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*- Essay on Otitis -*

*By*

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## On Otitis.

Inflammation may affect both the external and the internal ear at the same time; or it may commence in either, and be confined to it, or extend to both. When it is the external ear which is affected, the disease is called *Otitis Externa*; when again it is the internal ear which is affected, it is denominated *Otitis Interna*.

In the former, the parts involved in the disease are the auricle and the *Meatus Acusticus*, and in the latter, it is the *tympanum* and the *labyrinth* which are affected.

It is however the immediate effects of acute disease in the *labyrinth* are not recognisable, and as they are only suspected in consequence of the deafness produced; the term *Otitis Interna* has generally been restricted to inflammation of the *tympanum*, that being the part where the disease is at first detected.

and where its effects are more immediately apparent. It might therefore perhaps with greater correctness be denominated Otitis Media; but as it is generally known in medical works as Otitis Interna, and as the application of this phrase is clearly enough determined, we deem it scarcely worth while to adopt any other.

Like other inflammatory diseases Otitis may be either Acute or Chronic the symptoms being in both in general the same, differing only in degree. The Chronic stages of the disease be characterised by a discharge from the Meatus Externus has also been called Otorrhoea. Otitis Externa being characterised by less severe symptoms than Otitis Interna as it is frequently the precursor of the latter, and as it is more easily brought to a successful termination it properly falls to be first considered.

Chap. I.  
External Otitis.

Sect. I.

Acute External Otitis.

Acute External Otitis, may commence simultaneously in the Auricle and Meatus externus, but in by far the majority of cases it is confined to the Meatus.

The first symptom of its existence is rather a sense of heat, or an itching or irritation, than positive pain, but soon afterwards this gives place to a throbbing, aggravated pain in the Auditory Canal, which gradually increases to an intolerable degree, and which is augmented by the contact of Cold air and too warm fluids, and by the motions of the jaws in mastication and speaking.

It is in this manner distinguished from Otagias, the pain of which is suddenly intense. In several cases the pain is often lancinating, shooting through the head and face and down the neck, and attended by a burning sensation and a feeling of distension in the tube.

Hearing is always impaired, and

When the inflammation is intense,  
it is entirely suspended; yet  
amazing humming noises are  
experienced. The patient suffers  
from headache; the lining mem-  
brane of the meatus is red and  
swollen, and it often happens  
that the glands in the neck  
are increased in size. In  
every case the disease is accom-  
panied by more or less of fever.  
After a longer or shorter period -  
in some cases of a few hours,  
in others of one or two days -  
the lining membrane becomes  
covered with minute pustules  
which often occupy the whole  
length of the canal. When  
these burst, a reddish, serous  
discharge appears, which gradually  
becomes thicker and puriform,  
and as it increases the pain  
and febrile symptoms abate,  
unless the disease extends to  
the internal ear. This disch-  
arge, which for the most part  
is the product of the ceruminous  
glands, is generally tedious in its  
duration and unless the strictest  
attention be paid to cleanliness  
it becomes very copious and



excessively fetid. Occasionally  
in the progress of the disease. It  
changes its degree of consistence;  
until, as the inflammation declines,  
it gradually thickens into  
a consistent, caseous matter, which  
accumulates in the meatus; and  
is followed by a more copious  
secretion of wax than usual.  
Occasionally as the discharge from  
the meatus decreases, a brown  
exudation from behind the ear  
supervenes. Upon examination  
with the speculum, the meatus  
instead of being smooth, dry,  
free from wax, and of a pearly-  
white shining appearance, is  
found to be swollen, vascular,  
and covered with a slimy secretion.  
It may here be worthy of observation  
that it is of much importance for  
every surgeon to become familiar  
with the appearances of the external  
meatus, both when in a diseased  
and healthy state, in order to  
facilitate his diagnosis of this  
and other diseases of the ear.  
This can only be done satisfactorily  
by means of a suitable speculum,  
or what perhaps is more convenient  
as only the outer part of the meatus

can be dilated - a Simple Conical tube, which being introduced into the ear, and directing through its larger orifice a strong stream of light, at the same time moving it gently from side to side, the innermost portions of the Meatus and the Membrana tympani will be revealed to the operator.

This disease is of very frequent occurrence in persons of a delicate and susceptible constitution, or in those of a stumorous habit, from its tendency to excite indolent inflammation and swellings.

