symptoms may mitigate partly during the daytime, come on again fresh at night. This is often the case with children (in whom also the complaint is more common than in adults), but the little patient, however, eventually falls over to sleep.

All symptoms may spontaneously pass completely away; the attack subside recurring at night for a little bit eventually entirely subsiding.

1. In such a case the inflammation has either never gone beyond the stage of congestion + minute swelling; or

2. if it has got the length of effusion, this effusion has either become absorbed, or

3. has discharged itself by the Eustachian tube. Sometimes a spontaneous influx of the membrane may occur, and a little serous or mucous fluid escape. With this escape complete relief is experienced, the patient feels quite well again. The perforation closes again so (rapidly)
Pitio Media Acuta : Sick Tone.

Rapidly & perfectly that it may almost escape notice. Here is great force, however, in what McBride says that "it is of great importance not to consider these cases cured when the pain has subsided."

Diagnosis.

In the adult there are no difficulties in the diagnosis, as the patient will complain of pain &c. in the ear, direct attention to the part, when the physical examination will reveal the state of matters.

In the child especially the young infant, however, the diagnosis is not so easy (this of course holds good also in the severe type in which it is of greater importance), the attention may never be directed to the ear at all. Careful watching will usually however note some sign which will draw the attention to the real site of the trouble.

I have this very day been closely watching my own little son (aged 104 months) who is cutting his upper milk molars. He has a little cough (from slight bronchial catarrh) but has been playing about, walking about from one part of the room to another quite 

(Highly)
Achilles Media Acute: Diagnosis.

Every now and then, however, he would stop at brush with his right hand over his right ear as if trying to wipe away something, then start off to walk again or to resume his play.

On examining his ears just now, I found the right membrane tympani slightly dull lustreless; the pyramid of light not so perfect nor so bright as in the normal state. On breathing warm breath into the ear he laughed (seemed pleased by it).

Such an act as the child putting up the hand to the ear directed the attention to that part; when the ear is then carefully examined, the diagnosis is the same as in the adult.

In a mild case of Acute Media Acute one would find — on making otoscopic examination — more or less well defined changes in the appearance of the Membrane Tympani.

E.g. Physical signs.

In all probability there will be present congestion and inflammation — probably some reddening — of the mucous membrane; at first dryness, but afterwards increased secretion.
Changes in the \{ Membrana tympani \}.

1. Loss of the bright lustre; polisher, becomes dull – "like glass breathed upon." (Rosso)

It may also be somewhat indrawn; it may have lost the pyramids of light.

This may be all the change presented; or if the condition be a little more severe, then – along the handle of the malleus (both front and back, usually most marked posteriorly) there is distinct reddening from vascular injection. (27.

(See Case, VIII. Fig. XXII.) This redness usually passes also to the periphery by the anterior-posterior fold – especially the latter.

... sometimes a network of vessels radiating from the malleus handle towards the periphery is visible over the surface of the membrane which is very often in children – in my experience of a greenish-gray tint (as in the Fig. noted above – which is a very accurate depiction) on which red destined vessels show out very distinctly.
In other cases there may be a general
purplish tint of the whole membrane, due to the shining through of the congested
 tympanic vessels. Associated with this general purplish hue there will usually
be slightly deeper coloration of the massulae.

Occasionally in this mild form there may be some slight
bulging of the membrane in its lower
part — indicating that the process
has got beyond the stage of mere
congestion, that there is now some
hyper-secretion (rasos or mucos stos)
lodging in the tympanic cavity.

Course & Consequences.

This mild form may end —

I. In complete resolution spontaneously.
As mentioned before (Page 42) this may
occur with or without any discharge
through perforation of the membrane.
Sometimes all symptoms may dis-
appear with a "Crack" in the ear, due
to the sudden entrance of air into the
tympanum per the boustchian tube.

It may abate in the more
acute symptoms, but there may be
a little remnant of a Catarhhal process
left, which may predispose to subsequent
(attack).
attacks, may the foundations of a perhaps serious chronic condition. — Hence the cogency of Mr. Bridie's warning quoted before. (Page 12). Instead of these being any abatement of symptoms, these may become still more pronounced (perhaps from debility on the part of the patient), or neglect or unskilful and harmful treatment may aggravate the condition — hence a mild case may thus be converted into a serious one (q.v.)

Prognosis.

The prognosis in such mild cases is almost invariably good, as perfect restoration to the normal state may be obtained by suitable treatment, or — as in some cases untreated — this may occur spontaneously.

In delicate (Strumous, syphilitic, or Catarhal) subjects there may be a tendency for some residual Cataract to persist, which may lay the foundations of Chronic disease, which may prove somewhat intractable.

Treatment.

The treatment of Otitis media acuta will
be dealt with in detail after consideration of the "severe type". Mild cases require little active treatment at the time. Continuous hot douching of the ear, very probably the most relief of symptoms, with inflation by means of Politzer's air-bag (or the catheter of Bilger if localization is insufficient) to free the tympanum.

After the pain and discomfort and other symptoms are relieved, regular inflation of the tympanum must be practised — at first frequently (at all likelihood daily), but subsequently with increasing intervals until a perfect result is obtained.

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**Otitis Media Acuta**

**II Severe Form.**

This form may arise suddenly, may come on with intense violence as well as suddenness. It may arise "per se" — though usually in these cases a history may be elicited (more or less distinctly) of some previous symptoms of acute otitis.

1. Areal catachria. It may also come on as the result of aggravation and intensification of a pre-existing mild attack — as might be the case in a weakly, delicate subject.

2. It very frequently is the result of
a preceding acute pharyngeal inflammation (especially in the diphtheria) in which the throat symptoms have been severe, & the otitis from the outset of great severity.

A. In those cases in which the earlier form evolves out of the milder it seems to my mind that the great intensification of the pain & other symptoms is due —

(1) either to the inflammation having passed more deeply (towards granulose formation) & thereby really become a 'keratitis.' or —

(2) to there being a sudden & constantly increasing outpouring of secretion in the tympanum, which (unable to escape by the normal channel) is causing rest & constantly increasing "tension."  

(3) or it may possibly be due to a second or sub-mucous hyper-secretion assuming the purulent form.

B. In that class of cases in which the symptoms from the very outset are intense, this severity is probably due at first —

(1) to the great intensity of the congestive process which is maintained & added to later by the extreme rapidity responses with which the inflammatory products are poured into the tympanum.
In the beginning them the Membrane tympani will indicate excessive congestion and inflammation – without however the evidences of retained secretion. Whereas subsequently - if there be much secretion present - Bulging outwards of the Membrane tympani will be one of the prominent features. These two conditions may, of course, be present at the same time in the same Membrana.

Symptoms, Acute form:

Pain.
The most outstanding feature in these cases is the intense pain. The patient may be, with alarming suddenness, seized with pain of a most excruciating character. This pain may be confined to the ear – but for more nearly it is felt also over the side of the head, face, in the teeth, sometimes down the neck even to the shoulders. The pain is usually of a violent boring character, with sudden darts of the intensest agony – so that even a strong man will shrink out and quiver in anguish, while great drops of perspiration stand out on his forehead and flushed face.
There is probably no pain to which the human system is liable more severe than that due to the distension of the little space called the cavity of the tympanum with mucus, serum, or pus" (Rossa).

Every beat of the pulse may feel like a hammer thumping on the already agonised part. There are sometimes intermissions in the severity of the pain, but it only breaks out again with enhanced force. Sometimes the pain is absolutely continuous, and may be so severe as to cause delirium. This is not at all uncommon in children, in whom delirium is more easily produced.

In the case of children, a child, the little patient at first tosses about, screams frequently, puts its hand often up to the side of the head, but shrieks, and shrieks if any one touches the ear.

If old enough, the child will cry "my ear, my ear!" In the case of an infant any attempt at "dandalning" it, to try and soothe it, will only have the effect of making it scream more. Laying a child down also tends to increase the pain, from favouring congestion.

In severe cases in children, the diagnosis of meningitis is very likely.
Children.

To be made, especially as vomiting, convulsions, & fixed coma — as well as delirium — may supervene in what is really only a severe otitic media.

In children also, there may be some real meningeal congestion, even in the early stage, from the anatomical condition already referred to (diplo- petrosose sinu).

Any movement causes aggravation of the pain; the patient may be afraid to attempt to swallow, cough, spit, or to move the jaw at all from terror of the increased pain which the act would cause.

An infant, similarly, may be afraid to suck or swallow.

There is tenderness to touch, especially about the tragus, the maxillary articulation, behind the ear over the mastoid; probably also above the ear in the temporo-parietal region.

There may be "tenderness of the hair" on that side of the head.

There may be visible reddening or possibly an appearance of fulness about the tragus, & not infrequently redness, some swelling over the mastoid. The affected ear may seem to stand out from the head as compared with the other (best seen from behind).
Facies

The face is probably flushed & perspiring, though I have also seen it pale - bathed in cold sweat - with an anxious expression. The temperature usually shows distinct elevation, sometimes - especially in children - running up to as high as 105°-106°. Where the otitis comes on in the course of some febrile affection (e.g. Scarlet Fever) there will probably be a sharp rise in the already elevated temperature, & heat symptoms are then likely to occur, may probably be misinterpreted & the true cause of them not suspected, until a discharge from the ear makes the diagnosis evident.

Dyspnea

If the ear be examined with the tuning-fork there will be found on the affected side diminished - & still diminishing - hearing by air-conduction, with probably increased bone-conduction.

Subjective noises are likely to be present, sounding in the ears, & especially the throbbing of the pulse, which may be relieved temporarily by pressure on the Carotids.

Vertigo

There is sometimes also a distinct Vertigo - this may be due to increased (pressure)
Altering a set of Hax's tests. Since the liver to become the main source of enzymes, with the influence of the pancreas and other glands. The pancreas is a ductless gland, and the main source of enzymes.

Altering a set of Hax's tests. Since the liver to become the main source of enzymes, with the influence of the pancreas and other glands. The pancreas is a ductless gland, and the main source of enzymes.
Anterior and posterior folds, & the periphery.

(Case IV. Fig. XVIII).

4. There may again be a general diffuse redness of the membrane, in which the distinguishing features are no longer visible, and in which there is no specially localized vascular injection.

(Cases I. XII. XIII.) This redness is sometimes of a bright crimson, lake, or coppery, sometimes of a dirty "breezy" hue. In cases of great severity there may be distinct hemorrhages in the membrane clearly visible. (Case I. Fig.) If seen at a somewhat later stage the surface of the membrane (and probably also the deeper part of the membra) is covered with swollen, macerated epithelium, in which the distinguishing form & "landmarks" of the membrane are entirely obliterated. The whole of the epithelial layer may "recede," or give a dead-white appearance to the membrane, thus concealing the real inflammatory condition underlying.

The membrane may present the condition of being indurated, more particularly if the inflammatory process has begun in the Eustachian tube. The short process
No data in this image.
In such cases alteration of the angle of the patient's head may cause an alteration of the level of the fluid, if the effusion be thin; and after inflation air bubbles may sometimes be visible on examination as brightish points in the contained secretion.

Pathology of the Process

For obvious reasons the minute pathological-anatomical conditions presented by the middle ear in Acute otitis media cannot frequently be studied.

The conditions presented in the earliest stages are those of congestion and vascular engorgement, followed by oedema involving the mucous membrane.

As the result of the vascular distension, there occurs serous effusion — transudation of serous + white blood corpuscles. Subsequently increases mucous secretion. This secretion so produced tends to gravitate to the lowest part of the tympanic cavity.

As a result of the oedema of the mucous membrane & the excessive mucous secretion, there occurs (blocking)
Meeting of the Castilian took place.

The President asked to report on:
- A new book published
- The latest news
- The annual meeting
- The current financial

The President also noted:
- The importance of the event
- The need for funding
- The contributions of the members

A motion for adjournment was made and seconded.

Adjournment of the Castilian.
Pathology.

