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THE HYGIENE OF THE EAR.

BY

DR. VINCENZO COZZOLINO,

PROFESSOR IN THE ROYAL UNIVERSITY OF NAPLES AND DIRECTOR OF THE HOSPITAL CLINIC FOR DISEASES OF THE EAR, THROAT AND NOSE.

Translated from the Fifth Italian Edition

BY

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GLASGOW.

ALREADY PUBLISHED IN FRENCH, GERMAN, SWEDISH, SPANISH, AND RUSSIAN.

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1892.

TO

A. POLITZER,

PROFESSOR OF AURAL SURGERY,

UNIVERSITY OF VIENNA.

(*Translation of letter from Prof. Politzer.*)

VIENNA, *March* 4, 1890.

DEAREST FRIEND AND COLLEAGUE,

I have received your letter and the proof sheets of your 'Hygiene of the Ear,' which pleased me greatly. I am highly honoured by your dedication, which I accept with very much pleasure.

Always yours faithfully,

PROF. POLITZER,
Of the University of Vienna.

AUTHOR'S PREFACE.

Of all the translations of this little work which have been published, I prize most highly the translation into English by my colleague, James Erskine of Glasgow, well known as an otologist and as the translator of the important text-book on 'Diseases of the Ear,' by Dr. Hartmann of Berlin, having been also associated with the late Dr. Cassells in the translation of the classical work on 'The Ear,' by Professor Politzer of Vienna.

I have to thank Dr. Erskine for placing within the reach of English readers this short treatise on the 'Hygiene of the Ear,' a subject which has been ignored and neglected, whereby the sense of hearing and even the lives of patients have been sacrificed.

VINCENZO COZZOLINO.

Naples, *August*, 1892.

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THE HYGIENE OF THE EAR

CHAPTER I.

THE HYGIENE OF THE EAR IN INFANCY.

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THE ear calls for special care, even from the earliest hours of infancy. The external auditory meatus of the infant is sometimes obstructed by material called vernix caseosa, which may induce inflammation of the drum-head, and give rise to accumulations resembling cholesteatomata, and may cause caries of the ossicles of the tympanum.

The tympanic membrane should also be examined, in order to ascertain the condition of the mucous covering of the tympanic cavity. At the full period of intra-uterine life or about the time of birth, physiological changes take place in the tympanum, causing absorption of what was formerly called the gelatinous cushion of Wharton, which consists

of very primitive cellular elements and forms a distinct swelling of the mucous covering of the tympanum, especially of its labyrinthine wall. These changes ought to lead to the introduction of air into the tympanic cavity, following the first cry of the infant. About this period inflammation of the middle ear may occur, and give rise at length to inflammation of the labyrinth, resulting in the abolition of hearing. The medico-legal evidence on the question whether a child had ever breathed has been shown to be unreliable with regard to the absorption of Wharton's jelly, because the most recent anatomical and pathological investigations have proved that such absorption may commence before the first inspiratory act. Still, among medico-legal symptoms, it may have a relative value. If the function of respiration is feeble and restricted, the absorption in the tympanum does not take place readily. In such a case, if the tympanum is still closed, or if it is affected by slight inflammation, air should be gently blown through the Eustachian tube by Politzer's method. This may be done by blowing through an india-rubber tube passed into one nostril, holding the alæ of the nose firmly between the thumb and forefinger of the left hand and auscultating at the same time to ascertain whether any secretion is present in the tympanum.

It is necessary to protect the ear of the infant from the effects of cold and damp, which at this early age affect the tympanic membrane more directly, the bony portion of the auditory meatus being still incomplete. Caps are sometimes worn

too tightly fitting, and are apt to affect the shape of the auricle and to irritate the skin. The continuous friction of the cap may give rise to cracks of the skin and eczema, which readily extends to the auditory meatus.

Cleanliness of the auricle is most important, especially of its posterior aspect, and also of the auriculo-temporal region, on account of the abundant gland supply, as dermatitis often occurs in this situation in the form of eczema intertrigo, which is generally neglected and spreads towards the neck and surrounding parts.

The ears of infants should not be exposed to loud and continuous sounds, especially of high pitch, because they are apt to produce exhaustion of the auditory nerve.

Beating children on the ear with the hand, a common practice with nurses and guardians, is most reprehensible. Even speaking too near the ears of children is objectionable. But kissing the ear is much more objectionable, because it sets up strong vibrations in the meatus and acts like a cupping-glass, producing in rare cases rupture of the membrane, and more frequently congestion of the tympanum. The same may occur in adults. The author remembers the case of a man who, from kisses on the ear, had a serous exudation in the tympanum, arising with a feeling of fulness and closure accompanied by noises and slight deafness. These symptoms ceased immediately after perforation of the membrane and inflation by Politzer's method, which succeeded in completely clearing out the tympanic cavity. In the space of five or six

days the wound in the membrane healed, and no bad result followed.

The secretion of cerumen in the auditory canal frequently requires attention. By its abundance or consistence it may obstruct the meatus, producing irritation of its walls and serious alteration of tension in the tympanum, and giving rise finally to reflex nervous phenomena either from direct pressure on the tympanic membrane or by diminishing the external pressure from absorption of air contained between the plug of wax and the drum-head. Wax may be most readily removed by injecting tepid water with an appropriate syringe. The instillation of the usual popular nostrums is apt to prove injurious. The oils and fats commonly used are liable to become rancid, breaking up into glycerine and the fatty acids, and forming a culture soil for myriads of spores of fungi. The presence of these micro-organisms in the meatus produces a peculiar form of inflammation called otomycosis, with all its consequences.

Ear-cleansers made of bone or metal are dangerous to use, because, while they remove very small quantities of the accumulated wax, they irritate the tissues and produce dermatitis and furunculosis. In reckless hands such instruments have been made to perforate the drum-head. Being ignorant of the curve of the auditory meatus, people using these ear-cleansers, instead of extracting any considerable quantity of wax, push the accumulation further inwards from the cartilaginous to the bony portion of the canal. The presence of wax in that situation is indicated by the movement exercised on the

auditory meatus by the condylar ramus of the inferior maxilla in the act of mastication. It is to the annoyance caused in this way that the attention of the aural surgeon is often called.

The ear-cleansers terminating in a little spoon are more objectionable than those with a small sponge at the end, which, being dipped in tepid water, and rotated gently, cleanses the outer part of the meatus from accumulations of wax or dust.

While we cannot approve of the means prescribed in many books for the removal of wax, yet we cannot agree with those who hold that the ear is properly the one part of the body in which a little want of cleanliness is desirable. For the wax contains fatty material which decomposes and forms a suitable soil for the lodgment of small insects. In former times it was even believed that wax was a secretion from the brain evacuated by way of the ear. Nowadays the presence of wax in relation to hearing is not considered as of so much importance as in the past. Several forms of deafness were formerly attributed to the disappearance of wax, even chronic inflammation of the tympanum with sclerosis.