The periods of dentition and childhood, Syphilis, and disorders of the genital vial and the digestive organs in general, may be cited as among the other predisposing causes.

As exciting causes we may enumerate Cold; exposure to currents of cold air, especially after the removal of the hair; the presence of foreign bodies in the ear; accumulations of wax in the Meatus; Chemical irritants, the extension of inflammation from adjacent parts, such as the throat, tonsils, and fauces; and determination of



blood to the head.  
It often rarely requires to excited  
by injuries of the head, and the  
irritation of decayed teeth, and  
particularly in the latter case  
of the stomach and bowels be in  
an unhealthy condition. It often  
occurs after exanthematous dis-  
eases, especially scarlatina, small  
pox, and erysipelas; and when  
it is consequent upon erysipelas,  
the vessels in the lining membrane  
after bursting often degenerate  
into very troublesome ulcers, which  
continue for a long time to  
suppurate, accompanied with  
more or less deafness.

It may also occur in connection  
with herpetic eruptions on other  
parts of the body, or in connection  
with *furigo larvalis*, especially  
if either be too suddenly suppress-  
ed; and it is worthy of remark  
that if the discharge from the  
ear of an unhealthy child  
comes in contact with any abraded  
surface, it is very liable to  
induce a widely-spreading fur-  
igo. Further, it may be produc-  
ed by the bursting into the  
meatus of abscesses connected

with enlarged glands, or with Caries of the temporal bone, especially of the mastoid process, in fact there is constant otorrhoea with Caries of the temporal bone.

The treatment of acute external otitis is to be conducted on the usual principles. As long as the pain is moderate and febrile symptoms are absent, all that is necessary to be done is the removal of all sources of irritation, and the injection of tepid and simply anodyne fluids. The bowels should be kept open, and the diet restricted to liquids, for the reason that the pain is much increased by the mastication of solid food. The ear should be very gently syringed with glyster decoction, or with warm water, to which the acetate of lead may be very advantageously added, in the proportion of from five to ten grains to the ounce. And the best instrument for syringing the ear is an elastic bottle, care being taken to perform the operation as gently as possible and to avoid hurting the meatus with the nozzle of the pipe.

Let it be borne in mind, however, that in very acute inflammation, injections are liable to aggravate the disease, and they should therefore not be had recourse to until the symptoms have subsided.

Warm fomentations of poppy-heads or flannels should be constantly applied; and should the latter be preferred, nothing is so serviceable as a bag of soft linen filled with bran, and soaked in hot water. Should the pain be severe and febrile symptoms present, and particularly if the patient be robust or plethoric, bleeding, either from the arm or external jugular vein, should be had recourse to, followed by an emetic. After it, Operation a dose of Calomel with James' Powder ought to be given, followed in a few hours by a brisk purgative draught. Should the symptoms be not very sensibly relieved by the adoption of this treatment, recourse should be had to the application of leeches behind the ear; or Hartman's anesthetic ointment or leeches over the mastoid process; or blisters over

the mastoid process or base of the neck; the number of leeches to be applied depending upon the amount of the inflammation and strength of the patient. M. Had recommends two or three grains of Camphor, rolled up in Cotton, to be introduced into the Meatus, should there be no discharge; and by other recourse has been had to the liniment of digitalis dropped into the ear, or the introduction of Cotton impregnated with it. Tartar Emetic in small, nauseating doses has also been advantageously exhibited.

In the event of an abscess forming and projecting into the Canal, relief will be obtained and the probability of ulceration lessened by puncturing it, and allowing the matter to escape. Should there be inflammation of the cellular tissue external to the Meatus, its resolution should be attempted by antiphlogistic means; but should suppuration have commenced, in order to prevent ulceration in the Meatus, the abscess must be opened in

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front of the mastoid process,  
behind or below the canal, as  
may be necessary. But for this,  
serious evil might attend the  
extension of the abscess into the  
meatus, and probable consequent  
danger to the membrane tympani.

As consequences of such abs-  
cesses, when the ulcerations do  
not heal kindly, we may  
mention fistulous canals and  
growings, by which the morbid  
secretion is maintained, and  
fungoid granulations which, by  
encroaching upon the tube, in-  
crease the deafness.

If by the adoption of the treatment  
we have laid down, the disease  
does not terminate in resolution,  
and should it not extend to  
the internal ear - as sometimes  
happens when matter finds its  
way through the tympanum -  
it will change into the chronic  
form, to the consideration of  
which we will now proceed.

