

**TEXTBOOK OF**  
**OTOLARYNGOLOGY**

**DAVID D. DeWEESE, M.D.**  
**WILLIAM H. SAUNDERS, M.D.**

**SIXTH EDITION**

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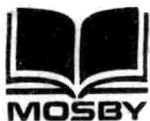
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# PREFACE

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This book is designed primarily for the medical student and the general practitioner. Emphasis is on diagnosis and treatment. The discussions of anatomy and physiology contain adequate data for orientation but are not so detailed that the student is overburdened. The selected readings indicate sources of additional information.

Examination of the ears, nose, and throat requires special techniques and instruments. The first chapter emphasizes this fact. If students are not familiar with these instruments and techniques, and if they do not know normal appearances, they will not be able to diagnose or treat diseases of these parts.

In this edition, as in previous editions, attention is drawn to the new concepts of diagnosis, treatment, and rehabilitation that in the last three decades have broadened the scope of the specialty. Special emphasis is placed on diseases of the salivary glands, the facial nerve, tumors of the head and neck, and speech problems—areas and conditions of importance that are often overlooked. The continuing interest in otologic surgery and in the physiology of hearing has led to careful correlation of disease states and operative procedures with the anatomy and physiology of the ear. In some instances new drawings and photographs have been added or old ones have been replaced to clarify basic concepts.

In the past twenty years the trained otolaryngologist has become the physician who most often treats diseases of the head and neck, with the exception of the brain and the eyes. Therefore additional emphasis has been placed on the management of tumors of the head and neck, on trauma to the soft and bony tissues of the face

and head, and on plastic surgery and reconstructive procedures.

The medical student is advised to read the entire book in continuity, since subsequent chapters enlarge on or complement prior chapters. The basic facts of otolaryngologic diagnosis are in this text. The discussions of treatment, which continues to change as a result of new research and new techniques, will require revision in future editions.

We wish to acknowledge the contributions of photographic material from our colleagues in otolaryngology and allied fields. Credit for these contributions is given in the legends. We wish to recognize the assistance of Jack A. Vernon, Professor of Otolaryngology and Director of the Kresge Hearing Research Laboratory of the Oregon Health Sciences University, for his suggestions in regard to the chapter on tinnitus and for his additions to that chapter. Robert E. Brummett, Professor of Otolaryngology, also of the Kresge Hearing Research Laboratory, was primarily responsible for the section on ototoxicity, and we acknowledge his contribution. We are indebted to Charles Von Wald of Portland, Oregon, for many of the photographs in this edition as well as in the previous editions. For original drawings we are indebted to Clarice Ashworth Francone and Fred Harwin of the University of Oregon Medical School and to Mary B. Meikle and Donna L. Himes of the Kresge Hearing Research Laboratory at the Oregon Health Sciences University. We are equally indebted to several illustrators from The Ohio State University.

David D. DeWeese  
William H. Saunders

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# 1 THE PHYSICAL EXAMINATION

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Examination of the ears, nose, and throat is basically a study of epithelium. Using brilliant illumination, the physician is able to inspect directly or indirectly most parts of the upper respiratory passages. A few parts, such as the nasal accessory sinuses and the middle ear, cannot be visualized. Nevertheless, the examiner is usually able to infer their condition from the appearance of adjacent mucous membranes.

**Lighting.** A great many lighting systems are used. Some, such as the flashlight or otoscope, are entirely inadequate when used anywhere except in the ear. Others, such as electric headlights, are of variable worth, depending on their brightness.

The light par excellence is that reflected from the otolaryngologist's head mirror. A clear 150-watt light bulb provides the light source and is placed just behind and to the right of the patient.

More and more often, otologists are using the Zeiss operating microscope for diagnostic examination of the ear (Fig. 1-1) and sometimes for other parts of the otolaryngeal examination. This instrument provides brilliant illumination and also binocular vision and magnification. It may be used with the patient in either the sitting position or the supine position; and because of its delicate balance, it is as convenient to use as any other lighting system.

**Adjustment of the head mirror.** To adjust the head mirror, one should first place it well down over the left eye so that the back of the mirror actually touches the skin or glasses (Fig. 1-2).

Then the right eye is closed and the light is focused on the patient's face to a small, brilliant spot. Too often the beginner fails to keep the light bright because he neglects to move his head toward or away from the patient. Obviously, since the focal length of the mirror is fixed, the only way the examiner can maintain a sharp focus is by adjusting his head position. Once the left eye is focused, the right eye may be opened for binocular vision. After a little experience, focusing becomes automatic and preliminary monocular focusing is not necessary.

If they wish, patients or students can observe part of their own examination (Fig. 1-7).

**Use of the tongue depressor.** The tongue depressor is held in the left hand (Fig. 1-3), so that the right hand is free to hold other instruments or to position the head. Tongue blades may be either the wooden type or the metal type. Most examiners prefer the wooden ones.

