THESIS
for
MD
Graduation
by
G.W. W. Ashdown
M.B., C.M., L.M., M.R.C.S.

Sodbury
Gloucestershire
On Diseases of the Ear met with in General Practice

The difficulty of selecting a subject for a thesis when constantly engaged in Practice, and being deprived of the assistance of scientific laboratory investigation of Universities and Medical schools, for the purpose of original research under the situtation rendered embarrassing. But studying and with a considerable number of cases of Diseases of the Ear since I commenced practice, and rather more than usually paths to the job of the General Practitioner has led me to take
Notes of the cases that have come under my notice and study more especially this most important and interesting department of Disease. For of all the afflictions incident to our nature none is perhaps greater or more grievously felt than the loss of hearing; it is a sense, second only to that of vision, which more than any other contributes to the mental beauty and the mental happiness of life. So the intellectual classes of society the deprivation affect both public and private, whilst to persons in the more humble ranks of life, the organ of hearing may be said to be of almost vital importance: for deprived of the sense of hearing they become disqualified for their ordinary occupation, as well as being deprived of the pleasure
While in its Anatomical Structure
no part of the human frame
has been more thoroughly investigated
than the ear, the most distinguished
Anatomists having examined it
with remarkable precision, yet it
is remarkable that in the whole
range of Medical literature no
work is so barren of practical
information as that which relates
to the diseases and treatment
of this organ.

I have been engaged in General
Practice almost continuously since
graduating M.B. in 1880 and
prove that time in the practice
of other gentlemen, but very much
more in my own practice, have
been consulted by 58 different
patients for deafness or other forms
of diseases of the Ear.

Of the 58 Cases,
14 Complained of
Deafness almost absolute, with noises
in the head, which were completely relieved and hearing perfectly restored.
12. They only able to be partially relieved. And the
remaining 32, were at the present
stage of our knowledge, and for
special reasons unable to obtain
relief. I have not considered it
worth while to include the indivi-
dual cases by name and
occupations, though I have them
at hand and notes of the
different cases, but propose to
take up the subject by a
discussion of the different
states of ear disease as classed in
the above cases with their
treatment and shall commence
by giving a short sketch of the
Anatomy of the Ear itself.
The most natural division of the ear
is into three portions, from this
relative position is seen in the
accompanying drawing, and the
from the special and peculiar
function belonging to each.
It may be divided thus into
I. The External Ear.
which includes the auricle
the external auditory passage.
II. The Middle Ear.
which comprises the tympanum
in the drum of the ear with its
contents, i.e., the chain of bones
with their muscles and nerves
and the Eustachian tube.
III. The Internal Ear.
or the labyrinth in which are the
vestibules, semicircular canals,
cochlea, and the packed nerve.
The External Ear: the auricle is divided
into a superior portion or prionia
and a small inferior portion the lobus.
The prionia presents eminences and
deflections. The outer margin is
called the helix, and that within
and opposite to it the antihelix.
Again the prominence situated
immediately below the auditory passage forming part of its margin is called the Tragus, which the opposite projection is the Antitragus. Along with these are depressions corresponding to the fossa of the helix, the fossa of the antitragus, which by their concavity gradually hold each other and finally terminate in the concha or the immediate opening of the external auditory passage. The lobus is situated at the inferior part of the cavity and constitutes the auricle. The structure of the cranium is cartilage covered with a thin membraneous layer over numerous small subcutaneous glands secreting a thin substance to resist the effects of cold. The lobus is of cellular substance with a varying quantity of fat. The ear, which is supplied both muscles
Humidnels...wards the sounds in certain ways are little developped going to the ear being killed in a great measure by the customs of dress, and to its not being called upon for such sudden and constrained attention as the mere passage which also have become to sound on the pursuit of the prey, and as a warning against the approach of the hunter, in which the muscular chamber is much more considerable and its capabilities much greater.

The arteries are derived from branches of the internal carotid and its branches from the auricular-ventricle branch of the fifth. They are formed and the lower part by the great arteries. The internal auditory passage is fairly cartilaginous and partly bone, becoming a little to lengths from line to line. Varies in the middle and larger at its external than its
internal extremity and owing to the oblique position of the Menbrana tympani its lower boundary is longer than the upper. Its direction being at first forwards, afterwards downwards and then downwards towards. It is lined by the cuticles in which are deposited several crumpled sheets with a few small hairs at the external end. The passage is terminated by the chorda tympani a thin semi-transparent membrane and a thin natural plate is interposed to it.

The Middle Ear. The tympanum is a small cavity of such width and depth as hardly admit of description. It may be said to be bounded externally by the membrand and internally by the cartilages posteriorly by a short canal leading to the masticatory muscles and anteriorly by the opening
of the pharyngeal tube which connects it with the throat. Within the hypopharynx is seen a chain of small bones the malleus, the incus, the os utriculare, and the stapes, the sesamoidean attachments connect these together to form an uninterrupted chain between the Mucous membra and the membrane of the fenestra ovalis by means of which the impression of sound are strengthened and conveyed from the former to the eardrum.

The pharyngeal tube commences at the anterior and lower part of the tympanum and proceeds downwards and forwards till it turns in the region and lateral part of the larynx in a expanded trumpet shaped orifice.

The Internal Ear consists of the vestibule of middle cavity, the
Semicircular canals and of the Cochlea. In these cavities the auditory nerve is delicately interlaced and is surrounded by an aqueous fluid termed the Silicous Lumen. The prominent ridge over which the stapes is placed transmits the vibration it has received from the chain of bones in the tympanum through the vestibule to the other parts of the labyrinth. The fluid it contains being set in motion acts by compression on the auditory nerve, which conveys the impression to the brain.

In mentioning the contents of the tympanum I forgot to mention perhaps the most important of all, for without it the sense of hearing is lost, namely, atmospheric air. I prepare to speak of the different diseases of the ear in my next.
Injuries to the external ear were
observed in three cases in which
from accident the auricle itself
was more or less disconnected
from its attachment with careful
adjustment did well, hearing not
especially affected.