Deaf-mutism results from the loss of hearing. Deaf-mutism and deafness are not diseases, but rather what may be called symptoms or sequelæ. Deaf-mutism may be defined as a symptomatic complication resulting from inability to hear sounds, and accompanied by the loss of speech. The latter results from the former. The organs of phonation and articulation are perfectly normal in the deaf-mute. The expression 'dumb from deafness' would

be better understood, as it describes the cause of the condition.

A mother ought at once to call the attention of an aurist to the ears of her child whenever she observes that it is unaffected by sounds and speech. She ought not to indulge the vain hope that the hearing will come in course of time. She need not delude herself by the child repeating the words 'papa' and 'mamma,' because these and other words of few syllables are acquired by merely watching the movements of the lips. Such words would not be repeated if the child could not see the mouth of the speaker. The eye takes the place of the ear, and reproduces the oral and facial movements. The pure oral method of teaching deaf-mutes is based on this fact. In the course of six or seven years they may be taught to speak.

As indicating the success of the oral method, the pupils of an institution for deaf-mutes in London gave a performance last year of Shakespeare's 'Richard III.' in which the actors acquitted themselves well, showing their ability not only to use words which they had never heard, but also to express the feelings and sentiments of others.

The oral method of instructing deaf-mutes may be claimed by Italy—at least, in respect to its scientific basis, as it was among the first countries in which the system originated and assumed a practical form; but a long time elapsed, namely, from the sixteenth to the middle of the eighteenth century, before it gained the reasonable and charitable support it deserved.

CHAPTER II.

THE HYGIENE OF THE EAR IN CHILDHOOD.

Foreign bodies in the ear—Danger of pulling and boxing the ears—Importance of patency of nasal passages—Nasal catarrh and its results—Deafness from intestinal worms—'School-deafness'—Testing the hearing of children—Stupidity in school-children mistaken for dulness of hearing—Importance of examination and treatment of the naso-pharynx.

CHILDREN have a common habit of inserting foreign bodies into their ears. These consist of grains of corn, pieces of paper, coral beads, seeds of locust and other fruits, ends of pencils, etc. Children therefore require to be constantly watched. If a child is observed to apply its hands suddenly to its ears and cry with pain, the ears should be carefully examined. The removal of foreign bodies is best effected by means of brisk injections of tepid water. Appropriate instruments should be used in rare cases in which injections fail, and then always by an experienced aural surgeon.

Pulling the auricle is apt to prove injurious and cause bleeding from the ear or inflammation of the external meatus and tympanic cavity. Boxing the ears is still more dangerous: the concussion may produce hyperæmia of the labyrinth. The

author had three such patients under treatment who recovered after hypodermic injection of pilocarpine and applications of the constant electric current.

In the case of children at the breast, it is important to observe that the nasal passages are patent and not narrowed by swelling of the mucous membrane or from the presence of dried mucus, which may cause serious disturbances of tension in the tympanum. The nasal condition must be treated at once.

Nasal catarrhs in children, sometimes congenital, may extend to the Eustachian tube, which might be termed 'the bronchus of the ear,' and thereby produce constriction or closure of that passage. From this cause grave results follow in the middle ear, which no longer performs its functions. The labyrinth becomes affected finally, and deaf-mutism may result. If treated in the earlier stages such serious consequences can be prevented.

Nasal catarrh may extend to the tympanic cavity, and set up purulent disease of the middle ear, the discharge of matter from which is believed by the public to be salutary, and therefore to be encouraged. Hence children lose their hearing, and frequently their lives, from extension of the inflammation to the brain. The health of the tympanum and the Eustachian tube depends on the condition of the nasal and naso-pharyngeal cavities, the affections of the former being usually extensions from those of the latter. Therefore diseases of the nose and naso-pharynx should be treated promptly. But the ear is not only affected by the extension of

actual disease from the nasal cavities, but also by contraction or closure of these spaces. Increase of pressure exercised by the expired air may injure the tympanum as in convulsive coughing and sneezing, which sometimes cause rupture of the membrane and hæmorrhage. The organ of hearing has, therefore, been described by Von Tröltsch as an appendage of the respiratory system, or, rather, in structure and function as related to the organs of respiration. From the very first cry of the child, the middle ear begins to act because air is then introduced through the Eustachian tube.

There is a rare form of deafness in children arising from reflex affection of the nerve supply of the ear through the sympathetic nervous system by the presence of worms in the intestine. According to Brown-Sequard, round and thread worms really set up inhibitory action of the sympathetic nerve.

So-called 'school-deafness' is, as a rule, only simple dulness of hearing aggravated by the imperfect acoustic arrangements of the schoolroom, and also by the weak voice of the teacher. Those children, therefore, whose hearing is under the normal standard are charged with laziness and inattention, and are punished accordingly. The defective hearing is frequently unobserved, not only by teachers and relatives, but even by the child itself.

In the Otological section of the last International Congress held at Philadelphia, Dr. Blake demonstrated the frequency of partial deafness among school-children, and urged the necessity of adopting special methods for their instruction. This subject

has also received the attention of Drs. Veil, Sexton, Maillard, Moure, and Gellé.

On an average, from fifteen to twenty per cent. of pupils are unable to write dictation correctly, when the teacher speaks in a high tone of voice at a distance of twenty to twenty-five feet. In the *Revue Sanitaire de Bordeaux*, Dr. Moure published a detailed analysis of the hearing of 4,788 pupils. He found the hearing defective in seventeen per cent. for words spoken in a bass voice. Assuming as a standard that this voice is heard at a distance of fifty feet in silent surroundings, he considers ears as defective which do not hear between that distance and fifteen feet.

The hearing of children calls for earnest attention both on the part of teachers and physicians, as many cases of deafness are not usually recognised. If a child cannot hear dictation at a distance of ten or fifteen feet, it should have a seat near the teacher. If several children have defective hearing, a special section of the class should be formed for them.

The best mode of testing the hearing is by the audiometer, or by the author's electro-telephonic instrument. The watch may be used instead of the audiometer, and, as a general rule, it may be taken that persons who hardly hear it a distance of four inches have defective hearing for the voice at a distance of twenty feet. The results of the examination vary, according as it is conducted in the open air or in a confined and still atmosphere.

Resonance in a schoolroom affects the distinctness

of the hearing, the pupils on the back benches being able only to hear imperfectly, as the intensity of the sound diminishes according to the square of the distance. The attention of the children is therefore not maintained. The teacher should make an effort to raise his voice proportionate to the size of the class. According to Gellé, a class should not be wider in extent than twenty-five to thirty feet, so that all the pupils may hear the teacher. The hearing of the children will be all the more imperfect, and the inattention all the greater, if the school is situated amidst very noisy surroundings, and if its walls are thin.

