DISEASES OF THE NOSE AND THROAT

BY

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DISEASES OF THE NOSE AND THROAT

To

GILBERT J. PALEN, A.B., M.D., F.A.C.S.

This work is dedicated
in recognition of his encouragement
and assistance in the early years
of the author's medical career.

PREFACE

Several years ago the author, in collaboration with Dr. Gilbert J. Palen, prepared and published a small work upon the ear: "The Practitioner's Otology." The reception of this was such as to prompt the preparation of a similar work upon the Nose and Throat for the undergraduate medical student and the general practitioner.

Patients presenting nose and throat symptoms demand more than a consideration of the local part affected, for many of these manifestations are due to general systemic deviations, some hygienic omission, dietary indiscretions or climatic influences. The practitioner is enjoined to consider these relationships in order to arrive at a proper understanding and to have at hand the necessary data upon which appropriate treatment may be outlined.

The Homeopathic remedies referred to in this work are academically incomplete. It would be impossible to cover this phase of the subject without incorporating an extensive treatise upon Homoeopathic Materia Medica. The remedies mentioned in this book are those we have found useful in actual practice.

Details of pathology and surgical procedures have been curtailed or omitted. The attempt has been made to produce a quick and ready reference to the more common nose and throat conditions.

J. V. F. Clay.

TABLE OF CONTENTS

CHAPTER I

ANATOMY OF THE NOSE

The nose is divided into an external portion, presenting as a part of the face, and an internal part, divided into two chambers by a medially placed septum or partition.

The *external nose* consists of a bony and cartilaginous arch, covered with muscle fibers, periosteum, perichondrium, and integument. The external bony arch is formed by the articulation of the nasal bones, the nasal spine of the frontal bone, and the nasal processes of the maxillary bones. The cartilaginous portion consists of two lateral plates divided into superior and inferior portions and three sesamoid cartilages on either side bound together by connective tissue. The cartilaginous septum occupies a median position. (See Plate I.)

The *internal nose* is divided into two parts or chambers by the median placed septum and each half presents a vestibule and nasal fossa. The vestibule is the space just inside of the nose which, under normal conditions, is patulous and contains numerous hairs. (See Plate II.)

The *nasal septum* extends from the base of the skull above to the upper surface of the hard palate below, and from the sphenoid posteriorly to the vestibule anteriorly. It is formed by the crest of the sphenoid, crest of the nasal bones, nasal spine of the frontal bone, perpendicular plate of the ethmoid, the vomer and the median crest formed by the apposition of the

palatine plates of the superior maxillary bones, the horizontal plates of the palatine bones and a quadrilateral shaped cartilage. It is seldom perfectly straight but inclines to one side or the other. (See Plate III.)

The *nasal fossæ* (See Plates IV and V), one on either side of the nose, present for consideration a roof, a lateral or outer wall, a median wall, and a floor. They communicate anteriorly with the exterior through

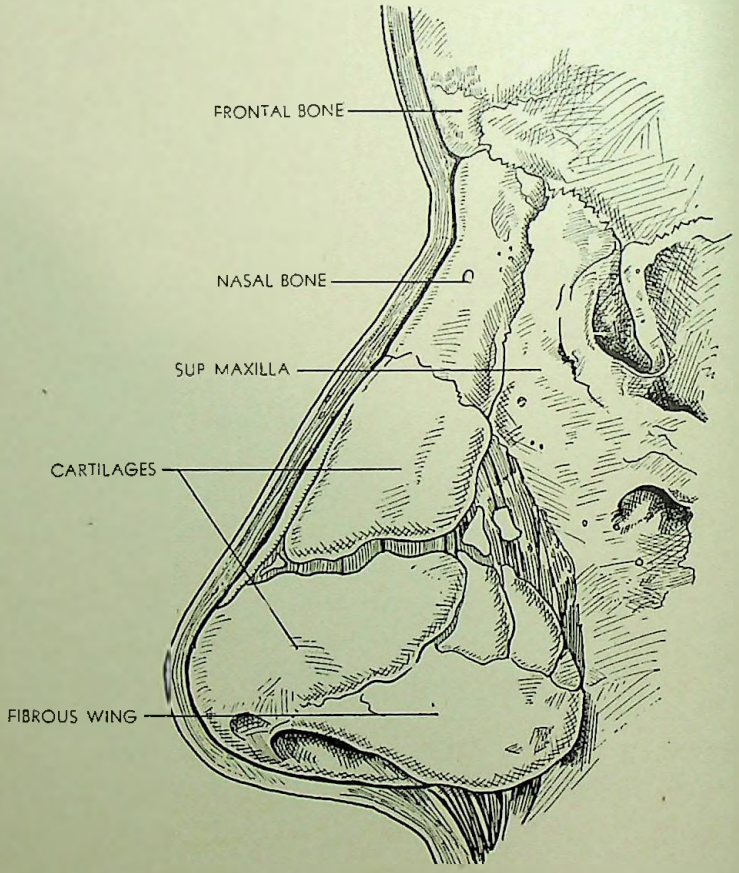

PLATE I—External Nose

the vestibule and posteriorly through the choanæ with the nasopharynx.

The *roof* slopes anteriorly due to the arch formed by the spine of the frontal bone and the articulation of the nasal bones. The posterior slope is formed by the body of the sphenoid. The median flattened bony roof between these two slopes is the cribriform plate of the ethmoid.

The *median lateral wall* of the nasal fossa is forme by the nasal septum.

The *outer lateral wall* is formed by the nasal processes and inner wall of the superior maxillary bone.

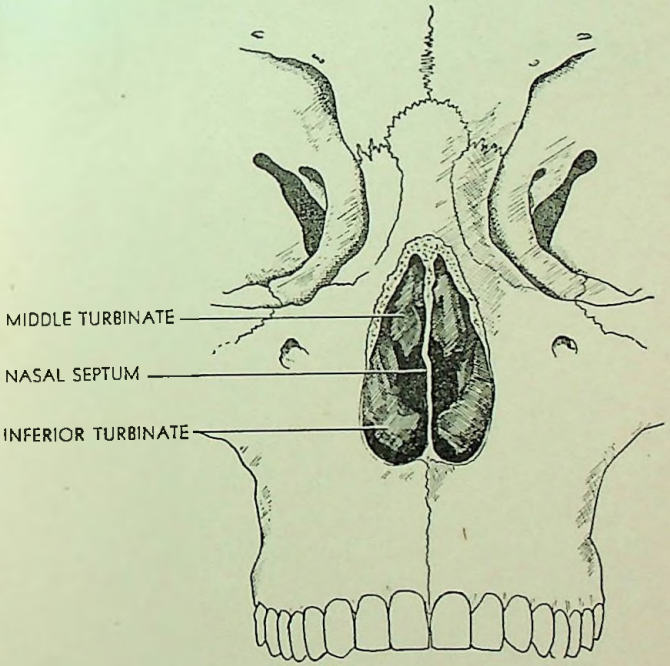

PLATE II—Anterior View of Nasal Cavity
(Modified from Deaver)

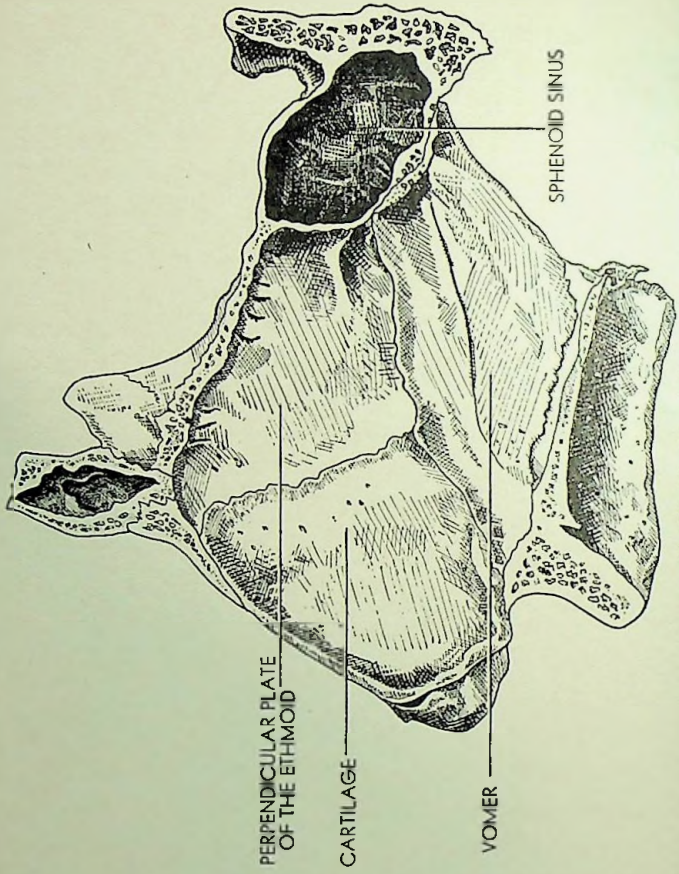

PLATE III—Nasal Septum (Modified from Deaver)

the lacrymal bone and the middle and superior processes of the ethmoid bone. These ethmoidal processes are the superior and middle turbinates. These are scroll-shaped, bony appendages projecting from the body of the ethmoid in a pendulous fashion into the nasal chamber. They are covered with mucous membrane. The inferior turbinate is a separate scroll-shaped bone

and articulates with the turbinal crest of the superior maxillary bone. The vertical plate of the palate bones and the inner surface of the internal pterygoid processes complete the outer wall.

The *turbinal bodies* or processes divide the nasal fossa into three meati: (1) The *inferior meatus* lies below the inferior turbinate bone and contains the nasal opening of the lacrymal duct which drains the tears from the lacrymal sac. (2) The *middle meatus* lies below the middle turbinate and presents the openings of the frontal sinus, anterior ethmoid cells and maxillary sinus. (3) The *superior meatus* lies above the middle turbinate and takes care of the drainage from the posterior ethmoid cells and the sphenoid sinus. (See under "Sinus Openings," page 24.)

The floor of the nasal fossa is wider than the roof, concave from side to side and slopes posteriorly. It is formed by the palatine processes of the superior maxillary bones anteriorly and the horizontal plate of the palatine bones posteriorly.

Various names have been given to the mucous membrane which lines the nose. Schneiderian is a favorite designation, giving credit to the anatomist who determined that the secretions from the nose were from the mucous membrane and not the brain. It is generally thin and intimately adherent to the underlying periosteum and perichondrium except over the inferior turbinates and the neighboring areas of the nasal septum where it is thickened and well supplied with cavernous, venous channels giving the membrane in these areas an erectile quality. In the respiratory area the mucosa is thick and consists of pseudo-strati-

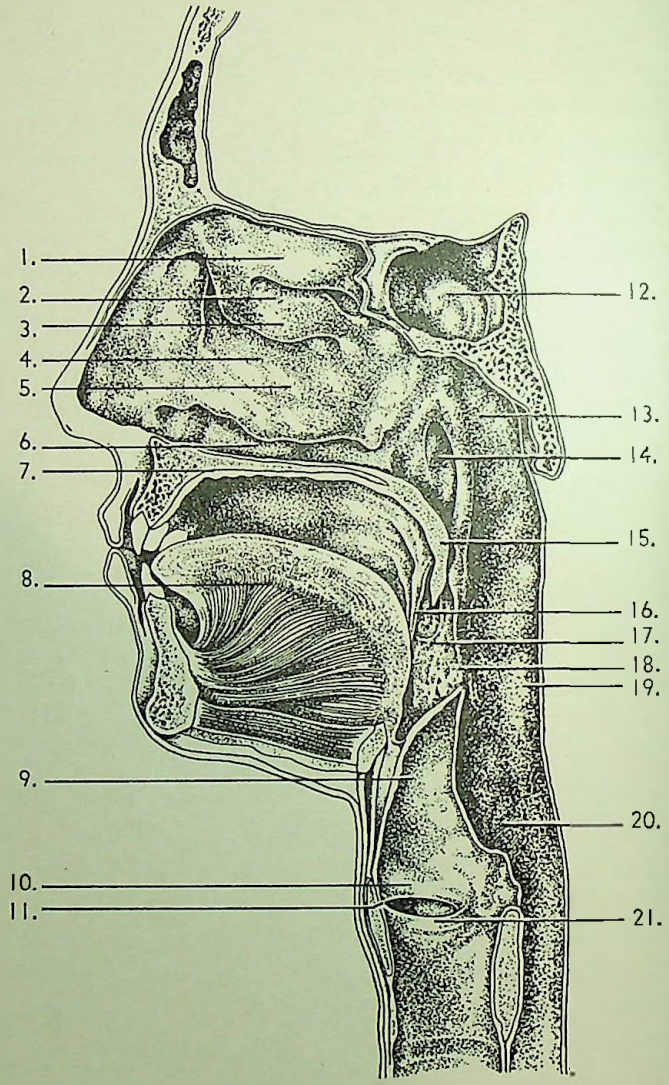

PLATE IV—Lateral View of Nose, Pharynx and Oral Cavity
(Modified from Deaver)

INDEX TO PLATE IV

1. SUPERIOR TURBINATE
2. SUPERIOR MEATUS
3. MIDDLE TURBINATE
4. MIDDLE MEATUS
5. INFERIOR TURBINATE
6. INFERIOR MEATUS
7. HARD PALATE
8. TONGUE
9. EPIGLOTTIS
10. FALSE VOCAL CORD
11. VENTRICLE OF THE LARYNX
12. SPHENOIDAL SINUS
13. POST NASAL SPACE
14. OPENING OF THE EUSTACHIAN TUBE
15. SOFT PALATE
16. ANTERIOR FAUCIAL PILLAR
17. FAUCIAL TONSIL
18. POSTERIOR FAUCIAL PILLAR
19. OROPHARYNX
20. LARYNGOPHARYNX
21. TRUE VOCAL CORD

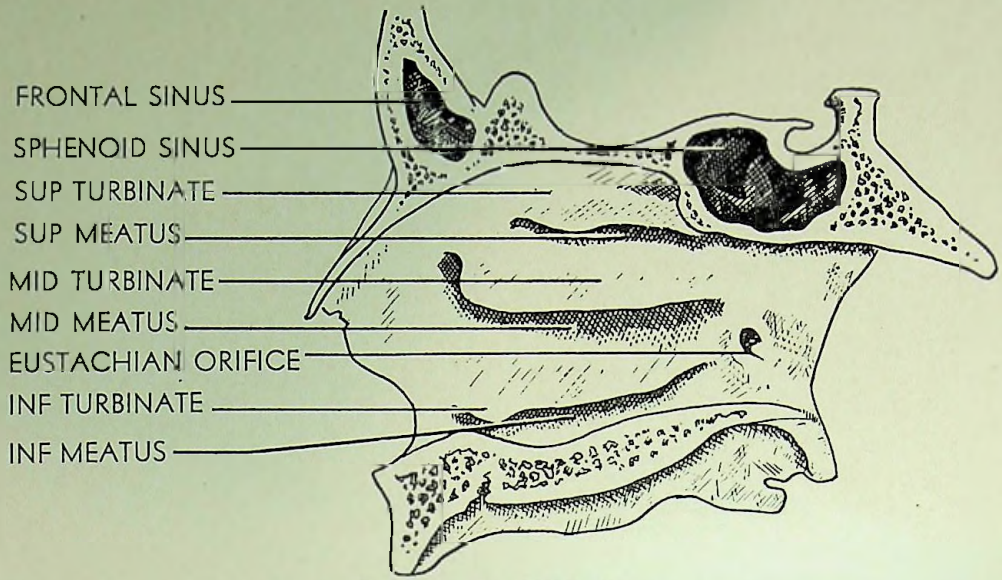

PLATE V—Lateral Wall of Nose

fied ciliated columnar epithelium with goblet cells and an abundance of mucous and serous glands and lymphoid bodies. In the olfactory region there is no erectile tissue, but here are located the specialized nerve endings, the *olfactory bulbs*, covered by a single layer of stratified cylindric epithelium.