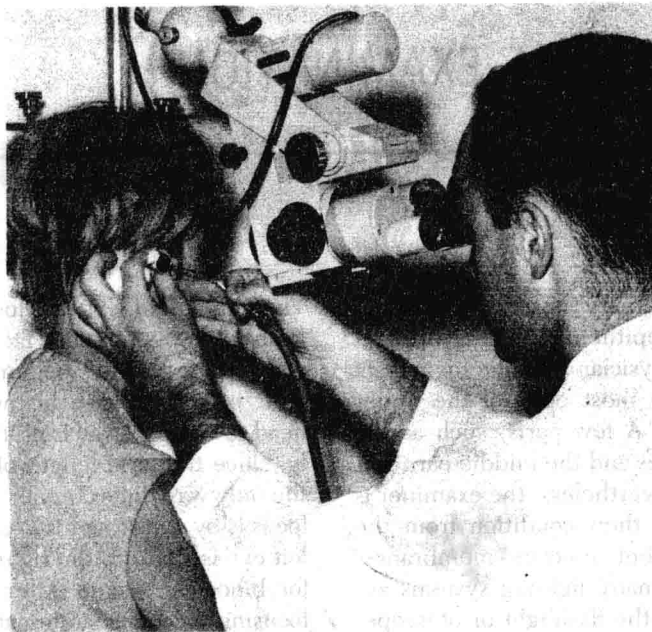
The blade should be placed on the middle third of the tongue. If placed too far anteriorly, it causes the posterior part of the tongue to mound up, obscuring rather than exposing the pharynx. On the other hand, most patients gag if the blade touches the posterior third of the tongue.

The correct maneuver depresses the tongue and scoops it forward at the same time. The blade is held in the corner of the mouth so that it will not be in the way of the instruments held in the right hand. The examiner should be careful not to press the patient's lower lip against the teeth.

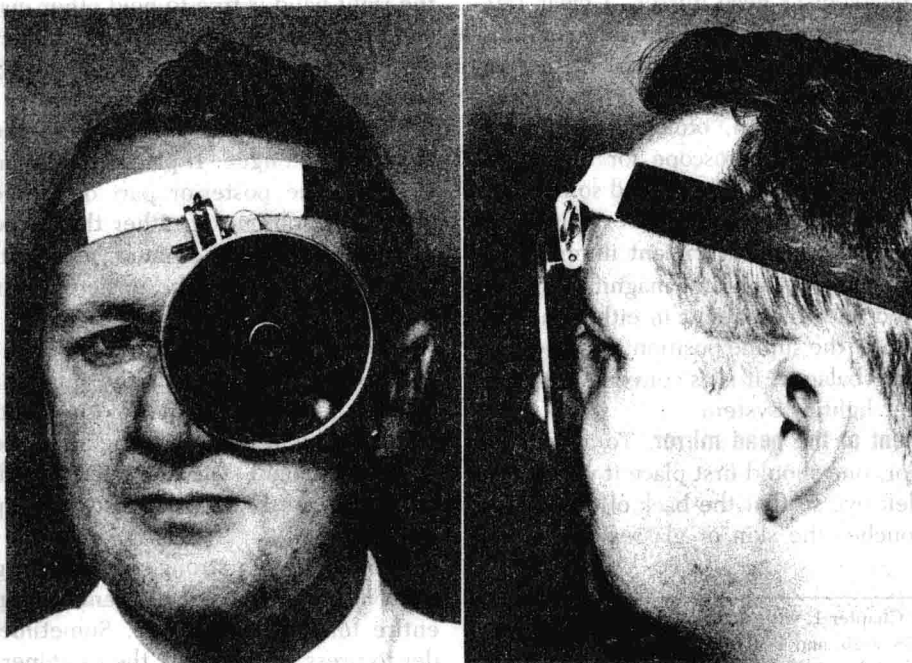
The tongue is a strong, muscular organ. One need not (and occasionally cannot) depress the entire tongue at one time. Sometimes, in order to press more firmly, the examiner may use two tongue blades, one placed on top of the other.

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The text for Chapter 1, with slight modifications, and Figs. 1-4, 1-8, 1-18, 1-25, and 1-30 taken from Saunders, W.H.: Ears, nose, and throat. In Prior, J.A., Silberstein, J.S., and Stang, J.: Physical diagnosis: the history and examination of the patient, ed. 6, St. Louis, 1981, The C.V. Mosby Co.



**FIG. 1-1.** Operating microscope used as a diagnostic instrument. Small aural suction tip aspirates serum or pus from the ear canal or middle ear.



**FIG. 1-2.** A, Head mirror in position. Note that the mirror is worn *very close to the face*. It is directly in front of the pupil. B, Lateral view.

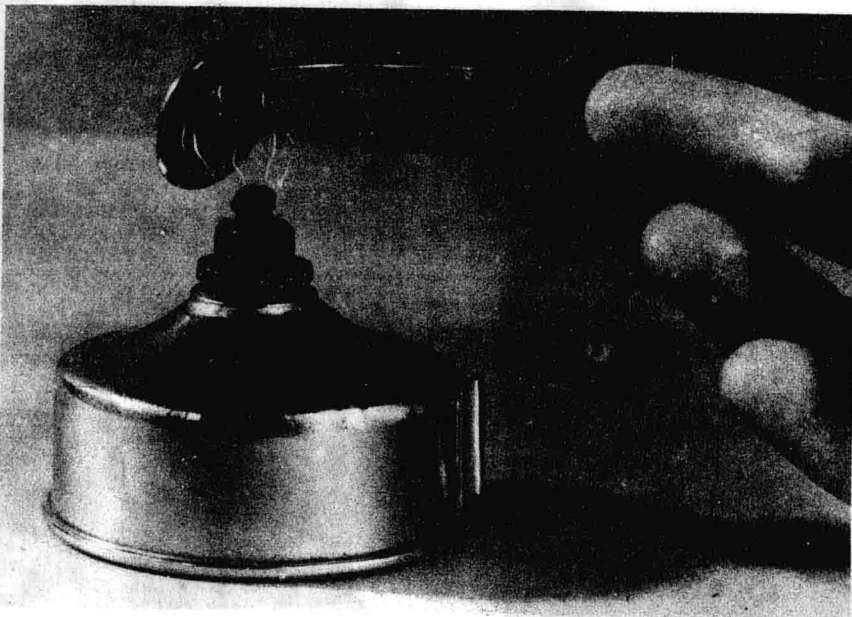


**FIG. 1-3.** Use of the tongue depressor. Note that the left hand is braced on the cheek; the right hand positions the head.