We have known many cases in which children were regarded as dull in intellect, absent-minded, lazy and evil-disposed, who were simply partially deaf. Instead of receiving proper treatment for the defect, they were disgraced and punished. In forming an opinion of the mental condition and of the intellectual development, it is always important to examine the hearing carefully. If found to be imperfect, the necessary treatment should be adopted at once, because, if neglected, the condition is likely to become incurable. Von Tröltsch has well observed: 'The moral and intellectual future of a child stand in direct relation to the functional activity of the ear.'

Among the cases of many stupid and dull children who have come under his observation, the author has the following notes of a case on record: 'The patient was a boy, twelve years of age. On the posterior wall of the pharyngeal cavity adenoid vegetations were found, a condition which is some-

what common at that age. These vegetations were easily diagnosed by digital examination. In this case the nasal douche had been applied for some time. Not only was the breathing affected, but also the hearing, by extension of the catarrhal process to the pharyngeal opening of the Eustachian tube, and into the tube itself. The vegetations were found to be situated also close to the opening of the tube. The mother of this child was greatly concerned about his defective mental training, and understood fully the bearing of his deafness upon it. It was explained to her that the condition of the naso-pharynx was the cause of the defective hearing, and that it was necessary to remove the vegetations growing there by scraping them away. But the patient was never brought for this treatment, no doubt having fallen into the hands of some physician who would solace the parents with the vain hope that he could cure the boy by painting the throat or applying gargles.

CHAPTER III.

THE HYGIENE OF THE EAR IN ADULT LIFE.

Hearing considered as an independent sense—Deafness in relation to literary distinction—Blindness and deafness contrasted—The case of Beethoven, the musical composer—Mistakes arising from dulness of hearing—Effects of extremes of temperature on the ear—Disturbance of the equilibrium of pressure on the tympanic membrane, and its results—Affections of the ear arising from sea-bathing—Mineral baths in relation to aural disease—Particular occupations as causes of ear troubles—Importance of examining the hearing of railway operatives—Snuff-taking and tobacco-chewing as causes of ear disease—The place of music in modern therapeutics.

THE organ of hearing performs its function almost quite independently of the assistance of the other sense organs. As language is acquired through the sense of hearing, and as the development of intelligence is co-extensive with the growth of language, it may be readily understood that the defect or loss of hearing will seriously affect the intellectual faculties. The intelligence of those who suffer from various degrees of deafness is proportional to the limits of the language which they have been able to acquire. Deaf-mutes are limited in their intelligence by artificial language. Lecat has remarked: 'Deafness is prema-

ture death, because the sense of hearing plays the most important part in the development of the intellectual faculties: without speech the idea is dumb, and without any outward expression; it can only remain as a sensation. Speech is really the door of exit of the auditory sensations.' As Bonnafont has said: 'The mind of the deaf remains in a perpetual sleep. The blind man is a stranger in the physical world, and the deaf man is a stranger in the moral world. The deaf will overcome natural difficulties more easily than the blind. But in relation to moral difficulties, the blind will play a better part than the deaf. The one, like Alexander, will cut the Gordian knot; the other will vanquish the sphinx and solve the riddle.'

A large number of the blind have been distinguished in literature, science, art, and industries. We commonly hear the expression, 'As studious, attentive, reflective or profound, as a blind man.' But among congenital deaf-mutes there is only one name on record, J. F. Berthier, who has produced real literary work. Jean Ferdinand Berthier, deaf-mute from birth, was a professor in the Royal Institute of Paris at the beginning of this century. By reason of his special knowledge of the subject, he was selected by that learned body to write a memoir on the education of deaf-mutes in all times and in all countries. For this work he was awarded a gold medal by the Society of Moral Science of the Seine-and-Oise, and he also received the decoration of the Cross of the Legion of Honour. Above all will he be held in memory for his valedictory address given in the language of signs and gestures, and in

the name of his fellow-sufferers, over the grave of their devoted friend the Abbé Sicard.

As deafness debars from society, it tends to misanthropy. The man who hears is never lonely, even if he is blind ; he finds solace even in the forest, from the rustling of leaves and the humming of insects. The blind man forgets his defect whenever anyone enters into conversation with him ; while the deaf are only reminded of their infirmity, and feel sad when anyone addresses them. Not without cause are the deaf more morose, sad, and unhappy than the blind. The glorious theatre of the external world is hidden from the blind man, but the deaf have lost the principal sense of social life. Von Tröltsch has referred to the baneful influence of deafness on the life-work and thought of the individual.

Beethoven endured all the anguish produced by the loss of hearing, and several of his masterpieces are only an echo of his sufferings. Fètis states that Beethoven's inclination for solitude was first observed in 1796, when he began to suffer from deafness, which was found to be incurable, and finally deprived him of his highest pleasure of hearing music. In his will, made in 1802, in favour of his two brothers, it is quite apparent that he had reached the verge of despair owing to the loss of his hearing. He shunned society because he did not wish his deafness to be known. On various occasions he felt impelled even to suicide, in order to terminate all his sufferings. He regarded his infirmity as a disgrace to a musician, and the disclosure of it grieved him sorely. When he conducted his

Fifth Symphony at Vienna, he received a great ovation, but he remained quite regardless of the enthusiasm till a member of the orchestra directed him to turn round to the audience. The people then observed that the great composer whom they were applauding so very enthusiastically was quite deaf. Beethoven broke down and wept bitterly.

A person who hears only imperfectly frequently makes stupid mistakes, and causes misunderstandings. Disputes sometimes arise in this way—an expression having been only heard in part, or a word having been misunderstood.

The external ear, comprising the auricle, auditory meatus and tympanic membrane, being in direct communication with the surrounding atmosphere, is affected by variation of temperature, which may give rise to diseased conditions. Excessive heat is injurious, and may set up hyperæmia of the internal ear. But more than the temperature of the surrounding atmosphere, great heat of the body arising in the course of infectious fevers has a direct effect upon the auditory nerve. Children who have recovered from measles, scarlatina, smallpox, erysipelas, and the like, often suffer from intra-cranial lesions of the nerve of hearing, the high febrile temperature perhaps alone affecting the delicate texture of this nerve, which gives it the name of the portio mollis (soft portion) of the seventh pair of cranial nerves.

Cold, especially along with moisture, favours the development of parasitic affections of the ear. In winter, people whose occupations expose them to the weather, namely coachmen, country labourers,

masons, etc., suffer from frost-bite of the auricle, and in extremely cold countries the part is often actually frozen, and partial or entire destruction results. The average temperature of the auditory meatus is 36° to 36·5° Cent. (97° to 98° Fah.). If this temperature is lowered much by the entrance of very cold air, the tympanic membrane becomes affected by congestion of the blood supply in it. Inflammation of the membrane (myringitis) rarely results from the effects of cold air in the auditory meatus, as it is protected by hairs at its external opening, which filter the air and render it less injurious. By its rich network of bloodvessels, an almost equable temperature is maintained in the fundus of the meatus. Moreover, the curves of the meatus prevent the direct entrance of air. The ear may be protected by wearing caps, veils, etc., when the cold is excessive. As a protection from cold, cotton-wool may also be inserted into the orifice of the meatus. In affections of the middle ear with perforation or destruction of the tympanic membrane, it is advisable to close the fundus of the meatus with boracic acid.