Injuries of the auricle in
which it was bent entirely in
an abnormal manner for double
concomitant together with the effect
of pressure. A well marked case
of curious flattening of the auricle
in which its characteristic manuvers
and depressions were almost absent.

Remarkable thickening of the auricle
result of chronic suppuration inflammation.
And there, where the orifice of the mouth was anteriorly a median slit, is the lateral diverticulum. In considering the formations of the cranial, it is helpful to bear in mind a few features in the development of this ear. The imbricate auditory follicle is situated just behind a point from which the ear branchial arches and fore branchial arches radiate. But the ear itself comes more especially in relation with two of these, namely the 3rd and 4th, or what are known as the 1st and 2nd post-branchial arches. From the posterior ramus of the 1st branchial arch, the Meckel's arch is developed, and from the same point of the second post-branchial arch come the aortic arches and pharyngeal. The auditory follicle, which forms the vestibule of the labyrinth, is situated just behind the posterior ramus of
The space between these two arches, which is known as the spiril fontanelle, the posterior of which just remains permanent forming the external auditory canal tympanic cavity, and the middle ear. In the process of development a septum has grown up from the membra tympani.

The pinna is gradually delimited from the epidermis, as a ridge of dermal tissue on the posterior margin of this first post-oral cell. This brief description of the development of the ear in vivo without special hearing on a very rudimentary ear of a child in L.A. 1846, who presented a fistulous circular opening anterior to the tragus admitting a stake from their communicating undoubtedly with the pharynx, which I recognize as a relic of the third post-oral cleft.
Diseases of the auricle occur more frequently in children than in older persons, at their time of life the supply of fluids to the organs is abundant, we may judge of this by the copious secretion of thin yellow wax in the meatus, even trickling over the concha.

As we advance in life the ear is more commonly subject to oedema and in this way I think is explained that diseases of the auricle and auditory passage occur more especially to youth, while diseases of the tympanum and canal are seldom in old age. Regarded for the above reason it is often met with in children around the auricle and about the meatus produced by chronic irritations discharge leading to scratching and rubbing by the patient.

Cases of Abscess, Whiskers, and well marked chalk lines should without any special significance...
Diseases of the Auditory Passage are of more deserving consideration both from their frequent occurrence and tendency to weakness of the ear by their continued use in the ear. In many cases in which it has been remarkably cured, and also considerable approximation of the walls of the canal producing another case of difficulty in obtaining a view of the membranous which of course is simply essential to arrive at a correct diagnosis of any case. The instruments generally use beingotropic through and the larynx tube well shaped instrument with regulating cover for diluted. The application of wax was a cause of complete deafness in a few cases, but I have noticed the somewhat remarkable fact that it does not seem to matter how
Just a quantity of warm salt

and watermassage. Provided

is taken to avoid finger and

finger care if the membrane

remains. Just the moment a

small particle is pressed

against the membrane the

vibration becomes lost, and the

patient is made deaf. I have

noticed several cases illustrating

of this fact and being told by patient

that in any particular location

as mentioned in the pages or portion

of the head that hearing is restored

from the mechanical friction caused

to remove the foreign particles

clear of the membrane. Careful

syringing with an utterly

solution of bicarbonate of soda

at about 101 F. suffice to remove

such obstructions and to clear

the sense of hearing entirely.

But as for surgical cures

we should be careful not to give
The favourable progress for masses of wax constantly increasing may lead to perforation of the membrane, to gradual dilatation of the meatus, to the formation of ulcers, and even cancerous. Moreover the infected wax may produce thickening of the bursa of the membrane, an abnormally deep position of it with accompanying tympanum, or under pressure on the cartilage of the labyrinth by the stapes.

The secretion of the meatus known as cerumen is according to Petrosavus a deposit of a semi-liquid consistency on account of the waxlike material made by the strand it contains. A part is soluble in water, another in alcohol & water. It also contains about 10 per cent of water, a mixture of oil & a starch, and a clay mineral will dissolve in water, alcohol or ether in which traces of alkali's oxide are found.
After the removal of hardened wax, moisten the aperture with a soothing astrigent fluid, and inject a solution of slightly contumacious lotion into the tubes of the nasum, followed by the instillation of a decoction of bitter weed. After the removal of wax, the subject is likely at this time to undergo exposure to cold air. I have observed cases of suppuration in the nerves from alternation in shape and caliber, decreasing the impression of sound above the tympanum. It may become constricted by the thickening of the post partum, and its relations of position as the tympanum. It may be obliterated in an aggregate of wounds or blood which, in creating, have entered the sides of the mastoid and thus closed the cavity. Magoun has remarkéd our imperfect state of this region and Blaudrin its fatal abode.
I have met with two cases suffering from deafness due to a peculiar collection of epithelial changes.*

Mr. T., an elderly subject in the town whose right auditory canal presented a remarkable corrugated concentric scale, lying ridges about half an inch from the menbrana and obstructing the caliber of the canal almost one-third which was removed by careful and judicious use of forceps to disconnect it which are at the somewhat firmly adherent to the epithelium of the canal itself.

Mr. T., aged 55, a humorist complained of deafness and roaring noises in the head which a concomitant were to be accounted for by the growth of an epithelial nod, over the menbrana distinct from it, but in close proximity about a line or two away, this doubtless