**Warming the mirror.** To prevent fogging, the examiner should use the flame of an alcohol lamp to warm the mirror to be used in examining the nasopharynx or larynx (Fig. 1-4). The glass surface is placed directly into the flame for a few seconds. The back of the mirror is then tested for warmth on the examiner's hand. Because children are sometimes frightened by the open flame, one may simply dip the mirror into a container of warm water before examining a child.

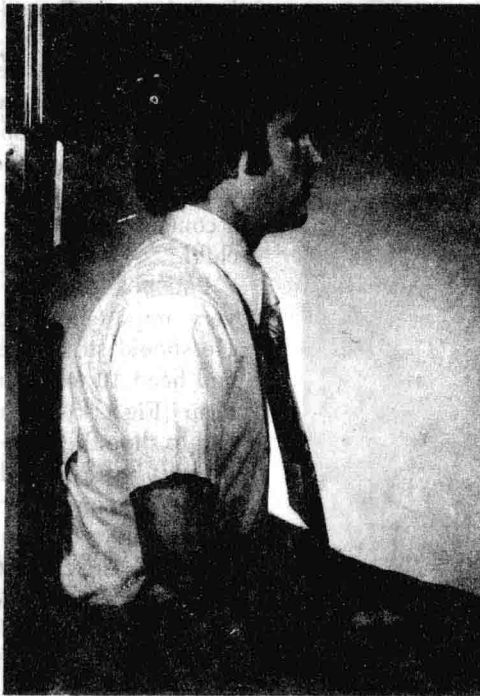
**Patient's position.** The patient's position is very important in otolaryngeal examinations. He should sit very erect, with knees together and head 10 to 12 inches from the back of the chair (Fig. 1-5). Many patients tend to slump and to slide their hips forward in the chair. The use of a headrest is discouraged because it fixes the head in one position and hinders the adjustments of the head position that are constantly required. The correct position is not restful, but the examination is not so long as to be tiring.

**Cotton applicator.** The cotton applicator is one of the most useful instruments in otolaryngeal examination. The examiner must learn to prepare his own, because commercial applicators



**FIG. 1-4.** Warming the mirror. The glass surface is placed directly over the flame.

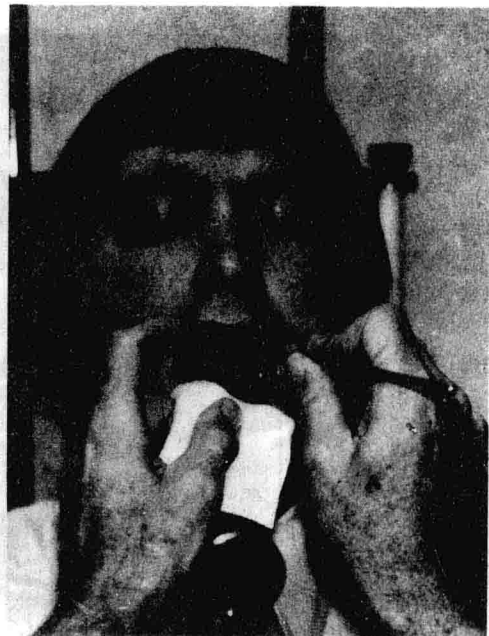




**FIG. 1-5.** Patient's position. The head and shoulders are drawn forward, with the hips against the back of the chair. Each patient must be positioned, often several times.



**FIG. 1-6.** Winding a cotton applicator.



**FIG. 1-7.** By holding a large mirror, the patient can see his own larynx, nose, and nasopharynx.

are never satisfactory. A stiff wire is used, and a small piece of loose cotton is wound around it (Fig. 1-6). The tip of the wire is placed in the center of the cotton, and the cotton is twisted onto the wire, leaving a small tuft at the end. The tuft may be firmed or left loose as the situation demands. Beginners often make their cotton applicators too thick or fail to have a very small tuft at the tip.

## EARS

**Auricle.** Conditions that affect the auricle are usually obvious and require little explanation. Some patients have congenitally deformed auricles that are too small (microtia) or too large (macrotia). Other ears stand out too prominently from the head (lop ears). Rarely, patients have no auricle at all, or a normal auricle may be associated with an atretic ear canal.

The examiner should inspect and palpate the auricle. Movements of the auricle and tragus are painful in external otitis but are not painful in otitis media. A postauricular scar indicates an old mastoidectomy.