Workmen exposed to loud sounds, as blasting in mines, reports from artillery, etc., should wear cotton-wool in the ears. Except in such cases and with the advice of a surgeon, cotton-wool should not be applied to the ears. It is ugly, uncleanly, and not good for the ear, which is sufficiently protected by nature. An ear plugged with cotton-wool would give even to the Apollo Belvidere the air of an invalid under treatment by the village apothecary.

Ear protectors composed of celluloid material are

used to cover the organ when exposed to extreme cold. They are of a skin colour, and are made the shape of the auricle. Being thin in texture, they do not interfere with the transmission of sound.

While we are able to protect our ears from cold, we certainly cannot equally protect the nasal cavities through which we breathe. Catarrhs of the nasal mucous covering occur very readily, and extend through the Eustachian tube to the tympanum and the tympanic membrane. Hence cold and dampness produce inflammation of the Eustachian tube and of the tympanic cavity. In order to prevent the degenerative changes (sclerosis, etc.) which take place in the tympanum and cause permanent deafness, it is absolutely necessary to treat nasal catarrh in its early stage.

Under ordinary conditions, the pressure of air contained in the tympanum is counterbalanced by that of the external air pressing on the tympanic membrane. If the pressure on one side is greater than on the other, the degree of tension of the membrane is increased, and rupture may result if the disturbance of the equilibrium takes place suddenly. Aeronauts and people ascending high mountains sometimes suffer from bleeding at the ears. By the rarefaction of the external air, the pressure of air in the tympanum is greater than the external pressure, and pushes the tympanic membrane outwards to such an extent that it is sometimes ruptured. Bleeding from the ear also occurs in men working in diving-bells from a reverse cause, the external pressure in this case being greater than the internal. It is thus evident that

the organ of hearing along with the respiratory structures is directly affected by the action of varying barometric pressure. The principal cause of the functional affections referable to the tympanum is simply the change of equilibrium of pressure within and without the ear. If the disturbance of equilibrium is very great, the labyrinth may even be affected, and also the auditory and other nerve centres. Workmen employed in such constructions as are used in bridge-building are subjected to the effects of compression and expansion of air, and while serious accidents do not occur during compression, sudden expansion may even cause paralysis or death from the shock; when the change is slow and gradual no such untoward result is produced. Compression of air produces displacement of the chain of ossicles, and consequent injury of the fenestræ and of the contents of the labyrinth. During the expansion of air the labyrinth is primarily, and perhaps solely, injured, and labyrinthine hæmorrhage is likely to occur. Observations on this subject have been made by Gerard in the *Revue Sanitare de Bordeaux et Sud-ouest*, (1884), and in a work entitled *Les accidents dans les travaux à l'air comprimé à propos de cas observés pendant la construction du pont de Cubzac sur la Dordogne* (1885). The aural affections produced in this way are described in detail in the author's 'Diseases of the Ear' (1887), and in his monograph 'Deafness and Deaf-mutism.'

In relation to the hygiene of the ear, the subject of bathing in general and sea-bathing in particular calls for consideration. Sea-bathing not only produces various affections of the ear, but it aggravates

those already existing. The author has contributed articles on this subject to the *Riforma Medica* (Naples, 1885), entitled 'The Ear, Nose, and Throat in Balneotherapy.'

In the case of the healthy ear, sea-bathing is apt to produce affections of the auditory meatus, the tympanic membrane and the Eustachian tube. In the diseased ear, sea-bathing aggravates the affection, causing chronic inflammation to become acute, and producing extension to the internal ear. In sclerotic otitis media the tinnitus is often very much increased. Patients have been known to contemplate suicide on account of the intolerable noises in their ears.

The worst results of sea-bathing are observed in diseases of the bony structures of the ear. The caries and necrosis extend, and the granulations become polypoid vegetations and polypi.

Patients suffering from ear diseases or their results should not swim under water nor submerge the head suddenly without closing the auditory meatus with a waxed plug of cotton-wool. In the case of children, care should be taken to prevent the water entering the nasal meatuses or the naso-pharynx, because by the opening of the Eustachian tube in the act of swallowing, the water may enter and pass into the tympanic cavity, producing inflammation of the tube or otitis media, generally of a purulent character.

Sea-water in the auditory meatus should be removed by means of absorbent cotton-wool applied on a holder. Fine boracic acid powder should then be insufflated into the ear.

The water may be removed from the Eustachian tube by performing Toynbee's experiment, which exhausts the tympanic cavity of air. This experiment may be called the expiratory method, as distinguished from the inspiratory, which produces aeration of the tympanum. These means of affecting the tympanic cavity may also be divided into the natural, as swallowing, coughing, and crying, and the artificial, namely, Valsalva's experiment—only practicable in adults, but generally hurtful—and Politzer's method, which is the most rational therapeutic procedure in modern otology, having rendered possible the cure of various lesions of the tube and tympanum.

If inflammation has arisen from the entrance of water into the auditory meatus, Politzer's method should be practised only with great caution, but not at all at the height of acute myringitis, as thereby severe pain or rupture of the membrane would be occasioned. If suppuration has developed and the membrane is still entire, paracentesis should be performed to give exit to the pus. When the perforation in the membrane is large and situated in the inferior segment of the membrane, Politzer's treatment should be followed by insufflation of finely-powdered boracic acid. A lotion of water, alcohol and boracic acid should be instilled if the perforation is small and situated in the upper part of the tympanic membrane. By similar means, otitis externa, furunculosis and myringitis may be treated, the rationale of the treatment being based on the principles of antiseptic surgery, which comprehend all the therapeutics of aural inflammation.

Before advising a course of baths to patients, the physician should ascertain whether they have suffered or are suffering from aural affections, and especially whether these affections are associated with noises in the ears, as such cases are apt to be aggravated by sea-bathing. Many mineral baths, and especially hot baths, are useful in chronic rheumatic affections of the skin, muscles and joints, but not in diseases of the ear, as they affect the vasomotor system and produce hyperæmia of the tympanum and of the labyrinth, and thus aggravate the tinnitus.

The local application of alkaline waters in cases of chronic purulent inflammation of the tympanic cavity only aggravates the disease. Being rich in alkaline and earthy carbonates, such waters deprive the tissues of their tonicity, increase the suppuration, and promote the development of granulations and polypi.

Cold water ought never to enter the auditory meatus of infants and children when they are being washed, because it is apt to give rise to hyperæmia and inflammation of the external and middle ear.