Eversion of the Contaminated Secretion—aided by the inflamed & softened condition of the tissues of the membrane—vaccumates through the substance of the tympanic membrane, & discharge occurs through the opening thus formed. If not evacuated, or thus spontaneously discharged, the pus may burrow & dissect the soft tissue, & thus make its way out of the tympanic cavity in different directions. The mastoid antrum & cells partake, in severe cases, of a similar inflammation to that in the tympanum. Spontaneous discharge of pus—if formed there—is anatomically impossible, serious symptoms may result in consequence.

This brief, imperfect, & at the best rough and ready summary of the pathological processes existing in acute otitis media is here inserted for its bearing—which is evident on the subject of Treatment.
Treatment

I. Treatment during the Acute Attack

A. Local

1. To relieve pain.
2. To reduce congestion and inflammation.
3. To remove secretion from, or
4. To restore air to, the tympanum.
5. To relieve the disturbances of hearing.
6. Treatment of pharynx.

B. General

1. Treatment for the otitic symptoms.
2. Treatment of the disease in the course of which the otitis has arisen.

II. After-Treatment

A. Local

1. When perforation
2. When no perforation

B. Constitutional

C. General Hygienic

D. Prevention of recurrence

III. Treatment of Complications
Treatment.

I. During the acute attack.

Motto: "With the conditions present in the disease, the least neglect may be followed by a fatal termination. While proper intervention at the suitable moment may be attended with the most brilliant result."

(Grubber)

A Local.

1. Relief of Pain.

The chief indication for treatment in this disease is to relieve that symptom which is most prominent = Pain.

In the earliest stage the pain (severe or slight) is due to the severity of the congestive process present.

If slight - the probability is that continuous douching with a stream of hot water - as hot as can comfortably be borne - will have the best possible effect, both in allaying the pain, and dispersing the infection present.

"Douching." Much more relief is gained by using a continuous douché, than by interrupted "Spraying." A regular douché reservoir & tube with nozzle, or the siphon-douché (as in Rudhichn's nasal douché) with an appropriate nozzle, is the best means to
Otis's India Route. Treatment.

Donching. Employ for thus douching the ear through the external auditory meatus.

Plain boiled water — at a suitable temperature — may be used as the liquid medium, or a weak antiseptic solution (e.g. Boric Acid) is preferred by some. Personally I believe that a weak saline solution (Common salt, 0.95 percent*) gives the best result in such a donche.

In donching where there is discharge in the ear, or evidences of a perforation of the membrane, a mild antiseptic solution should be used. (e.g. Sublimate Solution 1 : 5000).

Severe. In that class of cases in which the pain is of the severe type (or it may be most excruciating) — this is due (as has already been noted) at the outset, 1. To the intensity of the congestive process; 2. Later on, in the exudative stage, to the high state of tension accompanying the filling up of a constantly increasing seconetion within a rigid-walled cavity. The relieving of the pain then depends upon — What is the Cause of this pain?
Acute Otitis Media: Treatment.

Relief of Pain.

I. If the pain is the result of the Acuteness of the Congestion—

There is nothing in the world which gives such speedy, complete, and lasting relief as the withdrawal of blood.

The utilisation of Leeches, one, two or more (to as many as six even, in a strong, full-blooded individual) applied in front of the tragus, or over the mastoid process—(in my experience the former is the more efficacious, but I sometimes combine them)—will give very speedy relief. In the words which many of my patients have used concerning the result "It is magical," the relief that is afforded.

I have seen a child, that a few minutes before was almost delirious with pain, streamed incessantly, fell asleep within a few minutes of the application of a couple of leeches in front of the tragus, and thereafter never had another twinge of pain.

(Compare Case VII.)

In Scarlet fever cases, I believe that Scarlet fever— if seen and treated early, while still in the congestive stage, before any suppuration was established—free leeching, provided
the patient's general physical condition were able to stand it, will cut short many a case that would otherwise be most serious or even dangerous.

In Influenza cases, I have usually leched over the mastoid as well as before the tragus: & in cases where there was also severe frontal headache - with the addition of one or more leeches at the root of the nose. In many such cases the relief was pronounced by the patient to be "magical."

(Compare Case IV.)

In cases of a severe type it is well to combine the hot-douching of the ear with the blood-letting; & along with these benefit may be found from using also the instillation of some sedative drops.

In cases of moderate severity, blood-letting is not a necessity. Here the use of the hot douches & sedative "drops" will probably be sufficient to quell the pains.

Sedative instillations.

A variety of sedatives have been made use of for instillation into the ear to relieve otitic pain.

For a great many years now I have (need)
Cocain

used a simple aqueous solution (5 to 10%) of Cocain, well warmed & dropped into the ear, with good results in
many cases. Latterly I have practically discarded this
in favour of McBrade's

Cocain & Carbolic (10%) Glycerin, which
seems to give better results.

In some cases Cocain seems of little
or no benefit. Thus it seems impossible
where softened macerated epithelium
clogs the membrana tympani, but
in Cases - especially in children -
while there is a purely congested
state it is certainly beneficial.
In Cases where the membrana is
removed, if its epithelium, its shows
a raw reddened Surface, it is of
great value.

Morphia

Solutions of Morphia of varying
strengths (from gr. II or IV to 1/2; upwards)
are frequently used, & of use.

Care should be taken that the quantity
instilled does not exceed the amount of
a dose by the mouth, lest there be
active absorption.

Morphia -

A combination of Lignor Morphinae
& Lignor Plumbi (in dilute Solution)
forms a very sedative
Solution of Atropin (gr 1-2 to 3i) alone, or in combination with Morphia, forms another solution of distinct value as a sedative instillation in otitis media.

It is unnecessary to state that all such solutions should be well warmed, so that they should be run well down into the ear so as to lie in contact with the membrane itself. Some people are very awkward at any manipulation of this kind, & I make my patients employ a "Medicine dropper" (virtually a small pipette with a "nipple" at the top) for the purpose, which greatly facilitates the introduction.

Delstanche advocates the employment of liquid Vaseline injections "in the first stage of median otitis," claims for it that it relieves pain instantly & cures quickly. Of this I cannot speak from personal experience.

Quite lately I have experimented with Gradinigio's Solution.

\[ \text{g. Acid. Anthrac. 1 part} \]
\[ \text{Sod. Chlorid. 4} \]
\[ \text{g. Ascl. cing. 50} \]

This solution is distinctly sedative, though...
not strikingly more so than others. 

Müller recommends in all cases the procuring of the membrane tympanic, to be performed early, to "abort" the attack. This no doubt acts in virtue of its local bloodletting, but is doubtless a more effective mode of obtaining relief — which may often be as certainly obtained by milder measures.

A general practitioner cannot always get permission to perform paracentesis even where it seems really necessary, and to perform systematical absorption by Caustics is not likely to rank as an ordinary general practitioner's operation.

I have, for a number of years, frequently employed a means for relieving the pain in otitis media acuta (especially when secondary to nasopharyngeal inflammation) which I have never seen mentioned or described, the use of which is original as far as my knowledge.
Knowledge goes:—viz. Spraying in by the Eustachian catheter & Bolgers\'s way, a few drops of warmed (5-6%) Cocain solution in "normal saline.

This is only if one instead of sedative "drops" & does not take the place of "blood-letting", to which however it forms an adjuvant.

Though intra-symphamic injections, where the membrane is intact, are disapproved of by many—and said to be impossible—by some—(which two opinions are more or less mutatis mutandis)—I think that this has given relief in many cases, & I am certain it has never caused any unpleasant or toxic symptoms.

Doubtless most of the Solution never does get any farther than the Eustachian tube; but it is usually in those cases where that was the starting point of the disease that I have used this method.

The well-known "shrinking" effect which Cocain has on swollen mucous membrane, the manner in which it decreases vascular congestion, lends at any rate a theoretical value to the procedure, which seems
Relief of Pain

II.

If the use of bleeding, douching with hot solution, and syringe dropper does not relieve the pain; or if—being relieved—it again breaks forth severely later on, the probability is that the cause of the pain now is "tension" from secretion hemmed up in the rigid-walled ‘tympanic cavity.’ The pain may now be even worse than before.

(Read p. 61, "Boone.") Examination will probably now show some (general or local) bulging of the membrane— in addition to the signs of congestion.

To relieve the pain now, the indication is to free the tympanum of the hyper-secretion thereby relieve the tension.

There is, of course, blocking of the Eustachian tube from swelling of secretion, which closes the exit in which prevents not only the escape of the secretion, but also the normal "ventilation" of the tympanum.
In some instances—where the obstruction of the tube is not severe—simple Pollevication may suffice to open the Eustachian tube, to drive out the contained secretion, as well as to admit air again to the tympanic space.

More frequently, however, this is quite insufficient to overcome the Eustachian obstruction; the use of the Catheter becomes necessary. When this is passed, the patient’s head should be tilted towards the opposite shoulder. This action favours the escape of fluid during the performance of the act of inflation. The performance of a Swallowing motion by the patient at the same time also helps to render the operation more effectual.

In this connection I have often made use of the spray in of a Cocain Solution—as well as in the Congestive stage, as mentioned before.

In a Pravaz’s syringe (which like a hen above the ear, to be handy) is a 5 or 6% Solution of Cocain dissolved in “normal saline” Solution, warmed to a suitable temperature. The Catheter being passed into the mouth of the (Eustachian)
Eustachian tube, a few drops of the solution are injected into the catheter, and are—by using the air-bag—forced into the mouth of the Eustachian tube. The fact that this relieves pain and congestion there, diminishes swelling in and around the tubal orifice, allows the point of the catheter to be passed well within the month of the tube. The patient's head is then tilted to the opposite shoulder, the ordinary air-inflation performed with a fair amount of force to as to try to empty the cavity of the tympanum of the contained secretion—probably muco-serous, in the earlier stages. Thereafter, the patient's head is inclined to the shoulder of the same side as the affected ear, more of the solution is injected through the catheter at once driven on with the air-bag.

The most of it, no doubt, gets no farther than the Eustachian tube itself; but there it has a beneficial effect—soothing the pain, diminishing the congestion and swelling of the tube, thereby giving a better chance for the escape of subsequent secretion. Some of the solution may
Note. Since the foregoing was written, I have found that the use of Cocain (aqueous solution) — practically in the manner I had myself employed — for the Eustachian tube, has been advocated for the relief of Cases of "Tinnitus Aurium." It has, in this connection, been condemned by some as causing unpleasant toxic symptoms.

As the normal mucosa is very intolerant of interference (cocain in case of Tinnitus) of the M.S., this may account for some of the symptoms produced; moreover a non-inflamed mucosa will be more actively absorbent than in the inflamed condition, which may make the toxic effect of the Cocain apparent in some cases. I believe myself moreover that the use of Cocain in "normal saline" Solution (as mentioned opposite) causes less likelihood of unpleasant symptoms. I have not found recorded its use in inflammatory Status of the middle ear in the manner I have described.
However, he made to reach the tympanum as a fine spray in the stream of air, and I believe that it there also will reduce congestion, swelling, pain. — After a minute or so, simple inflation with the air stream alone is again practised.

Any treatment with cocaine is not to be frequently repeated, but the use of such a spray as described may be performed more than once with benefit to a swollen condition of the Eustachian mucosa.

I believe that the fact of using the cocaine in a "normal saline" solution is a point of importance. I have not seen any disagreeable or toxic effect produced; I feel sure that relief has been afforded by its use.

In cases of manifest bulging of the membrane tympani, or in cases where there is any localised pointing, threatening perforation, recourse should be at once had to the operation of "Paracentesis."

Immediate relief from the pain will be experienced, the tension is at once overcome. The discharge has
pain. The general physical symptoms are relieved.

The operation— which is really a simple one—is one from which (in my experience) the popular mind seems to shrink very much.

It should always be performed with antisepctic care, with an instrument proper to the operation.

A certain amount of anesthesia of the membra is may be induced beforehand by the use of a 10% soln of Cocainé, or— still better—the 10% Cocainé-Carbolic glycerin.

Immediately after performance of the paracentesis, the "air donorke" should be employed, followed by free warm antisepctic irrigation through the external meatus.