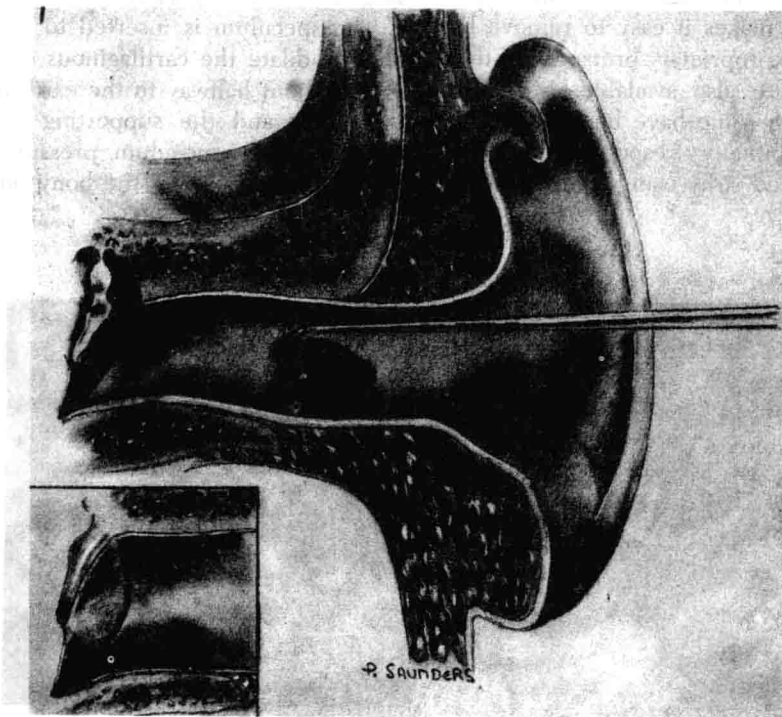
A small dimple just in front of and slightly

above the tragus is a remnant of the first branchial apparatus.

The need for inspection of the external ear is so obvious that it is frequently neglected, although it should require only a few seconds. Occasionally *tophi*, which are small white deposits of uric acid crystals that result from gout, are seen along the margins of the auricle. The gnarled, thickened *cauliflower ear* is the result of repeated trauma to the cartilage. Evidence of injury or congenital malformation is usually obvious.

Next, one inspects the external auditory canal and the tympanic membrane. In physical diagnosis, the tympanic membrane, or eardrum, may be regarded as a translucent membrane through which the otologist views normal anatomy and also pathologic processes in the middle ear.

**Cleaning the ear canal.** The most important step in preparing to examine the eardrum is making sure that the ear canal and the surface of the drumhead are clean. Wax, particulate matter, and all pus and secretions must be meticulously removed. This caution seems ob-



**FIG. 1-8.** Use of the cerumen spoon. *Inset*, Hematoma, which is easy to produce unless care is taken.

vious, but neglect of this preliminary is the rule. Actually, an experienced examiner may take several minutes to remove debris from the ear canal before he or she is ready to study the drumhead.

There are three methods of cleaning the ear canal. Often the simplest way is to remove particulate matter with a cerumen spoon (Fig. 1-8) or cotton applicator while working under direct vision through the ear speculum. The cerumen spoon should be inserted above the impacted wax; careful withdrawal of the spoon, which has been engaged in the wax, dislodges the wax. Because the epithelium covering the inner aspect of the ear canal is exquisitely sensitive, great care must be used in these manipulations to prevent pain and bleeding.

The second method of cleaning the ear canal is by irrigation (Fig. 1-9). Tap water is used—at body temperature, because water at any other temperature stimulates the inner ear and causes dizziness. If the cerumen to be removed is solidly impacted, and especially if it is dry and hard, irrigation may not be successful unless it is preceded by having the patient instill a few drops of mineral oil or so-called “sweet oil” in the ear for three or four nights. This oil softens the cerumen and makes it easy to remove by irrigation. Various proprietary preparations that will soften wax are also available. Most are harmless, although some have been known to cause a local inflammatory response.

The third method is by using a small, angu-

lated suction tip to aspirate pus or other liquid material from the ear canal (Fig. 1-1). This method is especially useful when pus coming through a perforated drumhead fills the middle ear as well as the ear canal. Then, by carefully advancing the suction tip, the examiner may clean the ear canal and finally the middle ear space itself of pus so that the ear can be examined.

• • •

A good way to begin the examination is to pull the auricle upward and backward and the tragus forward (Fig. 1-10). This maneuver opens the meatus and may even provide a good view of the drumhead. It also lets the examiner select an aural speculum of proper size.

**Examination with the aural speculum.** Most otologists employ a metal ear speculum and a head mirror to examine the drumhead. Generally, other practitioners use an electric otoscope (Fig. 1-11). Whichever instrument is used, the principles of examination are the same. *The speculum selected should be the largest that will fit the canal.* The student usually makes the mistake of choosing a small speculum when a large one could be used.