Sea-bathing should never be prescribed in cases of chronic rhinitis or pharyngitis resulting in hypertrophy and hyperplasia of the tissues and consequent degeneration. The best treatment for such cases is galvano-cauterization, chromic acid, etc.

The old stereotyped prescriptions must be abandoned, and each individual case must be treated according to its indications after accurate observation.

The ear is specially affected by various occupa-

tions, handicrafts and professions. In the more intellectual professions, the nervous apparatus of hearing, being in intimate relation with the brain, frequently suffers. Severe mental strain affects it, especially when the general nervous system is exhausted by overwork. From this cause many people are defective in hearing who are devoted to study or engaged in situations involving excessive and continuous mental strain.

Workmen exposed to dust of a more or less irritating nature, namely, miners, millers, sweepers, etc., ought to maintain cleanliness of the external ear in order to prevent aural affections which, although trifling at first, are calculated to produce serious consequences. The dust combines with the wax and forms plugs which set up irritation and produce dermatitis, myringitis, and finally perforation of the tympanic membrane, and purulent otitis media. Dust also, both mechanically and chemically, irritates the respiratory tracts, and produces naso-pharyngeal catarrh which extends to the tympanic cavity.

Some occupations affect the general system, as working in lead and its compounds, which cause what is called Saturnine deafness, and also hemianæsthesia, on which subject Raymond in 1876 published an important work entitled *Thèse sur les hémianesthesies saturnines.*

Brassworkers, engineers, miners, gunners, and generally all those who work at noisy occupations, suffer from serious and often incurable disease of the ear in the structure of the membranous labyrinth, namely, the ampullæ, the vestibule, and the lamina

basilaris, which are affected in the same way as the retina from exposure to very bright light. The continuous excitation caused by the loud noise exhausts the auditory nerve. In the case of gunners and artillerymen, the loud report caused by firing a cannon may produce rupture of the tympanic membrane and paralysis of the auditory nerve.

Many occupations expose operatives to cold and wet, which produce catarrh of the naso-pharynx, which by extension results in stenosis of the Eustachian tube, catarrhal otitis and deafness. The men most subject to affections of the ear are engine-drivers and railway employés, both from exposure to the weather and to the incessant loud noises. It is only possible to effect improvement or cure in such cases by removing the patient altogether from the sphere of the cause of the affection.

Railway operatives suffering from aural affections are apt to cause serious disasters, because they may not hear the sound of the whistle. Like people suffering from colour-blindness and unable to distinguish certain colours, the ear in such cases fails to perceive high notes or acute sounds. Moos brought this matter before the International Otological Congress at Milan in 1880, and others have drawn attention to it, namely, Grazzi of Florence, Masini of Genoa, Sapolini of Milan and the author in his 'Diseases of the Ear.' In order to prevent accidents, an aural surgeon should be appointed to make a thorough examination of the ears of men when applying for work on railways, and also to examine at intervals, especially in the case of those who

have previously been complaining of noises in the ears, dulness of hearing, giddiness, etc.

The habit of snuffing is apt to give rise to serious affections of the ear. The snuff causes catarrh of the naso-pharynx, which extends to the Eustachian tube and middle ear.

Tobacco, especially when chewed, exercises a dulling or toxic effect on the auditory as well as the optic nerve.

In the treatment of patients suffering from nervous disease, the ear plays an important part, as it is the chief medium through which impressions are transmitted from the outer world. Music has therefore found a place in modern therapeutics. The author remembers a demonstration of the musical treatment given at the Salpêtrière in Paris in 1882 by Charcot in a special class of patients suffering from nervous diseases in whom the mind was gravely affected.

Colombat in his work *De la musique dans ses rapports avec la santé publique*, 1873, proposes that music should be studied in its hygienic, etiological and therapeutic relations. He defines its influence under three heads : (1) It awakens new sensations. (2) It interprets to the mind and heart varied ideas and sensations, and produces a physical reaction. (3) It affects the ego directly, calling forth emotions and sensations already experienced, and through the association of ideas it exercises the greatest influence on the moral and physical well-being.

Music is variously appreciated according to age, temperament, sex and disposition of the hearer, and

according to its peculiar character and the circumstances in which it is produced.

The influence of music quickens the pulse, animates the countenance, and even assists the function of digestion and invigorates the muscular system.

Gretry describes the effect of music on the circulation. He put three fingers of the right hand on the left brachial artery, and sang an air to the measure of the beat of the pulse in the artery. After an interval of a few minutes he sang an air of a different rhythm and character, and then he felt distinctly that the pulse was altered.

Berlioz gives a graphic description of the effects which proved of constant assistance to him in the execution of his musical masterpiece. 'Nothing,' he says, 'could give a precise idea of such phenomena to anyone who never had the opportunity of experiencing them. All my being seemed affected by a fibrillary and vibratory movement. At first there was a delightful feeling, in which reasoning had no part. The emotion increasing in a direct ratio to the intensity and sublimity of the theme, produced a strange excitement in the circulation. The arteries beat strongly, and the tears which usually indicate the close of a paroxysm only denoted a progressive condition. Spasmodic contractions of the muscles took place, as also a convulsive trembling of the limbs, a feeling of numbness or anæsthesia in the extremities, a slight degree of paralysis, and finally giddiness and faintness.'

Hugo van der Goes, the celebrated Dutch painter, the pupil and successor of Jean van Dyck, driven to despair and madness by the death of his wife, re-

covered his reason by the influence of music. In the convent where he was confined, the hymns and religious music he heard had the effect of allaying his paroxysms of excitement, and one day, at the close of a chorus rendered expressly for him, he wept and regained his reason.

There are sounds calculated to excite feelings of apathy and melancholy, and music may produce undesirable impressions in some cases. In some consumptive patients melodious music gives rise to a feeling of breathlessness and oppression.

Music regarded as a means of popular education exercises greater moral influence than any other art, as it is capable of evoking the noblest sentiments. All the other arts seem quite still, while music is full of life and movement by reason of the contrasts of its tones and the combinations of most varied measures. The element of vitality in music enlivens the dullest minds, and calls forth thoughts varied and profound.

The simplest affection of the ear, such as an accumulation of wax, may lead at length to serious defects of hearing. The hygiene of the ear is of special importance to singers, as acuteness of hearing is even more necessary to them than vocal power. With a weak voice and perfect hearing, results may be obtained which are impossible to singers with imperfect hearing. A singer or musician should at once seek rational treatment for the slightest affection of the ear. Perfect hearing enables an artist to sing in correct tune, and to measure exactly the intensity of sound he is producing. Many artists are compelled to give up their

calling through slightly imperfect hearing. Many people are considered to have no ear for music who are only suffering from defective hearing, requiring appropriate treatment, the affection being quite curable.