## Sect. II.

### — Chronic External Otitis —

We may remark generally regarding  
chronic diseases of the ear,

that they more frequently come before the Surgeon's notice in what form there is the acute, being either terminations of an acute attack, or commencing at first in the chronic degree.

The great majority of cases of deafness result from this form of disease, which in some instances may continue throughout a lifetime without occasioning much inconvenience; whilst in others, passing to the structures in the vicinity of its original locality, it produces the most extensive disorganization.

In the chronic stage of External Otitis the symptoms are much the same as are observed in the acute stage, differing only in degrees, - being less severe and of long continuance.

The treatment, however, requires to be more energetic, from the disease having assumed now a more obstinate character.

The amendment of the general health ought to be the first care, and this in ordinary cases is most easily attained by the exhibition of aperients and



alteratives, change of air, nourishing diet, warm steam-bathing, and cleanliness, and should the patient be weak, tonics should be administered, preference being given to Steel.

When the actions of the vegetative organs, among which the secretions form so important a class are improved, the application of local remedies will in most cases be followed by successful results, and especially so if treatment be commenced at an early stage of the disease.

Should the disease be recent, and the acute stage only partially subsided, injections of warm water should be used several times daily for several days in succession. When however it is decidedly chronic, the ear should twice daily be very gently syringed with white Sulphuric water, in order to remove as much of the inspissated matter as possible; and immediately after a weak solution of alum, Sulphate or Acetate of Zinc, the Salts of Copper, or Nitrate of Silver, -

in the proportion of one to five  
grains to the ounce, - or a  
Solution containing two drachms  
of Lig. plumb. acet. to half  
a pint of distilled water, may  
be dropped into the meatus till  
it is filled, and after remain-  
ing there for a few minutes, be  
allowed to run out, - These  
lotions should be topical when  
used. In every case the Pro-  
-: gress of the Solution should be  
in proportion to the excitability  
of the meatus, and the extent  
of the morbid secretion.  
In some cases of extreme thick-  
-: ness of deposit, the Nitrate  
of silver has been advantageous.  
If applied in substance, the  
artificial covering protecting the  
lining membrane from injury,  
this demands extreme caution.  
Should there be granulations of  
the mucous membrane, - an  
exceedingly common consequence  
of External Otitis, - tents of lint  
dipped in a solution of acetate  
of lead, or Sulphate of Zinc, may  
be introduced into the meatus,  
or in the event of abscesses form-  
ing the matter should be allowed

to escape, by puncturing them.

If the discharge be very fetid, a lotion of two drachms of Chloride of lime to half a pint of distilled water may be used; and should the case be obstinate the whole interior of the meatus should twice a week be granulated with a solution of Nitrate of Silver, in the proportions of five grains to the ounce. If, as sometimes

happens, the discharge causes an excoriation of the annule, or of the neck, these parts should first be fomented, and afterwards an extract of the white precipitate of Mercury should be applied, but as a general rule it is not advisable to introduce ointments or oily injections into the meatus, for the reason that they are apt to become rancid and clog the canal.

If at any time during the treatment the discharge should suddenly cease, and an attack of acute pain and fever supervene, leeches, purgatives, fomentices, and hot fomentations must be had recourse to, and all astringent applications be abandoned.

until the subsidence of the pain  
and other acute symptoms.

It may not be out of place to remark  
here, that the Surgeon should  
carefully avoid plugging the  
ear with cotton, - a practice often  
resorted to by many, either from  
a belief in its virtues, or to prevent  
the discharge soiling the person  
or clothing of the patient. The  
only proper use that may be  
made of cotton is, if it be desir-  
able to protect the ear from cold,  
to insert loosely a small  
quantity into the Osseous.

## Chap. II.

### - Internal Otitis -

By otitis interna we are to under-  
stand inflammation of the tym-  
panum and internal ear. It  
frequently results from Otitis exte-  
rna, and if unattended to, or not  
terminating in resolution, its con-  
sequences are much more serious.  
Like Otitis externa it may be  
either acute or chronic.

The parts of the ear involved in  
Otitis interna, whether acute or  
chronic, are the tympanic cavity

with its continued chain of ossicles to membrane tympani and dependencies, the mastoid cells, and the Eustachian tube, all of which, lined with a mucous membrane, present an extensive uninterrupted surface, liable to be involved in affections of the tympanum.