The speculum is inserted to straighten and slightly dilate the cartilaginous ear canal (Fig. 1-12). About halfway to the eardrum the cartilage ends and the supporting wall becomes osseous. Here speculum pressure is painful. The epithelium lining the bony portion of the

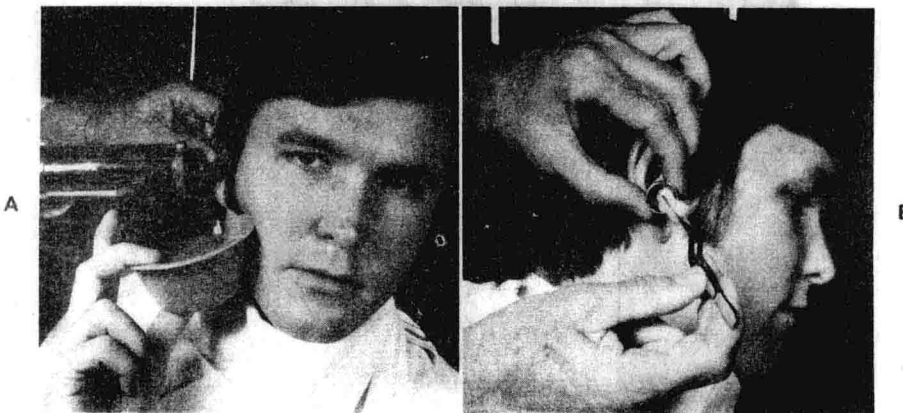


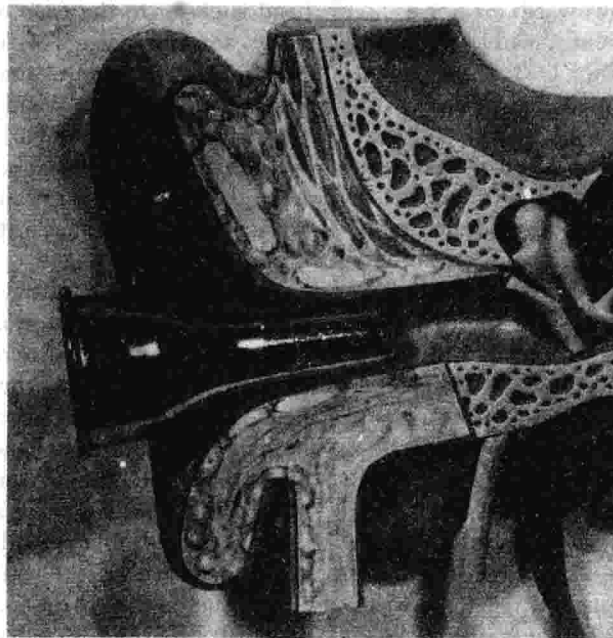
FIG. 1-9. A, Aural irrigation using tap water at body temperature. B, Drying the ear canal after irrigation.



**FIG. 1-10.** Spreading the meatus—a preliminary step.



**FIG. 1-11.** Electric otoscope. Traction on the auricle straightens the canal.



**FIG. 1-12.** The speculum dilates and straightens the cartilaginous portion of the ear/canal. If it is pressed against the inner, bony canal, it causes pain.

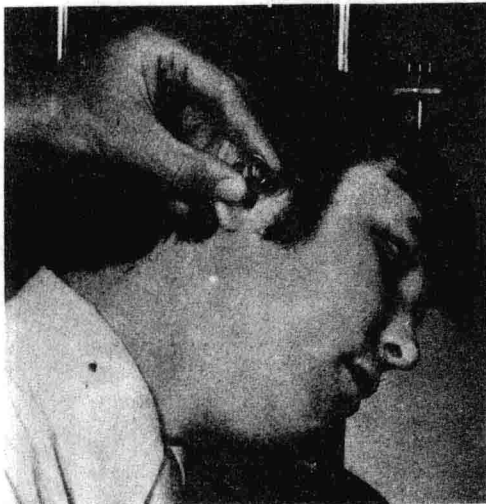


FIG. 1-13. Note that the head is tipped to one side. Also, note how one hand holds both the speculum and the auricle.

canal is very thin and exquisitely sensitive. One must be very gentle when cleaning the inner half of the ear canal—even more so than when cleaning the outer surface of the drumhead. In adults the ear canal may be straightened by pulling upward and backward on the auricle; in young children and infants it is straightened by pulling the auricle downward.

The position of the patient's head is important in aural examination (Fig. 1-13). One might think that with the patient's head perfectly upright the examiner could look directly into the ear canal and see the drumhead. This is a common error. Because of the oblique direction of the ear canal, the patient's head must be tipped sidewise (toward the opposite shoulder) for easy examination of the canal and drumhead. Students who neglect this step find that they are looking at the wall of the ear canal and not at the drumhead. It is usually necessary to change the head position several times in order to visualize all parts of the tympanic membrane.

**Layers of the drumhead.** There are three layers in the drumhead: an outer squamous epithelium, an inner cuboidal epithelium, and a middle fibrous layer. These layers constitute the structure of the pars tensa, which comprises almost all of the drumhead. In a very small part superiorly, known as the pars flaccida, the middle fibrous layer is absent.

When perforations heal in the drumhead, the area of perforation is often translucent or even transparent. The reason is that some perforations repair without formation of a fibrous layer. The healing also leaves that portion of the drumhead flaccid and therefore more easily moved by pneumatic pressure (through an otoscope) than the rest of the drumhead.

**Color of the drumhead.** The color of the drumhead is important because it is relatively constant in health. The normal drumhead is usually described as pearly gray. In disease the color may be amber (serum in the middle ear), blue (hemotympanum), dead white (pus in the middle ear), or red or pink (myringitis or infection of the middle ear). Ordinarily the tympanic membrane is quite shiny.

Dense white plaques representing deposits of calcium-like material are seen in some drumheads affected with tympanosclerosis. Other patients with tympanosclerosis have drumheads showing small white flecks scattered throughout the pars tensa. Ordinarily these minor changes merely indicate old, healed disease of the middle ear or tympanic membrane. They do not mean active disease.