Vigna holds that, with relation to what is called 'musical ear,' it is necessary to consider chiefly the quality of the sound, and not simply the degree of acoustic sensibility. Some musicians whose hearing is somewhat dull are able to appreciate the smallest differences of tone. This peculiarity has been observed in the case of a well-known master.

The late Biagio Miraglia, professor of phrenology, speaking on the subject of musical talent, made the observation that it does not depend on the ear alone, which simply transmits to the brain the sounds received. It is the brain which perceives and appreciates them, and gives them the harmony and melody which constitute music. While it is necessary to have a perfect auditory apparatus for collecting sonorous vibrations, the organ of musical talent is to be found in the brain.

The great composer Beethoven became very deaf long before age overtook him, and still he continued to write the notes of music which originated in his mind.

CHAPTER IV.

GENERAL OBSERVATIONS.

The most common periods for occurrence of ear diseases—Puberty, menstruation, and pregnancy in relation to disease of the ear—Sex and aural disease—Aural symptoms in hysteria—Danger of delaying treatment of affections of tympanic cavity—Cure of ear disease inversely proportional to age of patients—Drugs as causes of disease of the ear—Artificial aids to hearing—Fraudulent advertisers—Quack nostrums and ear-drums—Evils resulting from instilling oil in the ear and applying irritating substances—Disease of the teeth as a cause of ear affections—Meningitis mistaken for extension of ear disease to brain—'The opium of the ear'—Influenza as a cause of serious disease of the ear—Microbes associated with nasal catarrh and inflammation of the tympanic cavity—The telephone as affecting the ear—Appeal to teachers and guardians of youth in regard to the early recognition and treatment of ear disease.

In the preface to his *Trattato sulla Difteria*, 1887, the author states that it is more necessary to educate woman than man in the subject of hygiene, because she is the faithful guardian of the health of the family and of society. The history of all ages demonstrates that the civilization of a nation always progresses at the same rate as the intellectual and moral culture of woman. Montesquieu has said: 'Man makes the laws, but woman makes the morals.' As woman exercises the most powerful

influence on the well-being of the human family, she ought to receive a sound and useful education. She should study geometry and foreign languages less, and natural history, and science, and the language of her own country, more. She should also know the first principles of hygiene and medicine. On account of the important duties which mothers have to discharge in the treatment of sick children, they ought to learn what is necessary to assist the physician. This specially applies to the period of life at which ear disease is most liable to occur.

The period in which diseases of the ear occur most commonly, as statistics have shown, is from infancy to puberty. This does not arise from the weakness of the organ of hearing, as is commonly supposed, but from catarrhs of the nose and throat, which occur so frequently at that period, as also from development of adenoid tissue in the naso-pharynx, and from infectious fevers and constitutional disorders which specially affect the same region. Diseases of the respiratory passages and of the lungs tend to produce inflammatory complication in the middle ear, either mechanically, as in the effort of coughing, or by extension of the specific infecting virus. In cases of infective fevers or inflammation of the respiratory organs occurring in children, it is absolutely necessary to make a careful and systematic examination of the ear.

The hearing should always be examined in cases of suspected syphilis, which specially affects the internal ear. It may be assumed that a patient is suffering from syphilis when extreme deafness sets

in during a short period, as of a few months, without any previous affection of the middle ear.

One of the chief causes of ear disease is the prevalence of infantile affections in lymphatic or scrofulous constitutions, and more especially in inherited scrofulo-syphilis. In such patients the diseases affecting the mucous membrane of the posterior wall of the pharynx assume a chronic character, and extend by the Eustachian tube to the tympanic cavity, the covering of which is a continuation of the mucous membrane of the pharynx.

The treatment of acute and chronic affections of the nose and throat should never be neglected. Not only are they the direct cause of ear disease, but they render these mucous surfaces a ready soil for the development of microbes of various infectious diseases, for example, diphtheria, measles, scarlet fever, etc. Statistics have proved that people suffering from inflammation in these situations furnish the largest proportion of cases of disease of the ear.

In the period of puberty, the ear, equally with the other organs, is influenced by the process of the completion of development. The Eustachian tube and the external auditory meatus are fully developed in their osseous portions, and the cavity of the tympanum becomes smaller by the gradual development of the promontory. In such a period of physiological activity, if the ear is affected, its condition will be aggravated; suppurative inflammation will assume a very acute character, granulations and polypi will develop, and the bone will at length be affected. When chronic naso-pharyngeal catarrhal processes

assume an acute phase, the ear is often involved or its diseased condition aggravated. Hence prompt treatment of ear disease is necessary, especially at the period of active development, so that the integrity of the organ may be preserved. At that stage of life the health of all the organs of the body should be carefully maintained, in order that they may avail themselves of the higher degree of vitality and nutrition. This view is quite the reverse of that which people generally hold.

What has been said regarding puberty applies also to the menstrual period, on account of the close vaso-motor relations existing beween the genital organs of woman and the organ of hearing, both in its middle and internal portions. Rational hygiene, based upon pathology, indicates immediate treatment of functional disorders of the genital organs, especially in women. During the menstrual period an aggravation of the symptoms of ear affections is observed, especially in lesions of a trophic and nervous character, as in the early stages of sclerosis of the tympanum, and, moreover, if the labyrinth is involved, and also in suppurative inflammation of the middle ear.

We must protest against the empirical practice of attributing to pregnancy several painful diseases of the ear. The author remembers a case of furunculosis of the ear occurring in a lady who had been condemned to look forward to delivery for the miraculous disappearance of the disease. By appropriate treatment she was cured in a few days. The same thing is believed with regard to suppuration in the tympanum and other diseases of the ear.

Sex plays an important part in the causation of disease of the ear. Men, being more exposed, suffer more than women. In childhood the sexes are affected more equally.

In affections of the internal ear it is advisable to ascertain whether symptoms of hysteria are present, and in all affections of the nervous structures of the ear the general state of the nervous system should be examined. Nervous disorders in general may give rise to disturbances of the vaso-motor supply in the internal ear, and cause tinnitus and deafness, and at length may produce also a serous exudation in the middle ear, as has been demonstrated by Drs. Clarence J. Blake and L. Walton, in a work entitled 'Aural Symptoms in Hysteria, and the Hysterical Element in Aural Diseases,' 1885.

The treatment of ear affections should always be adopted at once, especially of catarrhal and purulent inflammation of the tympanic cavity. Delay means an increasing obstacle to a cure, and the loss of hearing is more or less proportional to the extent of the disease in the ear. There is less possibility of cure in an ear in which secondary lesions have occurred, such as perforation, thickening, calcareous degeneration, atrophy, cicatrices, adhesions, anchylosis, etc.—results which are diseased conditions in themselves, the causal disease being no longer observable. Moreover, suppuration in close vicinity to the cranial cavity is very likely to produce inflammation of the brain and its membranes, and bring about a fatal result. Not a few children said to be affected with primary meningitis really suffer from the consequences of a purulent discharge from the

middle ear. And yet such a discharge is even regarded by many people as salutary, because they believe the matter is thereby prevented from going to the brain. In course of time the suppuration produces ulceration in the situation of the fenestra ovalis and the fenestra rotunda, and the inflammation spreads to the labyrinth and causes total deafness, which is always incurable.