The air donorke will have to be repeated frequently in the subsequent treatment—to keep the tympanum free from secretion, to keep the perforation open so long as there is any secretion remaining, & to prevent the formation of any adhesions between the Membrana & internal tympanic wall.
Otitis media acute: Treatment.

Paracentesis of the membrane should be performed at the spot where any particular localized bulging is present.

If there is no localized protrusion, the posteroinferior quadrant of the membrane is the most suitable point to obtain free drainage, etc.

The operation should be done thoroughly, that drainage may be free. If there is much swelling of the deep part of the meatus, extend the incision may, should, be extended into the soft tissues here; this will cause free defluxion of the tissue there, and reduce pain & swelling, which otherwise might interfere with free drainage.

After the operation, when free discharge is taking place, frequent antiseptic irrigation of the ear should be carried out to keep the ear as clean & free from discharge as possible.

I believe it is a good plan to assist the draining away of the discharge by passing a strip of antiseptic gauze (I prefer to use Todeflor or "Thode cyanide" gauze) or antiseptic wool, well down into the
Otitis media acute. Treatment.

The ears must be kept as dry as possible, & thoroughly free from any accumulation of matter.

This gauze strip acts the part of an antiseptic dressing to the wound; it absorbs the discharge into an antiseptic material, & it prevents maceration & infection of the meatus from constant saturation with purulent matter.

In cases where the discharge is very profuse & irritating, it is a good plan to anoint the walls of the meatus after thoroughly syringing & drying out with fine ointment, which certainly helps to prevent maceration & of the meatal walls.

In those cases which do not come under observation until after rupture of the membrane & discharge has occurred, the treatment must be on the lines indicated above:

1. Cleanliness. (Scrupulously Kept)
2. Asepticity. (So far as possible can be)
3. Free drainage. These are the essential points.
46.

Otitis media Acute. Treatment.

Polysyrinisation is a most useful adjunct, and a real necessity, for the reasons already stated. Sparking it (0.3%) which must not be repeated.

In some cases it may be desirable or necessary to wash out the cavity of the tympanum through the Eustachian tube. This may be done through the Eustachian catheter, or else by means of Gruber's method. Whichever method is employed, gentleness in its performance is an absolute essential.

Warm mild antiseptic solutions should be employed for the purpose, Boracic Acid (about 3% or so) being that most frequently employed.

In most cases of a very severe nature, there will be some swelling and inflammation about the mastoid. This subject will be dealt with later on under the head of "Complications."

6.

Treatment of tonsillitis.

As the otitis so often depends on some acute affection in the nose and throat, appropriate treatment must be directed towards these also.
In tonsilitis, pharyngitis etc. the application of hot fomentes around the neck will be of great use in allaying pain and inflammation.

The inhalation of warm moist vapours through nose and mouth is also of decided benefit. For this purpose—plain steam; vapor coni; the vapour (with steam) of Cuprulin; Thick Benzoin. Co.; Al. pini. Syrææ, etc. are examples of useful medicaments for this purpose.

The employment also of warm soothing gurgles is very grateful to the patient, whose state is pharyngitis etc. Common Salt; Chlorate of Potass; Chloride of Ammonium; Bicarbonate of Soda; Boracic; Boracic Acid (pur.) are all simple materials which answer this purpose well. They may all be used in the proportion of roughly speaking—a teaspoonful to the half-pint of warm water.

The nose and naso-pharynx must be kept scrupulously cleared of any secretion—particularly in the post-nasal region. This is most easily achieved by the patient by means of some fine spray.
Spray, or the careful sprayed use of a nasal douche.

By this means, inflammation & swelling of the mucous membrane, blocking of the mouths of the Eustachian tubes, are kept down; & secretion is washed away from the nasal cavity, post-nasal space, & mouths of the tubes.

Such sprays—produced as the "Atomizer" (Borroughs & Sullens') or the "Aerolizer" (Humphrey)—are very effective, & easy of manipulation by the patient himself.

A simple effective way of spraying the nose, naso-pharynx, & Eustachian tubes can be practiced with Phipps' air bag, to the point of the nozzle is attached a length of soft rubber tubing long enough to form a bend, as above described.

Into the rubber tube—which must be of good calibre—is injected some of the solution to be used (warmed). The end of the tube is then inserted into the patient's nose, the act of Obligerisation is performed as usual,
and the air bag vigorously compressed three or four times. As the air current is driven along the tube it carries along with it the solution, which is thereby broken up into a fine spray, carried with the air to all parts of the nostril, post-nasal space, or into the Eustachian tubes.

The effect of spraying and polarizing is thus produced at one and the same time.

Similar solutions may be used for spraying as for gargling (e.g., antiseptic Chloride, or Carbonate of Soda, Chloride of Ammonium; or the Chlorate of Potash, being particularly suitable. — An excellent preparation for either gargle or spray is the "nasopharyngeal formula of Macnaghten Jones — in tablet form these are very convenient.

Where there is intense discomfort in the post-nasal space, much swelling of the turbinate bones, or about the mouths of the Eustachian tubes, spraying a solution (5%) of Cocain will give great relief. An aqueous solution of Antipyrin has also a very soothing influence.
Cocaine should not be frequently used extensively. It is particularly unsafe (as mentioned before) in reducing the swelling about the mouth of the Eustachian tube, thus permitting more readily inflation of the tympanic, favouring escape of contained secretion, & allowing — if desired — the application of solutions or vapours.

In some instances the use of solutions in an oily medium seems more gratifying to the patient than watery solutions. I have thus frequently made use of Paraldehyde in spirit, or dissolved therein Iodine, Terpine, Eucalyptol, &c.

TREATMENT DURING THE ACUTE ATTACK

B. GENERAL TREATMENT

1. Treatment for the Acute Symptoms.

For the Pain it may be necessary to give some Anodyne. Morphia, Chloral, Phenacetin &c are all useful as general sedatives, & may have to be resorted to. It would be, however, very bad practice to dull the patient's sensibility with opiates, & reflect the local condition.
Otis Media Acuta: Treatment

but profound sedatives are useful as an adjunct to suitable local treatment.

Such drugs as Antipyrin, Phenacetin, Antipyrin, and Antihistamines (among the more modern synthetic preparations) are certainly of use as antipyrexo-especially where there is a pyrexial condition; especially where the Otis occurs in the course of, or as a complication of, some febrile disease. (e.g. Influenza)

2.

In most acute cases, (especially if the otitis is the result of a Cataract), the patient will be benefited by a brisk purge. In the early stage of a mild case (from an acute Cataract), mustard and water foot-baths will be of Service in aborting a threatened attack. General treatment for an Acute Cataract will assist in Subduing the Otis also. Aconite in frequent small doses, apis Villous Acetatus, and other diaphoretics &c. may be of Service.

Complete Rest, both physical & mental, is to be enjoined—whatever the Cause of the Otis.
Suitable dieting — careful attention to the same — is also a matter of importance during an acute otitis media.

Where the otitis comes on in the course of some other disease, (e.g. Scarlet Fever), the treatment for that disease must be persevered with, but an acute ear inflammation should never be reflected from the idea (which seems too commonly prevalent) that it is but a symptom of that disease, requiring no special treatment. Treatment for the original disease, for the secondary otitis must go hand in hand, for "a neglected anural inflammation may lead, through suppuration of the middle ear, with all its consequences of Caries, polyphi, Meningitis, cerebral abscesses, pyemia &c., to the most deplorable results." (Rossa)

II. After-treatment.

A. Local.

α. Where no perforation has occurred, the use of Polyanthairia douche (or the Catheter) at first daily, then at
A longer interval, keeps the tympanum
free from irritation, prevents the
formation of adhesions, thickening of
the membrane, or development of a
chronic extantial condition.

There some pain or uneasiness
persists for a little after the severe
symptoms are past, irrigating the
ear fairly frequently with hot water
(1st trying out carefully, thereafter)
will soon give complete relief.

Massaging behind the
ear is of value in promoting absorption
preventing residual catarrh.

Camphor is of use as an anesthetic
for massaging. I have frequently
used Ungo. Potass. tinct. with the
view of promoting absorption from
the tympanum, with some success.

2. Where perforation of the memhrane
 tympani has occurred —
Politzer's air - douche is of use to keep
the tympanum free from discharge
as well as for its other purposes
already mentioned.

The general principles of
the treatment have been already
given, (7%, 13%, 14%, 25%, 7%) should
be)
be perseveringly carried out.

The instillation into the ear of antiseptic solutions, or the insufflation of antiseptic powders, is to be performed regularly with care.

The "dry-treatment" (by the insufflation of powders — usually Boric Acid in unpalatable powder) is most valuable, but must be carried out with discretion, under supervision.

This is particularly the case where the perforation is a small one. McBride reports cases of mastoid inflammation produced by the use of insufflations of Boracic Acid powder, which caused blunting of a small perforation, and thereby obstructed free drainage.

Where the discharge proves tedious, various astringent or stimulant substances are used in solution as "drops" for instillation into the ear.

Those in most common use are the Salts of Silver, Zinc, and lead, especially the nitrate of Silver.

In this essay it is not necessary to enlarge at all on this subject.
Aloes media acute. After treatment

May not uncommonly be a more or less "relaxed" condition of the nasal-pharyngeal mucosa remaining, which calls for treatment.

Astringent stimulant

Gargles and sprays (e.g. Sulfuric Acid, Alum, etc.) may be of use; or the topical application of Eucamum, Acid. Iodine, Iodine pigment, or Nitrate of Silver Solution, by means of a brush or mop, may have to be resorted to.

Or the use of Vapours

(e.g. nascent Chloride of Ammonium) may be of benefit; or these, by means of Valacul's process, be made to traverse the Ethmastic tubes and enter the lymphs, the assistance in relaxed states of the mucous membrane there. Along with the Chloride of Ammonium (e.g. in Godfrey's inhaler) may be used Piloc. Pumilina, Alum, Sulphur, & other aromatic vapours, which likewise have a stimulating effect on the mucous membrane.

In some cases, "tenus" may persist after all real symptoms have quite disappeared, the use of hydrobromic acid freely, or of the bromides.
Even should be resorted to. The
limities in those cases appears
to be really a neurosis.

B. Constitutional.

In all probability, as a result of
the acute otitis, or from the disease
originating it, there will be some
amount of physical debility,
this might keep a discharge long
continuing. Treatment directed
to maintaining the Constitutional
Vigour is thus to be attended to by
the use of suitable tonics:

- Quinine with Hydrocromic Acid;
- Strophemia; Iron in some of its many
  forms (especially as the Iodide in
  strumous cases); Cod-liver oil, Hypo-
  phosphites, Extract of malt, Crasso-
  tis, where there is any tubular tendency.
- Mercury, Iodide of Potassium, Iron,
  Cod-liver oil in a Syphilitic condition.

Suitable Constitutional Treatment for
the Rheumatic or gouty Condition, which
may have been the original cause.

Special attention to the diet & hygiene
in Diabetic Cases, or in Bright's disease;
All these points require attention to the Suc-
cessful after-treatment of this disease.
This disease—as was indicated under the chapter on Aetiology—is one which has a tendency to recur. A "previous attack" is a strong predisposing factor; and a patient who has had one attack of these conditions media acuta, will be very anxious to avoid a second similar experience.

A strict attention to general bodily hygiene, as well as to the local well-being of the parts, is necessary to achieving this desired result. Thus:

1. Suitable & sufficiently warm clothing;
2. Avoidance of damp, chills, wet feet; & direct draughts on the ear;
3. Abstention from excess in the use of alcohol & tobacco;
4. Sufficient & suitable food;
5. Appropriate exercise;
6. Cleansing the skin, keeping it active by bathing;
7. Getting rid of any actual local condition (Adenoids, Bylet &c.)