Three of the five openings to and from the tympanum are closed, namely, the fenestra ovalis, the fenestra rotunda, and the opening to the meatus externus. The other two are open, the one leading to the Eustachian tube, and the other to the mastoid cells. The Eustachian tube, however, is the only open channel of communication to the tympanum from without; but, as it is always involved in the inflammation, it is either entirely or partially closed during the progress of the disease. Hence there is no means of exit to the mucopurulent effusion produced by the inflammation; and thus the delicate structure of the ear being exposed to the pressure and other bad effects resulting from the close confinement of matter, the various morbid changes

afterwards to be noticed, which  
often result from otitis interna,  
and produced.

### Sect. I.

#### — Acute Internal Otitis —

Acute Internal Otitis is distinguished  
from the External by the deeper  
seated pain. in the early stages  
of the disease by there being no  
discharge from the Meatus externus,  
and by the circumstance that  
if the Membrana tympani be  
ruptured and the patient  
caused to make a forcible expira-  
tion, the mouth and nostrils being  
at the same time closed, air  
will be heard whistling through  
the aperture. To a certain

extent its symptoms resemble those  
of External Otitis; differing, of  
course, in consequence of the structure  
affected, of their greater severity,  
and of the matter when formed  
not meeting with a ready outlet.

Sometimes the symptoms are  
 ushered in by a pain, which being  
regarded as a simple ear-ache,  
is often neglected. At other  
times the first indication of  
disease is a severe headache



or hemorrhage. Whatever be the nature of the primary symptoms, there soon arises a violent, deep-seated, unremitting pain in the ear, sometimes throbbing and lancinating, which is increased by even the slightest noises, by the motions of the jaw, and by attempts at deglutition. The pain affects the whole head, but more especially the side corresponding with the seat of the inflammation. Loud clanging noises are felt in the ear, and the patient is also deaf on the affected side. When suppuration commences in the tympanic cavity, the pain increases, and the patient refers to the bottom of the external canal as the most painful part. This is accompanied by a heavy tensile sensation, approaching almost to bursting; by rigors, swelling of the tonsils, much a dull pain or itching at the back of the throat. Upon examination with the Speculum also, the Membrane tympanica appears white and tense. The pulse is now quick,

but not remarkable for fulness or strength; the skin is somewhat hot and dry; the countenance is anxious and red; the eyes red and watery; the tongue is furred; the appetite is lost, and the taste becomes vitiated; and the secretions are suspended. There is also more or less of fever; restlessness; sleeplessness; and in the most severe cases, delirium, especially at night, or convulsions in children.

If the inflammation do not speedily terminate in resolution, the fever often assumes a nervous or typhoid character.

It frequently happens that the symptoms abate towards morning, a reaction, often accompanied by rigors, coming on in the evening.

This may be considered the first stage of the disease, and is that of inflammation terminating in suppuration.

It sometimes happens indeed that the timely application of judicious treatment, so lessens the inflammation, that the disease terminates either in

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resolution or in a numerous sec-  
-ection; but more frequently after  
the lapse of a week or two, it  
passes on to suppuration, pus  
accumulates in the tympanic  
cavity and dependencies, and  
forces its way externally, its app-  
-earance commencing the second  
stage of the disease.

The pus is discharged either  
through a spontaneous perforation  
of the membrane tympani,  
through the Eustachian tube,  
or through a fistulous opening  
in the Inactoid process.

The first of these is the most  
common, its frequency being  
to that of the second in  
the proportion of ten to one.

The first stage of the infl-  
-ammation generally closes  
the Eustachian tube by adhes-  
-ion, and hence the difficulty  
of the matter finding its exit  
in that direction. The  
third way of escape for the  
pus is comparatively rare.

The discharge through the  
membrane tympani generally  
takes place suddenly. A large  
quantity of pus is voided, as if

an abscess had burst, and the patient experiences an instant subsidence of the distressing symptoms, which increases with the continuance of the evacuation.