Bonnafont of Paris has shown that the proportion of cures in cases of diseases of the ear is in inverse ratio to the age of the patients. From infancy to adolescence all patients recover or improve except cases of congenital deafness, or of deafness resulting from lesions in the auditory centre or nerve. From fifteen to thirty years of age, two-thirds recover or improve; the remainder are relieved. After this period, the proportion is reversed, and the number of cases only slightly amenable to treatment or incurable becomes much greater according as the age is more advanced. From these statistics cases of deafness are of course excluded in which the causes are easily removed, as obstruction of the meatus by detachment of the cutaneous covering in old people, as demonstrated by Von Tröltsch, and also temporary obstructions of the Eustachian tube.

Certain drugs exercise an injurious action on the internal ear, namely, quinine and its preparations, and salicylic acid and the salicylates. These remedies are often indispensable, and, substitutes being unsatisfactory, are fraught with positive harm to the organ of hearing. If substitutes are not permissible, the dose should not be excessive, and it should not be repeated at short intervals, except when abso-

lutely necessary. They should not be continued after symptoms of functional disorders of the auditory nerve set in, because these drugs, salicylic acid more than quinine, give rise to hyperæmia in the labyrinth and trophic disturbances in the lamina basilaris, which may become persistent, and at length produce alteration of structure, followed by subjective noises and deafness. The author has often observed the recurrence of symptoms of tinnitus and defective hearing in patients under his care, in whom he has suspected previous treatment with quinine, and as a rule his suspicions have been verified. Of all the preparations of quinine, the salicylate is the most injurious to the structures in the internal ear. This specific action of quinine and salicylic acid on the ear explains the beneficial effect of these drugs in aural lesions associated with motor symptoms, namely, in vertigo, agoraphobia and Menière's disease, as advised by Charcot, who holds that quinine anæsthetizes the sensory centre. In such cases the salicylate of soda effects a still more decided influence, and often acts in cases in which quinine fails.

Chenopodium (goosefoot), which is used as a vermifuge, especially in the United States of America, produces deafness during its administration, and even for a long time afterwards. (Alfred North, in *Journal of Otology*, 1880.)

The hygiene of the ear, like that of the eye, adopts artificial aids. For the history of apparatus for assisting the hearing, such as the ear of Dionysius, the horn of Alexander the Great, the artificial tympanum of Toynbee (1853), and its varied modifica-

tions, the best work for consultation is that of Dr. Rattel (1886), assistant at the aural clinic in the National Institute of Deaf-mutes in Paris, under the direction of Professor Ladreit de Lacharrière. Patients should be warned against quacks and adventurers who advertise 'ear-trumpets and ear-drums which will enable the deaf to hear, or even more than hear, after using them some months, the wonderful instruments being scarcely visible.' It may be stated here that it is scientifically impossible to improve the hearing by means of a hearing trumpet of smaller size than the normal and natural structures, the auricle and the external auditory meatus. The instruments advertised are harmful, because by their presence they irritate and contract the external auditory meatus. In the same category of useless instruments we have to place the acoustic staff, the acoustic fan, etc. Such contrivances cause narrowing of the calibre of the external auditory canal, a smaller number of sonorous vibrations being admitted. By closure of the meatus, the equilibrium of atmospheric pressure on the tympanic membrane is disturbed and subjective noises are occasioned.

As it is impossible to indicate an appropriate lens for defective vision without examining the eye, so is it impossible to say what hearing apparatus is required by a particular patient without examining the ear. On this account it is advisable that patients requiring aids to hearing should consult an aural surgeon, if they do not wish to lose money and endanger the power of hearing which they may have. People should be on their guard against

adventurers, whose design is only to defraud poor credulous patients of their money.

The profession of aural surgery, even at this time of day, does not possess a hearing apparatus constructed in accordance with improvements in electricity and the perfection of the microphone. At the International Otological Congress at Basle, 1884, Baron Leon de Lenval, himself affected with extreme deafness from sclerosis of the tympanic cavity, offered, through Benni of Warsaw, a prize of 3,000 francs for the best application of the principles of the microphone to the construction of an apparatus for improving the hearing in deaf people. The time fixed for the competition expired on September 1, 1888, and the result was to be announced at the fourth International Congress of Otologists, at Brussels, that year; but as the committee did not receive any contrivance worthy of notice, the term of the competition was extended to the next congress, to be held at Florence.

In addition to instruments designed for receiving sonorous vibrations, various kinds of appliances have been made for transmitting the sound to the internal ear by the medium of the bones of the cranium; for example, the antiquated phonopher of the Chinese, the audiphone and the dentaphone. These instruments, devised for the conduction of sound, are of most value in aural practice as means of diagnosis and prognosis; they are not much used as aids to hearing. Both classes of instruments, namely, those acting by transmission of sound through the auditory canal, and those acting by osseous conduction through the cranium, are only applicable in cases

of deafness from lesions in the middle ear, which may be called deafness from a mechanical cause, as from disordered tension, the internal ear being unaffected. A correct diagnosis therefore is always necessary in order to determine whether a particular case can be benefited by any acoustic apparatus.

Fraud is the only object of charlatans who profess to cure deaf patients whom they have never seen. From a few subjective symptoms detailed in a schedule sent through the post a diagnosis cannot be made; a careful objective examination is necessary in each case. 'Chirurgus mente prius et oculo agat quam manu armata.' In fact, the treatment of curable cases of deafness, usually resulting from affections of the middle ear, is mechanical, and not medicinal. Medicinal treatment is indicated when it is necessary to subdue an acute inflammatory process in its early stage, but the restoration of equilibrium of tension in the middle ear is really a mechanical operation, or what may be called intratympanic surgery for an acoustic purpose. The author has obtained good results by such treatment, as, for example, in cases in which the stapes had become fixed and immovable in the niche of the fenestra ovalis, as a result of inflammatory processes in the middle ear.

It is necessary to notice the hearing oils, the so-called artificial tympana, and other nostrums and panaceas of the advertising columns in the journals. It is really high time that the authorities prohibited the impudent advertising of whatever is detrimental to health. The number of the credulous dupes of these unscrupulous advertisers is really very great.

Oils for the ear are not only useless, but very injurious, because they become rancid and irritate the auditory meatus, and provide a soil for fungi, such as the aspergillus, the penicillium, etc. Hence arises otomycosis, producing pruritus and inflammation of the external meatus, which may extend to the tympanic membrane and tympanum, and set up suppuration, resulting in dulness of hearing and deafness. In the category of ear-oils we find 'oil of bitter almonds, oil of white lilies, oil of anise and the like, always to be used warm.' The pulp of colocynth, the juice of cucumbers and their roots, have also been accredited with curing dulness of hearing and deafness.