These are examples of points towards which general & local hygiene is to be directed with a view to the prevention of recurrence of the disease. Similarly, in the case
<table>
<thead>
<tr>
<th>No.</th>
<th>Cause of the Affection</th>
<th>Perforation or not?</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Acute F.P. Catarrh</td>
<td>No.</td>
<td>Complete cure</td>
</tr>
<tr>
<td>II</td>
<td>Idiopathic</td>
<td>Yes.</td>
<td>Cure with cicatrices</td>
</tr>
<tr>
<td>III</td>
<td>Influenza</td>
<td>Yes.</td>
<td>&quot; &quot;</td>
</tr>
<tr>
<td>IV</td>
<td>do</td>
<td>No.</td>
<td>Complete cure</td>
</tr>
<tr>
<td>V</td>
<td>do</td>
<td>No.</td>
<td>&quot; &quot;</td>
</tr>
<tr>
<td>VI</td>
<td>Seething</td>
<td>Yes.</td>
<td>Death.</td>
</tr>
<tr>
<td>VII</td>
<td>Scarletina</td>
<td>(Croupic Stokes)</td>
<td>No.</td>
</tr>
<tr>
<td>VIII</td>
<td>&quot; (convaling)</td>
<td>No.</td>
<td>Cured.</td>
</tr>
<tr>
<td>IX</td>
<td>&quot; (Post Scarletina)</td>
<td>Paracentesis</td>
<td>No.</td>
</tr>
<tr>
<td>X</td>
<td>Rupture of M.I.</td>
<td>Yes.</td>
<td>&quot; &quot;</td>
</tr>
<tr>
<td>XI</td>
<td>Foreign body</td>
<td>M.I. removed</td>
<td>Cured.</td>
</tr>
<tr>
<td>XII</td>
<td>&quot; (rueous)</td>
<td>No.</td>
<td>&quot; &quot;</td>
</tr>
<tr>
<td>XIII</td>
<td>Chemical irritant</td>
<td>Yes.</td>
<td>Small permanent perfor.</td>
</tr>
<tr>
<td>XIV</td>
<td>Erysipelias</td>
<td>No.</td>
<td>Cured.</td>
</tr>
<tr>
<td>XV</td>
<td>Cold wound on a.</td>
<td></td>
<td>&quot; &quot;</td>
</tr>
<tr>
<td>XVII</td>
<td>Rupture of extema a.</td>
<td>Yes.</td>
<td>Chf. Suppression</td>
</tr>
<tr>
<td>XVIII</td>
<td>Pharyngitis &amp;.</td>
<td>No.</td>
<td>Cicatrics</td>
</tr>
<tr>
<td></td>
<td>(Puruns attacked)</td>
<td>Yes.</td>
<td>Old cicatrices</td>
</tr>
<tr>
<td>XV</td>
<td>Toxic infection</td>
<td>No.</td>
<td>Cured.</td>
</tr>
<tr>
<td>XVII</td>
<td>&quot; Family Br.</td>
<td>No.</td>
<td>&quot; &quot;</td>
</tr>
<tr>
<td>XIX</td>
<td>Disposition</td>
<td>No.</td>
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<tr>
<td>XX</td>
<td>Idiopathic</td>
<td>No.</td>
<td>&quot; &quot;</td>
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*Facial Paralysis*
Illustrative Cases.
The following twenty cases from my own practice are selected as being typical of the class of cases of this disease that the general practitioner may meet with any day of his life. The illustrations are in all cases original, or taken from nature.

Note. (For the sake of clearness—a good many of the illustrations of the Membrana tympani are drawn larger than life size.)

Case I.

Intensely Severe Acute Media—Caused by an acute tonsillopharyngeal Catarrh—Great tension in Tympanum—Cured.


Present History. He has had two previous attacks in the Left Ear in bygone years.

Present History. He has had cold in the head, a little dulness in both ears for the last two days. To-day (Dec 1, 1896) he went suddenly very deaf in the Right Ear, immediately thereafter there ensued great pain in that ear, intense throbbing in, & pain extending round about, the ear & side of the head.

I was called on to see him about 10.30 p.m.
(i.e. about 12 hours after the sudden deafness)

Present State. Face flushed, perspiring copiously; suffering intense agony. He is an elderly man of great self-control, but the pain is so great that he has been screaming out.

Otoscopic Exam. - Left Ear. M. J. Slightly dull, somewhat indrawn, slight vascular injection about malleus, otherwise normal.

Right Ear. - M. J. of a dirty raw-buff colour, intensely congested, dull, with haemorrhagic spots in the posterior superior, spades inferior quadrants; at the antero-inferior aspect of the periphery. Some bulging of the membrane in front of & behind the malleus handle. (Fig IX.) had taken leeches with me, but unfortunately no paracentesis knife. Leeches applied in front of tragus & over mastoid, but practically no relief was obtained. Draining the ear with hot water gave relief temporarily only. Instillation of warmed solution of Cocain (3%) seemed also without benefit.

This was manifestly a case where there was tension from retained secretion, & paracentesis the proper treatment; but unfortunately (as I have stated)
a "peracutaneous" knife was the one thing I had not with me.

Obliteration was attempted, but failed utterly.

The catheter was then passed; then

air was with considerable difficulty.

Only after several attempts, made to

elute the tympanum - distinct bubbling

accompanying the act of inflation. The

head was well tilted to the other side.

Inflation performed till no more moist

sounds were heard.

Some warmed cream (5% in normal saline) solution was injected

into the catheter; sprayed into the Eustachian

tube; thereafter simple air inflation

gently performed. Patient experienced

some relief; & morphia solution was then

warmed & dropped into the ear. He

fell asleep some time thereafter. No

cadative was given.

The pain, however, re-

turned again (apparently as the fluid)

re-established) in the morning; & the

douching with hot water; Spraying;

& sedative drops, were repeated, & re-

peated with for a few days. Patient

also gargled & used a nasal spray

(Single salt + warm water) frequently,

& continued this throughout treatment.

For some time the catheter was used

(daily.)
Subsequent Progress & Treatment.

Dec. 14th 1895

Illeisnus a Case

Daily for some time – as Polypisation could not overcome the Eustachian obstruction at first. Not Dwinling was also used for some days.

![Image](Fig. X)

Fig. X shows the appearance is now + its landmarks are appearing again (which has apparently been under the mucous internal layer) is disappearing. The haemorrhagic shot at the periphery is almost entirely absorbed, the one in the poster-inferior segment (which is apparently under the cutaneous layer) is beginning to dry up as a scab.

![Image](Fig. XI)

Fig. XI shows on Dec. 22nd still generally a little pink, much indrawn, the process of the malleus now showing prominently, individual blood vessels distinguished. The upper peripheral haemorrhage have now quite disappeared, the other one has dried up into a little scab, shows signs of commencing separation. Polypisation performed.
Dec. 30th 1875.

Fig. XII. Shows appearance later.

Membrane assuming true. Hr. is beginning.

The Mallus visible now, the withdrawing of the membrane is much less. The anterior & posterior folds, about the Mallus handle. Still show congestion. A curious & very well marked leash of vessels is seen. The small scar is shrivelled & nearly quite separated. (This is a very accurate representation indeed of the appearance at this stage).

Jan. 9th 1876.

Fig. XIII. is the condition on January 9th 1876. The congestion is now almost entirely gone. Remaining mallus posterior membrane of light is now almost complete again. The membrane assuming its normal tint. The hearing has now nearly normal & as good, or better than, in the other ear. This patient took a very fret (retired).
Case I.

Interest in his own case, carries out his treatment most faithfully, was always quite anxious to have drawings made of the condition of matters.

With that he came 1896.

Once again the was

the hearing in the ear perfect, or better than in the other ear (in which, as mentioned before, he had had two previous attacks).

Note: This was really a case for paracentesis, then being great and rapid accumulation of fluid in the tympanum. Not having a paracentesis knife with me (the exigencies of country practice precluding the possibility of getting one for some time), I had to try to evacuate the secretion as I best could. That this was successful is true, but I doubt not that a paracentesis would have brought about a more rapid — though I do not think a more complete — cure. I think the Stein Spraying of the Eustachian tube & Sym.

parum was certainly of benefit.
Note.

I have given a number of drawings of Case I as they are, I think, interesting as showing clearly the previous stages in the clearing away of the otitis, & the return of the membrane Sympathi to the normal condition.

These illustrations are fairly typical of what occurs in any such Case in which no perforation occurs.

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Case II

Acute Otitis media in a child at 5½ yrs — Perforation of M.T. — Healing with cicatrix.

W.C.S.G. — aged 5½ yrs. seen Jan. 9th, 1895. History of sudden sharp pain in ear for some days, moderate at times & again breaking out. On the day previous to my being called a discharge had "burst from the ear."

Present State: Left ear full of mucus.

When this was syringed out, (it was of a somewhatropy, thick, translucent consistency) the Membrana was seen coated with sodden epidermis. By gentle syringing & nothing a good clear view was obtained. The Membrana was reddened & raw, there was a perforation below the lambs. This perforation was somewhat
Illustrative Cases (II)

1. Pouting & thick mucopurulent matter was oozing through (Fig XV)

Treatment:
- A strip of silken gauze was inserted.
- After treatment, frequent syringing was performed with Boracic lotion, perfect cleanliness was maintained. Boracic lotion used as "drops" after syringing out, a gauze strip as an absorbent antiseptic dressing.
- The wound healed very rapidly, it was completely closed within three weeks. Syrup. Ferri. Succ. was given during the treatment.

Result: Complete and sound cicatrization occurred, with perfect hearing.

Recorded the hearing on Oct 26th. There was a slight depression, but no adhesions of scar. Hearing perfect. He has never had any recurrence.
Case III. Influenza—influenza, acute.
Acute otitis media—perforation—very great suppuration—cicatrising.

Mr C., of C., farm. Called to see her on Feb 26th, 1890, for suppurative discharge from the ear.

History: She had had what was quite evidently influenza, with most intense pain in the right ear. "The ear had burst", given relief, but there has been a very great suppurative discharge from the ear. So had has his been, that through the previous night the matter flowing from the ear had soaked its way completely through the pillow into the bolster underneath.

Present State. Rt. meatus full of thin pus, which is oozing from the ear.

On springing out (with cork, cocaine sublimi, solution 1 in 2000) the pus from the meatus, there was seen in the membrana tympani a good-sized perforation, behind and below the handle of the malleus. The membrane was much macerated, the tympanum evidently full of thin pus—in which pulsation was distinctly visible.

She has now no pain whatsoever, but the pus is beginning to excrete the skin.
Treatment. Polarization : frequent spraying with 1-2000 Sublimate Solution, & draining & dressing with a strip of Iodin foam gauge. Subsequently, Boric acid lotion as drops, & Tincture of Eucalyptus to the excoriated skin. Polarization continued, & General Tonics administered.

Course. Discharge gradually diminished. The perforation was closing rapidly, when she left the district in the end of March. She was then almost healed.

Result. I had not seen her for a period of 5 years & 8 months, but on Nov. 30th, 1895, I met her on the street, & persuaded her to allow me to see her drawing (Fig XVII) of her ear lobe & to allow me to examine the cicatrice at the site of the old perforation. This cicatrice had evidently become the seat of a calcareous deposit, which rendered it dense, opaque, & whitish. Hearing good, no subjective noises in ear, she informs me that she had no subsequent treatment after passing out of my hands.
Case IV. Acute Otitis Media from Influenza - intense pain, leaking; cure without perforation.

Mrs. E. J., A. Kieran. Seen on Sept. 9th, 1893. Feverish, intense frontal headache, especially about the root of the nose. Complaining also of the most intense agonizing pain in the Right Ear, radiating also from there up to the temple and over the side of the head.

She is naturally very stout and florid, and very subject to attacks of Croupal "Aches in the Head." (Note: She had anacysis in 1875 - had a stroke of Hemiplegia.)

Present State. Patient flushed, perspiring, Temp. 102.2°. In very great agony both from pain in ear, frontal headache.

Otoscopic Exam.: Right Membrana tympani intensely congested, universal red hue with deepness about handle, the Posterior field, flaccid, x phosphor of Hemiplegy (Fig XVIII).

Treatment.

Leeches were at once applied in front of the Tragus, over the mastoid, and one between the eyebrows.
The best case (T) to anticipate is a

Avery is the same person as Case IV

Avery is the same case as Case IV

Case IV

More than likely, the patient was

The patient was seen and

The patient was a

The patient was a

The patient was a

The patient was a

The patient was a

The patient was a

The patient was a
At very much the same time, there practically the same circumstances but occurring quite a different form.