The *vestibule of the nose* is lined with integument containing sweat and sebaceous glands and hair follicles.

The *blood supply* of the nose is maintained through the ophthalmic branch of the internal carotid and the internal and external maxillary branches of the external carotid.

The branches of the *ophthalmic artery* are the anterior and posterior ethmoidal which supply the ethmoid cells, the frontal sinuses and the roof of the nose. The dorsal nasal branch supplies the dorsum and sides of the nose.

The branches of the *internal maxillary artery:* The sphenopalatine supplies the mucosa of the turbinated bones, the meati, and the septum. It also gives off the infraorbital and alveolar branches which supply the lining membrane of the maxillary sinus. A pharyngeal branch is distributed to the sphenoidal sinus.

The branches of the *external maxillary* are the superior labial which goes to the septum and the alar branch which supplies the alæ.

The *veins* form a close plexus beneath the mucous membrane especially well marked over the lower part of the septum, middle and inferior turbinates. Some of the veins drain into the sphenopalatine, the anterior facial, the ophthalmic and a few communicate with

PLATE VI—Relation of Nasal Accessory Sinuses to the Hiatus and to each other (Skillern's Modification of Hajek)

the veins of the frontal lobe of the brain through the cribriform plate of the ethmoid.

Nerves.—The nasal branch of the ophthalmic nerve supplies sensation to the nasal septum and outer wall of the nose. The inferior turbinate and the floor of the nose receive their nerve supply from the anterior branch of the superior maxillary. The vidian nerve, a branch of the sphenopalatine ganglion, supplies the upper septum and the superior turbinate. The nasopalatine nerve innervates the mid portion of the septum and the anterior palatine supplies sensation to the inferior and middle turbinates.

Nasal Accessory Sinuses

(Para Nasal Air Cells)

The *frontal sinuses* are two irregularly shaped and variously sized bony cavities situated above the nose between the two tables of the frontal bone. They are either separated by a bony partition or may communicate. The floor corresponds to the roof of the orbit. The posterior or inner surface is the anterior wall of the anterior fossa of the skull. These sinuses are lined with a stratified ciliated epithelium. Communication with the nose is through the nasofrontal duct which enters the nose beneath the middle turbinate anteriorly.

The *ethmoidal cells* consist of a number of cells located in the body of the ethmoid bone. They are divided into an anterior and posterior group by the middle turbinate bone. The anterior group opens into the nasal meatus beneath the middle turbinate. The posterior ethmoidal cells open into the superior meatus

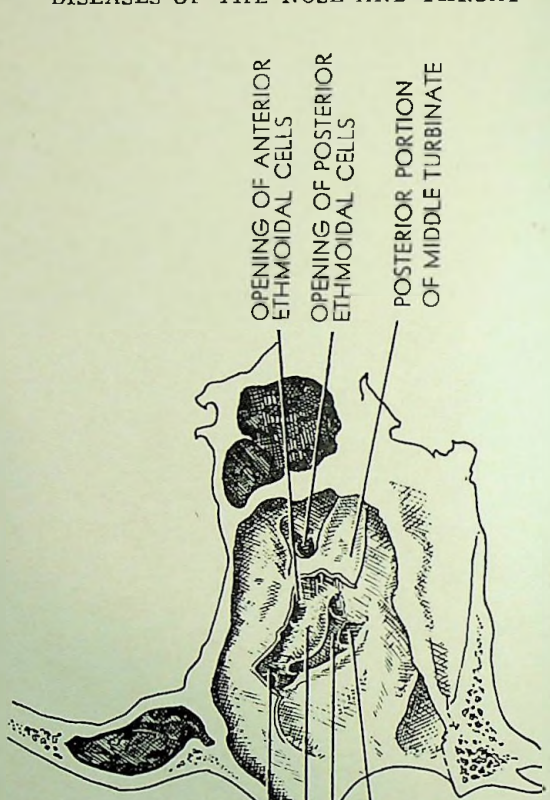

PLATE VII—Lateral Wall of Nose
Anterior half of middle turbinate removed to show openings of sinuses

above the middle turbinate bone. A convex prominence presents in the middle meatus just beneath the middle turbinate. This is the bulla ethmoidalis and is an opening for the median ethmoidal cells. The ethmoidal cells are lined with stratified ciliated epithelium which is continuous with that lining the nasal cavity.

The *maxillary sinuses* are the largest of the accessory cavities. They are situated in the superior maxillary bone, one on either side. The floor is in relation to the alveolar processes and frequently the roots of the first and second molar teeth extend into the cavity. The roof of the maxillary sinus forms a part of the floor of the orbit. The drainage of the maxillary sinus is accomplished through an opening or ostium located well above the floor of the sinus and found in the lower posterior portion of the hiatus semilunaris so that it is possible for the material from the frontal sinus and ethmoid cells to find its way into the maxillary sinus by draining downward and backward into the hiatus. The maxillary sinuses are lined with a stratified ciliated epithelium continuous with that of the cavities of the nose.

The *sphenoidal sinuses* are bony cavities located in the body of the sphenoid bone. There are two in number and usually separated by a bony partition. The opening of these sinuses communicates with the superior meatus of the nose. These cavities are lined with a stratified ciliated epithelium also continuous with that of the nose. The sphenoidal cavities have very important anatomical relations with the optic and other cranial nerves.

Sinus openings.—In the lateral wall of the nose beneath the middle turbinate is a curved depression, the *hiatus semilunaris*. This lies between the bulla ethmoidalis, a prominent ethmoid cell, and the *uncinate process* of the ethmoid. The anterior and superior end of the hiatus leads to the frontal sinus either directly or by continuation of a canal. The posterior end of the hiatus ends in a deep groove and into this the maxillary sinus opens. The openings of the anterior ethmoidal cells lie just beneath the middle turbinate in the middle meatus. The posterior ethmoid cells and the sphenoidal sinuses drain into the groove of the superior meatus which lies above the middle turbinate. (See Plate VII.)

Through the cribriform plate of the ethmoid the terminals of the *olfactory bulbs* pass through small foramina to be distributed in the mucous membrane in the olfactory region. These nerves have to do solely with the sense of smell.

The nose is liberally supplied with *lymphatics* and may be generally divided into two sets. The anterior which drain the anterior portion of the nose and empty into the submaxillary glands and the posterior group which drain into the deep cervical glands.

Physiology of the nose.—The nose furnishes the passageway for the conduction of air from the outside to the nasopharynx. As air passes through the nose it is filtered of foreign particles. At the same time the olfactory bulbs are stimulated and impressions carried to the brain centers where odors are perceived. The mucosa of the nose regulates the moisture and temperature of the inspired air, adding to or subtract-

ing from, as the circumstances demand. The nose furnishes the continued drainage of lacrymal secretions as the lower end of the lacrymal duct empties into the inferior meatus. Inspired air passing through the nose is made available for ventilation of the Eustachian tube and middle ears. Through the reverse action of this tube and its position, the nose may be considered as playing a part in the drainage of the middle ear and Eustachian tube. All of the nasal accessory cavities open into the nose, therefore it functions to ventilate and drain these air cells. Under normal conditions the nasal secretions have an inhibitory effect upon the growth of bacteria. The nose also plays a prominent part in voice production, acting as a resonating chamber. The inspired air current passes into the nose and is reflected upward. This, together with a diminished pressure, allows the air to filter upward into the region of the olfactory bulbs. It then continues through the nasal chamber into the post-nasal space. The expired air follows a different course. As it ascends the pharynx and post-nasal space, it is deflected by the sphenoid body along the floor of the nose and directly out through the anterior nares. Drainage of the nasal sinuses is assisted by this negative pressure occasioned in the sinus by the suction action of air passing over the sinus openings. This tends to aspirate the secretions into the nose.

Pharynx

The pharynx is a conical, hollow musculo, membranous tube which lies behind the nose, mouth and larynx. It extends from the base of the skull to the lower level of the cricoid cartilage anteriorly and opposite the

sixth cervical vertebræ posteriorly. It is flattened anterioposteriorly and is wider laterally, the greatest lateral diameter being at the level of the hyoid bone. The narrowest diameter is at its lower end where it *becomes the œsophagus.*

The pharynx is divided into three portions, that lying between the base of the skull and the soft palate and which communicates with the nose is known as the *nasopharynx*. The second portion extends from the soft palate to the level of the hyoid bone. It communicates with the mouth and is known as the *oropharynx*. The third portion extending from the level of the hyoid bone to the cricoid cartilage is known as the *laryngopharynx* and here it becomes continuous with the œsophagus. (See Plate IV.)

The pharynx is lined throughout with mucous membrane which varies in different parts. In the nasopharynx it is stratified, columnar epithelium, while in the oropharynx and laryngopharynx the squamous cell type is found.

There are seven openings to the pharynx. The nasopharynx has four, two of which are into the posterior nares and two into the Eustachian tubes. The oropharynx has one, opening into the fauces. In the laryngopharynx one opening is found into the larynx and the other into the œsophagus.

The orifices of the Eustachian tubes are found one in either lateral wall of the nasopharynx. Behind these openings will be found a depression, the fossa of Rosenmuller. Surrounding the tubal orifice will be found masses of lymphoid tissue and this has been designated Gerlack's or the tubal tonsil.

In the nasopharynx, upon its upper and posterior wall, is an area of lymphoid follicles which have been named Luschka's or the pharyngeal tonsil or the more common name, *adenoid*.

The palate consists of two portions, the *anterior, hard* or *bony palate* and the *posterior, soft* or *membranous palate*. The *hard palate* consists of the palate processes of the maxillary and palate bones and extends from the alveolar processes anteriorly and laterally to a free border posteriorly to which the soft palate is attached. The *soft palate* is a musculo membranous structure extending from the posterior free extremity of the hard palate and projects backward and downward, the lateral portions merging with the pharyngeal walls and the lower median border terminating in a free conical appendage, the *uvula*.

From the base of the uvula the soft palate divides on both sides into two folds of mucous membrane and muscle extending downward and outward. These folds constitute the pillars of the fauces. The *anterior pillar* is formed by the *palato glossus muscle* covered with mucosa. It extends from the base of the uvula, downward, outward and forward, its lower end being attached to the side and base of the tongue. The *posterior pillar* is formed by the *palatopharyngeus muscle* covered by mucosa. It is posterior to and nearer the median line than the anterior pillar and extends downward, outward and backward, its lower termination merging with the lateral wall of the pharynx. The triangular space formed by these pillars and completed by the superior constrictor muscle which forms the

outer wall, constitutes the *tonsillar fossa* and lodges the faucial tonsil.

The *faucial tonsils* are two lymphoid structures situated one on either side, occupying the tonsillar fossa. Their size varies. In some instances the tonsil completely fills the fossa and is readily seen, while in other instances none of the tonsil tissue is readily discernible until the anterior faucial pillar is hooked forward. The pharyngeal surface of the tonsil presents from twelve to fifteen openings, the orifices of the so-called crypts. The openings in the upper portion of the tonsil extend outward and downward, while the openings in the lower portion extend outward and upward, so that the crypt arrangement is fan shaped. Numerous follicles open into the crypts, these being lined with mucous membrane which is continuous with that lining the crypts.