**Position of the drumhead.** The position of the drumhead is oblique with respect to the ear canal. The upper posterior part of the drumhead is closer to the examiner's eye than is the lower anterior part. This obliqueness is more pronounced in infants than in adults. Sometimes all of the drumhead cannot be seen because the floor of the ear canal is at a higher level than the lowermost part of the drumhead. Also, the anterior part of the drumhead may be hidden by prominence of the bony wall of the ear canal.

The drumhead is also very slightly conical, with the concavity external. When pus forms in the middle ear because of otitis media, intratympanic pressures are raised and the drumhead actually bulges outward. Sometimes this bulging is in one part of the drumhead only; at other times the entire drumhead bulges so that none of the landmarks are seen.

A "retracted" drumhead occurs when intratympanic pressures are reduced. In such a situation, the entire drumhead is depressed by external atmospheric pressure, the malleus is left in sharp outline, and the malleolar folds are accentuated. This alteration of tympanic



pressure is common. It occurs when the eustachian tube is obstructed (because of adenoiditis in the child, for example, or as a result of too rapid descent during air travel). Whatever the cause, the tube no longer ventilates the middle ear properly, and oxygen is absorbed from the middle ear and mastoid air cells into the bloodstream. A partial vacuum results. A transudate of blood serum may partially fill the middle ear to relieve the vacuum, and the drumhead appears amber. Also, an air-fluid level may be seen, or bubbles of air may appear in the amber fluid.

**Landmarks.** The landmarks visible in the normal drumhead (Figs. 1-14 and 1-15) vary with differences in its translucency. The *malleus* is the primary landmark. At its upper end the lateral or *short process* stands out as a tiny knob. The manubrium, or the handle of the malleus, extends downward from the short process to the *umbo*. Both the short process and the manubrium are embedded in the drumhead.

When bulging of the drumhead occurs, the manubrium and the short process become less and less well seen until they finally disappear. On the other hand, when the drumhead is retracted, the malleus stands out prominently and the white bone of the short process shines chalky white through the drumhead.

The *anterior* and *posterior malleolar folds* are seen superiorly and enclose between them the *pars flaccida* (Shrapnell's membrane). These folds or epithelium become more prominent when the drumhead is retracted.

The *annulus* is the peripheral fibrous ring of the tympanic membrane that fits in the tympanic sulcus. It looks whiter or denser than the rest of the drumhead. It is complete except superiorly, where it is deficient between the anterior and posterior malleolar folds. The importance of the annulus in aural diagnosis cannot be stressed too much. The examiner must follow the annulus completely around. It is at the periphery of the drumhead that important perforations often occur, and they will not be found unless the annulus is systematically examined.

The *light reflex*, or *cone of light*, reflects from the anterior inferior quadrant when the drumhead is in its normal position and its outer epithelium is normal. The light reflex extends inferiorly and anteriorly from the umbo. Some-

times the reflex becomes broken or muddled, and sometimes it is missing altogether. Such changes usually indicate a disease state, but too much emphasis should not be placed on variations of the light reflex alone.

The *long process of the incus* is frequently visible posterior to the manubrium of the malleus. Whether or not it can be seen depends on the translucency of the tympanic membrane and the shape of the posterior wall of the bony ear canal. When the incus is seen, the examiner can be fairly certain of a normal middle ear.

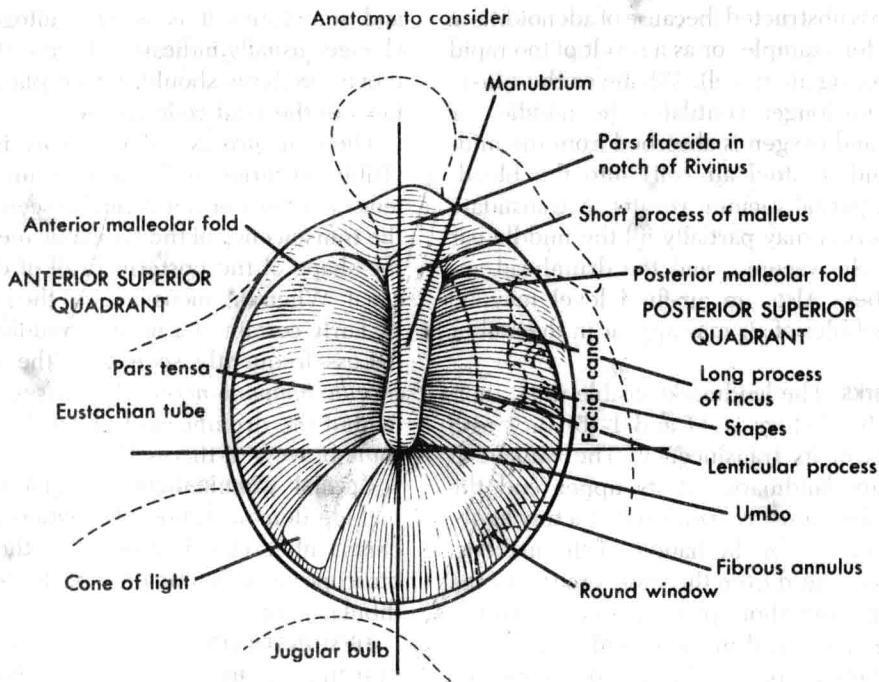
Less frequently seen than the incus is the *chorda tympani nerve*. It crosses transversely behind the drumhead at about the level of the short process of the malleus.