Case V. From Influenza — attacking mostly the Eustachian tube — Serous exudation in tympanum — Cured.

Kanees H —, housemaid to Mrs. J. (Case IV) seized with Influenza on Sept. 29th 1893; (Catarhal symptoms were well marked); Complained of dullness of pressure in both ears; great tinnitus, & in the Right ear some degree of pain. Very severe frontal headache.

Of their own accord (after the very brilliant result in Mrs. J's Case) they had applied a leech behind the right ear, but without any result in the way of relieving the pain, & they desisted from further attempts.

Present State: Patientフェムッシュ, Sept 1st, slight Catarhal pneumonia; frontal headache severe. Pain in right ear, not very severe; but intense feeling of dullness & oppression — dizziness.

Otoscopic Specimen — Left Membrana dull, indrawn; "Short process" prominent, slight Congestion about malleus handle & Membrana placida. Right M. T.
Case V

Right Membrana: markedly indrawn, the malleus handle foreshortened, the Short process the folds (especially the posterior) prominent. Marked congestion of Membrana placida, \& folds; \& along posterior aspect of malleus handle, a slight band running from there to the posterior - superior wall of Meatus.

(Compare description of the blood vessels of the Membrana tympani - "Aurantichrest." - guinea in the chapter on the Anatomy of the Middle ear.)

In the lower part of the Cava tympani fluid came through the S. reaching to level of the (Fig XIX).

Seemed to be

\[ \text{parenchyma of} \]

\[ \text{treatment.} \]

\[ \text{Eustachian Catheter passed,} \]

\[ \text{fluid expelled by brisk inflation; the head being well tilted over to the left side.} \]

\[ \text{There was a good deal of Eustachian obstruction, but the Cocain spraying through the Catheter was of assistance.} \]

\[ \text{With the expulsion of the fluid,} \]

\[ \text{inflation with air, there was immediate relief from the intensely oppressed fecling.} \]

\[ \text{A leach was applied to the} \]

\[ \text{(root)} \]
Case V

History:  No marked nasal symptoms, &nose was dry and firmer. Three days after injury the nose bled severely, with immediate relief to the headache.

To reduce the marked nasopharyngeal congestion, steaming & gargling with warm Boracic lotion was used. Also treatment for the Catarrhal pneumonia condition, which was fortunately slight, but the cough very spasmodic.

Inflation was regularly practiced, & complete restitution effected.

Case VI: Infant - "Scrething" - Subacute Otitis - Convulsions - Death.

C. D., a delicate infant, lethargic at birth. (March 27th, 1889) Very restless. Crying constantly. The cause of the pain was not diagnosed like the "ear burn." Present State. Ear full of purulent matter, copious discharge; after syringing out with 1:5000 Sublimated Solution, found there was perforation of the membrane, apparently free drainage.

Treatment: The ear was kept as clean as possible by frequent syringing and drying out. The child was given some Syrup of Hypophosphite. The discharge gradually diminished, the child seemed along well, with the exception of some (other)
other teeth subsequently. The child became suddenly worse. The temperature shot up suddenly, the child was seized with convulsions, became comatose and died June 3rd, 1889. No post-mortem.

Note: I believe that death in this case arose probably from meningitis (possibly Septicaemia). The case is interesting as showing what a serious illness may ensue from what is unfortunately often regarded as a trivial condition.

Scarlatinal Cases. (VII, VIII, IX).

Case VII. Scarlet Fever. - Outbreak on the 3rd day. - Intense hæmi. - Leeching the attack aborted.

Elizabeth A. - 15 yrs. of a - farm.

Showed first signs of Scarlet Fever on Feb. 18th, 1876. The rash came out very brilliant. Sore throat, tonsils, face very red, inflamed, throat ulcerated. On Feb. 20th the complaint of slight "lump" once or twice, but it went away completely again.

At 3 a.m. on Feb. 21st I was called
up to drive out (6 miles into the country) to see her as she was in "great agony" with her ear. I took out several leeches.

**Present State.** The girl was screaming in agony—introduced two or three people to hold her—she was almost delirious with pain. Face flushed, respiration: Temp 103.5. Right ear affected.

**Auscultation Examination.** R. Ear.—There is a general pink condition of the right membrana, from the shining through of the tympanic vessels, with a bright red about the handle, the posterior the genus of the (Fig XX)

**Congestion** media, anterior folds, periphery membrana. No bulging, nor indrawing of the membrana.

No evidence of retained secretion (nec had been no time for that to form).

Evidently the agony was pain from intense tympanic congestion.

**Treatment.** The ear was doused with water as hot as could be borne, then 2 leeches were applied in front of the tragus; the result was "magical."

The leeches drew blood very freely (Fig XX)
And relief was immediate. A few drops of Cocain & atropine Solution were warmed & dropped into the ear, & she fell asleep in a few minutes.

Subsequent history. She never had another symptom in the ear.

In sixty hours after, was almost only a trace of the matter, & the handle, & margin of the ear had almost disappeared, & the matter assuming its natural hue & lustre.

Patient has been having the throat gurgled & steamed, & has been gargling it frequently.

Note. This was an attack of acute scarlatinal otitis media, which was "aborted" by the use of cocain. The leeches drew very freely, none of the bits filled for long thereafter. I feel sure that this case untreated would have run on to severe suppuration, probably would have become chronic.
Case VIII. Scarlet Fever - Otto during Convalescing Stage - Recovery.

E. M., Schoolgirl, was seized on Oct. 30th 1895 with Scarlet Fever of moderate severity. Rash slight. Heart symptoms comparatively slight, reduces without any elevation. Made very good progress. All symptoms abated - Rash disappeared, & Temperature was normal.

On Nov. 9th Complained of earache in the right ear. The temperature again rose. There was no previous reduces her pain whether.

Endoscopic Examination. Right membrane tympanic dull, greenish-grey in color. Bright red congestion about the handle of the malleus, about the slight about the of the men.

The anterior folds of the inferior of the Membrana, the most prominent part catching the light (Fig XXII). which is a most accurate depiction of the condition.

Treatment. I considered this a most...
Case VIII

Suitable case for paracentesis, but was refused permission. The ear was well drenched with hot water. The tympanum inflated with the catheter, the secretion expelled. A 5% cocaine solution in normal saline was sprayed in for the catheter. Similar solution instilled into the meatus (warmed of course, in each instance).

Progress. The next day, the patient said the pain had left entirely & never returned. Inflation was performed daily at first, & no other treatment applied—as there were no more otitic symptoms.

On Nov. 16th

The condition returned to normal, normal. No more swelling visible about the periphery of the folds. The tympanum of light once more normal, showing that the membrane had re-assumed its natural concavity. Hearing practically normal.

Result. This case went on to perfect recovery in all respects.

Note. I consider that the correct
Illustrative Cases.

Treatment for this case was paracentesis, as there was manifest bulging from retained seerction (see Fig. XXI). The pain evidently was largely caused by the tension. The treatment which was perforce adopted in lieu of this latter produced a most satisfactory result, and I do not think paracentesis could have produced a better. This proves that paracentesis was not a necessity; (as also in Case I) brilliant results may follow a milder treatment.

I know that inflation of the tympanicum in an acute stage of this disease is condemned by many, but in Cases such as No. 11, the present one, it was most valuable—emptying the tympanum of seerction, thus releasing the tension.

I suppose it might be possible that an inflamed membrane might be ruptured by a possible inflation, but even then the result would only be that of a widely reformed paracentesis, it would be quite as favorable as a spontaneous rupture.

Case IX. Scarlet Fever, otitis in the desquamating stage.
Case IX. Otitis media acuta after
Scarlatina (in desquamating stage) -
Suffocation - Paracentesis of Membrana
Placida - Recovery.

J. R. W. - Insurance Agent, took
Scarlet Fever on August 25th, 1895 - of a
Severe type. Intensely vivid hematemic
Made good progress recovery, but was
much frustrated by the disease. The
Desquamation was very great.
He went out first in the beginning
of October. On Oct. 7th I was called to see
him as he was suffering intense pain in
the right ear, which was getting worse
twice. He had apparently quite com-
pleted desquamating.

Otoscopic Examination. On examining
the R. Ear, there were found numerous
flakes of desquamating skin, projecting
into the meatus, shadowing in the field
of vision. (V. Fig. XXIV) The whole membrane
was intensely
very great
was present
mellitus. handle
(where visible).
membrana
just over

10.30 A.M.
aut.

Fig. XXIV.

Scarlatina Staining. Membrane.

J. R. W. -
Oct 7th, 1895.

Reduced: Congestion about the
Periphery In the
Placida the Short

Process)
Case IX

Process. Here was very manifest bulging of the membrane. This was of a yellow colour, I was evidently due to pus pointing in Brucat's space. The pain was most intense. (Fig. XXIV)

Treatment. This was manifestly a case for immediate opening. This was at once done. The liberation of the pus gave speedy relief. Obliteration was performed, the ear dressed out with hot water with "Listerine" added as an antiseptic.

Course. Daily inflation, dressing with the "Listerine" solution was performed, a light plug of "cotton gauge" kept in, the meatus.

Healing proceeded rapidly. On Oct. 22nd the condition was as in the incision healed, a prominence slight congestion about the mallus handle. The rest of the membrane somewhat dull, a little of the entrance adherent internally. (Fig. XXV.)

J.R.W.
Oct. 23rd 1895.
Segment of the membrane, behind the handle of the malleus. (The appearance of the membrane at this stage is very well shown in Fig XXV.) There was slight retraction of the membrane apparently — though this may have been more apparent than real, the swelling of the membrane flattened making the upper part more prominent. Result. Occasional telescoping was performed, & the ear made a perfect recovery without further incident.

For the purpose of a drawing I got him on Dec 22nd.

Dec 22nd 1895.

The condition of affairs was as in Fig XXV. The membrane was now quite normal, the site of the paracentesis being shown by a very faint linear scar. The hearing was perfect. He has never felt the slightest discomfort in the ear.

Note. I incline to think now that the incision in this case was made in a faulty manner, (though this had no ill effect on the result,) that it would have been better made running (in true)
Case IX. Carried up the entire extent of the membrana eel, 
if necessary right have been extended 
into the superior wall of the meatus. 
Absolutely perfect drainage would 
thus have been made a certainty. 
However, as it was, the result was 
unexceptionable.

Case X. Rupture of the Membrana 
Sympathica — Concussion of labyrin 
Eruption of middle ear — Permanent 
deadness.

Geo. J., farmer S. Stone Farm.
a young man of very alcoholic tendencies, 
suffering from chronic naso-pharyngeal 
catarrh (alcoholic, probably), riding home 
drunk late at night was thrown from 
his horse, & dragged by the stirrup. 
He was picked up insensible to all 
home, Feb. 14th 1888.

He was insensible, bleeding had been 
taking place from the left ear, & I 
treated him as being a case of fracture 
of the base of the skull. The ear was 
Springed out with warmed Carbolic 
Solution, the meatus packed with 
Sublimated wool, ran antiseptic 
dressing applied outside. In short the
Case X was treated as one of a "Com-
posed fracture of the base of the skull.

Course. He was insensate for a
number of hours, then became con-
scious. The antiseptic dressing was
left on, however. In the course of
a day or two he developed severe pain
in that ear, the dressings were then
removed. The ear examined. There
was found to be a rupture of the
membrana tympani and purulent discharge
from the tympanum.

(Fig. XXVII)

Subsequent Treatment. The ear was fre-
guently syringed out with antiseptic
solution, kept scrupulously clean.
Gauze strips inserted in the meatus. The
perforation healed.

Injection there had
been some
the labyrinthine
renew, as
he remained permanently deaf in
that ear. He left this country some
time thereafter for America where he
now is.

Note. This case might possibly
have done better had it been left
Alone, but with the idea of there being a fracture of the base of the skull—(which possibly there was not)—from the insensibility, the bleeding from the ear—therefore a compound fracture, I treated it aseptically as a compound fracture.