Two folds of mucous membrane extend from the borders of the anterior and posterior arches. These are the *plica triangularis* and *plica retrotonsillaris*. The appreciation of these plicæ is important in recognizing the type of tonsil present. The plica triangularis is constant but varies in extent. In its greatest development it is a right angle triangular web with its apex attached to the upper and inner border of the posterior pillar. The base is attached to the lateral pharyngeal wall above the base of the tongue and the perpendicular attached to the inner border of the anterior arch. It covers a progressively increasing area of the tonsil from above downward and acts as a sling or restraining band, covering a large portion of the tonsil. The *retro tonsillar plica* is inconstant but when present is

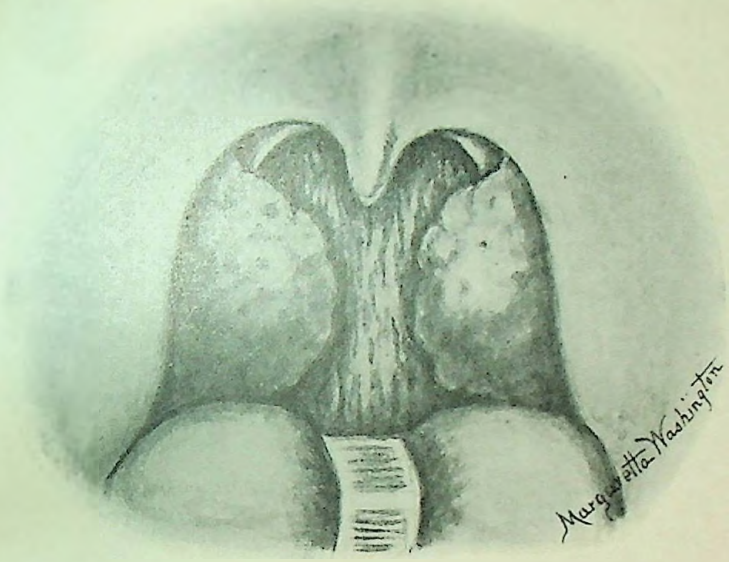

Plate VIII—Large free tonsils. The anterior arches appear sharply defined. As there is no restraining plica, the tonsil extends well into the pharynx. (Practitioner's Otology.)

continuous above from the apex of the plica triangularis. When this plica is well developed it forms with the plica triangularis a complete ring like web, around the internal border of the fossa and submerges the tonsil. According to the extent of the plica, tonsils may be divided into *free tonsils,* those in which there is a very little plica present and whose crypts drain readily; and secondly, *submerged tonsils,* those in which the plica is well developed and covers a large area of the pharyngeal surface of the tonsil. A further subdivision of faucial tonsils may be *large free* and *small*

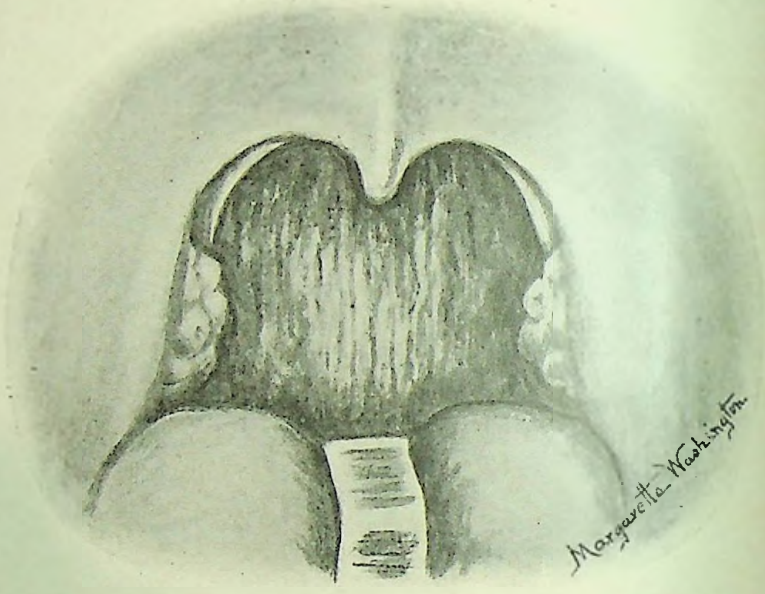

Plate IX—Small free tonsils. The characteristics same as above, but the tonsil is much smaller. (Practitioner's Otology.)

free or *large submerged* and *small submerged*. (See Plates VIII, IX, X and XI.)

The *faucial tonsil* receives its blood supply from branches of the external cartoid. (See Plate XII.)

A small vessel is found springing from the dorsalis linguæ which, passing between the mucous membrane and fibrous layer of the plica, finally breaks up into small vessels, which apparently enter the tonsil substance. This vessel has been called the *tonsillar branch* of the dorsalis linguæ and it is severed when the plica is divided.

A superior tonsillar vessel, entering the fossa near

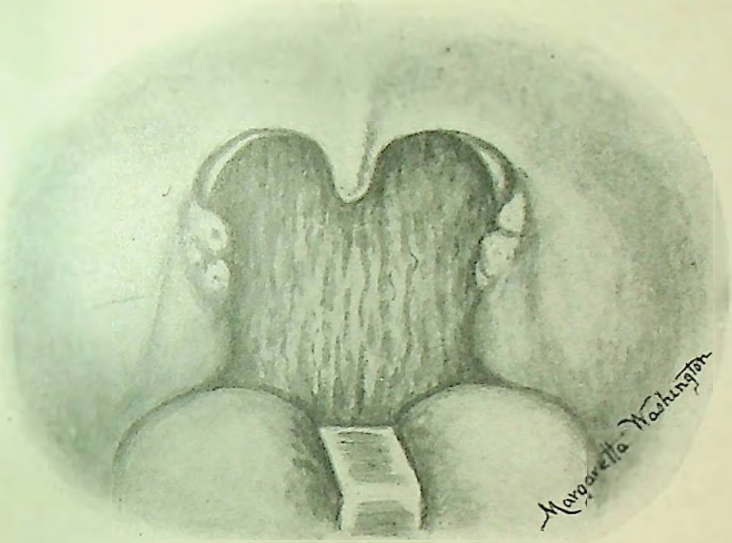

Plate X—Large submerged tonsils. The anterior arches are illy defined due to the presence of the plicæ triangularis which are holding the tonsils back in the fossæ. (Practitioner's Otology.)

its upper extremity, passes downward between the capsule of the tonsil and the muscular aponeurosis for a distance of one-half inch, then pierces the tonsil. This vessel is formed through an anastomosis of branches of the ascending palatine (a branch of the facial) and the descending palatine (a branch of the internal maxillary).

A posterior tonsillar artery (a branch of the ascending palatine) enters through the palato pharyngeus muscle and pierces the tonsil between the equator and lower pole of the tonsil. Three inferior tonsillar vessels are also found, one (a branch of the dorsalis

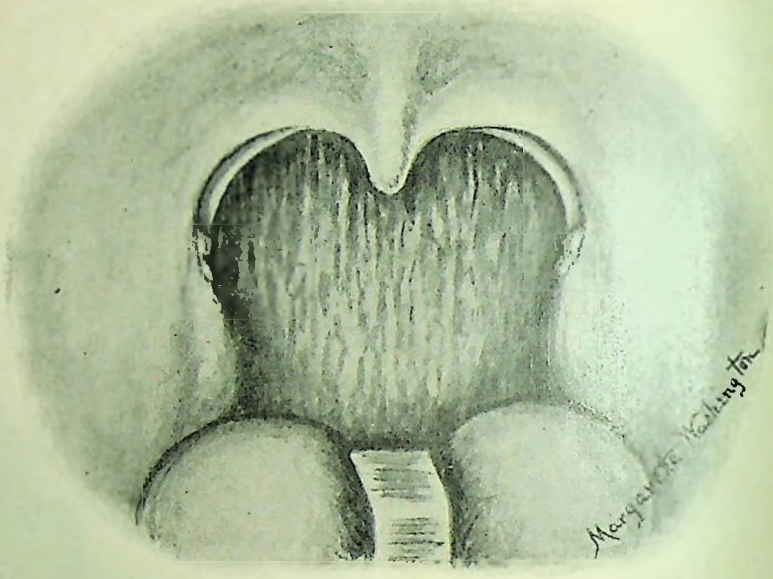

Plate XI—Small submerged tonsils. The same characteristics as above, but the amount of tonsil tissue much less. (Practitioner's Otology.)

linguæ), enters the tonsil below the equator, the other two vessels (the largest vessels going to the tonsils) are branches of the tonsillar branch of the facial. One of these branches courses between the capsule and the fossa wall and enters the tonsil well down near the base of the tongue.

There are two principal venous channels of practical importance in the tonsillar fossa. One will be found coursing along the inner edge of the palato pharyngeus muscle from a point near the upper pole to a point near the base of the tongue where it joins a large vein piercing the superior constrictor muscle. This empties

into the pharyngeal plexus. The second smaller vein can be found extending downward along the posterior edge of the palato glossus muscle. This empties into the lingual vein.

The lymphatics draining the tonsil empty into the deep cervical chain beneath the sterno mastoid muscle

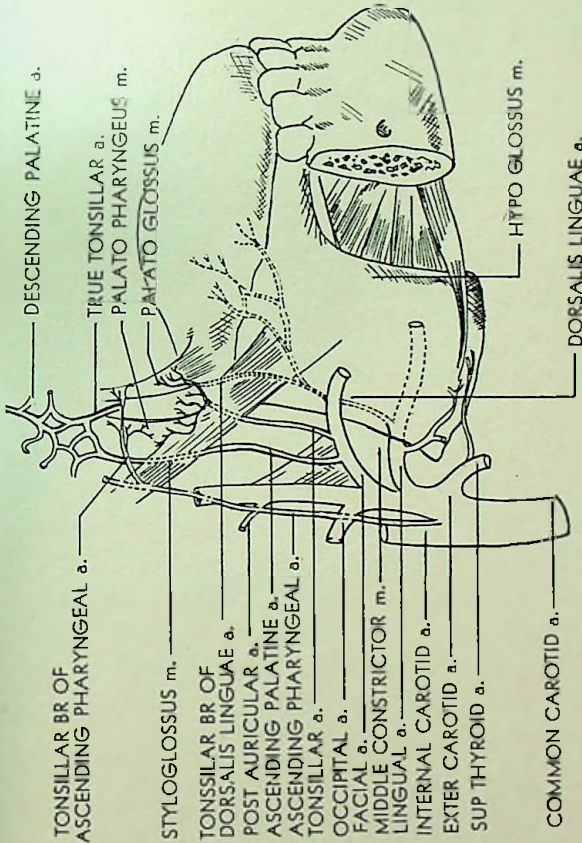

PLATE XII—Blood Supply of the Tonsil
(J. L. Davis)

and from here they continue to the thoracic glands and eventually to the thoracic duct.

The *lingual tonsil* consists of an aggregation of submucosal lymphoid follicles at the base of the tongue between the circumvallate papillæ and the epiglottis. It gives a roughened contour in this region due to umbilicated nipple shaped follicles which lead to an infundibuliform cavity.

The grouping of the lingual tonsil anteriorly in the pharynx, the faucial, or palatine tonsils anterolaterally, the tubal or Gerlack's tonsils posterolaterally and Luska's or the pharyngeal tonsil superiorly in the nasopharynx, constitutes a ring-like arrangement of the six pharyngeal tonsils to which the name of Waldyer's ring has been given. The function of this lymphoid ring placed about the portal of the respiratory and digestive tracts has been variously stated and claims made as to its action as a first line of defense in infections.

The blood supply of the pharynx comes from the ascending pharyngeal branches of the superior thyroid, the descending pharyngeal branches and the pterygopalatine vessels.

The nerve supply is derived from branches of the pneumogastric, glossopharyngeal, superior laryngeal and the superior cervical of the sympathetic.

Larynx

The larynx is the principle organ of phonation. It also acts to guard against the entrance of foreign bodies into the trachea and bronchial tubes. It is located in the upper and forepart of the neck and lies

between the base of the tongue above and the trachea below. When at rest, in the adult, it is in front of the fourth, fifth, and sixth cervical vertebræ and separated from these by the lower portion of the pharynx and the prevertebral muscles. It lies somewhat higher during childhood and in the female. Directly in front, in the median line, the larynx is covered with skin and cervical fascia. On either side are the sternohyoid, the sternothyroid, and the thyrohyoid muscles, the upper portion of the lateral lobe of the thyroid gland and the great vessels of the neck. The upper part of the larynx is triangular in shape with the apex pointing anteriorly. As the larynx extends backward it becomes cylindrical in shape and smaller in caliber. The upper or pharyngeal opening slopes backward and downward toward the pharynx. This opening is closed by the epiglottis during the act of swallowing.

The framework of the larynx is cartilaginous in nature. There are three single cartilages; the thyroid, the cricoid and the epiglottis; and three paired cartilages; two arytenoid, two corniculate (Cartilages of Santorini), and two cuneiform (Cartilages of Wrisberg).

The *thyroid cartilage* (See Plate XIII) consists of two plates joined in front at an angle forming a prominence known as the Adam's apple. Just above this prominence the union is incomplete resulting in a cleft which is known as the *thyroid notch*. The posterior edges of this cartilage are widely separated. From the upper posterior extremity of each lateral plate is a projection extending upward, inward and backward. These projections are the *superior cornuæ* to which are at-

tached the thyrohyoid ligaments. From the posterior inferior end of either lateral plate of the thyroid cartilage is a projection extending downward, inward and forward. These projections constitute the *inferior cornuæ* and articulate with the cricoid cartilage which lies just below the thyroid cartilage. The stylo- and palato-pharyngeus muscles are attached to the upper and posterior borders of the thyroid cartilage.

The *cricoid cartilage* forms a complete thick, strong ring around the lower part of the larynx and acts as

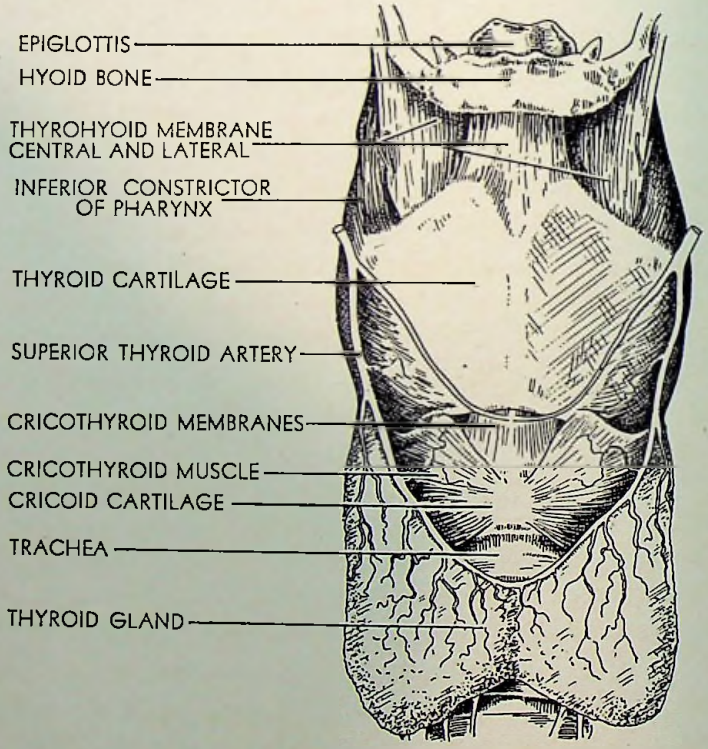

PLATE XIII—Anterior View of Larynx
(Modified from Deaver)

its base. It is attached to the thyroid cartilage by the inferior cornuæ and articulates posteriorly with the arytenoid cartilages with which it forms the posterior wall of the larynx. To its lateral surface are attached the cricoarytenoideus posticus muscles and the longitudinal fibers of the œsophagus.