The freedom of the discharge varies either in consequence of the consistence of the matter, which is sometimes so great as to prevent its free passage through the perforation in the Membrana Tympani, and to cause its reaccumulation in the cavity, - or in consequence of its becoming inspissated and forming an incrustation in the Meatus; in both of which cases, both the local and general symptoms are of course aggravated. Examination

with the Speculum generally shows the perforation in the Membrane, and when this is impracticable, air may be forced through the Eustachian tube, forming bubbles in the matter; the absence, however, of this sign is not to be depended on, as the tube may be impermeable. When the matter finds its way through the

Eustachian tube, the discharge is sometimes so copious and sudden as to resemble the bursting of an abscess in the tonsils, and a muco-puriform, sanious, or purulent matter is expectorated. At other times, it escapes by degrees, and there is a constant disagreeable sensation in the posterior fauces or throat, with continual spitting. Should the disease not terminate in resolution or in the discharge of the matter, the symptoms assume characters indicating inflammation of the membranes of the brain; and after a longer or shorter period of delirium, the patient falls into a comatose state and expires. After resolution or discharge of the matter externally, hearing often remains impaired, owing to the consequent lesions; and is either recovered after some time or remains permanently impaired. These lesions are thickening of the cartilaginous parts of the conduit, thickening of the lining membrane of the meatus, thickening, sparsity, and perforation

of the Membrana tympani, loss of the ossicles, and obstruction of the Eustachian tube.

Acute Internal Otitis may arise from any of the causes that either predispose to or actually excite external otitis. Thus it is a very frequent result of exanthematic diseases, especially Scarlatina. Or it may arise in a predisposed Subject, from unwholesome diet and residence in close badly-ventilated apartments, resembling in this respect diseases of the eye.

It may also be produced by local irritation, such as the extension of inflammation from the tonsils or ganges through the Eustachian tube. Currents of cold air blowing into the meatus, or improper surgical appliances to the meatus.

It is also not infrequently caused by difficult and painful dentition, or during the cutting of the wisdom teeth. Another

cause is extension of disease from the brain, whether the original complaint be spontaneous or traumatic. It is asserted that it alternates with Ophthalmia;



and it is quite certain that it frequently accompanies, and appears to be in a measure modified by affections of the eye. A common opinion prevails that loud noises, such as cannonading, will rupture the membrane tympani, and produce all the consequences of tympanical inflammation and suppuration; but it is more probable that other causes have been at work, to which the disease may with greater correctness be attributed. Two causes ought to be particular, only noticed as being liable to produce it in an otherwise healthy patient, the one is cold bathing, and the other, the habit of blowing the nose violently, which often produces a painful strain on all the parts of the middle ear, and sometimes even ruptures the membrane tympani. Scrophulous is the great predisposing cause of internal otitis; and syphilis, and all debilitating diatheses, likewise predispose to it.

The treatment of acute internal otitis must be conducted on

the strictest antiphlogistic principles, after bleeding until an effect is produced upon the symptoms generally, or at least upon the pulse, the repeated application of leeches behind the ear, with blisters or tartar-emetic ointment over the mastoid process, is often requisite. If after these, an emetic fails to alleviate the acute symptoms, Antimonials should be given in doses sufficient to give the patient a feeling of nausea, with brisk purgatives.

Should the disease threaten to be obstinate or to extend, speedy salivation should be excited; and for this purpose, Calomel in doses of from one to three grains combined with Opium, should be administered every three or four hours.

In addition to this the local treatment should consist in the application of warmth and moisture to the affected side of the head, and in the avoidance of irritating the meatus, by injections or otherwise. When the disease extends to the

membranes of the brain, the head must be shaved, and evaporating lotions freely applied, either warm or cold as may be most beneficial. When suppuration has commenced, and the patient feels an extreme tender sensation, with throbbing pain in the ear, and violent headache, then the speedy evacuation of the matter becomes an object of the first importance, as its retention will very materially aggravate the disease, endangering the bony structure of the ear, and being liable to produce inflammation of the membranes of the brain.

The application of fomentations and frictions, in order to expedite ulcerative perforation of the membrane tympani, and the consequent evacuation of the collected matter, have been recommended; but these often fail. If, upon examination the membrane appears opaque, and particularly if it appears convex from the pressure within; if pain and tenderness upon pressure exist in the mastoid process, and especially if the integument

covering it be tunefixed and red,  
from the inflammation and  
perhaps also the suppuration  
having extended to the cells; if  
the Eustachian tube prove to be  
impenetrable to air, the sooner  
an exit is procured for the pus  
the better for the patient.