*...
by its mechanical vibration and contact was found to be the chief source of the distressing noises and timpaccio hearing. It was readily removed and those presenting under the microscope to ordinary epithelial nodules of the canal was not nearly so thick and corrugated as in former ease. Injury to the skin appeared to be suspended from the upper wall and presented a portion of upper which the other grew from the floor of the canal and was excavated. These common are derived from the lining elements of the not auditory canal by gradual accretion of growth causing great deafness and sometimes offering great resistance. Adenoma join an analysis of such cases he says "of 165 cases from which adenoma was removed only 65 were cured besides 13 cases that were much improved"
There were 103 cases of great compression. While there were 62 ears that were with a slight or not at all, it is therefore important that every case should be carefully examined after obstruction of the ear. Having been removed because of the hearing power is not already restored some other disease must be present which requires attention. Therefore it is fair to infer that the inflammatory affection which gave rise to those conditions extends even to the tympanum and ear achicr passages and auricle will be found an obstruction from bland and numerous equalities obstructive to hearing. On one side of the membrane used is secreted which on the other is the cavity of the tympanum mucous is secreted. Either motion when depend of its weight by the minimal heat of the parts becomes
a hardened mass and forms an obstruction to sound. It is impossible to suppose that the membrana tympani should be the boundary of the attenuated conditions either of the tympanum and mastoid. Take either of the two sides or the internal auditory passage or the other or admitting that to be correct we have at last an explanation why it is that subjects are but partially relieved by the mere removal of these. For the commonest symptoms in the discharge of the internal auditory canal I have found in many cases is that tympanum affected known as Chordaea. This discharge may be confined to the external meatus involving chiefly the commissures epithelium and lining membrane or may be connected with the whole length of the canal. The discharge from the秘urea generally continues as a thin mucous or transparent mucous secretion and
freuently nothing more is succeed
than simply an increase of the
natural secretion. The
secretion attending the common-cold
is that of itching, running or constant
sneeze which causes the patient to
try to relieve himself by rubbing
the face with his fingers or
introducing other mechanical means
only exciting the irritative and
aggravating the complaint. The
secretion continues and departs
with a secretion of purulent form.
I think entirely this can be little
doubt that the sense and irritative
dischargesare their irritant in
a great manner to the development
and proliferation of fungoid forms
and have observed in chronic discases
occurs certain minute forms
described as spores of vegetable
organisms. It is the
vegetable fungoid met with in the
auditing passage to aspergillus
according to Kooshe it is the most common site suspected it produces a dermatitis of the mucous
membrane with leucocytes and inflammation of the ear, this disease is not a primary one but a
consequence of diffuse - perhaps with inflammation - which loosens the epidermis preceding its
onset and is very often found after excessive heat. There is also in the presence of a sebaceous
mucous discharge from the ear for as Schwartze has observed when this is very profuse suppuration in the
ear occurs does not find a favorable
progression does not find a favora
Löwenberg considers 
awful fungus is due to a multiplication
of a parasitic protophyte. Also Dr.
White did. Hoff and Cowper have
remarked the coincidence
of aural fungus, abscess
in the meatus or covering it with
epidermic scar, all and other
influences traceable to climatic conditions and defective drainage and probably in some instances to contagion. Thus in May 1880, about the same time that Pasteur was pointing out the proof of the germ theory in the Etiology of Salmonella enteritis of cancer, Becquerel noticed a mild epidemic form of aural furunculus.

Again in considering the Causes which are at work and contributing an interesting Case I had read of a girl “etching mother who complained of slight dryness in the eye and a thin watery discharge, the membrane presented a dull, slightly congested appearance with a good deal of redness and tenderness of the lining of the canals in the conjunctiva, and probable Case I was led to examine the teeth and found one molar in the same
side not unsupervised and the
sent of modest or natural, I instructed
the facts and all the others had
buried conditions disappeared.
Now in ordinary relation
of that kind of symptoms, we
have the pain in accordance and
exudation taking place in fact
widely expanded from the exciting
bodies. And in these conditions,
the only obvious connection
link between the regions being the
continuity of nerve fibre, and
we found this continuity affected
not only by the sensory motor terms
but by the important relations of
the sensory motor nerves and the
functions which they perform.
A considerable portion of the blood
supply of the Menbrana Sphincter
is derived from an artery that
drains the external carotid on the
external canal and proceeds by
a very short course directly to
its destination (see diagram) will be explained in accompanying sketch. Being thus closely connected with a large arterial trunk, this small temporal branch of the internal arterial possesses very favorable circumstances for a steady augmentation of blood supply. Read the nervous element constituting the internal plexus at this point of its course come largely from the other ganglion (uruted, swollen, or draining). On the other hand, the inferior dental nerve supplying the decayed tooth also communicates with this ganglion. We thus have a direct channel of nerve communication through the ganglion between the source of irritation the tooth, and the vascular supply of the drained. Its vessels would become largely distended from the effect of the stimulus, impressions proceeding...
from the decayed tooth sending
wave of local abolition in the
irrigation — on the surface of
the drumhead. Scents vibration
is thus established with its attendant
stretching of the sensitive thread
tissue occasioning the pain felt
in these conditions. If the vibration
is sufficiently prolonged it may
take place passing on to hypochondria
and a quickened overture is produced.
Another somewhat similar phenomenon
having its origin to relieve irritation
I have often noticed in a few of
my cases or the symptom known
as ear cough led to the association
of the word of the ear with those
of the larynx, and I have often
observed it in subjects to whom
introducing the procedure was attended
by catarrhal excitement of the larynx,
merely immediately that instrument
is withdrawn. The irritation
of the sensitive fibres of the auricle
stimulated in the muscles and reflected along the motor fibres of the inferior laryngeal nerve meeting in the larynx by causing contraction of the cri-"ferring muscle. This muscular spasm would appear to be the extreme influence which these elements of more steady of the facts are capable of manifesting. And this leads me to advance for practical suggestions from the above physiological facts. If a more mechanical irritation of the muscles will induce a temporary spasm of coughing, it would seem probable that if a blast of cold air falling on this locality may have a similar effect. And still more if applied with sufficient intensity through for a short period, it may create in a similar way to a persistent mechanical irritation and induce reflex trophic changes in the larynx.
I suggest therefore the possibility of Acromegalic growth occurring this spring viz. a deluge of cold air falling upon the root. In view of such a contingency it will be worth while to provide against depriving the root of the excess of cold winds in addition predisposed to this affection. Should the suggestion prove successful in paving off a disease which in all likelihood rather prevails as an overgrowth than as an injury made by the cold winds, it will add a new instance to those already established in which the study of causal relationships has thrown light on the obscure sources of disease and has thrown assistance to remove them.

I think from the foregoing observations we have every right to presume the phenomenon of summer cough described following a removal course i.e. by an overgrowth commencing in the spring...
Reducing an abnormal condition
in the larynx, in fact I recollect
seeing at least two cases in
which laryngeal disease was
associated with deafness.
Dollishk notes the fact and
quoting Gerhardt states: "More
pain in the ears has been observed
in ulcerative destruction of the
epiglottis almost constantly, it
may exist permanently or only
during the act of swallowing."