The cricothyroid membrane and lateral cricoarytenoid muscles are attached to the upper border of the cricoid cartilage. Its lower edge is attached to the first ring of the trachea by a fibrous membrane, the cricotracheal ligament.

The *epiglottis* is a leaf-shaped plate of yellow elastic cartilage attached below to the notch of the thyroid cartilage. It is attached to the base of the tongue by three ligaments, the median and two lateral glosso-epiglottidean folds, forming on either side a fossa, the *vallecula*. The epiglottis is attached to the hyoid bone by means of the hyo-epiglottic ligament. The lateral margins are connected with the arytenoid cartilages by the aryepiglottic folds. During respiration the epiglottis curls up over the base of the tongue and when deglutition takes place it covers the œsophageal opening.

The *arytenoid cartilages,* one on either side of the larynx, are irregular, three sided, pyramidal bodies which articulate by their bases with the oblique facets of the superior border of the cricoid cartilage. Upon the apex of each is attached the cartilage of Santorini. The false vocal cord and the thyroarytenoideus muscle are attached to the anterior surface, and the true cords are attached to the vocal process. These cartilages also present a lateral angle which is rounded affording

attachment to the posterior and lateral cricoarytenoid muscles.

The *cartilages of Santorini* or cornicula laryngis, are two small cone-shaped yellow elastic cartilages situated one on either side in the aryepiglottic folds and articulate with the arytenoid cartilages.

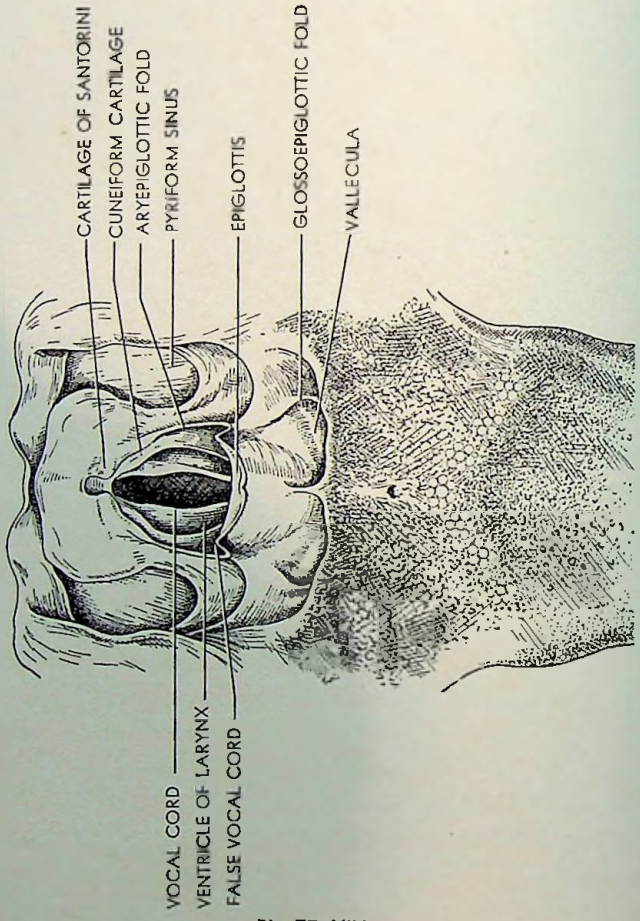

PLATE XIV
Laryngeal Structures from Above

The *cuneiform cartilages* (Wrisberg) are two small conical bodies situated one on either side within the aryepiglottic folds just external to the cartilages of Santorini.

Ligaments of the Larynx

The ligaments of the larynx are divided into extrinsic and intrinsic. The extrinsic ligaments bind the larynx to the hyoid bone while the intrinsic ligaments bind the component cartilages which form the larynx.

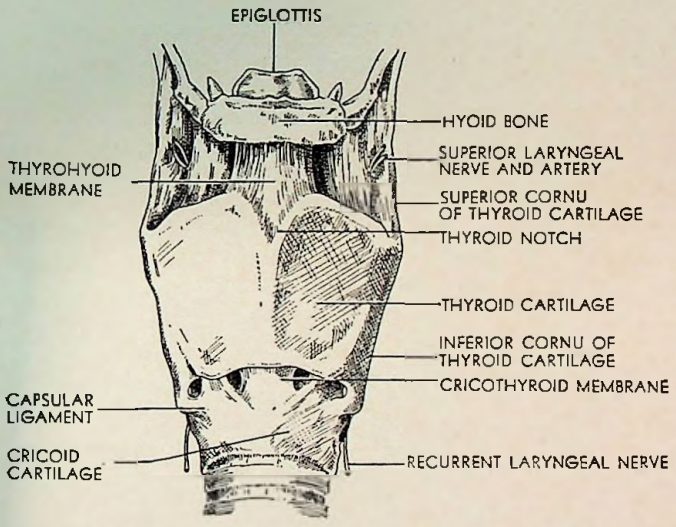

PLATE XV—Anterior View of Larynx
(Modified from Deaver)

The *extrinsic* ligaments are:

The *thyrohyoid membrane*, which connects the upper border of the thyroid cartilage with the inner surface of the hyoid bone.

Two *lateral thyrohyoid ligaments;* these connect the superior cornua of the thyroid cartilage with the greater cornua of the hyoid bone.

The *hyoepiglottic ligaments;* these connect the anterior surface of the epiglottis with the upper portion of the body of the hyoid bone.

The *intrinsic* ligaments are:

The *cricothyroid membrane;* (conus elasticus) this is composed of yellow elastic tissue. It connects the lower margin of the thyroid with the upper margin of the cricoid and is reflected over the surface of the cricoid cartilages as far down as the level of the false vocal cords.

The *cricothyroid capsular ligaments;* these are two in number and encapsulate the crico-thyroid articulation.

The *cricoarytenoid ligaments;* these are two in number and bind the cricoid to the base of the arytenoid cartilage.

The *cricoarytenoid capsular ligaments;* these two ligaments surround the cricoarytenoid articulation.

The *superior thyroarytenoid ligaments;* are two in number and with their surrounding mucous membrane form the false vocal cords.

The *inferior thyroartenoid ligaments;* these two ligaments with their surrounding mucous membrane constitute the true vocal cords.

The *thyroepiglottic ligament;* this serves as a means of attachment between the epiglottis and the thyroid cartilage.

The *glosso epiglottic folds;* are three reflections of mucous membane which connect the epiglottis to the root of the tongue.

Muscles of the Larynx

The muscles of the larynx are divided (as are the ligaments) into extrinsic and intrinsic. The extrinsic muscles extend from the larynx to the adjacent parts while the intrinsic muscles are confined within the larynx.

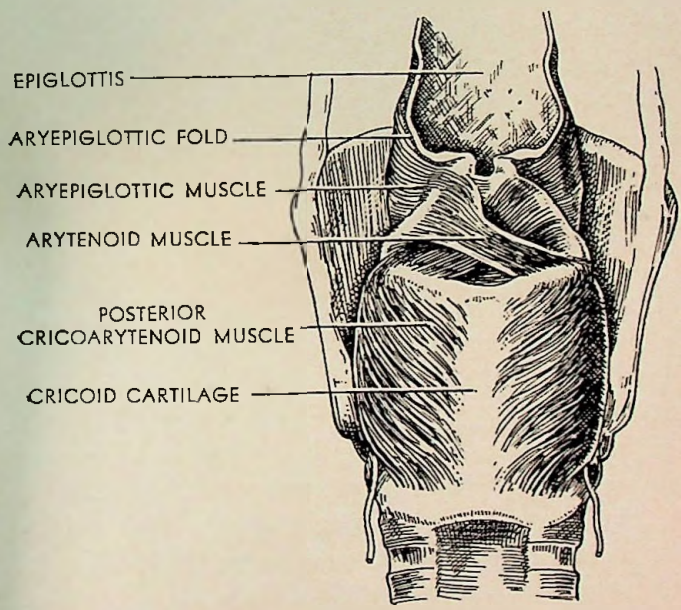

PLATE XVI—Posterior view of Larynx
(Modified from Deaver)

The *extrinsic* muscles are the *sternothyroid, thyrohyoid, stylopharyngeus, palatopharyngeus,* and the inferior *constrictor* of the pharynx.

The *intrinsic* muscles are divided into two subgroups, those which act on the cords and rima glottidis and those which are connected with the epiglottis.

The muscles which act on the cords and rima glottidis consist of four paired muscles and one single centrally placed muscle. The paired muscles are:

The *cricothyroid,* arising from the lower and inner border of the thyroid is inserted into the anterior and lateral aspect of the cricoid cartilage. It is innervated by the superior laryngeal nerve. Its action is to tilt the thyroid forward and cause tension of the cords.

The *cricoarytenoid posterior* arises from the posterior surface of the cricoid and is inserted into the posterior angle of the base of the arytenoid cartilage. It is innervated by the recurrent laryngeal nerve. Its action is to rotate the arytenoids outward thus opening the glottis and at the same time keeping the cords tense.

The *cricoarytenoid lateralis* arises from the lateral and superior border of the arch of the cricoid and is inserted into the posterior angle of the base of the arytenoid cartilage. It is innervated by the recurrent laryngeal nerve. Its action is to rotate the arytenoid inward closing the anterior portion of the glottis.

The *thyroarytenoid* arises from the angle of the thyroid and the posterior surface of the cricothyroid membrane and is inserted into the vocal process, the base and anterior surface of the arytenoid cartilage. It is innervated by the recurrent laryngeal nerve. Its action is to shorten and relax the tension of the cords.

The single muscle which acts on the cords and the rima glottidis is the *arytenoid.* This muscle extends

from the posterior border and outer surface of one arytenoid cartilage to its fellow of the opposite side; some of its fibers also pass into the neighboring muscles—the thyroarytenoid, arytenoepiglottic and lateral cricoarytenoid. It is innervated by the superior and recurrent laryngeal nerve. The action of its transverse and oblique fibers closes the posterior portion of the glottis.

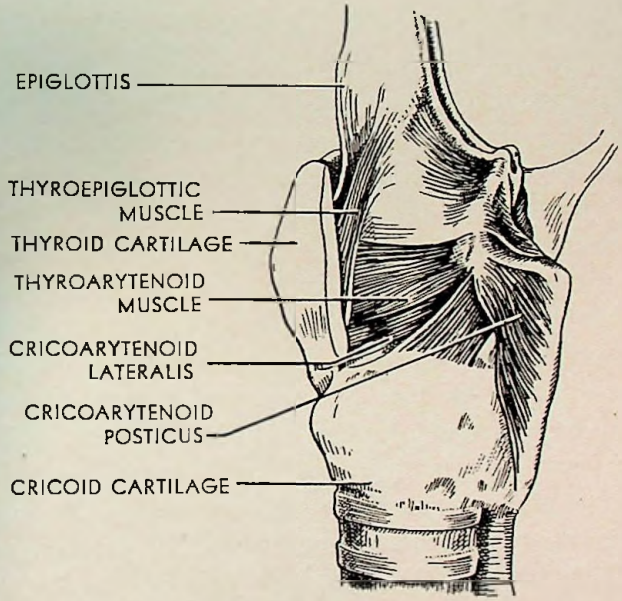

PLATE XVII—Lateral View of Larynx
(Modified from Deaver)

The epiglottis is supplied with three paired. double-acting muscles which are innervated by the recurrent laryngeal nerve. These muscles are:

The *thyroepiglottic* muscle arises from the inner surface of the thyroid cartilage and is inserted into the

lateral margin of the epiglottis and the arytenoepiglottidean fold. It is innervated by the recurrent laryngeal nerve. Its action is to depress the epiglottis and to compress the sacculus laryngis.

The *superior arytenoepiglottic* muscle arises from the apex of the arytenoid cartilage and is inserted into the arytenoepiglottidean fold. It is innervated by the recurrent laryngeal nerve. Its action is to constrict the superior aperture of the larynx.

The *inferior arytenoepiglottic* muscle arises from the inner portion of the arytenoid cartilage and is inserted into the margin of the epiglottis. It is innervated by the recurrent laryngeal and its action is to compress the sacculus laryngis.

Summarizing the action of the intrinsic muscles; the glottis is closed by the arytenoid and the cricoarytenoid muscles; the cords are made tense by the action of the cricothyroid muscles. Relaxation of the cords is accomplished by the thyroarytenoid muscles. The cords are separated by the posterior cricoarytenoids. The epiglottis is depressed by the thyroepiglottic muscles, the sacculus laryngis is compressed by the action of the thyroepiglottic and inferior arytenoepiglottic muscles. The superior aperture of the larynx is constricted by the superior arytenoepiglottic muscles.

There are two sets of vocal cords, the true and false. The *true cords* consist of the inferior thyroarytenoid ligaments covered with two layers of mucous membrane. They present a pearly white color in health and extend from the anterior angle of the thyroid to the vocal processes of the arytenoid cartilages.

The so-called *false vocal cords* or *ventricular bands* consist of two folds of mucous membrane enclosing the superior thyroarytenoid ligament. They are membranous, red in color, with inner borders slightly cresentric in shape. They extend from the angle of the thyroid cartilage to the anterior surface of the arytenoid cartilages.

The space between the vocal cords is called the *glottis,* the rima of the glottis or the chink of the glottis. It is triangular in shape when the cords are widely separated during deep inspiration. During phonation the cords approximate forming a narrow slit.