When it can be accomplished  
the best mode of evacuation is  
through the Eustachian tube,  
as there may then be a probab-  
ility that the ossicles may  
be preserved, and with them the  
general functions of the tympani-  
cum. Gargles containing the  
bichlorate of Potash and Nitric, the  
fumes of tobacco forcibly applied,  
the vapour of essential decoctions,  
or injections into the tube, have  
been prescribed in order to  
remove the obstruction; but  
these are rarely successful.

It then becomes a question how  
far it is proper to use force, by  
the use of a catheter, for the obli-  
-eration of the obstruction, but by  
the adoption of this means, there  
is danger of increasing the infl-  
-ammation, and even of rupturing  
the tube. And in all cases it

is attended with much pain. The safer plan therefore is to puncture the Membrana tympani, without waiting for the spontaneous evacuation of the matter, which insinuates itself into the various sinuosities of the ear. The propriety of this procedure will be more readily acknowledged when it is considered that it is the usual mode of evacuation when the disease is left to the efforts of nature. This operation having been performed, it will be necessary to inject warm water in order to promote the easy discharge of the matter, which will often be found to have more or less consistent, and causing the patient to lie on the affected side. If inflammatory symptoms either continue or return after this, antiphlogistic measures should be adopted; and if the discharge should continue, diluent and emollient injections should be had recourse to, in order to obviate any clogging of the meatus and accumulation of matter in the middle ear. For this end an injection

composed of a drachm of Caustic  
potash to a pint of rose-water  
has been recommended.

Tonics and laxatives, with exer-  
cise of air, and attention to diet  
and cleanliness, ought also to be  
prescribed with the view of  
preventing the disease from deg-  
enerating into the ulcerative or  
chronic state.

Should an  
abscess be formed over the mas-  
toid process in consequence of  
the inflammation having extend-  
ed through the bone, it must  
of course be drained, when if it  
communicates with the cells,  
the matter will be evacuated;

and when no communication ex-  
ists, it may be perforated; for  
where pus is lodged in the  
mastoid cells, it cannot pass  
into the tympanum, in conse-  
quence of the channel of com-  
munication between these cavities  
being in the upper part, unless  
ulceration of the bone has taken  
place. It is therefore advisable  
to perforate the mastoid process,  
so as to form a free communication  
with the cells, using injections  
of tepid hot bland fluids.



in order to facilitate the discharge, when the matter has attained too great consistence to flow out naturally. The after treatment of the abscess, and the caries of the bone, which is sometimes very extensive, must be conducted upon general principles.

## Sect. II.

Chronic Internal Otitis — Chronic Internal Otitis is of very common occurrence, one of the most frequent causes of deafness, and in its effects is sometimes fatal by causing disease in the brain. The seat of the disease is the mucous membrane of the tympanic cavity, but not infrequently does it extend to the cellular tissue and proceeds onwards to the foramen and the bone. In addition to the causes which are liable to produce acute internal otitis, the disease under consideration appears in many cases to be excited by the extension of inflammation originating in the external ear, though more

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frequently it commences in the  
tympanic cavity or Eustachian  
tube, and extends outwards  
through the membrane to the  
meatus. Either as a consequence  
of the acute form of the  
disease, than as a chronic affec-  
tion from the beginning.

When it is an extension from  
external otitis, its symptoms do  
not at first present much dif-  
ference from those of the latter.

But they soon increase in seve-  
rity. The pain becomes more  
urgent and friction and fre-  
quently shoots into the head.

The discharge is more copious and  
frequently bloody; - Should the  
Eustachian tube be permeable, it  
often escapes into the pharynx and  
mouth; - and deafness is much  
augmented.

When the disease  
commences in the tympanic cav-  
ity, the dull, heavy, mazy Depre-  
ssion is more severe, and is ac-  
companied with lancinating pains  
through the head, - the deafness  
is sometimes complete in the  
ear affected, and there is fre-  
quently cloudiness and torpor,  
with slight delirium, and

Sometimes a chilliness, with febrile reaction. This state of things may continue for a longer or shorter period. In the ordinary course of the disease, the tympanic membrane ulcerates, and an evacuation of the matter suddenly takes place, affording considerable relief to the patient, and sooner or later carrying with it the ossicle. Thus an otorrhoea is established which may continue for an indefinitely long period. After a while the discharge ceases to be bloody, and becomes mucous, then almost serous, and at last gradually subsides; during which changes, the ossicular follicle, by degrees assumes than normal secretion, and hearing is restored in proportion to the extent of the disorganization which has occurred.