Treatment of Otothrea

1. Constitutional
2. Through cleanliness
3. Adhesive applications

Constitutional treatment is of the
utmost importance. Iodine solution
and thorough gargling will
often fail to complete a cure
unless the general health is attended.

Children suffering from Otothrea
demonstrate different signs
as well as different forms. Adhesive
applications
I always use warm, powdered algin or tricalcium acetate known as the Bovis and suitable cases I have used with success, Carbolic acid solutions 1:100 and fulminated water 3% to 5%. I usually employ as antiseptic lotions. I adopt nitrate of silver 20 to 30 grain (0.5 to 0.7 mg) and results are obtained practically over the region of the bladder which is part of the region associated with cancer disease and also to the region of the urethra. Carefully working the canal with a catheter after wound I consider specially useful to prevent the collection and the irritation of the discharges from contact with the pathological fluids. These are not met with cases requiring strong caustics and myself should feel very reluctant to employ them. Though smaller doses of about 15 mg given up to 30 mg of nitrate of silver and repetition in certain intractable cases.
Diseases of the Middle Ear

Discharge from the tympanum or internal auditory is a much more serious complication than the one we have just considered. It is usually the result of acute inflammation occurring in the ear and is sometimes attended with perforation of the drum, and frequently by discharge of the mastoid sinus, caused by a portion of the pus remaining constantly in the tympanum which is apt to become decomposed by the air and thus form discharge acting on the bony structures with which it is surrounded, producing carried out organization accompanied with dull, deep-seated pain in the ear and loss of hearing and finally with such as internal rigour, deafness under the circumstances may in the state of the membrana or in the middle ear, changing from one to the other, depending on the disease.
Before passing to the diseases of the \textit{Eustachian Tube} and deafness occasioned thereby, it will be useful for me to consider their physical action for the purpose of elucidating the nature of those diseases and the utility of treatments employed.

The \textit{Eustachian Tube} is lined throughout by a delicate formation of 

\textit{Mucous Membrane} covering the \textit{Pharynx} while its \textit{chief function is the secretion of \textit{Mucous Fluid}, lubricating the surfaces and keeping them in a healthy condition.}

As this secretion is continuous it is necessary for health that the \textit{supernumerary fluid} should be removed which is affected in different modes in different parts of the animal, chiefly by the movements of our \textit{Inspiratory Air} and \textit{Exspiratory Air}. Hence we have the \textit{contraction} and \textit{dilatation of the tubes, and to \textit{their delicate and beautiful} organic \textit{function known as \\textit{Eustachian Tube.}}}
were first discovered by C.M. Veduta of Padua, who consisted of threads of fluid on the outside of the membrane and surrounded with active cells. These threads consist in the regular and continuous vibratory motion of the filaments which are insufficient to create currents in the fluid in its surface and to reach in the removal of animate particles which may come in contact with them. But when from a circulatory cause as spoken for cutaneous complaints, delirium or these states become influenced or in a state of irritation a larger amount of secretion is thrown off than usual and is self carried off by the removal of the latter by respiration and dermal action remaining in the body. In cases of the typhoid fever, when there is peritoneal adhesion of the Salmonian, bring fluid and exudation more or less extensive, adhesion of the subcutaneous cansals, which is invariably attended with deafness.
Under these circumstances, it is that outhearing of the E. tube becomes of such great importance, being, in fact, the only means by which a restoration to the normal state can be attempted with any reasonable hope of success.

It is interesting also to consider in what manner the E. tube contributes to the perfection of hearing. The bony walls of the tube are probably to connect the cavity of the tympanum with the external ear, and to bring the internal ear in connection with the cavities of the nose or frontal sinuses whereby a considerable resonance and surface of force are given to the sound as they travel through this ear.

If we give importance of force I consider which air in the tympanum performs is its influence on the equilibrium of pressure and temperature of the air on either side of the membrane.
The case of the tympanum either becomes expanded to a volume by the \begin{footnotesize}\textit{end of the body} or is partially or entirely absorbed in either case an alteration of vital consequence occurs in the membrane, for if the air in the cavity becomes absorbed so as to occasion a vacuum the atmospheric pressure is sufficient to force the membrane inward and render it more or less concave on the external surface; if on the other hand the air becomes expanded in the tympanum beyond the normal limits the membrane is forced outward but does not become concave owing to its attachment to the bundles of the cartilage. In either case whether the pressure be from within or without imperfection of hearing is the result. That is a very peculiar circumstance I have noticed connected with diseases arising from the altered state of the texture of the membrane as above described.
Dr. Harvey found in cases that when deafness from terror or the motion of the INNOMANDI continues a conversation in a sharp tone is much more audible than when the sounds are of a gravier character. Hence it arises that in deafness of this kind patients can converse or carry on a conversation with those who talk in a sharp, better than those who speak in a low tone of voice. Such individuals also can hear more distinctly while driving in a carriage through a noisy street or what is exposed to considerable noise of a continuous kind than in a room from which external noise is excluded. And how this occurs I think is to be found in the circumstances that while the grave rumbling tone of the carriage and the usual tumult of the street are perceived by the person who hears naturally well and tend to cause them as well produce dulness of the sense, the deaf
person in join the advantage of not presenting the nostrumous in body with sufficient distinctness to occasion inconvenience, besides assuming a shriller tone of voice to affect its receptors in some degree the bounds to himself rather from those around them a circumstance which gives an additional advantage to the other individual.

Catheterism of the entrance passage is required for a variety of purposes.

1. For the exploration of the passage and symptoms by which their healthy or diseased condition can be determined.

2. For their opening up, when filled with various blood or pus.

3. For their dilatation when contracted from the thinness of their sides or obstructed from adhesion or structure.

4. For the introduction of medicines.
fluids or vapours to act on the surface of the tympanum and to
restore the bursified auditory nerve or to carry its morbid vitrification.
8. To improve the condition of the auricular membrane.

From the time of Galen to this
idea first occurred by acting upon
the sense of hearing through the
opening of the Pharynxian tube,

catheterism of the E. passages and
injections into the cavity of the
Tympanum have undergone many
modifications and improvements.