Between the ventricular band or false vocal cord above and the true cord below, there is an oval depression on either side. These recesses are known as the *ventricles of the larynx.*

Within the upper portion of the ventricle is a conic-shaped depression, the *sacculus laryngeus* or laryngeal pouch, containing a number of small mucous glands. The secretion from these glands lubricates the vocal cords.

The space above the false vocal cords extending to the aryteno-epiglottidean fold above is known as the *inominate fossa.* The pear-shaped space between the aryteno-epiglottidean fold and the wing of the thyroid cartilage is known as the *pyriform sinus.*

The entire larynx is lined with a thin mucous membrane. The epithelium is stratified squamous down to the level of the false vocal cords; from here down it is pseudo-stratified ciliated columnar except over the true vocal cords where it is stratified squamous.

The superior and inferior thyroid arteries, through their laryngeal branches furnish the *blood supply* to the larynx. The cricothyroid branch is the most important. This crosses the cricothyroid membrane and communicates with its fellow of the opposite side. The veins as usual accompany the arteries. Those veins which accompany the superior laryngeal artery join the superior thyroid vein which empties into the internal juglar vein. Those which accompany the inferior laryngeal artery empty into the inominate vein through the inferior thyroid vein.

The *lymphatics* of the larynx are divided into an upper and lower set. The upper set pierces the thyrohyoid membrane and empties into the glands located at the bifurcation of the common carotid artery. Some of the lower set pierce the cricothyroid membrane to empty into a gland lying just in front of the ligament or just in front of the trachea, while others empty into the deep cervical glands.

The *superior laryngeal nerve* and the *recurrent laryngeal nerve,* both branches of the pneumogastric nerve, innervate the larynx. The *superior laryngeal nerve,* through its internal and external branches supplies sensation mainly to the mucous membrane but it sends branches to the cricothyroid and arytenoid muscles.

The superior laryngeal which divides into an internal sensory and an external motor branch is important because suspension of its function permits of the aspiration of foreign substances.

The *recurrent laryngeal nerve* is motor, supplying all the muscles of the larynx except the cricothyroid

and differs in its course on the two sides. This is important to remember in order to understand the clinical manisfestations in cases of paralysis. On the right side the nerve passes from before backward around the subclavian artery. On the left side it winds around the arch of the aorta, traversing some distance through the mediastinum.

Voice is produced by the vibration of the vocal cords. These sounds are inaudibile until amplified by the nose, pharynx and mouth. The pitch of sound is determined by the length, thickness and tension of the cords and the force of the expired air. Vibration of the cords in part or in segments results in the so-called *falsetto voice.* Loudness of the voice depends upon the amplification produced by the nose, mouth and pharynx and the force of the vibrations. Voice character is influenced by many anatomical differences especially in the resonating or amplifying chambers. *Singing* differs from speaking in that there is a continuous variation up and down the scale of vowels. In singing a reflex mechanism also plays a large part. The exact tuning of the vocal cords depends to a greater or less degree, upon reflex impulses from the ear to special coordinating nerve centers. The education of these centers is primary to that of the voluntary centers and therefore the latter can only control the former in persons especially educated in singing. Thus the accuracy of the pitch is dependent upon the sound apprehending and appreciating organs and their nerve centers.

CHAPTER II

SYSTEM OF EXAMINATION

A carefully taken systematic history in nose and throat cases will give valuable information. Among the more important symptoms will be noted:

Nasal obstruction.—This may be unilateral, bilateral, alternating, constant or intermittent. Unilateral constant nasal obstruction in an adult patient is strongly suggestive of a deviated septum or a new growth. Bilateral constant obstruction may be due to hypertrophic rhinitis, polypus, abscess or tumor. Intermittent or alternating obstruction occurs as a result of vaso-motor disturbances and is present in subacute and chronic rhinitis. Constant nasal obstruction in children suggests adenoids while unilateral obstruction in these little patients, especially if accompanied by offensive secretion, should arouse suspicion of the presence of a foreign body in the nose.

Nasal discharge may drain anteriorly and be blown from the nose or it may flow posteriorly into the post nasal space to be drawn forward into the mouth. Thin watery secretion is observed in vaso-motor conditions. Purulent discharge occurs in purulent rhinitis but more commonly in sinus disease. Large quantities of purulent discharge when blown from the nose may come from the frontal sinus, anterior ethmoidal cells or the maxillary sinus. Post nasal discharge may originate in the posterior ethmoidal cells or the sphenoid sinuses.

Alterations in the sense of smell.—The sense of smell may be altered or absent. It is frequently blunted or absent in acute nasal pathology when the prognosis is usually favorable but where there is a history of failing or loss of sense of smell in chronic cases, the prognosis is less favorable.

Frequent cold catching may indicate local nasal pathology and this occurs with striking regularity in obstruction from any cause. It is also a common symptom of sinus disease and chronic tonsil infection.

Epistaxis or bleeding from the nose is observed in cases presenting varicosities in the septal mucous membrane, or from ulcerations, polypus, adenoids and malignant disease. It is also a symptom of altered blood pressure and of the various anæmias.

Pain in disease of the nasal accessory sinuses. This may be referred to the cheek in the case of involvement of the maxillary sinus, to the inner wall of the orbit or over the eye in frontal sinusitis, and to the root of the nose and orbit in anterior ethmoidal involvement. In the case of sphenoidal and posterior ethmoidal disease the pain may be referred to the occiput or crown of the head.

Visual disturbances are frequently due to disease of the nasal accessory sinuses. Inability to use the eyes for any length of time without excessive fatigue is a symptom observed in patients suffering from chronic ethmoidal infections. Disease of the sphenoid and posterior ethmoid cells may attack the optic nerve, producing varying degrees of loss of vision. Serious inflammatory conditions of the orbit and of the eyeball itself may result from nasal pathology.

In pharyngeal cases, *dryness* is noted in most acute and chronic diseases. *Aching* is complained of in rheumatic conditions; *soreness* in chronic tonsillitis; *sensation of a lump* or foreign body or of a crumb, will be complained of by the neurotics. *Painful swallowing* is complained of in acute inflammations, while difficulty in swallowing is due to loss of muscular tone as in post diphtheretic or bulbar paralysis.

Alterations in the voice call attention to the larynx. This symptom may be associated with cough and obstruction to breathing. The sudden loss of voice without other symptoms is usually functional or hysterical. The so-called hysterical aphonias should have not only a careful nose and throat examination, but likewise an examination of the lungs. A husky voice accompanied by an irritative cough is observed in acute inflammations of the larynx. Difficulty in inspiration with tendency to retraction of the supersternal notch in children should make one suspicious of diphtheria, spasmodic croup or a foreign body. *Alterations in the voice in adults, especially if over forty years of age, call for a most careful laryngeal examination and the elimination of malignancy as the cause.* Intermittent huskiness of the voice is usually due to sticky mucous secretions in the larynx. A constant husky voice may be due to chronic inflammatory laryngeal pathology with thickening or new growth.

Cough.—Dry coughs are frequently reflex. In children a nocturnal dry cough may be due to adenoids, but it frequently is due to a co-existing sinusitis. Hacking coughs with secretion occur in subglottic conditions, while hacking cough without secretion may

be due to pharyngeal or laryngeal irritation. Titillating coughs are often caused by lingual and faucial tonsillar irritation. Bronchial coughs are usually accompanied by some secretion.

Dyspnœa when inspiratory is due to a lesion in or above the larynx. Expiratory dyspnœa is tracheal or bronchial. Difficult breathing is present in acute inflammation and œdema of the larynx, croup, diphtheria, traumatism, foreign bodies, retropharyngeal abscess, syphilis, malignancy and certain laryngeal paralyses.

Examination of Patient

For the routine examination of the upper respiratory tract, the following instruments are necessary: (1) a head mirror, (2) nasal speculum, (3) tongue depressor, (4) faucial pillar or arch retractor, (5) post rhinoscopic mirror, and (6) a laryngoscopic mirror.

The patient should be seated directly in front of the examiner. The source of light should be in back of the patient and usually to the side upon which the examiner wears the head mirror, although this is not absolutely necessary. Before attempting to examine the patient's nose or throat with instruments, a careful general inspection of the patient should be made, noting the general facial characteristics. From this observation valuable data is often obtained such as pupillary reactions, ocular movements, and external deviations or thickening of the nose. Contracted nares and shortened upper lip with mouth breathing are seen in the individual with obstruction to nasal breathing whether this be due to post nasal adenoids or pathology within the nose.

Rhinoscopy should be started by inspection of the vestibule of the nose. This is accomplished by placing the four fingers of the left hand upon the patient's forehead—the thumb elevating the tip of the nose. With the reflected light from the head mirror upon the nose, a satisfactory examination of the vestibule can be made. In the vestibule of the nose one should look for the presence of fissures or lesions of the hair follicles. The nasal speculum is introduced with the blades closed and directed upward and backward. The blades are opened gently. The movability of the ala enables the examiner to adjust the speculum in order to see the various portions of the nose. It is necessary to change the position of the patient's head in order to bring the various areas of the nasal chambers into view.

The first structure which comes into view as the nasal speculum is opened is the inferior turbinate, which presents as a pendulous, pinkish projection from the lateral wall. Looking below this, the floor of the nose will be seen to be concave, sloping backwards and larger than the rest of the nasal cavity. The middle turbinate will be noted as a smaller, pendulous, pinkish, smooth projection extending into the nasal chamber above the inferior turbinate. The septum is the partition separating the one side of the nose from the other. It is usually not straight except when made so by previous surgical operation. It will be found to deviate either to the right or to the left. The presence or absence of secretions should be looked for, and if present, its color, type and location noted. Where pathology exists and a more detailed examina-

tion is deemed necessary, the nasal mucosa is contracted by the application of either cocaine or adrenalin or a combination of these two agents. A very favorite combination is the following, known as Hirsch solution:

Cocaine (aq. sol.) 25% ..... 2.5 cc.
Potass. Sulph. 2% ..... 2.5 cc.
Adrenalin 1/1000 ..... 5.0 cc.
Carbolic acid ½ of 1% qs. ad .....25.0 cc.

This solution is effective and of minimum toxicity. It has the unpleasant reaction of later causing excessive sneezing and profuse watery discharge from the nose. The patient should be warned of this and informed that the unpleasant reaction will pass away in a few hours. The oral cavity is next examined, noting the color of the membrane of the lips, the cheeks, gums, condition of the alveolar processes, the teeth and the tongue. The tongue depressor is now introduced. It should be held gently in the examiner's hand, the blade upon the patient's tongue should not extend posteriorly beyond the circumvallate papillæ. The pressure should be downward and gently forward. This will bring into view the faucial pillars, tonsil region, the soft palate, and the posterior pharyngeal wall. It is a better plan at this point to proceed with the post nasal examination with the mirror to be followed by the laryngeal examination with the mirror before using the arch retractor upon the faucial tonsil. This latter manipulation will, if done previous to the post nasal and laryngeal examinations, necessitate waiting until the patient's unpleasant reaction to the pillar retractor has subsided. In some phlegmatic and less sensitive

individuals, it is quite possible to deviate from this routine. In order to introduce the post rhinoscopic mirror, the patient's head is extended slightly forward. A number one or number two mirror, depending upon the size of the patient's oral cavity, should be heated and introduced behind the velum palati in such a manner that the light reflected upon the mirror will be directed into the vault of the pharynx. Posterior rhinoscopy is difficult and can only be accomplished through the exercise of patience and dexterity. Care must be exercised not to touch the back of the tongue or the posterior pharyngeal wall, as gagging prevents a view of the vault. In some cases it becomes necessary to use a palate retractor. This instrument has a loop which engages behind the soft palate and draws it forward when traction is made. When successful in placing the mirror with the full co-operation of the patient, it is possible to see the vault of the pharynx, posterior end of the septum, the middle and inferior turbinates. These latter present bulbous projections from the lateral wall of the nose and are somewhat paler than their anterior portions. On either side, posterior to the nasal openings, will be seen the orifices of the Eustachian tubes and behind these openings an elevation or posterior lip which gradually slopes into a groove situated between the lip of the tube and the posterior pharyngeal wall. This groove is the Fossa of Rosenmüller.

In order to obtain a view of the laryngo pharynx and the larynx, the examiner's eye must be directly on a level with the patient's mouth. The patient's head is extended slightly forward. The tongue is grasped

in a towel or piece of gauze between the thumb and index finger and drawn carefully forward and downward over the lower teeth. A large laryngeal mirror which has been previously heated is introduced into the mouth with the posterior surface of the mirror directed toward the roof of the mouth. The posterior surface of the mirror will rest against the soft palate and may be made to push this structure upward out of the way. Care must be exercised to avoid touching the tongue with the mirror. The mirror is now in place with the reflecting surface directed toward the larynx and the examiner's head mirror light directed upon the mirror. The position of the mirror may have to be altered slightly in order to see the different portions of the larynx. In some cases it will be necessary to employ the Killian position in which the patient stands with the face directed downward. The physician kneels in front of the patient, the mirror and light used as above described. The *epiglottis* appears in the mirror as higher and further removed, while those structures situated posteriorly appear lower and nearer. Illustrations of the larynx are usually portrayed as they appear in the laryngeal mirror. In the living subject the actual condition is reversed. Upon either side of and between the epiglottis and the lingual tonsil are recesses known as the *vallecul*æ. Posterior to the epiglottis is the opening of the *glottis* upon either side of which will be seen the *vocal cords* which stand out as two pearly white smooth bands. These appear to be close to the opening of the glottis, but as a matter of fact they lie deeply. Where the vocal cord is attached laterally is

a slit-like opening to the ventricles of Morgagni. A better view of these will be obtained during deep respiration with the laryngeal mirror faced toward the side to be examined and with the patient's head inclined toward the opposite side. Just above the *ventricle* is the *ventricular band*. As the vocal cords pass posteriorly they diverge to reach the *arytenoids*. The space between the cords at this point is termed the *interarytenoid space*. Externally and curving around to join the epiglottis are the *aryepiglottic folds*, outside of which are seen the *pyriform sinuses*. It is important to note the position of the cords during respiratory movements and phonation. During respiration the cords stand open, away from the midian line, presenting a somewhat truncated triangular opening, the narrowest portion of the apperature anteriorly and the widest portion posteriorly. During phonation the vocal bands should move toward the median line, leaving a very narrow slit. Patience and practice are necessary in order to accomplish a satisfactory laryngoscopic examination. Attempts may be unsuccessful because of improper position of the patient, the examiner, the light or the laryngeal mirror, irritability of the tongue, pendulous epiglottis and clumsy technique. It may be necessary to quiet the irritability of the parts by the application of a four per cent. cocaine to the pharynx and larynx.