This is the bright side of the picture, and is the one which is most frequently met with. On examination, the mucous membrane of the tympanum appears darker and firmer than usual, and this is particularly the case while it is secreting pus.

As the disease subsides it assumes a more healthy appearance. At other times fungus may be discovered growing from it, which as long as it remains, will promote the secretion of matter. This we have said is the bright view of the termination of a dangerous disease, but sometimes a dark prospect presents itself. The inflammation involves the cellular tissue, obliterates the Eustachian tube, extends to the periosteum, the bone forams, and the mastoid cells, which latter sometimes exfoliate, forming an external wound, through which escape portions of bone and quantities of fetid matter. Yet even this may be recovered from, and hearing to a certain extent re-established, if the patient's general powers be good. But if the disease has been of long standing before the membrane tympanic ulcerates, the symptoms of cerebral affection are more masked. The patient becomes lethargic, his deafness is very much increased, the frame

extends to the brain, and at times  
fractures alveolus, accompanied  
sometimes by Convulsive Move-  
ments. Food is not easily retain-  
ed upon the Stomach, the  
bowels are generally active, with  
occasional diarrhoea; the Sec-  
retions are diminished; and  
gradually the patient falls into  
a state of Coma and expires.

Should the Membrana tympani,  
during this course of the disease,  
and even, though some relief  
may be obtained by the escape  
of matter, it is however only  
temporary, as the symptoms  
return, and the disease progress-  
es to a fatal termination.

The treatment of Chronic inter-  
nal Otitis is conducted under  
great disadvantages, as it is  
often so insidious that extensive  
disorganization may have taken  
place, before alarm has been  
excited.

Pure air, regular and wholesome  
diet, moderate exercise, warm  
bathing, and cleanliness, with a  
strict attention to the state of  
the bowels, should be particularly  
insisted upon.

Bleeding is necessary only early in those cases which present more of a subacute character, or when there is an obstruction of the discharge. Repeated blisters behind the ear, stretching to the occiput, or on the nape of the neck often prove very serviceable. M. Stark directs that the head be shaved, rubbed with Stimulants, and be kept covered with a silk cap. If an otorrhoea be established its removal must not be attempted by the use of powerful astringents in case of the extension of the disease to the brain, and in fact even the mildest astringents should not be had recourse to until the discharge is sensibly diminished, and a weak infusion of roses or of Chamomile flowers, and afterwards a weak solution of Sulphate of Zinc or of Croscote, is to be prescribed. Oily injections are not to be used as they become rancid.

When the discharge suddenly ceases, its restoration should be attempted, by the use of



warm fomentations and poultices, with the injection of a solution of three grains of the bichloride of Mercury in eight ounces of water. If the suppuration be attended by the accession of acute symptoms, from two to four leeches should be applied over the mastoid process.

If matter collect in the vicinity of the mastoid process, it should be given to it by a free incision down to the Carious bone, and gentle tonics should be administered, and symptoms of the disease extending to the brain should be carefully watched for, and met at once by vigorous treatment.

By the constant use of diluent and emollient injections, of warm water or milk and water, with careful regard to the general health, the disease may be kept stationary, if a cure cannot be effected. In Scrofulous and lymphatic subjects, tonics, the infusion of MadR, and the preparations of iodine in small doses, with now and then Milk purgatives, will prove serviceable

Should there be no acute symptoms present or febrile action.

If the disease be connected with the Syphilitic diathesis, or has followed an attack of Syphilitic sore throat, the bichloride of Mercury may be exhibited along with Sarsaparilla. When there is fever, with a loaded tongue, or pain in the head, in addition to the appropriate local means, recourse should be had to gentle and cooling purgatives or aperients, external derivatives, diaphoretics, and a mild farinaceous diet. Mineral waters. - the Chalybeate, aerated, and Sulphurous, when there is no fever and other acute symptoms; the aperient and refrigerent, when there is, - may very appropriately accompany the treatment we have laid down.

### Chap. III.

- Disorganization produced by Otitis.  
In concluding our essay upon Otitis, it may be interesting & shortly to notice the morbid changes accompanying and

produced by it.