But the Cleland must be avoided
the first introduction of a catheter
through the nose into the pharynx.

And in the Philosophical Transactions
1731 vol. xx1 1845 is a paper published
by him giving an account of experiments
in Sheffield to remedy some kinds of
cautious proceeding from obstructions
in the 'nose and external auditory passages'. In the year 1735
Nathan another English surgeon published a very interesting paper upon the subject in the Phil. Trans. Vol. XIX. p. 215 in which for the first time we find reports of cases of at least partial cure. He says Mr. Hake distinctly that passage leading from the ear into the brain called the Interaustachianum so as to hinder the escape of air through it into the cavity of the temporal sinus is perhaps unnecessarily intemperate destruction of the sense of hearing.

He observes observed that a curious of the course the patients became deaf by its compressing or closing the tube. Many practical writers assert the same to have happened from adjacent ulcerous, and Nathanael related that a certain person had an ulcer upon the shins on the left side which communicated with and carried back the orifice of the tube which when he stopped with a tooth clipped in Wells immediately lost his hearing or
That side, &c. accorded with as soon as the first was taken off and I have known myself a similar troublous occasion: deafness.

Catheticum of the Turkishman passages is safe, prurient, and efficient and it is fortunate that it has such recommendations whatsoever as it cannot be disproved with in the diagnosis or treatment of deafness. Amongst the cases of deafness that have come under my notice in a fair number I have employed catheticum rather to ascertain the nature of the disease or for the relief of the case, and have never had any mishap for I think if done with care no injury could possibly arise. As a slightly

as a diagnostic agent will be at once admitted when we see we have or this means of ascertaining the permeability of the &c. take for the relaxation of the vessels cannot always be relied upon, and as a remedial agent it is one of the
Chief methods of treatment by which we are able to achieve beneficial results for in four cases amongst those in which I have used it, the sense of hearing has been completely restored.

Diseases of the Intermittar.

Deafness from disease of the auditory nerve is quite as far less frequent than is generally believed. Thus it has been reported paralysis of this nerve may be produced by pressure exerted upon it in any part of its course, between the semicircular and its prolongation in the labyrinthus, for instance, by tumours within the cranial or its functions. It may be abolished by loud, sudden sounds as thunder or the report of artillery in the same manner as blindness of sound through increase stimuli of the entire organ by violent light. Serious deafness may be purely symptomatic of other diseases, as dyspepsia of intest
Sometimes deafness arises after an attack of croup, and also in doubt from the Communion of infants during delirium and probably a great number of cases of deafness develop in cases of this description. With comparatively little a good deal of uncertainty has prevailed in the diagnoses of ulcers of the ear in these or other organs of similar importance, which has no doubt arisen from the position and complexity of the organ preventing attempts to connect the symptoms observed with the structural lesions seen in p.m. examinations. In ascertaining the condition of the auditory nerve in any case having satisfied enough of the movements of internal disease, we are enabled by the usual aids of surgery to replace the tympanic cavity and attach the skin which can be done by means of the cautery and by applying a flexible stethoscope to connect our ear with that of the
Partial, thus by the continuous admission of ear into the tympanum and by the diminution of the sound it produces discover the condition of the tympanic cavity. For when the tube and cavity are free, the air strikes against the membrane and when the shock is over a slight buzzing or tickling in the ear of the patient is heard caused by the streaming of the air. From what an examination as above conducted has shown not only the intense wish to be healed, but also the fact acceptably by the Patriarchal Rules, I think we can safely infer that deafness depends on the state of the nerve itself, or of the labyrinth which contains the impression. Another means of assisting our judgment when enquiring into the cause of deafness I think is in the manner in which the deaf individual hears his own voice, for if the deafness arises from disease
of the nerve, the patient's own voice is an inaudible sound in any other sound, but if obstruction of the Eustachian tube is the cause, the noise continues to be heard. People affected with deafness as a consequence of terror of the auditory nerve generally hear better after they have been exposed to loud noises for probably this noise excites the fluid more, and for the time until the irritant has subsided the hearing is improved. The symptoms of Deafness I cannot see to be of much value in estimating the causes of nervous deafness as it is occasionally present in the most varied situations of age and its connections. In cases of true nervous deafness I think we can gather from Calabria the remarkable sympathy of action between the optic and auditory nerves of the two sides of the body which contributes in health, to the harmonious exercise of their functions,
comes into operation in cases of disease; so that a decided state of the organ on one side of the body rarely fails to impair the efficacy of its fellow on the opposite side.

Once it is rare in these cases of our own origin to find one ear helping alone, if the hearing has been for a long time impaired.

As regards the statement of the case of Lewis Oliphant, Cottonian of the entorhine in the sense to suggest a rational and very important means for the introduction of curative measures much nearer the seat of disease than, by any other way, through and being at present add to the path from much experience. There is no doubt that we could have medicated fluid to pass into the cavity, which by dilatation would pass readily through the delicate membrane of the aqueous humor. This fluid, filled the lacrimal and thus, in effect became applied to the extended nerve termin
causing its dormant readiness and
its possible restoration, the lost sense
of the nerve. In this manner having
these affections of the ear accessible
to remedies which nature ever
must be made to work out from the
successful application of our Ther
Drugs of Action.
There is perhaps no symptom in
our diseases about which more persons
think than that of Impotency, both
as regards its reach, locality, and also
its pathology, which is indeed not to
be overlooked at seeing that all
patients on this ever form widespread.
area that it is indefinable as yet
to determine the causes on which
the various forms depend. The subject
is one therefore worthy of consideration.
Consider the just health of properly
issues from the habit of regular need
when we are not only free by their
aims to certain activities conditions of
the various systems (especially the auditory)}
Which not denying that such a condition never obtains it will be much more helpful to take up the distinctly objective occurrence of symptoms contrary to that for a sound to be heard, it must have a prior existence in some abnormal condition capable of giving rise to the. In pursuing the facts suggested by certain anatomical and physiological relations of the ear we are enabled to reduce thus various forms of symptoms to a systematic arrangement as follows