Patients suffering from deafness should also be warned against the fraudulent pretences of so-called inventors of artificial drums for restoring the hearing in all kinds of deafness, which only injure the ear. These drums are only a bad imitation of Toynbee's artificial drum, with an additional membrane fixed at the outer extremity of the metallic stem, and closing the external meatus. The author has observed those drums in the hands of some of his patients, who, like many others, placing faith in panaceas and miraculous inventions, had been taken in by the impudent advertisement. The construction of the drums betrays ignorance of the anatomical structure of the ear. They are cut like a Maltese cross, and fixed on a brass stalk about three-quarters of an inch long, and sold for fifty shillings, the total cost of making them being about a penny. Along with this apparatus, which is the same for every patient, a powder is also sold, to be used daily like snuff. For all the various affections of the ear

the same appliance is provided. The treatment is not only similar, but identical in all cases. If in individuals in a state of health there cannot be identity, because every individual has his peculiarities, so much more is this true in diseased conditions, each case demanding special examination and treatment.

The use of artificial tympanic membranes is indicated in the cases of patients who have suffered from suppurative inflammation in the middle ear with perforation of the membrane, whatever may be its size and situation. Especially are drum membranes indicated in cases of perforation in both ears. In all cases the suppuration in the tympanic cavity should be first arrested by appropriate antiseptic treatment before the artificial membranes are applied. The improvement of hearing affected by artificial drums depends principally on the slight pressure exerted at a certain point of the remnant of the tympanic membrane.

We have to condemn the old practice of introducing irritating applications into the auditory meatus with a view to allaying the pain of toothache. In so-called reflex otalgia from dental caries, the treatment should be directed to the teeth. The close relations existing between the diseases of the teeth and those of the ear call for careful attention in the practice of aural surgery. At the seventeenth Congress of American Otologists (1884), Dr. Sexton gave a demonstration of the influence of dental irritation upon the ear. He showed a large number of casts of the teeth from cases with prominent symptoms in the ear arising from caries of the teeth or other dental affections which were all cured by

treatment of the teeth. In the *Archives of Otology* for March, 1886, Dr. Dickson Bruns published statistics on this subject based on the cases of fifty patients taken at random who suffered from disease of the teeth and of the ear at the same time. The conclusion he formed was that the case is exceptional in which one can establish a direct or causal relation between disease of the teeth and of the ear, yet it is to be noted that the ear more affected corresponds to the side of the jaw containing the greatest number of diseased teeth. But since these facts are noted especially in scrofulous patients, such cases should be regarded as coincidences. Hence it follows that, in the present actual state of our knowledge, dental irritation considered as a cause of affections of the ear, as formerly believed, is rather the exception than the rule.

No doubt symptoms of irritation in the ear arising from the teeth are observed in the two periods of dentition, and particularly in the temporary period. Some American doctors have sought to establish the relation of cause and effect between dental irritation in the first dentition and reflex otalgia, as well as acute inflammation in the middle ear. The pain might arise from pressure exerted by a tooth on the terminal branches of the trigeminus nerve. Considering that the vagus anastomoses with the glossopharyngeal nerve, which sends some branches not only to the mucous membrane of the pharynx and the Eustachian tube, but also to that of the promontory (Jacobson's nerve), one can understand how vaso-motor hyperæmia may produce at length exudation into the tympanum. Such affection of

the middle ear, whenever it occurs, ought to be treated at once like any case of inflammation, and not left to resolve itself with the development of teething. Prompt treatment of such cases will prevent serious consequences.

Intra-cranial inflammation readily occurs in children by extension through the natural suture in the bone forming the roof of the tympanum. In practice cases of this kind are taken for meningitis. It is always necessary to examine the ears of children to establish a diagnosis of meningitis, as suppurative inflammation of the tympanum is liable to escape observation, the discharge of pus from the ear being frequently overlooked.

Water or other fluids should always be used tepid for injection into the auditory meatus. Warm water allays pain in the ear, hence the author calls it 'the opium of the ear.'

As a cause of serious disease of the ear, we have to refer to the recent epidemic of influenza. The diplococcus of Fraenkl, and the pneumoccus of Friedlaender are found in this affection localized mostly in the respiratory passages. The hyperæmia and microbic catarrhal inflammation extend therefrom through the Eustachian tube to the tympanic cavity. Intense hyperæmia and exudative inflammation of the tympanic cavity frequently occurred in the mastoid cells in patients who had not up to that time been affected by constitutional febrile symptoms of influenza. These aural affections had certain characters altogether peculiar, and different from simple purulent inflammation as observed in ordinary cases produced by the staphylococcus and

streptococcus of suppuration. The author obtained beneficial results from the use of the following powders applied to the nasal passages by means of a powder-blower, namely: (1) boric acid, pure, 6 parts; naphtholin, ·5; antipyrin, 2; menthol in powder, ·15; salol, 4; or (2) boric acid, pure, 5 to 8 parts; salol and antipyrin, 1·5 to 2; hydrochlorate of cocain ·3 to ·6. Although these powders, applied to the nostrils, cannot produce immunity from influenza, yet they are calculated to check its extension, because the pathogenic microbes lodge in the recesses of the nasal passages and are confined to these situations.

In winter and autumn, people who contract coryza readily should snuff daily an antiseptic powder, especially in severe weather, as by warding off acute attacks of coryza painful otitis may be prevented, as also serious bronchial and pulmonary inflammation. In coryza, microbes are usually found in the mucous membrane of the nasal passages.

We may append the following observations regarding the influence of the use of the telephone on the ear, which were made by Professor Lannois of Lyons in a communication to the International Congress of Otology and Laryngology at Paris, 1889.

1. The very frequent use of the telephone does not seem to have any serious effect on the healthy ear, but it is hurtful to an ear affected by previous disease.

2. The effects produced consist of diminution of the hearing power, subjective noises, headache, giddiness, nervous hyper-excitability, and even psychical derangement.

3. Those effects are often temporary, and dis-

appear as the person becomes accustomed to the use of the instrument. In any case they cease after giving up its use.

The author finally appeals to teachers and all who are entrusted with the care and education of children and youth. Teachers should never overlook a pupil with a discharge of matter from the ear, not only in the interest of cleanliness, but for the sake of the hearing of the child and for its very life's sake. Moreover, the matter may contain tubercular germs and inoculate other children. The decomposing fœtid pus from the ear, in addition to the bacteria of suppuration, may contain fungi and also larvæ of insects, which, being transmitted to healthy ears by the fingers, etc., may set up otomycosis and suppurative inflammation.

THE END.

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