At first the lining membrane of the tympanic retains its original delicacy of structure, the only change being that its vessels are enlarged and tortuous. Blood is sometimes effused into its substance, or between it and the membrane of the fenestra rotunda; and sometimes lymph is effused on its free surface. As the disease gains ground, the membrane becomes thickened and flocculent, and occasionally covered with tuberculous concretions.

There may also be a softening or even perforation of the ossicles. But most frequently the morbid change which occurs, consists of fibrous bands, occupying sometimes nearly the whole of the cavity.

Sometimes these bands connect the inner surface of the membrana tympani to the inner wall of the tympanic cavity; at others they connect it to the malleus or stapes; but most frequently they extend from the crura of the stapes to the adjoining wall of the tympanic cavity as it were enveloping that bone.

The Eustachian tube, the only open channel of communication to and from the tympanum, being more or less obstructed by its lining membrane having become involved in the inflammation, we will suppose some matter to be retained in the tympanic cavity and mastoid cells, notwithstanding the perforation of the membrane tympani. It is retained in the former, because of the peculiar form of the meatus externus, which being arched, and having the crown of the arch on a level with the tympanum, resists rather than favours the spontaneous evacuation of the cavity. It is retained in the mastoid cells because they form a cul-de-sac. Now, the perforation of the membrane tympani having given access to the air, the contained matter is decomposed and induces ulceration of the lining membrane of the tympanum and of the mastoid cells. The osseous structure is now exposed to the influence of this irritating matter, and a carious disorganization takes place.

This disorganization advances with greater rapidity in the mastoid cells than in the tympanum, because of their less compact structure, and is shown by the mastoid process becoming tender on fracture, and the integuments puffy and vascular. In course of time, the bone is completely perforated, and an abscess shows itself behind the ear.

The exact situation of the carious perforation is usually at the anterior part of the groove which gives origin to the digastric muscle. The abscess does not burst readily, but extends forwards behind the ear, as in this direction, the soft parts offer less resistance. Sometimes however it extends downwards under the sterno-mastoid muscle; but never backwards, on account of the resistance of the digastric and trachelo-mastoid muscles, and of the deep cervical fascia.

The caries of the mastoid cells, however, is not limited to this outward direction, but extends on all sides, and next affects

the posterior walls of the cells,  
and perforates the petrous portion  
of the temporal bone which forms  
the floor of the lateral sinus,  
the bone here being naturally thin.  
Through this the matter penetrates,  
and by irritating and detaching  
the dura mater, gives rise to  
decided cerebral symptoms.

Sometimes the same process goes  
on in the roof of the mastoid  
cells formed by the superior  
surface of the petrous portion,  
but more rarely, as here the bone  
is thicker, and therefore less  
easily perforated.

Should the patient still survive,  
the ossicles in the tympanum  
are destroyed, and discharged  
through the meatus externus.

Ultimately, the whole organization  
of the middle ear is destroyed;  
the membranes which close the  
fenestra rotunda and the fen-  
estra ovalis being destroyed, and  
the vestibule, the semicircular  
canals, and the Scala of the  
cochlea being disorganized.

In this way all the sinuosities,  
and cavities, and bony fabric of  
the ear are broken down and



Profounded, and the whole interior of the petrous portion of the Mastoid process presents one large Carious excavation.

In the course of the disorganization above described, the petrous dura is also involved, and this gives rise to neuralgic pains, Convulsive twitchings, and paralysis of the muscles of the affected side of the face.

This disorganization of the ear may be the work of several years before it affects the brain; but when the dura Mater is reached by the secretion from the ear, it inflames and suppurates, and becomes detached by the matter introducing itself between it and the skull. The patient may then be carried off at once by meningitis, or the disorganization may progress, and cause ulceration of the dura Mater and other membranes, and at last of the brain itself.

The ulceration of the may be superficial, or it may penetrate into its substance and form a suppurating cavity, which may in some cases occupy the whole

of the middle lobe of the corresponding hemisphere, or the corresponding lobe of the Cerebellum.

With one important remark we will conclude. - It is generally when meningitis supervenes that the patient leaves the artist, and is transferred to the care of the physician, who finding the signs of cerebral disease marked and decided, is apt to overlook the affection of the ear, and conclude that the inflammation of the brain is idiopathic, and this the more readily, as the patient may direct his attention to the cerebral symptoms without referring to the disease of the ear, not being aware of their connection. The diagnosis therefore in such cases is very important, inasmuch as the bleeding required to save the patient in the one instance would be fatal in the other. -