<table>
<thead>
<tr>
<th>Local Malign Condition</th>
<th>Character for Sounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hypoguttation Convulsio... Articular.</td>
<td>Pulmonary noises</td>
</tr>
<tr>
<td>2. Do. Do... Terna.</td>
<td>Whistling noises</td>
</tr>
<tr>
<td>3. Anoemia, convulsion... Exero card.</td>
<td>Pulverization</td>
</tr>
<tr>
<td>4. Fluid in Songanum... Cylinder or tube tubes... middle ear...</td>
<td>Bubbling and gurgling noises</td>
</tr>
<tr>
<td>4. Convulsion of mucous... choreo...</td>
<td>Tubal noises</td>
</tr>
<tr>
<td>5. Under contraction...</td>
<td>Swinging, sideling</td>
</tr>
<tr>
<td>5. Internal muscles</td>
<td>Resumed noises</td>
</tr>
</tbody>
</table>
Commencing our consideration with
the first of these (I will call them
congestion) it is to be noted that
this part of the auditory apparatus
receives its vessels from the nostril
carotid, a totally distinct course to
that which supplies the more
external and conductive parts of the
ear, which brings out two facts:
1st. The very distinct course of the
teacher coming from the subclavian
at the root of the neck and
2d. The very nature of which regulates
its calibre, come from the subclavian
of the sympathetic. The veins which
discharge the blood from the labyrinth
back into the superior petrosal sinus
which is directly connected with the
venous sinus in front and the
lateral sinus behind, it is easy to see
how any obstruction to the venous
circulation will render the outlet of
blood from the labyrinth.
Now if the internal auditory artery
comes
source above indicated, becomes dilated by dilatation of its natural tonsus, which is regulated by appetite. Thus, it will act only to clear out blood, but will occupy more space than it normally should do, and therefore any circumstances, such as irritation of the nerves of the stomach through the pons vagunae, which butt to this dilatation of calibre so that these vessels contain several times the quantity of blood that ordinarily flows through them, produces to the patient nausea if a throbbing pulsating character aurally to them and synchronous with the heart action, and by this we may conclude the circulation in the labyrinth is paroxysmic. The treatment of this class of mines in the head finds almost a specific remedy in Hydrobromic Acid which I have used with success before the operations of Dr. Fothergill who has shown that this drug catégorie
The aural symptoms caused by large doses of narcotics when administered with it, and that these drugs are specifically related to the tissue tracks over whose circulation the inferior cingulated exercises inhibiting control and that therapeutically these drugs are antipathetic, the former increasing the inhibition of the mass motor centre constituted in the spinal the latter diminishing it.

The next class of toxicities depend upon causes other than those aural due are wholly numerous. One of these is adherence to the circulation at large, anaemia, whether due to exhausting discharge, loss of blood, cholera, etc., is accompanied with that peculiar sound the shrill de cible, and then it is reasonable that the internal cerebral fuses close to the labyrinth in its course through to the ear and nose, it is not surprising that the patient should apprehend
any abnormal sound occurring
with when each sound is followed
the eardrum observation.
For the voice under Ausculation of
the eardrum and its immediate sounds
produces by conduction this peculiar
form of stimuli and especially in
this the case with the structural
variety, also in some cases of
Brad's disease as so suspected
any extra sound is often
attained with ringing in the ears.
In considering the preceding voices
in our classification they can I think
be divided into two groups, one
of these on or less intermittent
continuing bubbling crackling or
rasping sounds, the other generally
continuous of a distinct buzzing
character. Which allowing of careful
descriptions of the subject often liken
itself to the toad voice produced by
holding a shell to the ear then
anything else. Respecting the
With groups of quaking and hollering
and compared to the hollering of
bubbles in the breast. It is explained in
all probability by the presence of fluid
in the middle ear or mastoid cavities.
Consequently, this mucoid or once purulent
fluid being forced into an
ear chamber communicating with
the throat it subjected at required
intervals to the passage through it
doing bubbles of air. Gases may
also be generated in it and
evacuate in a similar way. The
ready relief of these cases will
depend upon the facility of the
air tubes and the ease with which
irritant can be applied directly
through it to the ear and whether
the mucous membrane is such as to
admit of the irritant being rendered
The case of a young woman I saw
a few weeks back, was I consider
an example of the above existing
condition. She had a weak and
Troubled appearance having had
my little check in consequence of
the intensity of the gust of wind
in our left ear. The chest was
with difficulty passed before had a
good deal of thickening about the
parts as result of a chronic tricus
in driving air into the ear a great
deal of probing ensued which
when the tubes were all cleared
away ceased entirely, but only to
continue as the throat motion was
again established with the produce
of the sound though at first so bad
such cases require a course of treatment
directed to the cavity of the tympanum
and the tube as well as to the oral
nasal region. Muriatic solutions of
Essiac and Carbolic Acid are of much service
as the Essiac forces what I am
fond of finding useful to the oral
nasal region. If this state of thing
coincide with perforation I think it
would be advisable and recommended
case to inject suitable amount of the
saline solution through the middle
ear to the throat.

We have next to consider those cases
of a running and keuring chill and
which are more or less caused
in their duration, they often occur
with the intermittent sweating and
also with those of a palpus,
and of thrush, climate and coughing
by the hypothesis we started but
that they were experienced in the
practice there exists a definite
objective cause, the factors which
would appear mainly instrumental
in the production of this class of
sound may be inferred, either to
Contraction of the intrinsic muscles
of the lid, or to the rushing of
an increased flow of blood through
the diseased and dilated vessels of the
cavity of the tympanum, both these
effects may cooperate in producing
the symptoms of which the patient

II
Inflammaric
Condition.