**Special examinations.** Special examinations include demonstration of function of the eustachian tube, examination with the pneumatic otoscope, and examination of the temporomandibular joint.

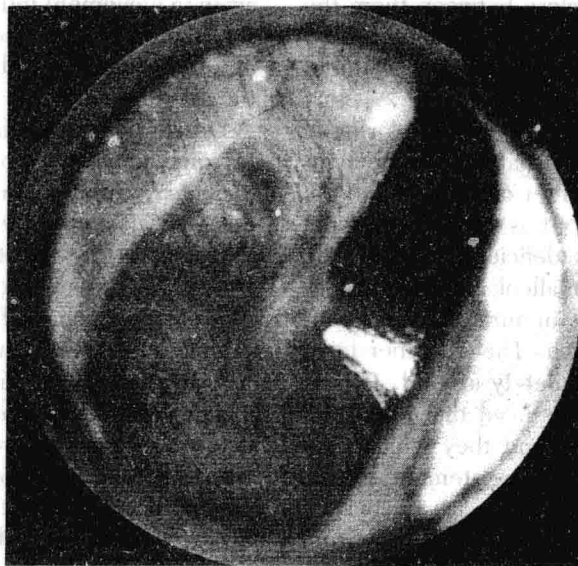
**DEMONSTRATION OF FUNCTION OF THE EUSTACHIAN TUBE.** Function of the eustachian tube may be demonstrated by looking at the drumhead under magnification while the patient holds his nose and swallows. This maneuver reinforces the opening of the eustachian tube, which usually occurs during swallowing. At the moment of swallowing, the drumhead can be seen to flick outward and then inward again, a movement indicating patency of the eustachian tube. Also, the patient feels a sensation of pressure in one or both ears at the height of the swallow.

Demonstration of tubal patency is important in some patients who have certain symptoms (deafness, tinnitus, or dizziness) that may be due to occlusion of the tube.

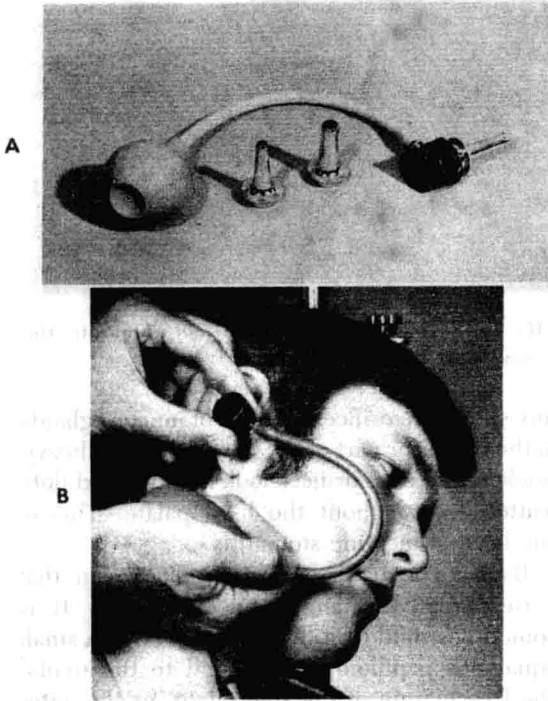
**EXAMINATION WITH THE PNEUMATIC OTOSCOPE.** The pneumatic otoscope (Fig. 1-16) is a useful device that enables the examiner to compress air in the ear canal. This procedure exerts pressure against the drumhead, and it moves in and out as a bulb in the examiner's hand is alternately squeezed and released. Pinhole perforations that otherwise may not be apparent can be detected as middle ear secretions are drawn through them by suction. Certain drumheads will be found to be more flaccid than normal (usually because of healed perforations), and others will not move at all because they are perforated. Adhesions or fluid in the middle



**FIG. 1-14.** Relationships of important middle ear structures. (From Saunders, W.H., and Paparella, M.M.: Atlas of ear surgery, ed. 2, St. Louis, 1971, The C.V. Mosby Co.)



**FIG. 1-15.** Normal tympanic membrane. Note how the anterior wall of the ear canal obscures part of the drumhead. (From Buckingham, R.: What's New, No. 193, North Chicago, Ill., 1956, Abbott Laboratories.)



**FIG. 1-16.** A, Pneumatic otoscope. The speculum that fits this otoscope is attached. The magnifying lens may also be used with the usual type of speculum if magnification only is desired. B, Pneumatic otoscope in use. Note the lateral tipping of the head—the correct position for all otoscopic examinations.

ear may also prevent normal excursions of the drumhead. The pneumatic otoscope can be used to suck down secretions from the epitympanum or mastoid antrum in patients having chronic mastoiditis or to evacuate the middle ear of fluid after myringotomy.

**EXAMINATION OF THE TEMPOROMANDIBULAR JOINT.** It is common to see a patient with ear pain that is the result of referred pain from the temporomandibular joint. If the index fingers are pressed into the joint spaces as the patient opens his mouth widely, pain may be elicited (often only on one side) when he closes his mouth. This pain is commonly referred to the ear, and the patient complains not of a pain in his jaw joint but of otalgia. A common cause is malocclusion.

