

DISEASES OF THE EAR

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649563098

Diseases of the Ear by George P. Field

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GEORGE P. FIELD

**DISEASES
OF THE EAR**

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BY

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SECOND EDITION.

ILLUSTRATED WITH COLOURED PLATES AND WOODCUTS.



LONDON:
HENRY RENSHAW, 356, STRAND.

1879.

160. f. 69.

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DISEASES OF THE EAR.

CHAPTER I.

ANATOMY OF THE EAR.

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In order that the practitioner may be enabled to appreciate the meaning and value of the various symptoms which spring from pathological changes in the different parts of the organ of hearing, a practical knowledge of the anatomy of the healthy ear must be premised. The relative position of adjoining and neighbouring structures must be kept constantly in view; nor must it be forgotten that areas which are apparently distant from the seat of disease, may yet be in close anatomical relationship through the medium of nervous, vascular, lymphatic, or other connection.

The following brief description of the ear, whilst laying no claim to scientific merit, may yet be of value in recalling, or suggesting certain anatomical details to some few of those who may not be disinclined to dip further into the pages on "Diseases of the Ear."

The organ of hearing consists of three distinct parts, named from their relative position, external, middle, and internal ear.

THE EXTERNAL EAR.

The external ear commences in the expanded pinna, which consists of yellow cartilage enclosed within delicate skin. By this trumpet-shaped expansion many, but by no means all, of the sound-waves are collected, to be conducted by the column of air occupying the external meatus down to the parchment of the drum (middle ear), the *membrana tympani*.

Darwin considers that the whole of this external shell is merely rudimentary in man, as are also the various folds and prominences which in the lower animals strengthen and support the ear. ("Descent of Man.") The late Mr. Toynebee, also, after considerable investigation, held the same opinion, and in a case of rodent ulcer for which my colleague, Mr. Edmund Owen, lately removed the whole of the pinna, the sense of hearing did not appear to be in the least diminished by the operation.

The intrinsic and extrinsic muscular bands in connection with the human ear are, beyond all doubt, but rudimentary; though persons are occasionally found in whom the power of moving the pinna persists. It is an interesting fact, that the more nearly the shape of the ear of the quadrumana approaches that of man, the less developed do these proper muscles become.

From an error or arrest in the development of the human ear, the pointed pinna now and then, though rarely, recurs. The appearance thus presented is highly suggestive of the existence of a certain, though perhaps distant relationship, at any rate as regards development, between man and the ape.

The margin of the pinna is called the helix; it "obviously consists of the extreme margin of the ear

folded inwards," whilst the small pointed projection which is tilted forwards from it, represents the apex of the ear of certain lower animals (Darwin). This little blunt point stands strangely outwards in certain men, and was curled upwards and forwards in those statues in which the ancients gave us their idea of the fabulous sylvan deities.

The skin of the external ear, though thin, is so closely connected with the cartilaginous framework that abscesses beneath it are usually small and closely circumscribed; and a cut through the pinna heals but slowly on account of the presence of the cartilage. The lobule, the most dependent part of the external ear, contains no cartilage: it is made of skin and connective tissue, and is but poorly supplied with nerves. The old-fashioned advice to pierce the lobule and insert an earring for the cure of weak eyes (chronic ophthalmia), probably had its origin in the fact that counter-irritation so near to the orbit relieves, in some derivative way, the conjunctival congestion.

Short thick hairs at the entrance of the external auditory meatus guard it somewhat against intrusive insects. The wax secreted by the glands of the canal-wall keep the integument from drying and chapping.

The delicate skin between the pinna and the mastoid process is frequently the seat (especially in children) of intertrigo or eczema. The latter condition not infrequently gives rise to enlargement of the lymphatic gland over the mastoid process. The presence of this lymphatic gland should be borne in mind: it is often the seat of abscess from *impetigo capitis*. It may also take on a chronic enlargement, like the glands under the sterno-mastoid, or, indeed, in any other region.

A small branch of the pneumogastric nerve (Arnold's) is here distributed. This is the twig which the alderman stimulates after dinner with the corner of his napkin dipped in cold water; and so the stomach hurries on the digestive process with renewed attempts at energy.

The external auditory meatus is about three-quarters of an inch long, and starting from the depths of the pinna (concha) between the condyle of the jaw and the mastoid process, passes at first a little upwards and then slightly downwards, until it reaches the tympanic membrane. The main course of the canal is like that of the petrous portion of the temporal bone itself, forwards and inwards. Like an hour glass, it is somewhat smaller at the middle than at either end; so that though a cherry-stone or a pea may lie loose at its inner end, the surgeon may experience considerable difficulty in getting it back through the straits. The cul-de-sac being considerably larger than the cherry-stone or pea, the foreign body will lie loosely, and will not set up nearly as much inflammation as if it were tightly jammed at the bottom of the meatus.

The external meatus is not made entirely of bone, for the cartilage of the pinna runs into it, and the pinna must be drawn well upwards and a little outwards, if the observer is desirous of obtaining a good view of the depths of the canal.

The bony part of the meatus is developed from a separate centre of ossification—the tympanic bone—which appears on the fœtus as a delicate osseous horse-shoe with the gap looking upwards. Within this ring as the frame, the tympanic membrane is stretched.

The meatus is lined with a layer of true skin and epidermis; the former frequently suffers from a chronic

inflammation which causes it to become thickened and to secrete much wax, and also to proliferate epidermal scales to excess. Thus the canal becomes narrowed and often plugged.

Erysipelas of the meatus may spread by continuity of tissue to the middle ear, and even to the membranes of the brain.

We remarked above that the external auditory meatus runs in front of the mastoid process, and it must be remembered that the purulent discharge in otorrhoea may be derived from suppuration going on in the neighbouring (mastoid) cells,—a very grave condition.

The tympanic membrane slants downwards and forwards at the bottom of the external auditory meatus. When healthy it is pearly-white, and so translucent that the handle of the hammer (malleus) may be seen running downwards and backwards across its inner surface. Dragged inwards by the hammer, the membrane is concave on the outer surface, and convex on the tympanic side. It is composed of three layers, of which the middle is the strongest, being made of radiating and other fibres. The outer layer is derived from the epidermis which lines the meatus throughout. Post-mortem soaking of the ear enables the dissector to remove the whole of the epidermis (including that from the membrane) like the finger of a glove. The other side of the membrane is covered by the delicate mucous membrane which lines the middle ear.

The membrane derives a small arterial supply from the vessels of the meatus, but two twigs run into the inner surface along the handle of the hammer; these are derived from the stylo-mastoid branch of the posterior auricular, or from some other tympanic artery.