I
Inflammaric
Condition.
complaints because this congestion of the middle ear is calculated to irritate the muscles and excite them to spasmodic action at the same time the contraction thus induced will aggravate the original disturbance of the circulation. Let us first consider the sounds resulting from muscular contraction. We know the fact that if a person, lying with the side of his head on a pillow, tightly clenches his closed jaws a sound is heard by him coming from the close proximity of the contracting muscles of the auditory apparatus; hence it will be apparent that if the sound in question can be heard when situated without the ear, the coordinate contraction of muscles situated within the hearing apparatus must be even more audible. The ordinary contraction of the inner tympanic and stapedius we know are only appreciated in healthy ear.
it requires for its production a
paroxysmic contraction due to some
involuntary motion of the muscles from
corresponding disease to produce
such a vibration of its fibers as
would constitute an audible note.
The possibility of its occurrence was first
suggested by Étienne, but the
methods by which it occurs and the
diagnosis are of more recent date
and require a good deal of study.
They have been carefully investigated
by various continental authorities
prominent among whom are Weber, Riel,
and Stamp. The latter being the
first to point out that the tenia
of the lower tongue is projected into
the anterior surface of the handle of the
mandible as well as into its inner angle.
This fact has an important bearing
on the position which the mandible
will assume when subjected to
the strain of the muscles which act upon
it, either from circumstances the true
will undergo a kind of deceleration on its posterior axis, the effect of which is that while the distal end of the membrana is directed inward the upper end of the muscular liga and the membrana is exerted by the anterior segment so that the tension segment is partly retracted and causing it fall away from the plane of the rest of the membrana in the direction of the tympanic cavity. Though attempts to displace this particular condition are made and forget the fact that eustachian contraction and adhesions may be frequent sources of displacement of the portion of the membrana which is where known it is due to muscular action the entire membrana is normally mobile and is more or less capable of restoration to its normal place by inflation through the Eustachian tubes.

The accompanying little sketch may
It will help to elucidate the foregoing facts, which show that the diencephalon and inner part of the thalamus to be involved with nerves from the occipital temporal of the 5th which renders them extraordinarily sensitive. This nerve it will be remembered supplies an effect to the eye, the eye and this ganglion supplies the nerve to the inner thalamus. Now we know this to be a physiological axiom that when the peripheral distribution of a sensitive nerve is excited, reflex action is excited in the muscles supplied by this nerve. Thus it is clear that such a set of phenomena are set up when the inner head is tickled or irritated when in consequence the inner thalamus becomes symptomatically involved. The irritation of the fibers causing the sound of which the patient complains, while
The action of the arteries upon the membrane of the orbit (for only) produces such disturbance of the equilibrium apparatus in the semicircular canals that the patient often feels quite dizzy with a strong tendency to fall over. It may still perhaps be regarded as a moot question whether when every other factor is eliminated, pressure on the inter-labyrinthine fluid is ever capable of giving rise to such a state which might fairly be called subjective. When discussing the pathology of pulsating tinnitus, we may show a paranchymous state of the arteries of the labyrinth, communicated their fluid to the contiguous nerves and so gave rise to the symptom...
including the capillaries of the cochlea upon each other enough attended with similar results. Because compression of the vessels by increasing the resistance to the passage of fluid through them would appear to explain the rushing noise complained of when such pressure exists.

And now we come to the other group to which we attributed these humming and buzzing sounds due to a high-pressured condition of the vessels of the middle ear and both tube or of all three combined. For the proper understanding of this condition we must consider the important fact that the cavity of the drum is furnished with blood vessels continuous on the one side with the external auditory or the other with the mastoid. Perhaps the common form of this kind, this Wind of Vibrations
occurs when cerumen has accumulated for a long time in the meatus and when the true element in the causation of the sound becomes evident when the obstruction is removed from the canal which with the auricle is invariably sound and not injected and having in mind the vascular connections referred to it is literally certain I think that congestion extends also into the tympanic cavity.

And the explanation to be offered is that this capillary congestion produces a sound like bruit, and this occurring within the auditory apparatus is ascribed as such by it. Evidence in favour of this view of the hypertonic origin of certain bruits is afforded by the case recorded by Dr. He in which the involved ear was situated at the opposite end of the auditory
Passage 13. at the mouth of the labrachin tube. The patient with the
ear complained of a continuous sound in one ear and of a
vibration in the pharynx as if a
hair had got into his mouth.
After the man's death a grain of
hazelnut was discovered projecting from
the pharyngeal orifice of the tube and
receding into the oesophageal portion.
And even I think from these
facts and the explanation of
which, we are in a position to
understand more clearly that it
probably that in a large and
frequent class of cases of deafness
which for the most part have a
pharyngeal origin we are invariably
meet with triturnities. It is in this
instance perhaps that our best
endeavours Should form us worthy
and in these that we have heard
fail and do promptly to provide us to
do something for the brains, and it
mind about the diseases which they have occasioned us long ago. Can these cases be at all recovered hopeless by our own short experience. This opinion, as considerable benefit has followed. The use of remedies as the hydrochloric acid, ipecacuanha, and other means to abate the hydroaemia and any condition dependent upon the cholesterin would be treated accordingly; while this very limited space in which the clinical processes have place and the difficulty of getting at these are indeed another obstacle to successful treatment.

Having so far considered different diseases and various symptoms in connection with morbid conditions of the ear as have been suggested to my mind from or a careful examination
of the cases I have come across in practice; I now wish to go on to make a few remarks in regard to any and the best means we have for conquering and alleviating cases that are found to be incurably dear. We also have had opportunity of observing the progress of incurable deafness as it stealthily but surely advances, that it is safe to note the peculiarly depressing influence that malaria exerts over the mind, and they must have seen that this depression unless cautiously guarded against becomes a most formidable ally to this bad disease and aggravates considerably the misery of the invalid. I have already said that deafness arising chiefly from disease of the auditory nerves is less common perhaps than aurist
generally believe, still I feel at the same time persuaded that almost all deaf people suffer from a peculiar fluid of nervousness of a very distressing character as a consequence or symptom rather than a cause. Deafness, hearing as actual nervous deafness would seem a very rare complaint. I think I have stated previous the influence of dyspepsia in the production of abnormal states of the brain; in one case I well remember in which chronic stomach disturbance was the cause of defective hearing and in several cases occurring in middle aged persons they have been found more or less associated. Whether the prejudicial effect of chronic dyspepsia on the brain and diseases is attributable to
The influence of the depressive disorder or of the depressing effect of supra-nervous activity on the body, is a subject perhaps for future investigation. But at the same time it seems very certain that a considerable number of deaf persons suffer from a peculiar form of nervous irritability.