In all possibly the antiseptic solution coming in contact with the tympanic membrane membrane was the means of setting up the otitis media.

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Case XI. Foreign Body in Ear—attempted unskillful removal—wounding of membrane—acute inflammation—complete recovery.

Mr. M., q. S. Hill, was supervising the threshing of a stack of oats Feb. 8th, 1895. A grain flew into his ear causing him great pain & distress. Some of the farm workers attempted to remove it with long forceps. These attempts caused him intense pain, with no result.

The following day he presented himself at my house with the above history, complaining of intense pain, great limitation, & some dizziness.

Otoscopic Examination. In the left (ear)
Case XI

The grain of oats was seen deep down in the meatus, evidently in contact with the drum membrane, and with its points embedded in the superior and inferior meatal walls. The membrane itself was very much involved, and a marked congestion of the blind red line, with extravasation behind the end of the handle, was evidently the result of a wounding of the membrane in attempts at removal of the foreign body.

The posterior and inferior walls of the external meatus were crusted with dried blood, and there was also evidence of wounding at the points of the oat grain also, which were sticking in the walls of the meatus.

\textbf{Treatment.} With a suitable pair of corneal forceps the grain of corn was seized, and tilted so as to liberate one end, which was withdrawn with the greatest ease. The ear was then treated out with hot antiseptic solution (Disterine in dilute Solution). With removal of the corn grain, there

\textbf{Fig. XXVIII.}

N.B. N.
Feb. 9, 1895.
Illustrative Cases

Case XI

at once relief of the pain, disappearance of the tinnitus & vertigo.

All the symptoms disappeared in a very short time under the soothing influence of hot douching alone, and complete recovery of hearing re. was obtained.

The pain & discomfort of the foreign body itself was small as compared with that which had been produced by the clumsy attempts at removal. In these efforts the pain had apparently been thrust up against the membrana, this had set up the intense tinnitus & vertigo. The points of the instruments used had also wounded the membrana itself & the bony walls.

The otitis was in this case due more to the ignorant & clumsy attempts at removal, than to the foreign body itself.

Case XII. Ananimate foreign body in ear (pora lutea cistitae) - intense pain & distress - Zorning in of a "Chemical irritant" - acute otitis media. Recovery. Cauf. - The captain of an American barque in the dock, laden with a cargo of bones. June 11th 1894 Came, complaining that he had been unwell the morning (of)
of the previous day by feeling that some living thing had gone down inside his ear. It kept moving, and caused him the most intense pain and distress, and an unendurable noise in the ear (evidently drumming on the drum). To use his own expression, he "declared to kill that bug"; with this object in view they poured into his ear a quantity of crude kerosene oil.

This was effective in causing a cessation of the movements, but the pain continued severe, and appeared instead of diminishing. The pain began to spread up the side of his head.

**Present State.** The right auricle and external meatus are all oily and smell abominably of crude paraffin oil. By otoscope the waxes of meatus are clogged with an oily film. The membrana is of a dirty red hue, and is filmy with the iridescence of the oil. The oil is very thick and almost unabsorbable. The oil is present in the meatus of the ear.

Fig. XXIX.
Illustrative Cases. XII

Case XII

Seen a small dark body (certainly not wholly visible). (c. Fig. XXVIII)

Treatment. The ear was syringed out with an alkaline solution (of Bicarbonate of Soda), & a dead beetle, a quarter of an inch long – of a dark greenish colour – was washed out with the first syringeful. (I have this beetle still in my possession).

The syringing out of the ear with the alkaline solution was continued until all traces of the taroaffine remain washed away.

The pain was now greatly less, but to help to allay inflammation & reduce pain, drops of “lead & morphia” solution were ordered to be instilled warm twice or thrice daily.

Some deafness persisted somewhat, until Politzer’s inflation was performed a few times. All symptoms then disappeared, complete hearing was restored, there were no ill effects thereafter.

Note. It seems to me that in this case there was a double foreign irritation of the ear. In the first place, the beetle, an animate body, set up pain, distress & inflammation
by its presence and its movements. In the second place, a chemical irritant, foreign body was introduced into the ear in the endeavour to counteract the effect of the bullet. Between the two of these causes, a sharp and painful otitis media was produced, which however soon disappeared under suitable sedative treatment.

Case XIII.  **Erysipelas of face, auricle, external auditory meatus - acute otitis media**

**Perforation of Membrana Placentula**  (remained)

Mary M. - seen May 15th, 1888. has had an attack of erysipelas involving the face, side of head, & ear.

**Present State.**  There is a swollen & discharging condition of the face & auricle on the left side, with some condensation formation of crusts. The swelling is especially great about the outer opening of the external auditory meatus, which is blocked by necrotic epithelium.

She is complaining of the most intense pain in the ear, very great deafness on that side, & much tenderness.

On the outer opening of the meatus being cleared, the meatus itself was
Case X III

Present State

Seem to be blocked with feeling states of skin. This was aspirated clear as far as possible, & the cast of skin seized with the forceps. On traction being made, a complete cast of the enteral membrane & tympanum came away like the finger of a glove, consisting of the epidermal layer itself, & the scar tissue of the otosclerotic membrane in part. Removal of the mem. seen, raw, red, & with a manifest perforation in the side of the membrane facia. None of the distinguishing features of the normal membrane were discernible. There was suppurative discharge within the tympanum. (Fig. XXX)

Treatment. The ear was drenched out freely & frequently with Boracic Acid Solution; Obliteration being also performed to drive the pus out through the perforation. Boracic Acid in Solution as "drops" was also used, but without much improvement.

Subsequently Mixture of Silver Solution
was employed, (as strong as 20 grains to the ounce,) & subsequently other astringents by the rectum, & by the Eustachian catheter.

The case proved somewhat obstinate—partly, I have no doubt, due to the defective drainage caused by the situation of the perforation; but the discharge gradually decreased, until by Sept. 5th 1886 it had quite disappeared.

There however remained a small perforation in the membrana faucae. Hearing, nevertheless, was very good in that ear, in fact practically unimpaired.

During the course of the disease the patient took large doses of the subl. ferri muriat. (Edin), & nourishing food & wine, as she was very greatly debilitated.

**Result.**

The case practically the perforation moment.

The ear on 1st Feb. 1895, Subsequently.

Condition was as depressed. **(Fig. XXXI)**
Case XIII

The membrana was practically normal in its appearance, saying that it seemed rather more than usually transparent, hence appeared more pinkish in hue than usually is the case.

In the membrana placida there still remains a tiny perforation, through which a current of air can be driven. The hearing, however, is very good; since Sept. 1888 she has never had the least trouble or discomfort in the ear.

Note. Perhaps the most interesting feature in this case was the manner in which the epithelial lining of the meatus, the cutaneous layer of the membrana peeled off in one piece — like the tip of the finger glove — showing the absolute continuity of that tissue. The permanent perforation (a very narrow one) remaining might have been classed as a "portamento Rinini" of developmental origin by any one acquainted with the previous history of the ear. The excellent recovery of hearing is also noteworthy.

A.B.: Possibly this case might have healed quicker than it did, had parenteral been performed in the auricle segment, & free drainage then been obtained.
Circumscribed (furuncular) inflammation of external auditory meatus — involvement of tympanum — No perforation — Recovery.

Miss A —, a Norwegian lady, seen on Sept. 28th 1875. She just arrived in this country two days before. For the last five weeks she has been suffering from frequently recurring septic attacks of pain in the right ear. Within the last 48 hours there has been a great increase in this pain, which has extended its area all over the temple and the side of the head. There has also been a feverish state and feeling of general exhaustion.

**Phæosopic Exam.** Some amount of gently swelling in the meatus + purulent matter on the floor. Two well marked furuncles are visible occupying a large part of the lumen of the meatus, the upper part alone being clear. Of these furuncles one has recently burst. Mrs. A. the other is in a less mature stage.

![Image](visor11.png)

**Fig. XXXII.**

Miss A. —

Sept. 28th 1875.
membrana flaccida, which shows bright crimson injection of its vessels.

**Treatment.** The ear was cleaned with hot water with "listerine" added to weak solution. Leeches were applied in front of tragus & over the mastoid, 2 drops instilled of Throatol (5%) Eucalyptol (10%) in 10. Amygdaloid date. A strip of gauge moistened with this solution well warmed was passed well down into the meatus.

**After treatment.** The drops were used three or four times daily, the ear syringed out daily with the "listerine" lotion to which was added some bi-carbonate of soda. The larger perforation did not change all its contents, the smaller one aborted, no further inflammation occurred.

**Course.** There was considerable deafness in the external auditory meatus, also slightly of the membrana itself, but no perforation occurred; the congestion gradually resolved itself. There was at first considerable deafness. Polynization was followed several times with a view to expelling any secretion, etc. The hearing became quite normal again.
Case XIV

During the attack the patient was treated with Sulphide of Calcium internally, and subsequently of Iron and ordered out-door in six weeks after the onset, the condition was as above, practically perfectly normal. There was never the least attack of pain in the ear, subsequently, hearing was perfect.

Note: Acute otitis media as a sequel of furuncles seems much rarer than after "diffuse" external otitis. In this case, there was some general diffuse otitis externa superadded to the furuncular condition. I believe that these had come to be really a periostitic condition, that the inflammation of the middle ear came as a sequel of that.

The interesting points of this case are - the cause of the otitis media; the relief given by the leeching; the aborting of a subacute furuncle already formed, together with the natural course of the original process after the leeching, or use of the "drops" mentioned. (Recall)
Case XIV

Note.

Regarding the latter point, the "drops" instilled in oily solutions are practically universally condemned, but in numerous cases I think they give more ease than any aqueous "drops." If the case is under proper observation, the ear syringed out with mild alkaline solutions there is no fear of lassitude or other troubles associated with the use of oily ear drops.

The use of "distrotein" in aqueous solution (2-10) — which may be rendered alkaline, if desired, by the addition of soda bicarb. — has given me first satisfaction as a mild, yet somewhat sedative, antiseptic in anural cases.

Case XV

Pre-existing ear disease (Chronic Suppuration) — acute attack supervening — burrowing of pus. etc.

J. C., insurance agent. Has had a chronic suppuration of the ear for many years, with constant discharge.

Three days ago he was exposed for two hours to an unusually cold wind blowing into the ear, which set the cold greatly at the time. Pain came on soon after, and has continued and increased greatly ever since.
Illustrative Cases XV

Case XV

Since the discharge entirely ceased, none has come from the ear at all since that time. The pain is now most intense, all over the side of the head, she has had no sleep for the last two nights.

Present State. Right ear is prominent, the auricle being tilted forward by swelling behind. This swelling has a boggy feeling, but no distinct fluctuation is to be made out. There is much tenderness over the swelling as also all over the temporal-parietal region where there is a somewhat adenomatous condition. On making otoscopic exam it was found that there was a polypus of some size completely blocking the canal of the ear. The polypus was markedly congested, & apparently partially strangulated from swelling.

Treatment. The ear was thoroughly syringed out with warm antiseptic solution, the polypus was then removed with a fine wire snare. Bloody-smart hemorrhage followed this removal, which was easily controlled however. The ear was very freely & frequently drenched out with...
Illustrative Case XV.

Sublimate Solution (1:5000).

Poultices were applied—frequently renewed to the swelling behind the ear.

Next day there was marked fluctuation behind the ear, the swelling was at once opened, and a quantity of extremely fetid greenish pus was evacuated. There was no trace of infection exposed or diseased bone to be felt. The cavity was thoroughly syringed out, as was also the external meatus; a strip of gauge was inserted to drain the cavity and keep the opening patent.

There was complete relief of all the painful symptoms; the wound was carefully dressed—Liodiform and Liodiform gauge being fully used; the ear kept scrupulously clean.

There was very great destruction of the membrana tympani of very old standing, part of the membrane with the malleus attached was adherent to the internal wall.

By Oct. 19th the wound behind the ear was completely cicatrizid; the ear no longer prominent, there was a slight purulent discharge by the external meatus.
The base of the extracted polypus was touched with chromic acid, the nose ordered to dose out the ear might morning with Boric acid lotion.