## OROPHARYNX

The pharynx is divided into three parts—oropharynx, nasopharynx (epipharynx), and hypo-

pharynx. A patient complaining of sore throat might have a generalized pharyngitis involving all three parts; or only one part might be involved, as in carcinoma of the epiglottis, for example. It is necessary to use *different instruments* to see these three parts; and unless *all* parts of the pharynx are examined, the examiner cannot expect to establish a correct diagnosis for the patient complaining of sore throat.

Before any part of the pharynx is examined, the patient should remove his dentures. This is important, not only because the denture itself covers much of the mucosal surface to be examined but also because the lower plate tilts upward, causing gagging, and the upper plate often drops.

**The tongue.** The tongue is examined by both inspection and palpation. Palpation is necessary because some diseases of the tongue cause no surface manifestations and otherwise cannot be detected.

**LINGUAL PAPILLAE.** The filiform papillae are the most numerous. Keratinization of these papillae produces the well-known “coated tongue.” Fungiform papillae are scattered throughout the filiform papillae and are especially abundant on the sides and apex of the tongue. These papillae look like small red dots because the underlying vascular connective tissue shines through the thin epithelium. The circumvallate papillae are arranged in an inverted V at the posterior part of the tongue. The apex of the V is at the foramen cecum. The circumvallate papillae are best examined with a laryngeal mirror.

**VENTRAL SURFACE.** The ventral surface of the tongue toward the floor of the mouth is smooth and shows large veins. In older persons these veins may become varicose.

**FRENUM.** The frenum is found in the midline under the tongue. Rather rarely, this structure is abnormally short and causes so-called tongue-tie. If the patient can protrude his tongue between his teeth, he should have no difficulty with speech.

**GLOSSOPALATINE FOLD.** The glossopalatine fold connects the tongue with the palate and is known as the anterior tonsillar pillar.

**OTHER STRUCTURES.** Other structures associated with the tongue are the lingual tonsils, the valleculae, and the glossoepiglottic folds. These structures are best seen with the laryn-



geal mirror and therefore will be described with the laryngeal examination.

**Floor of the mouth.** The floor of the mouth is another region where palpation is important. Tissues here are loose, and neoplasms sometimes are detectable only by palpation. The submaxillary salivary ducts may contain calculi that are best felt by palpation. Bimanual examination, using one gloved finger inside the mouth and the other hand outside, is best.

**Submaxillary salivary gland.** The submaxillary salivary gland empties into the floor of the mouth on either side of the frenum of the tongue. The orifices of the ducts are quite small, but they may be seen as small dark spots from which clear fluid can be expressed by pressure over the submaxillary gland. The orifices of the sublingual glands are not seen.

**Teeth and gingivae.** There are 32 teeth in the full adult dentition. The teeth are inspected for evidence of caries and malocclusion. Sometimes it is worthwhile to percuss a tooth to elicit tenderness in patients suspected of having a dental abscess.

The gums should be inspected and at times palpated. Bleeding from the gums is not unusual and at times is the sole cause of expectorated blood. In adults the gums gradually recede from the teeth and expose a larger and larger amount of tooth root.

**Buccal mucosa.** The parotid duct opens into the buccal mucosa opposite the upper second molar (Fig. 1-17). The orifice is larger than the submaxillary orifices and readily admits a probe. Pressure over the parotid gland produces a clear secretion.

In most adults yellowish glandlike structures may be seen shining through the buccal mucosa. They are sometimes mistaken for an abnormality, but they actually represent sebaceous glands lying directly under the squamous epithelium of the oral cavity.

Frequently there is a white line of parakeratin in the buccal mucosa adjacent to the occlusal surfaces of the molars. This results from invagination of the cheek between the teeth or from sucking on the cheek.

**Palate.** There is a distinct difference in color between the hard and soft palates. The soft palate is pink and shows fine vessels under the mucosa. The hard palate is whiter, more irregular, and has rugae running transversely. Scru-



FIG. 1-17. Parotid (Stensen's) duct, opposite the second superior molar tooth.

tiny shows the orifices of ducts of mucous glands in the posterior part of the hard palate. In heavy smokers the duct orifices look like tiny red dots scattered throughout the hard palate. This is one form of nicotine stomatitis.

**Uvula.** The uvula is a muscular organ that varies greatly in length and thickness. It is sometimes bifid (Fig. 2-11). Frequently a small squamous papilloma is attached to the uvula, the free margin of the soft palate, or the anterior tonsillar pillar (Fig. 2-12).

**Tonsils.** Normally the palatine or faucial tonsils do not project much beyond the limits of the tonsillar pillars (Figs. 1-18 and 3-1). They are approximately the same color as the rest of the oral mucosa. There are crypts in the tonsils in which squamous epithelium exfoliates. Some patients have deep crypts; in such patients plugs of epithelial debris push toward the surface, where they appear as white spots on the tonsils. In other patients white spots on the tonsils may indicate follicular tonsillitis.

It is sometimes helpful to retract the anterior tonsillar pillar for better visualization of the tonsil. Palpation of the tonsil is important if a neoplasm is suspected.

Tonsillectomy is common. It is usually simple to tell when a patient has had a tonsillectomy because of the changes in the anterior or posterior pillars that occur with healing. Also, lymphoid nodules may remain in the tonsillar fossa and form so-called tonsillar tags.

**Posterior pharyngeal wall.** The posterior pharyngeal wall is the part of the pharynx that is visible when one uses only a tongue blade. Students are prone to speak of hyperemia or "injection" of the throat when they see any vessels on the posterior pharyngeal wall. Usually these small vessels are normal and do not represent