Direct laryngoscopy is performed by an electrically illuminated tube, spatula, or speculum which is introduced over the base of the tongue and passed into the space between the base of the tongue and the epiglottis for a distance of from 1 to 1½ cm. The distal end

of the instrument is brought downward and forward by raising the handle. This pulls the epiglottis and hyoid bone downward, outward and forward toward the examiner at the same time the patient's head is drawn forward. This type of laryngoscopy is employed in children and adults where the indirect method has not been satisfactory and for operative manipulations.

After the laryngoscopic examination has been accomplished the examiner should return to the pharynx and proceed to examine the faucial tonsils. A suitable retractor should be hooked just behind the anterior faucial pillar and drawn gently forward. This brings the tonsil into view, and, by pressure backward against the tonsil, the contents, if any, of the crypts will be expressed. Many offending submerged tonsils are overlooked through failure to perform this last movement in the technique of examination of the throat.

CHAPTER III

COLD TAKING

Taking cold is a term commonly and loosely applied to acute catarrhal inflammation of the upper respiratory tract and may include the nose (acute rhinitis), the nasal accessory sinuses (sinusitis), pharyngitis, laryngitis, tracheitis and bronchitis.

Etiology.—Children of lymphoid tendency are especially liable to recurrent attacks. Colds occur with equal frequency in cold or warm climates if the patients are exposed. One can contract just as severe a cold in the summer time as in the winter, although the spring and autumn months show the higher incidence. This is not necessarily the result of the weather, but the manner in which individuals conduct themselves and the state of their resistance. Exposure to damp, cold or overheated and poorly ventilated rooms or houses, and mental or physical fatigue are common causes. Too little attention is given to the humidity of our overheated dry houses in the winter. Enterprising heating engineers are doing excellent work along these lines and have elaborated very helpful humidifiers which may be placed in operation in the homes. Dietary excesses are responsible for lowering the resistance and increasing the susceptibility to colds. Children and adults who indulge their craving for sweets are frequently benefited when their sugar intake is curtailed or eliminated. The matter of clothing is

often the basis of cold taking. Too much and improper clothing cause overheating and devitalizing sweating followed by rapid cooling. Wool and flannel undergarments are improper. Cotton, silk or linen are preferable. Chilling the body surfaces in restricted areas is frequently a cause of cold taking. This occurs as a result of wet cold feet and in children who are bundled with clothing about the upper body, good shoes and stockings, but with the lower thighs, knees and upper legs bared to all sorts of chilly blasts.

Individuals who are cold takers should have a careful scrutiny of the nose, nasal accessory sinuses, pharynx and tonsils. Nasal obstruction whether due to hypertrophied turbinates, deflected septum or new growths are predisposed to head cold taking. This applies with equal emphasis to individuals who have post nasal adenoid vegetations and hypertrophied or diseased tonsils.

Symptoms.—These are so well appreciated that they are missed through contempt. The earliest manifestation must be appreciated and acted upon if abortive treatment is to be successful or if treatment is to mitigate the attack. At times it begins with slight chilliness or creepiness in the middle of the back, slight headache, drowsiness, a tickling sensation in the nose followed by sneezing and dryness or soreness in the post nasal space or in the oropharynx. There may or may not be a slight fever. The symptoms more commonly begin in the nose, spread to the nasal accessory sinuses and the Eustachian tube or downward into the pharynx, larynx, trachea or bronchi. The severity of the systemic symptoms depends upon the general resist-

ance of the patient and the virulence of the infection. These symptoms include general bodily aching, lethargy, restlessness, anxiousness or irritability, thirst, anorexia and constipation.

Bacteriology.—Acute cold is due to a lessening of the resistance of the nasal mucosa and the invasion of various organisms, the micrococcus catarrhalis, diplococcus coryzæ, bacillus of Friedlander, pseudo diphtheria bacillus and the bacillus coryzæ segmentosus. No known organism can be regarded as the cause for a similarity of symptoms occurs as a result of a variety of organisms.

Pathology.—The reaction to invasion of the organism is first hyperæmia with increased leucocytosis. Mucin, mucous cells and some leucocytes are poured upon the surface. Through the continued action of bacteria the leucocytes find their way to the surface and a mucopurulent discharge results. If the inflammation is very severe the membrane itself is destroyed and there is a deposit of fibrin—a fibrinous inflammation. This may go on to ulceration. If the submucosal tissue becomes involved the inflammation is phlegmonous.

Prevention.—Acute catarrhal inflammation of the upper respiratory tract is highly infectious. The prevention of cold taking has occupied the attention of the medical profession for ages. Persons who are habitually taking cold should have, as previously stated, a thorough examination of the nose and throat and deviations from the normal must be corrected. These are too frequently the etiological factors overlooked or disregarded. The importance of proper living and

working quarters must be kept in mind. Adequate rest of the mind and body enter very largely into the resistance of the individual. The skin as a respiratory and excretory organ demands proper care. Bathing can be overdone as well as underdone. Warm baths followed by brisk rubdown are far more important than cold plunges. Exercise in the open air commensurate with the individual's physical make-up offers its contribution to building resistance. Over indulgence resulting in fatigue changes it into a causative factor. Clothing and feeding have been touched upon above. Direct infection can be guarded against only by isolation. The disregard for this is perhaps the outstanding reason for the widespread dissemination of colds. One may observe at any public gathering the number of persons sneezing and coughing about the infected spray and realize that any who are at that time receptive will fall victims.

Treatment.—While it is seldom possible to stop a cold, proper treatment will do much to mitigate the attack. In order to do this the individual who feels that a cold has been contracted should, upon the appearance of the slightest suspicious evidence, employ measures which will aid in restoring as quickly as possible the resisting balance. The safest and quickest way to do this is to go to bed and to stay there for a few days. A turkish bath is useful in breaking up a cold. The hot, mustard foot bath aids in breaking up the vaso-motor disturbance. Activity of the skin can be brought about by a hot drink and nothing takes the place of an adequate dose of spiritus frumenti in

hot water. A light diet should be taken and the bowels activated by a saline laxative.

The homœopathic remedies recommended for acute cold will be found under Acute Rhinitis, Acute Pharyngitis and Acute Laryngitis.

Those who prefer to resort to other therapeutic measures will find that acetylsalicylic acid in five-grain doses every few hours for the first twenty-four hours will temporarily relieve the symptoms. One-grain doses of Dover's powder repeated every few hours or five-grain doses of Cinnamon every three hours are useful.

For treatment of local symptoms as they occur in the nose, throat and larynx see under acute diseases of these organs.

CHAPTED IV

DISEASES OF THE NOSE

Acute Rhinitis

Acute inflammation of the nasal mucous membrane is induced by lowered resistance through mental or physical fatigue, sudden changes in the temperature, pre-existing pathology or anatomical abnormality. These latter include chronic rhinitis, sinusitis, adenoids, septal deflections and frequently chronically diseased tonsils. It is usually part of acute infectious diseases such as influenza and measles. It results from exposure to drafts, irritating vapors or the wearing of wet garments and living in damp, cold rooms.

The *pathological changes* may be divided into three stages and expressed by definite symptoms. In the first stage the mucous membrane of the nose is hyperemic. The patient complains of chilliness, followed by dryness of the nose and throat, headache, and lassitude. This readily gives way to the secretory stage and is marked by a profuse serous discharge. The mucous membrane is now engorged and swollen. This impedes nasal respiration and the patient is compelled to breathe through the mouth. The sense of smell is blunted or lost, there is watering of the eyes, sneezing, alteration of the voice, cough and slight rise in temperature. The third stage is attended by a less profuse but thicker discharge. The nasal breathing improves,

the headache is relieved, the voice returns and the patient is more comfortable.

Acute rhinitis may be complicated by sinusitis and especially is this liable to occur where previous obstruction exists. Pharyngitis may develop as a result of extension or through the enforced mouth breathing. The Eustachian tube and middle ear may be invaded through extension with the resulting tubal catarrh and in some instances an otitis media.

The *prognosis* of acute rhinitis is good. It tends to a spontaneous recovery in from three to five days.

Treatment.—It is well to refrain from any active form of local treatment in the early stage of acute rhinitis.

In the secretory stage the use of argyrol tampons according to the method of Dowling will hasten recovery. The proper use of this method of treating conditions of the nasal structure and the para nasal air cells is of sufficient importance to deserve a detailed description. No one form of local treatment of the nose and nasal sinuses has ever accomplished such beneficial results. We are indebted to Dr. J. Ivimey Dowling, of Albany, N. Y., for introducing this procedure and the following description has been gleaned from his writings:

Any of the silver colloids in 10 per cent. solution may be used. Before introducing the tampon, the nose should be inspected in order to determine the width of the nares and the presence of any irregularities, for the tampon should be so made that it will reach from the anterior nares to the choanæ posteriorly, and of

such thickness as will permit a snug fit without undue pressure.

The tampons are made from sterilized, long fiber cotton, wound about a long, thin, wire-like applicator. The particular style of applicator and kind of cotton are essential in order that a long tampon may be made and properly introduced.

To make the tampon, the necessary quantity of cotton is flattened and stretched to the required thickness and length and placed on the flat of the left hand. The applicator, held in the right hand, is placed across the middle of the cotton which is then folded toward the body, over the wire and held in place with the thumb. The tampon is wound upon the applicator and saturated with a 10 per cent. solution of argyrol or other colloidal solution. The average quantity that each tampon will hold is from 30 drops to one dram. The tampon is introduced into the nares, above the scroll of the middle turbinated body, first giving it the sphenoid direction, pushing it as far back as possible between the middle turbinated body and septum. After the tampon is properly placed, the applicator is slowly withdrawn by reversing the applicator from right to left, at the same time giving a slight upward shove to the tampon in order to engage and hold it as high in the nose as possible. When the applicator has been partly withdrawn, the handle is depressed until the wire is almost in contact with the upper lip, with the tip pointing toward the infundibulum, then a final push is given in order to engage the tampon as nearly as possible in the vicinity of the infundibulum. The wire

is now withdrawn, leaving the tampon in its proper position.

The tampons should always be placed in both nostrils, for while one side may be more involved than the other, it is seldom that one side alone is affected, although symptoms may only be referred to a single side. It is necessary to leave the tampons in place from ten minutes to an hour.

The use of cocain before placing the tampons is seldom required and should be avoided. The best results are obtained without its preliminary use.

A single tampon in either nostril is sufficient and in placing it, consideration of two directions is essential in order to properly locate the tampon within the nasal chamber. The first or primary direction is the sphenoid direction and the second, or final, the infundibulum direction.

The first step can usually be approximated because the middle turbinated body is generally too large to permit the placing of a tampon direct to the ostium of the sphenoid. The second step, however, can generally be accomplished and this is important in order to obtain desired results.

After the tampons have been removed, the nares are flushed with an alkaline solution at room temperature. In some climates the use of cool irrigation after the tampon treatment has been found satisfactory and a tonic effect upon the nasal tissues is produced. Irrigation is, at times, contraindicated, especially in women at or about the time of the menses. Oil is not employed following the treatment.

Indications.—This treatment is indicated in acute or chronic disease of the nose and nasal accessory sinuses.

Effects.—The results obtained through this treatment are immediate and remote, pleasant and disagreeable and are also subjective and objective. The immediate effects are suffusion of the conjunctiva, lachrymation, an increase of an already existing conjunctival congestion, sneezing and flow of mucus from the nose. Intraocular and tympanic congestions are lessened and visual acuity may be rendered more acute. Tinnitus is frequently lessened or controlled for a time. Actual drainage of the sinuses is accomplished. It lessens the radiating pains due to involvement of the ciliary nerves or various branches of the trigeminus. Headaches which are described as frontal, vertical, occipital or of the entire cranium, are frequently benefited after one or more treatments.

The disagreeable effects occasionally noted are a decided turgescence of the erectile tissues of the nose, increase of pains, vertigo and nystagmus. These aggravations are not greatly lessened by the use of cocain; must pass off gradually and seem to yield to rest.

Frequency of Treatments.—The frequency of treatments is governed entirely by the length of time the induced effects persist. Daily, weekly or less frequent treatments may be necessary.

Continuance of Treatments.—A single treatment is often sufficient for the cure of acute head colds, while for the more chronic conditions of the eyes or sinuses, the treatment may be necessary over a period of months or even for several years.

In the presence of pathogenic organisms there is a

distinct bleaching of the tampon which will change from its normal dark brown color to a yellowish tinge or may be completely decolorized.

A satisfactory nomenclature has been devised whereby the tampon may be readily interpreted as a diagnostic aid, making it easy to determine progressive improvement in any given case through successive treatments.

The following is suggested for general adoption:

Plus—1 Simple decoloration of tampon.

Plus—2 Simple decoloration of tampon, sneezing and jelly mucus on irrigation.

Plus—3 Simple decoloration of tampon, sneezing, ocular suffusion and jelly mucus on irrigation.

Plus—4 Simple decoloration of tampon, sneezing, ocular suffusion with chemosis, jelly mucus on irrigation, and ropy discharge oftimes adherent to posterior end of tampon.

Plus—5 Simple decoloration of tampon, sneezing, ocular suffusion with chemosis, jelly mucus on irrigation, and ropy discharge oftimes adherent to posterior end of tampon and aural reaction (vertigo).

The use of intranasal ultra-violet ray following the argyrol tampon treatment is recommended. This should be given in one-half minute doses, to be increased gradually in subsequent treatments.