As he did not desire any further treatment, he ceased to come under my observation.

Note. This case is introduced here as showing A. the predisposing influence of a pre-existing ear disease in inducing an acute attack, B. the effect that such an acute attack had on the pre-existing disease.

In this case apparently the sequence of events was this: On the pre-existing ear complications, with the polypus present, the Cori would act as an exciting cause of acute congestion. This acute congestion caused at first a diminution of the ordinary secretion, at the same time a great increase in the size of the polypus, which became swollen and triangulated, thus completely blocking the canal. The fluid was thus unable to escape "fer Vena natiralem", it was locked.
Case XV

up within the tympanum. The secondary effect of the acute congestion would be to make a first increase in the amount of tension, this being set up caused intense tension strain, and it had then borrowed its way out of the tympanum behind the antrum & so made its appearance over the mastoid. Fortunately there was apparently no extension of the process within the mastoid, in the antra & cells.

Case XVI

Otitis media acute in both ears — previous similar attacks with cicatrices in the membrane.

Joseph D., a waiter, born 1846, complaining of having had severe pain in both ears; in the right one first — which is now discharging, & the pain eased — & subsequently in the left, in which the pain is now severe. He has had a sore throat for several days past.

In bygone years he has had attacks of a similar nature; & has had discharge from the left ear on previous occasions also.
Illustrative Cases XVI

Case XVI

Present State. Patient has got an outbreak of Herpes on the lips. He has also got an acute Pharyngitis & tonsillitis with ulcerated patches. (He has been subject to sore throats).

Otoscopic Exam. Right ear: acute otitis media, which has gone on to suppuration & perforation; the memhrana much reddened & congested, discharge free.

Left ear: In a state of acute inflammation, the memhrana of a general reddish-pink colour, with marked congestion (bright red) about handle. There are two x

Cricotympanic the memhrana, side of the

On inflation method there presented the appearance given in the above illustration. (Fig XXXIV)

Treatment. Right ear, douching out antiseptically. Boracic Acid drops instilled. Left ear, hot douching, instillation of Carbolic & Morphia drops.
Case XVI.  The acute symptoms diminished very rapidly, & when he found himself getting so quickly better, he foolishly ceased attending & passed out of observation.

Note. This case is interesting as showing a decided tendency to such inflammation of the middle ear, as the predisposing influence to subsequent attacks which previous similar attacks seem to have.

Judging from my experience of this patient, in all probability in his previous attacks (as in the present instance) he did not carry out to the full the treatment he should have had, being content in all likelihood when he found the acute symptoms relieved; hence there may have been a residual condition.

In his former attacks the perforation had cicatrized very well; but an ear with such cicatrices would be "below par".

Cases XVII. XVIII. XIX. Three members of one family all affected with acute otitis media — no influenza nor other contagious disease. ? Toxic infection from defective drains. "Family predisposition."
On August 6th, 1887, I was called out to a farmhouse several miles away to see Mrs. M. and her daughter Eliza M., both of whom were reported to be suffering from severe headache.

The weather at this time had been uninterruptedlly fine and dry for weeks, (the celebrated "Jubilee" Summer); there was no question of cold or damp in the case. There was absolutely no infectious disease about; the time was prior to the first appearance of influenza.

Mrs. M. was complaining of dulness in both ears, which had been in existence for a day or two, accompanied by some pain. She has now pretty severe pain in and around the right ear, radiating up the side of the head. Abnormal Exam. Both membranes are dull; the left one somewhat congested; the right one very much so, being a dull coppery red.

Her daughter, Elizabeth M., (a girl with a decided catastrophic tendency) was complaining of a very similar state of affairs. She had a
Nasopharyngeal catarrh (which was evidently a more or less chronic condition with her), and the otoscopic examination revealed a very similar condition of affairs to that of her mother, though not quite so acute as the condition in Mrs. M.'s right ear. The pain was fairly severe, theDrawing & deafness very marked.

The congestion of the membranae was not so luminal as in Mrs. M.'s right ear, but there was marked congestion about the malleus handle, & the vascular network over the membrane & about the periphery.

On the second day thereafter, a younger daughter, Eliza, aged about 8 yrs., was in turn affected with a similar affection, in one ear very slight, but fairly severe in the other, but on the whole of a more moderate type.

Treatment. All three cases were treated alike. Hot Douching; instillation of Carbolic Tinct. drops, or reflection by Politzer's method.

Result. All cases recovered completely.

The right ear in Mrs. M. - also in Eliza. M. - discharged a very little
Also.

As to the causation of rheumatic fever, a marked predilection is shown for the rheumatic infection in those cases. I think this may be taken as an indication that the infection is present, and that a fair number of the attacks have been rheumatoid. But, to return to the question of rheumatic fever in the case of Bruce, it is a little difficult to make out any connexion between the two. Bruce's case is somewhat complicated, and there may be other factors at work. I think it is best to keep the matter in mind, and to keep an eye on the case.
disease. Did the cases infect each other, or did each case arise "de novo" from the same exciting cause? It did not occur to me at that time, but I have subsequently thought that very possibly this was an instance of toxic affinity media from sewer-gas poisoning (as mentioned by Casale).

The system of drainage at farms-houses is often so very defective, for many weeks before the occurrence of these cases, there had been a complete drought and scarcity of water, and in all likelihood there was exceedingly defective flushing of the drains, &c. With such a condition of matters it might easily happen that sewer-gas was present in considerable amount.

This would affect the mother and children more, as they were, of course, much more within doors.

Case XX. Acute Otitis media in a child — Facial Paralysis — Recovery.

Lizzie B., a schoolgirl, about 11 years old, said to have carache "something wrong with her face."
Illustrative Cases

Case

She was seen to have enlarged tonsils, an oedematous condition of the nostrils; a moderate attack of otitis media in the right ear. A very well marked paralysis of the right side of the face, which had come on soon after the pain developed in the ear.

She had been sitting when she felt a cold draught blow into the ear, and attributed the earache to this cause.

Treatment: Simply hot douching of the ear for the pain (which was not severe),oblige's inflation of the tympanum, & gargling the throat.

The ear symptoms soon subsided, but the facial paralysis moved somewhat obdurately.

Massaging behind the ear was practised, some diluted Societe of Potassium ointment being used as an astringent.

Internally minute doses of Potass. iodid. & Syrup. ferric iodide were administered.

Subsequently a small blister was applied in front of the tragus.

Result: It was several weeks before...
the nerve fully regained its functions, but complete restoration occurred finally. The ear itself very soon became well.

Note. I believe that this case was one in which the moderately acute inflammatory process present in the middle ear affected the facial nerve as it passed along the Fallopian Canal. Possibly the bony wall of the Canal was more or less deficient in this case — or at any rate exceedingly thin, as the otitic inflammation was not of a very severe type.

The case is interesting as showing — what has often been remarked by authorities — that facial paralysis (gataemorpy character) may follow from a comparatively mild otitis media.

These twenty cases of acute otitis media alone recorded are not set down as being in any way unusual, but on the contrary, as being merely typical
Examples of a class of cases that may be, it is, met with very frequently by every general practitioner. I have selected those here recorded as affording a moderate diversity of etiology, and also as showing variations in type in cases in which the causes were similar.

The illustrations of the membrane have all been drawn directly by myself, and I think—in fact, in almost every instance—they very faithfully depict the condition present.

Chap. VI

Course.

Complications.

Results.
Course & Complications of Otitis Media Acuta - in tabular form.

1. May be confused with Sympathetic, Eustachian tube.
2. Cause perforation of the Membrana.
3. "Otitis extrema diffusa", "otitis extrema disseans" (Bennet).
4. Periostitis of Mastoid.
5. Suppuration in Mastoid antrum & cells.
7. Glandular Inflammation + Suppuration.
8. Cervical abscess. (same may burrow down the neck)
11. Inflammation of, or ulceration into, the Labyrinth.
12. Meningitis; sub-dural Suppuration.
13. Cerebral & Cerebellar abscess.
14. Haemorrhage. - Ulceration into the Cardiac Artery; Jugular vein sc.
16. Pyaemia; Metastatic Abscesses. sc.

Note: The slight latter complications are more likely to result through the medium of Chronic Suppuration, following on the acute.
Course of:

A case of otitis media of the severe type is scarcely possible of spontaneous resolution, especially if there be much serous put up within the tympanum.

It may perhaps happen that spontaneous discharge occurs through the Eustachian tube, but generally this is a very unlikely occurrence, as the secretion can perforate the membrane tympani as a rule with more ease than it can overcome the Eustachian obstruction.

Politzer and others assert that even purulent secretion can be absorbed to disappear, but this seems an extremely unusual and unlikely occurrence.

Under suitable treatment, however, the inflammation may be "aborted"—or at any rate so far mitigated as to run a comparatively innocuous course, where otherwise most destructive consequences might have resulted which might have endangered even the life of the patient.

If the case is seen early, (and)
And treated promptly. Though the ear...

...may be treated. With suitable treatment...

The congestion, lasting for a little time...

Gradually diminish, so that the reddened...

As the tinnitus of the membrane...

Gradually fade. In the normal condition...

The tympanum becomes the normal condition...

Care must be taken to inflate the tympanum...

By the external auditory meatus, the middle...
membrane; the last of all is dis-
appearance being that at the malleus
handle.

If untreated (and in some
cases even in spite of the best of
treatment — notably in Scarlet Fever
& Diphtheria) the course which the
inflammation runs is probably
very much as follows: — As a result
of inflammatory softening of the
membrana tympani, from the
pressure of the contained secretion,
rapture of the membrane occurs —
sometimes with a loud explosive
sound in the ear —, & discharge
of the secretion occurs into the Ex-
ternal auditory meatus.

Usually when this takes
place there is immediate cessation
of the intense pain, as the tension
has been relieved. 

This discharge may be
serous, mucous, serous, or more or
less purulent — in very severe
cases most probably the latter.
It is at first probably copious,
but gradually diminishes in quant-
ity, & in favourable cases, it may
sometimes spontaneously cease,

(Natural)
Perforation

Natural Cure Result.

This is a rather unlikely event — far more probably the discharge tends to persist, it may undergo septic infection; the train is laid for a chronic supplicative inflammation with all its attendant and consequent discomforts and dangers.

The perforation of the membranes tympani which occurs may be a small one; or there may be great ulcerative destruction, so that practically all the membrane is destroyed; and all stages between these two extremes may be seen.

Location & Size of the perforation, a good deal may depend; if free drainage can be seen, the case is carefully treated, a good result may be looked for.

Relapse. Sometimes a perforation may heal up before the inflammatory process has spent itself; in which case a recrudescence of all the acute symptoms will again occur, and necessitate paracentesis for their relief.

If the inflammatory process does

(No.)
Caries or necrosis of the tympanic membrane may occur comparatively early from interference with their blood supply by the swelling of the mucosa. Caries or necrosis of the tympanic membrane may be called for in certain cases, when there is long persistence of an offensive discharge; and also removal of softened areas in the bony tympanic walls—when such areas exist. Such operations are, of course, purely in the domain of the Specialist.

Mastoid Periostitis

A complication which may occur early in the course of an acute otitis media is Mastoid Periostitis. This may occur even before the appearance of discharge from the ear, or at a subsequent period. In such cases there is some
Mastoid Periostitis

Symptoms

Redness, pain, tenderness over the mastoid. There may also be swelling over the process, and consequent projection of the auricle. The patient will complain of increased pain in the back of the ear, there will be a rise in temperature, and aggravation of the general physical symptoms.

It is important that this condition should be early recognized and treated, as it may soon run to suppurative periostitis, and subsequent Caries of Necrosis of the mastoid process.

Treatment

With the first appearance of such symptoms, treatment should be at once directed to reducing the local congestion. The application of two or three leeches over the mastoid may effect this. The application of clyster is another method of combating congestion - by Siler's clyster, or by the use of an ice-bag.

If relief is not obtained by such means then an incision shoule be made right down to the bone.
Suppuration in Mastoid Cells.

McBride quotes cases of Mastoid Complications induced by the unmitigable inanition of Antiseptic Powders, blocking a perforation & so damming back pus.