Many deaf persons also have reason to believe themselves incurable or very near whose cases may be able to be relieved, suffer from any nervous disorder. They should not once put themselves under medical treatment, because one through their hearing may be hopeless, as soon as it is of the greatest importance to preserve from the mental and physical depression which thus everyday tends to produce. And this cannot be opposed.
unless the bodily health be
attended to as the best
regulated means tend to yield
on the effect of severe infirmities
of continued with other forms
of bodily infirmity.
These persons have become hope-
lessly deaf and only can they
of themselves do a good deal
forward preserving their minds
in a healthy condition but the
can often assist the delicate
and impaired sense when
nothing else but self-treatment
is left the slightest aid.
I should at this point wish to insist upon the immense
assistance afforded to the ear
by the sense of sight. A
deaf person endowed with a
quick eye has at this command
a powerful means of compensating
for this deficiency of hearing.
There are many instances known
of deaf mutes so perfectly trained in the use of the sign that they can detect every word of a conversation by closely watching the lips of the speaker having previously been taught the use of articulate language by the use of the eye alone. Then are other persons totally deaf but retaining the faculty of speech who can readily understand every word by watching the movements of the lips.

It also would appear to be true that in ordinary conversation between persons of good hearing the compara-

In brief, all that is said is, I think, to a considerable extent dependent on the combined use of the eye and the ear through the sense united for it to the ear alone, or even where a few references I think the

true to a
greater extent than we should perhaps at first imagine. If a person with good hearing be in a large assembly or theater and at such a distance as to render the words of the speaker indistinct, the men distinctly make out what is said by the use of an opera glass. Or if there should be such a noise as to interrupt the hearing, the use of the glass will undoubtedly assist to a great extent, appearing as if the words thus made were magnified instead of the objects being so enlarged as to enable us to perceive the action of the lips and expression of the face accompanying the voice. Again if a completely deaf person sit by the side of a person who has acute hearing and the former use a glass, he will ascertain the letters of the two which is said. And
as it will be if one person with acute vision be a little deaf and another quick of hearing but shortsighted. The deaf person will often appear to hear the letter of the text and will catch the meaning of words which are actually lost to the quick hearer.

Or if two persons of equally good hearing are together one of them seeing short and the other long sight the latter will have infinitely the advantage of understanding what is said. These facts which would be easily capable of verification show me the excessive importance of aiding the ear by means of the eye. On the other hand it is well known that persons relying wholly but possessed of acute hearing have a wonderful power of obtaining information through the medium of the ear and other
other causes which in ordinary cases reach the mind entirely through the eye.

The exercise of the faculty of attention is also of considerable importance and is necessarily deep.

It is a matter of experience that when a deaf person is listening to a speech or conversation the ear at first perhaps scarcely distinguishes a single word, but by attention and by ceaselessly drawing every faculty upon the subject he gradually catches the words of the speaker. If he is listening to a speaker upon a subject he understands he is often able to take up such sentences accurately by building the matter in the same train of thought with that of the speaker, and if there be any words he fails to hear they often become suggested by those which follow.
or precede them for by a kind of intuition a well-educated person knows to some degree the words which are to follow by those which immediately precede, just as in music a person possessed of a musical ear almost always thinks a little in advance though he may be listening to a composition he has never heard before. On the other hand there are certain things such as figures and proper names in which this faculty of anticipation cannot be done, and in them the ideal person will fail. If it failure such as this leads often will lead to a suspicion of deafness. It may be observed that persons who can follow a speaker in every particular are initially
and hopelessly at fault if
the event upon an arithmetical
calculation or speak of numbers
of persons and places. It is
a fact many partially deaf
persons can hear and understand
the date of the current year
this quarterly without much
difficulty catch the date of
a quiz taken at random.
We also if the numerals are
counted in order as 1,2,3,4,
A,B,C,D, they are readily com-
prehended by an attentive deaf
person. But if you give a
different combination of these
2,4,1,3, B,D,C,A, the
person will be confused;
and many persons will not
believe themselves read. This
are becoming deaf when they
only fail of hearing things
of this kind. Of the hearing
remaining good on roads
This matter. There can be I think however a longer life than this of the duration of deafness. If the partially deaf person lose the thread of a discourse by temporary inattention he is incapable of resuming it immediately, but by a quick concentration of his attention and by studying the arguments of the hearer. He is gradually able to recover the meaning and follow it as before. A deaf person should never suffer himself to lapse into inattention, because of his inability to hear every word which may be uttered around him. It is much better to lose a few words and misapprehend the meaning of others than to give up the whole either from inattention or in despair. It has often been said I believe...
That deafness is favorable to profound thought and meditation, and that deaf people generally think more deeply than others on account of their inaccessibility. Without doubt, when the peace of \( O_o \) xing is respected or violated, the power of thought does "shine resplendent and illumine" to a greater degree, but the deaf should especially be especially cautious how they submit themselves to scent into a state of abstraction and above all should avoid the tendency to remain in society. Many deaf people while passing through the streets, try to shut out the sounds as much as possible. Failing in that, they would reflect, but I do not wish to say that such
a habit is highly unusual to
the failing voice. They should
I think rather try to catch
the natural sounds of breathing
instead of blunting theirs own
the affect by a voluntary
effort. I can think of no
better exercise for imitation
and partially deaf persons
than practicing writing down
or a condensed form of conversa-
tion or the reading of
another person. Such a
practice is better than merely
listening to a person reading
because it requires a more than
ordinary degree of attention to
being the mind in obedience
of the ear. Next to this
should be the habit of listening
carefully for some time daily
of a person while reading
alone. Remarks of this
kind are of much value to
The leaf and if it is true that the caltrop should have been only noticed by writers on natural history in a rather casual manner. It indeed it can be said to have been noticed at all. As a further endorsement to urge the deep habits of affection I may say that nothing is more painful to hear than the gradual but final loss of one of the most familiar and agreeable sounds of nature. If the deep the air is always heavy and silvery and the earth monotonously dull; the play of expression in the faces of friends may compensate in some degree for the loss of the forms of friendship and affection and this smile of nature appear thus more delightful.