Locally, for home use, an oil containing one grain of menthol and one drop of oil of cassia to the ounce

of albolene will be found very grateful. This oil may be dropped into the nose or used in an atomizer.

The homœopathic remedies suggested are:

Aconite 3x.—One-half dram of 3x in four ounces of water and a teaspoonful of the mixture every half hour until symptoms are relieved and then continue at less frequent intervals. This agent is indicated in acute rhinitis which occurs through vascular changes brought about by exposure to wind and sudden changes in the temperature. Further indications for its use are the anxious mental condition of the patient with the attending restlessness, fever and thirst. The patient is a picture of acute vascular irritability.

Allium cepa.—Opinions vary as to the potency of this drug which should be used. Some recommend the 3d, the 4th and the 6thx. Personally, I prescribe it in the 2x and this has been decided upon after long experience. Sneezing is the outstanding symptom indicating this remedy. The discharge from the nose is acrid. It burns the tissues about the vestibule of the nose and the upper lip and there is burning and stinging in the eyes. While the nasal secretions burn and excoriate, that from the eyes is of a bland nature. The symptoms are aggravated when the patient is in a warm room and improved when they are in the open air. There is also a morning aggravation. The Allium cepa case also presents a tendency for rapid extension to the larynx and pharynx and there is a titillating cough attending.

Arsenicum 30thx.—This remedy is indicated in the patient who presents recurring colds, usually the result of a constitutional deficiency. Sneezing is a prominent

symptom which is followed by profuse, watery discharge which burns and excoriates the nostrils and the lip. The patient complains of the burning in this instance not only externally but in the nose itself. Frontal headache is a prominent symptom. Patients requiring Arsenicum are usually of the hay fever and asthma type.

Belladonna, 2x or *3x.*—Care must be exercised in using this remedy as some patients have a peculiar sensitivity to its action. Belladonna is indicated in the congestive cases. This is evidenced by the engorgement of the peripheral vessels. The face is flushed. The great vessels of the neck are seen to pulsate. The skin is parched. The headache is a prominent symptom. Sensitiveness of the conjunctiva causes photophobia. There is frequent sneezing. The nose, externally, is usually red.

Dulcamara 3x.—The indication for this remedy is the effect of weather upon the process. There is a particular aggravation due to dampness. It also has some of the symptoms of Gelsemium such as croupiness and chilliness up and down the spine.

Euphrasia, Tincture and *3x.*—The best results from this remedy have been obtained in my hands by exhibiting it in five-to ten-drop doses of the tincture every two or three hours and given early. The cases in which this remedy does its best work are those in which the eye symptoms stand out prominently. The eyes are red, inflamed and there is a great deal of lacrymation which tends to excoriate the cheek. The nasal secretions are less irritating.

Ferrum phosphoricum 2x.—This remedy is of great value where the acute rhinitis is associated with lower respiratory irritation, that is, the larynx and the trachea are involved in addition to the common symptoms of rhinitis.

Gelsemium 1x.—The indications for Gelsemium are depression, both mental and physical and colds acquired through exposure to dampness. The patient is constantly on the verge of a chill because of the creepy sensation in the back. To this is added a marked drowsiness, apathy and confusion of thought. The headache is dull and full and the eyeballs are sore and ache when moved from side to side or up and down and the vision may be blurred. The face feels hot.

Kali iod. 6x.—This remedy is indicated in the later stage when the discharge becomes dark green or yellow. The nasal accessory cavities are involved, especially the maxillary. It is particularly indicated in individuals of a luetic or scrofulous tendency.

Nux vomica 1x.—This remedy is indicated in the second stage of the condition where the nostrils are rather badly obstructed due to vasomotor paresis and this obstruction alternates from one nostril to the other and is worse at night. There is a disagreeable heavy feeling over the bridge of the nose and there is present a dry cough.

Pulsatilla 3x.—Is indicated in the third stage of rhinitis when the discharge is greenish yellow and thick; the patient feels better in the open air and has the typical Pulsatilla mental frame, which is sad, weepy and discouraged.

Sanguinaria canadensis or sanguinaria nitrate 1x.— This remedy is another one to be thought of in the later stages of acute rhinitis, particularly in those cases where the frontal sinuses and the Eustachian tube and middle ear show a tendency to involvement. The discharge is fluent, acrid and the senses of smell and taste are blunted and there is a great deal of sneezing. If there is headache it is usually in the occipital region and spreads up over the head to the right eye.

Simple Chronic Rhinitis

This condition is also termed chronic catarrh and sub-acute rhinitis. It is characterized by discharge from the nose and varying degrees of nasal obstruction. It occurs as the result of frequent attacks of acute rhinitis. It follows prolonged exposure to irritants, alcohol and tobacco. It is observed in association with chronic toxæmias. Dietary indiscretions, especially the indulgence in sugars and starches, are common causes.

The chief *symptoms* are discharge from the nose, obstruction to breathing and susceptibility to cold catching. As the condition progresses the Eustachian tube and middle ear are involved with the added symptoms of tinnitus, stuffiness in the ears and dull hearing.

Examination of the nose shows a turgescence of the turbinates which may occupy most of the nasal cavity. Stringy, tenacious, mucous secretion covers the turbinates. Frequently septal deviations are noted and these act to perpetuate the condition. The posterior ends of the turbinates as seen by posterior rhinoscopy will present a grayish mulberry bulbous enlargement.

Chronic rhinitis is one of the causes of the so-called pocket handkerchief deafness. This occurs because these patients practice frequent forcible nose blowing and this results in inflation of the middle ears with eventual relaxing effect upon the membrana tympani and the tympanic ligaments. Under proper and persistent treatment the prognosis of chronic rhinitis is good.

Treatment.—Careful regulation of the hygiene is most important. The diet must be regulated to limit or exclude sugars and starches. Constipation if present will require measures to correct it. Tobacco and alcohol should be curtailed or eliminated as the case demands. The living and working conditions of the patient should be investigated. Frequently improper heating or ventilation will be found to operate most unfavorably.

The local *treatment* consists of Dowling's argyrol tampons and this procedure, when properly applied, produces prompt improvement. The tampons should be applied two or three times weekly and allowed to remain in the nose for a half hour at each treatment. The intervals between treatments may be lengthened as improvement occurs and this is determined by a lessening of the reaction, suffusion of the eyes, sneezing and nasal discharge and the changes in the bleaching of the tampon after it has been in the nose for the prescribed time. (See Dowling Tampon Treatment.) The patient may augment the treatment by the use of a spray of menthol 2 grains, camphor 2 grains to the ounce of albolene; this to be used twice daily.

The homœopathic remedies recommended are:

Calcarea carbonica 3x.—The indications for this remedy are the sweaty, chilly, flabby, obese patients with glandular enlargements and children of rachitic tendency who have catarrhal tendencies in all of the mucous membranes.

Calcarea phosphorica 3x.—This remedy is used in chronic catarrhal pathology; enlarged tonsils and adenoids or mucous polypus, in anæmic, lymphatic, mouth breathing individuals.

Hepar sulph. 3x.—The Hepar patient catches cold very easily, sneezes frequently when exposed to cold and presents glandular enlargements. This is a valuable remedy in the recurring colds associated with chronic disease of the nasal accessory sinuses.

Hydrastis 2x.—This remedy helps the cases presenting thick, tenacious, mucous discharge either white or yellow and either blown from the nose or drawn into the post nasal space. It is useful in patients who have a train of gastrointestinal symptoms of a catarrhal nature.

Kali bichromicum 3x.—The secretion in the case requiring Kali bichromicum is tough, stringy, tenacious mucus which adheres to the membrane and requires considerable effort to dislodge. There may be pressure at the root of the nose and dull, heavy frontal headache relieved by pressure over the bridge of the nose.

Kali iodatum 2x.—The discharge is watery; alternating with greenish or yellow mucus. Throbbing may be present in the nasal bones. This remedy is valuable in cases showing extension to the middle ears and to the maxillary sinuses.

Kali sulphuricum 3x.—The discharge is yellow and

profuse and the patient is relieved in the open air and worse in the warmth.

Mercurius vivus 6x.—Thin, acrid discharge is present early and this excoriates. Later the discharge becomes thick and bland.

Natrum muriaticum 6x.—The discharge is profuse and thick, white or clear mucus, associated with which is sneezing, worse in the morning and when exposed to air.

Nux vomica 2x.—Sneezing and alternating nasal obstruction are the outstanding nasal symptoms. The nose tends to dry up and obstruct at night associated with a dry, tickling cough. The symptoms are worse in the morning, in the open air and from stimulants. The symptoms are relieved in moist atmosphere.

Pulsatilla 2x.—Profuseness of the discharge is the outstanding indication. The discharge may be yellow or greenish or have a fœtid odor. The nose is stuffy. This patient is always relieved when in the open air and is worse from warmth.

Sanguinaria 2x.—Dull, congestive type of headache from the occiput to the frontal sinus area is characteristic. The sense of smell and taste are blunted or lost. The nasal discharge is acrid. Sneezing is common. Pain may be complained of in the frontal region.

Sepia 6x.—This remedy is prescribed upon the hepatic and menstrual symptomatology. Patients with simple chronic rhinitis present general relaxed venous channels. Hæmorrhoids may be part of the picture. The nasal discharge is thick, greenish lumps of mucus. The patient complains of pressure over the bridge of the nose.

Chronic Hypertrophic Rhinitis

This is a chronic inflammatory condition of the nasal mucous membrane characterized by hypertrophy and hyperplasia. It follows frequent attacks of acute rhinitis or a continuation of a chronic simple rhinitis. Therefore, the causes of hypertrophic rhinitis are the same as for the chronic rhinitis. Obstructive conditions such as congenitally narrowed nares, abnormally arched turbinates and deviated septum act as causative factors.

The *symptoms* are obstructed nasal breathing, nasal discharge, cold-taking tendency, alteration in the voice and frontal headache. The enforced mouth breathing brings about a pharyngitis, tracheitis, bronchitis or bronchospasm. Extension of the pathology to the Eustachian tubes and middle ears produce interference with the hearing.

Examination of the nose reveals irregular thickening of the nasal mucosa. Bulbous nodular enlargements of the ends of the turbinates form a common picture in this disease. Polypi or polypoid degeneration of the turbinates are common. A polypus presents as a smooth, glistening, grayish, moist, movable tumefaction attached to the nasal membrane by means of a pedicle. Polypoid degeneration of the turbinates appears as an irregular nodular mulberry like tumefaction growing from an end or margin of a turbinate. It is not freely movable like the polypus.

Treatment.—In the less severe cases where the mucosal thickening does not cause obstruction and in the absence of polypi or polypoid changes, the organic silver tampon treatment is applicable and when per-

sisted in brings about satisfactory results. This may be supplemented by home treatment of a spray of adrenalin chloride 1 to 10,000, or ephredine 1 to 5,000, followed by a spray of menthol, grain one; albolene one ounce. This may be carried out over a period of several weeks.

In marked cases where the turbinal thickening is considerable the application of the galvanic cautery is indicated. The nose is cocainized by applying to the areas to be treated a four percent solution. When the tissues can be palpated with a probe without exciting distress the galvanic cautery heated to a cherry red is applied to burn a groove in the thickened part. This destroys varicosities and the subsequent contraction of the scar further reduces the enlargement. Care should be exercised not to burn too much at one time. It is better to wait for a considerable period before cauterizing a second time. Excessive cauterization brings about atrophy.

Polypi and polypoid degenerations should be removed by excision. The polypus is readily removed with the wire snare. Polypoid tissue is removed after cocainization of the area by freeing it from its attachment with the nasal scissors. The nasal snare wire is made to encircle the partially freed involved area and removal effected by closing the snare wire. The removal of polypoid posterior ends is attended with more technical difficulty. The snare wire may be made to encircle the diseased area through the nose and guided by the operator's finger in the post-nasal space. In performing these surgical procedures again it is important not to remove tissue that is not diseased. Bleed-

ing from removal of portions of the turbinates is at times quite free and especially is this true of the inferior turbinate. Usually, however, packing the nose after these operations is not necessary. When, however, it is necessary to pack the nose with gauze or other material to control bleeding, it should be remembered such packing should not be disturbed for some time or left in situ too long. Usually it can be removed at the end of forty-eight hours.

Correction of the local obstructive pathology does not cure these patients. It is important to search for the active factor in the production of the condition. The general hygienic conditions must be investigated. The diet, the use of alcohol and tobacco, rest, exercise and working conditions require consideration.

For homœopathic remedies in this condition see under Chronic Rhinitis.

Purulent Rhinitis

This is sometimes called strumous rhinitis. It occurs more commonly in children of the tubercular and specific type. It is chronic and follows specific infections like measles, scarlet fever and diphtheria. Gonorrheal infection contracted during birth from the infected vagina of the mother is a supposed cause.

The outstanding symptom is a fœtid greenish discharge which at times is blood streaked, excoriates the vestibule of the nose and causes fissures. The swelling of the nasal mucosa and the accumulation of the discharge cause obstructed breathing.

Examination of the nose usually reveals thickened alæ, excoriated and fissured vestibule, swollen turbi-

nates and free mucopurulent discharge especially on the floor of the nose. In cases that have gone on for a protracted period the turbinates may be collapsed.

The *treatment* of purulent rhinitis calls for a careful appreciation of the patient's general condition. Cod liver oil, iodide of iron and the iodide of arsenic are indicated. Sugar and pastry should be eliminated from the diet and in their place calcium containing vegetables should be taken liberally. The local treatment consists of cleansing the nose with warm saline solution. Where possible the use of the argyrol nasal tampon properly applied brings about very pleasing results. Following the tampon treatment the nose should be cleansed with an alkaline solution.

For the homœopathic remedies used in this condition see under Chronic Rhinitis.

Atrophic Rhinitis

This is also spoken of as dry rhinitis, ozæna or offensive dry catarrh. It is characterized by atrophy and dryness of the nasal mucous membrane, the formation of crusts and a very offensive odor which is not usually perceived by the patient but all too apparent to those who come in contact with the patient.