Suppuration in the Mastoid Cells is a more serious Complication than Periostitis of the Mastoid, the close relation of (I)}
Suppuration
of the dura mater to the mastoid walls, rendering it especially.

In a case of manifest
mastoid inflammation, where relief
was not obtained even by Wilde's
incision; where the mastoid pain,
tenderness persisted or increased;
where the temperature or other physical
conditions showed no amelioration—or became worse; we might then
Conclude that there was inflammation
of possibly suppuration in the mastoid
antrum & cells.

Treatment

This is a situation from which
natural drainage is practically im-
possible, & in all probability the
surgeon will require to drill, chisel, or gorge into the mastoid
behind the ear so as to thoroughly
expose, open, & drain the antrum
& cells.

This opening will require to
be kept patent so long as any sup-
pARATION continues.

If free drainage of the sinus
were not obtained, the pus might
— as it would be bound to find exit.
Evacuate itself spontaneously — either externally (behind the ear, in the external auditory meatus) or internally. 2. Through the roof, into the middle cranial fossa. — or 3. Into the posterior cranial fossa — by the groove for the lateral sinuses.

Caries & Necrosis of the Mastoid may readily & rapidly follow on the two last-mentioned conditions. A sequestrum may be formed of parts or less extent of which may expel spontaneously, or require operative measures for its removal.

Treatment.

The treatment of such a condition is, of course, a matter of ordinary general surgical principles.

Paralysis of the Portio dura of the 7th nerve may occur in even a comparatively slight status media acute (see Case XX). The nerve in such a case regains its function after a while, as there has probably only been inflammation of the (Renilennis)
The employment of suitable massage, galvanism, &c., is of distinct value in improving the condition.

Facial Paralysis, however, may occur as the result of a destructive process within the tympanum, exposing & destroying the nerve. In such cases, where there is destruction of the nerve, the condition is an irremediable one.

A not very infrequent result is glandular inflammation & suppuration. The little gland just immediately overlying the mastoid is frequently affected, may sometimes simulate mastoid periostitis. The cervical glands may be affected as a result of inflammation & suppuration in the tympanum, antrum, &c. Of the original cause of that inflammation may itself set up this glandular inflammation (e.g. in Scarlet Fever).

Treatment. Such cases are to be treated on ordinary surgical principles. Poultices & soothing applications to the inflamed glands, with free incision, drainage, & antisepsis...
Complications.

Where there is actual suppuration, will be required.

Suppuration from the Synovium, or from the Mastoid process— if not obtaining free exit—may burrow in different directions.

Thus it may burrow along under the lining tissues of the thin external meatus, & burst out in some part of the meatus—forming what Burnett terms "Otitis externa disseccans."

Similarly it may happen that the pus may make its way by gravitation down the neck, or may point as a Cervical abscess—perhaps even at the lower part of the neck.

Treatment. If the case be carefully observed & treated, such a condition should not occur, as free exit for all pus should be maintained.

In the event of such a condition occurring—free opening, draining, antiseptic treatment, with the prevention of burrowing from the original source of the pus—will be requisite.
Diffuse & Granular Inflammations of the External auditory meatus may result from the lodgment of mites in the meatus, & infection of its walls.

Treatment. Prevention of such a condition should be thought about by the maintenance of perfect Cleanliness, & dryness - as far as possible.

Evacuation of pus by making them may possibly be required; though incisions into a part liable to be bathed with pus are not perhaps very advisable. Thorough asepsis & antisepsis must be aimed at.

Granulations & Polypi may spring up, & may serve to keep a discharge persisting. Such granulations may spring from the edges of a perforation, or the mucous membrane of the tympanic cavity may hypertrophy, protrude through the perforation as a polypus. It is easy to see how such conditions may be a source of danger from interference (with)
with free drainage.

The presence of granulations may also indicate a carious condition of the underlying bone.

Treatment. Polypi may be removed with the agency of a fine wire snare.

Emboliant granulations, or polypoidal thickenings of the mucous membrane, are — I think — best treated by means of chronic acid. The part should be first anaesthetised with Cocain, then dried carefully, the chronic acid then applied — Care being taken that its application is confined to the diseased parts. Any excess should be at once removed thereafter.

Nitrate of Silver — as a bead, fixed on the end of a probe — Chlor Acetic Acid, & other Ischarotics are also employed for this purpose.

Astringent Solutions are sometimes also employed for the purpose of shrivelling up granulations — Nitrate of Silver in varying strengths; Salts of Zine: Sulphate & perchloride of Iron.
All employed for this purpose. "Dry treatment" may be in many cases the more advisable than the use of solutions. Care must be taken that free drainage is not interfered with.

Mention has already been made of various instances where caries or necrosis may occur. Recollecting the anatomical surroundings we may readily believe that in cases where such conditions occur the dangers to meninges & blood-vessels are real and great." (Randall). This is more particularly the case in children but in adults also it holds good; when we remember how thin are the bone walls, that they are sometimes cribriform, & may be deficient altogether — & that important structures are in immediate relation to them, it will be at once apparent that these "real & great" dangers may be also very close at hand or a carious or necrotic process in the bone may rapidly precipitate them.
Intra-cranial Inflammations & Suppurations.

Meningitis.

Especially in children may meningitis follow as a sequel of acute otitis media; the anatomical reasons for this have been already more than once referred to.

Symptoms. Sudden increase in temperature, persisting in its elevation; delirium—more or less violent; headache; photophobia; vomiting; Convulsions—localized or general, followed by Paralysis (Hemiplegia, Paralysis), or Coma—Such symptoms would point to the occurrence of Intra-cranial Inflammation or Suppuration. Whether the inflammation thus indicated were only meningial or implied a suppurrative process in the brain substance itself is a matter almost impossible of absolute diagnosis.

Acute cerebral abscess, however, is a rare occurrence compared with the Chronic form, very acute symptoms are most likely to be meningial.
Central & Cerebellar Abscess.

The presence of localised tenderness on percussion; headache of a dull constant character; the occurrence of signs of localised interference with function — localised convulsions or paralyses (e.g. Aphasia) — these would point to the intra-cranial lesion being of the nature of central abscess, rather than diffuse meningitis.

The chronic form of central abscess is much more common than the acute, the symptoms are very insidious — general & advancing Asthenia, irritability, sleeplessness, mental hebephrenia, gradually advancing to Coma. In the case of the cerebellum being attacked insensibility of joint, vomiting, etc. are characteristic symptoms.

The Temporo-Sphenoidal lobe of the brain is the most frequent site for a central abscess, as it overlies the roof of the tympanum. Sometimes the abscess may not immediately overlie the seat of the original disease, but may be deep in the substance of the brain. (Grind B. Pathology. Edin. Med. J. 1876)
Complications

Central
Cellular
Abscess

Treatment

Suppurative

Surgery of

The pus in those abscesses is often of an extremely fetid description.

Treatment. If the case be a simple meningeal inflammation, the treatment should be as for her condition. The application of cold to the head (ice-bag, Lecher's aire), with purgation; the administration of Salts of Potassium, Bromide of Potas,

to may be sufficient.

It should be unnecessary now to re-state that free drainage from the ear must be maintained, or if necessary the membrane be re-seized, lest the apparent meningeal symptoms were really of tympanic origin.

Shall probability, however, the meningitis may be suppurative. In such a case, as also in the case of Central or cellular abscess, surgical inter-

ference is absolutely demanded, or a fatal result is certain.

Such treatment to be effectual must be boldly carried out - free exposure, opening, and draining (it may be necessary to explod deeply the brain substance),
Complications

with strict antiseptic treatment, must be carried out.

The results of such intra-cranial surgery, performed for this purpose, as obtained by many surgeons (Mackenrodt, others) are much brighter than might be looked for.

The description of such operations does not come within the scope of this present essay.

Hemorrhage, Phlebitis, Strombosis &c.

The near proximity of large important blood vessels to the walls of the middle ear is a prime source of danger in inflammatory affection of that part, acute as well as chronic. No doubt it is more often in chronic suppurations that such complications arise (though sometimes in the acute stage), but as the Chronic suppuration is itself a sequel of the acute, its complications follow as remote consequences of the Acute stage.

"Extension of ulceration from the Tympanum may involve
Complications

Hemorrhage. The Carotid, or the Jugular vein, fatal hemorrhage occurring through the External auditory meatus. (Owen, "Acute inflammation of middle ear." i.e. op. cit.)

A similar result may less frequently occur from ulceration into the lateral sinus.

Politzer and others record numerous instances of sudden fatal hemorrhage from ulceration into these great vessels.

Treatment. Such a condition would demand prompt ligature of the Internal or Common Carotid Artery — if the bleeding arose from the artery — but where there a fatal result is practically certain, no recoveries are recorded.

Plugging the Canal or using astringents is, of course, useless.

Phlebitis, Thrombosis, &c.

"The occlusion of one of the large venous channels within the cranium by an infective thrombus is always to be remembered as one of the possible complications of acute or chronic suppuration within the temple." (Schenk, op. cit.)
This may occur with or without a carious process in the bony wall, usually affects the lateral sinus, or the jugular vein.

Usually the process is complicated with other cerebral symptoms (meningitis etc.), which make an absolute diagnosis difficult.

The occurrence of rigors, headache, giddiness, delirium, etc., is symptomatic, but not especially characteristic.

In cases where the jugular vein is affected, there may be edematous swelling of that side of the head and face from obstruction of the venous return.

When the process is fully developed, however, symptoms of pyaemia make themselves apparent.

Sudden rise of temperature with rigors and profound respiration, followed by equally sudden falls in temperature, indicate the passage of septic matter into the blood.

Subsequent involvement of more distant organs (e.g. septic pneumonia), with evidences of metastatic abscesses in other organs of the body, great asthenia and emaciation, all point
Complications.

Thrombosis
Pyæmia

Treatment

To the development of a general septic condition.

In all probability an untreated case will run a rapidly fatal course, though there are recorded cases of sinus thrombosis which underwent spontaneous cure.

Medical treatment offers little encouragement to the physician though every effort should be made to support the patient's strength & purify the blood. Quinine, the muriate of iron etc. may be of service in this direction.

Surgical treatment is now recognised as an essential to success in those cases. — In the case of the lateral sinus, trephining down on & exposing the sinus, clearing out septic clots, and "obliterating the lumen of the sinus" (Macewen) with ligature of the internal jugular (Horley): and in the case of jugular phlebitis — ligature & division of the internal jugular; these are operations which have been successfully practised — the mere mention of which is here sufficient.
Death.

"Death may result from the disease, from direct involvement of the cranial contents, either directly or after the development of rhachial inflammation." (Sedgwick).

This comprises cases of meningitis, extracranial abscess, central cerebellar abscess, sinus thrombosis with subsequent pyaemia & its consequences.

Death may also occur from hemorrhage — arterial or venous — from phlebitis of the jugular, with pyaemia etc. resulting therefrom.

Schmiedel reports a case of death from "Tetanus", in the case of a boy in whose tympanum a stone had lodged eleven days before, set up acute suppuration. It was removed by operation, but the boy died of tetanus 5 days later.

Through the medium of chronic tuberculosis, suppuration thus seems good reason to believe that general tubercular infection may possibly be produced by the agency of Caries deposits in the middle ear. (Barr.)
Otitis Media Acuta.

Results - Functional & Vital - in tabular form.

I. Recovery
   - Complete Restoration of Hearing
   - Incomplete

II. Chronic Catarrh of the Middle Ear
    - Dry
    - Moist
    - With all the attendant consequences.

III. Chronic Suppuration
     - With all its terrible train of consequences - proximate or remote.

IV. Inflammation of Labyrinth
    - Permanent loss of hearing.

V. Death
   - Either directly - or perhaps more probably through the medium of chronic suppuration - from

   1. Caries or Necrosis of Temporal bone, etc.
   2. Hemorrhage.
   3. Phlebitis + Thrombosis
   5. Cerebral + Cerebellar abscesses.
   6. Pyaemia + Miliary abscesses.
   7. Tuberculosis. (Rare)
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