The *etiology* has not been settled from a bacteriological standpoint for organisms found in ozæna have been isolated in other conditions and even in healthy individuals. The coccobacillus of Perez, found in the secretion beneath the crusts, will produce the characteristic odor in artificial media and in dogs but it also presents a pathogenicity in other conditions.

Atrophic rhinitis follows chronic hypertrophic and

purulent rhinitis, chronic suppurative sinusitis and diphtheria. Congenital syphilis and heredity are supposed to play a part. It is usually observed after ten years of age and seldom after twenty-five years.

The *symptoms* are dryness of the nose and throat. Crust formation may completely obstruct nasal breathing. The vestibule of the nose becomes fissured, irritated and painful due to the excoriating discharge. The sense of smell is blunted or lost. The Eustachian tubes and middle ear involvement causes dull hearing. Dryness of the pharynx and larynx, frequently associated, produces cough and alteration in the voice.

Atrophic rhinitis must be differentiated from late syphilis, tuberculosis, foreign body in the nose, and nasal accessory sinus disease. In syphilis the history, involvement of the bony septum with perforation and serological study will help to differentiate. In tuberculosis the manifestation is lupus which heals and spreads and if perforation of the septum occurs it is in the cartilaginous portion. A foreign body in the nose causes a unilateral excoriating discharge. The differentiation from disease of the nasal accessory sinuses requires care and attention. Crusts should be removed from the nose followed by careful cleansing with an alkaline solution. The nose should then be inspected for the occurrence of discharge from the middle meatus above the middle turbinate or into the choanæ. When this is found the examination should be continued as described under Nasal Accessory Sinuses Page 99.

Examination of the nose externally frequently reveals some depression of the bridge or a broadening of

the nose. The skin about the vestibule is thickened and the vibrissæ are deficient. The nose contains crusts of dried secretion beneath which is a fluid mucopurulent secretion emitting a fœtid odor. The nasal cavities are abnormally roomy due to the collapse of the turbinal bodies and the atrophy of the septal mucosa. The pharynx will frequently present similar changes with crust formation or abnormal dryness.

The prognosis of atrophic rhinitis is poor as regards cure. Persistent treatment will control the odor and lessen the crust formation.

Treatment.—Removal of the crusts may be accomplished by douching the nose with a warm alkaline solution of sodium chloride ten grains, sodium bicarbonate ten grains to the ounce of warm water. Tampons of cotton saturated in glycerine, placed in the nose and allowed to remain for several minutes, will cause a free flow of mucus and assist in the separation of the crusts. Hydrogen peroxide or the essence of caroid are also very useful in removing crusts. After the nose is thoroughly cleansed a stimulating medicament should be applied. Iodine five grains to the ounce of glycerine is very useful. A beneficial but heroic treatment is the application of crude carbolic acid to the nasal mucosa followed quickly by the application of alcohol. This treatment causes an early disappearance of the fœtor.

Frequently these patients present a markedly excoriated condition of the vestibule and the upper lip due to the acid discharge. In these conditions the following local application will be found to be of benefit:

milk of magnesia, one ounce; olive oil, one ounce; oil of white pine, fifteen drops.

The odor may at times be brought under control by tamponing the nares with a 2 per cent. mercurochrome solution. The tampons should be allowed to remain for fifteen minutes followed by the intra-nasal application of the ultra-violet ray. These exposures should be of one-half minute duration in the beginning, gradually increasing to ten or fifteen minutes as tolerance is developed. Another local remedy useful where the fœtor is troublesome is ammoniated mercury, four grains to the half ounce of sugar of milk. A pinch of this powder is used daily as a snuff.

In assuming the care of a case of atrophic rhinitis the patient should be thoroughly impressed with the chronicity of the condition and the necessity for daily, careful cleansing treatment and local application, as often as possible, until the crusting and the fœtor are brought under control. After this, in suitable cases, the patient may be trained in the technique of daily treatment. It is also important to make a careful general survey of the patient with a chronic atrophic rhinitis. These individuals always present a lowered vitality and this should receive attention.

Various surgical procedures have been practiced with the object of reducing the roominess of the nasal cavity. Submucosal implantation of wax was in vogue at one time. Later the operation of Halle was hailed with much enthusiasm. This consisted in mobilizing the lateral walls of the nose and pushing them toward the median line until the middle turbinates touched the septum. Scarification of the mucosa of the approxi-

mated surfaces was performed to encourage the formation of adhesions. The results of this operation have not encouraged the continuance or general acceptance of the procedure.

The homœopathic remedies recommended in atrophic rhinitis are as follows:

Arsenicum iodide 2x.—The general poor nutrition of the patient frequently prompts the prescribing of this remedy. The local indications are corrosive nasal discharge which irritates and causes shrinking of the alæ.

Aurum muriaticum 3x.—The associated mental depression is very marked and this is a frequent symptom in patients suffering from ozæna. The discharge from the nose is bloody, offensive greenish plugs.

Graphites 6x.—Scabbing and fissures about the alæ with similar fissures in the corners of the mouth or back of the ears are suggestive indications for this remedy.

Kali bichromicum 3x.—Plugs of tenacious mucus are blown from the nose with some bleeding which is due to ulceration of the nasal mucosa. The nose is painful externally.

Mercurius corrosivus 6x.—The nasal bones are painful; the discharge is corrosive mucus which causes rawness and smarting in the nose.

Nitricum acidum 3x.—The patient takes cold easily and presents green, offensive corroding discharge which produces a red nose.

Petroleum 3x.—Cracks and fissures about the vestibule and crusts in the nose are the chief local indications. The patient is irritable and depressed.

Pulsatilla 3x.—The discharge is profuse, greenish

and fetid. The patient presents a changeable mental attitude.

Psorinum 30x.—The odor of everything about the patient is fœtid.

Sepia 6x.—The discharge from the nose is yellowish green and associated with pain and pressure about the root of the nose, in patients who suffer menstrual difficulties at which time the nose is particularly annoying.

Silica 6x.—This remedy is useful in rachitic and tubercular patients. They complain of morning sneezing, loss of sense of smell and the discharge dries in the nose forming large crusts.

The use of iodide of potassium or sodium in three to five-grain doses three times a day is found useful in cases not responding to other medication.

Vaso-Motor Rhinitis

This term is used to include such conditions as are known under the designation of hay fever, pollen fever, spring catarrh, rose cold, timothy fever, ragweed fever, perennial hay fever and hyperæsthetic rhinitis.

The condition occurs in individuals having a sensitive mucous membrane in the nose, a sensitive nervous system and an individual allergic reaction to proteins.

The *causes* are pollens of trees, plants, grasses, emanations of animals, furs, foods, face powders, other cosmetics and bacteria. House dust, probably a combination of many proteins, is also included. The rose cold or timothy fever is due to the pollen of timothy, red top and other grasses and appears about the middle of May and lasts until the middle of July. Fall hay fever, or ragweed fever, is caused by the pollen of

the giant or dwarf ragweed and the cocklebur. This appears about the middle of August and lasts until the end of September. The so-called perennial hay fever is the term which has been given to the symptom complex when it occurs during the year irrespective of seasons. It is now clearly understood that it is due to a protein to which the patient exhibits a great sensitivity. The nasal symptoms of vaso-motor rhinitis are intensified by the presence of nasal pathology such as sinus disease, polypi, deflected nasal septum, adenoids and diseased tonsils.

The *symptoms* of pollen fever are itching of eyes, ears, nose and throat, paroxysmal photophobia, lacrymation and violent sneezing. These paroxysms show a tendency to periodicity, being especially bad at sunset, early morning and when arising from bed. In the perennial type the symptoms are less intense. The patients are usually mentally and physically depressed and suffer from dull frontal headache. Later in the course of the condition, or early in aggravated cases, bronchospasm develops.

Examination shows suffused injected conjunctiva. The nose presents excoriation about the vestibule. The nasal mucous membrane is pale, puffy and succulent and a free watery discharge will be noted.

Vaso-motor rhinitis is diagnosed by the history of its occurrence and by the dermal tests of such articles as are suggested by the history and other circumstances attending the individual case.

Treatment.—Seasonal cases are generally completely relieved by removal from the location of the offending pollens. These patients are perfectly comfortable

when on the high seas. Desensitization with antigens of the offending agents offers a fair measure of success when properly administered. Cases due to foods, animal fur, cosmetics and bacterial cases are similarly dealt with, removal of the offending agent and where this is not practical, attempted desensitization.

Duncan's method of desensitization by using the secretions of the patient's nose or by making antigens from the substance to which the patient is sensitive gives good results. Secretion is obtained by placing a sterile cotton tampon in the nose during active symptoms of the spring or fall type of pollen fever. This is allowed to remain until it becomes thoroughly saturated with the secretion. It is then removed and placed in a Berkfeld filter and one cc. of sterile water added. This is allowed to filter. The filtrate is then successively diluted five or six times with sterile water in the proportion of one part of the previous dilution to nine parts of distilled water. A small dose, one tenth cc., of the last filtrate is administered hypodermically and if no unpleasant reaction occurs, one-half cc. is administered. This is repeated every three to five days, depending upon the return of the symptoms.

General bodily ultra-violet ray exposures are of value in this condition.

The eye symptoms will be relieved by a solution of boric acid, grains ten, sassafras pith, grains ten to the ounce of rose water. This to be used in an eyecup at frequent intervals.

Calcium chloride, five to ten grains, well diluted in water, three or four times a day acts very favorably in many cases.

Dilute nitro-hydrochloric acid, five to ten minims, well diluted in water three times daily, is recommended.

Great relief of the nasal obstruction is at times obtained by spraying the nose with an ephedrine solution.

The homœopathic remedies recommended in vasomotor rhinitis are:

Allium cepa 1x.—Sneezing with acrid nasal discharge, which is worse in the morning and better out of doors. There is marked photophobia.

Arsenicum album 6x.—Profuse watery irritating discharge from the nose, associated with intense thirst, burning and prostration. It is useful in the asthmatic cases.

Arsenicum iodide 2x.—Thin watery excoriating discharge with associated hoarseness and general physical debility.

Aralia racemosa ϕ.—The sneezing is excited by the slightest breeze blowing over the patient's head. Asthmatic seizures which come on after the patient has been asleep for a time.

Euphrasia ϕ.—Profuse excoriating discharge from the eyes and nose.

Gelsemium 1x.—Mentally depressed and sluggish. Chilly and aggravated in damp weather. Sneezing and suffusion of the conjunctiva.

Hepar sulph. 3x.—Profuse secretion and easy perspiration. Chilliness and marked hypersensitiveness. The nose stops up as soon as it gets cool.

Naphthalinum 1x.—This remedy is more useful in the later asthmatic stage.

Nux vomica ex.—The nose is stopped up at night and discharges freely during the day and when it is obstructed.

Cerebrospinal Rhinorrhœa

This is a rare and usually fatal condition. It is a leakage of cerebrospinal fluid from the nose, usually from one side, and the exact route of its escape is not known. It follows injuries to the base of the skull, including intranasal operations. The patient complains of a constant dropping of fluid from the nose. It is free of taste or smell and sediment. It contains no albumin or mucin and if examined promptly after collection, presents a copper reduction reaction with Fehling's solution. When discharged into a handkerchief and allowed to dry the handkerchief remains soft. There is no treatment for the condition and most cases terminate fatally in meningitis.

Epistaxis

Bleeding from the nose is a symptom resulting from trauma, nasal pathology or systemic disease. The bleeding will be found to come from small vessels in the mucosal covering of the cartilaginous septum anteriorly near the floor. This area is known as Kiesselbach's. Varicose veins occur upon the septum and these will frequently bleed. Ulceration and perforation of the septum, due to syphilis, tuberculosis or malignancy, will occasion bleeding. Epistaxis is sometimes a symptom of cardiac, hepatic or renal disease, arteriosclerosis, hypertension, the various anæmias and acute septic or infectious diseases. Young children

with adenoids have frequent nose bleed, and when this symptom follows the removal of tonsils and adenoids it will usually be found that the bleeding is from the adenoid area. Not infrequently little girl patients will have nose bleed at intervals until the establishment of the menses. Absorption of phosphorus, chloralamide, the salicylates and large doses of quinine will produce nasal bleeding.

Nose bleed is very unpleasant and alarming to the patient and sometimes to the physician, resulting in the too early institution of unnecessary radical measures for control.

The first step in the *treatment* is to establish mental and physical quiet. In adults an anodyne may be required and morphia hypodermically is a sure acting remedy. In children this is usually not indicated or necessary. When the physician arrives upon the scene the nose is filled with a blood clot with oozing of blood either anteriorly or posteriorly into the post nasal space to be expectorated through the mouth. The clot should be removed with dressing forceps, and by having the patient blow the nose. This may cause a recurrence of active bleeding, but it will give an opportunity of seeing just where the bleeding comes from. A cotton tampon, saturated with Hirsch solution (see formula under Examination of the Nose), should be inserted over the bleeding area and allowed to remain for at least five minutes. This usually controls the bleeding to an extent that the exact point of bleeding can be located and treated by the application of the actual cautery or the use of chromic acid. In some severe cases the anterior nares will require packing and in-

frequently a post nasal pack may be required. Such packing should not be allowed to remain more than forty-eight hours. A thorough survey of the patient should be made for the discovery of conditions known to cause this symptom.

The homœopathic remedies useful in epistaxis are:

Aconite 2x.—Nose bleed in over active heart with attending fear and restlessness. It is particularly useful in the nose bleed of children and hypertension adults.

China 2x is indicated in patients who have been depleted by the nasal bleeding.

Crotalus 30x is the remedy to be used in nose bleed attending septic conditions and acute infectious diseases of the malignant type.

Geranium maluatum ø.—This remedy is given in thirty-drop doses of the tincture every three hours.

Hamamelis ø.—Nasal bleeding from varicose veins in the septal mucosa. The vessel walls are thin and bleed upon slight manipulation.

Injuries to the Nose

Fracture of the bony framework of the nose is caused by direct trauma and results in a dislocation of the nasal septum or the displacement of one or both nasal bones. The mal position of the nasal septum usually produces some obstruction to breathing. Displacement of the nasal bones causes a flattening or broadening of the bridge. If only one nasal bone is fractured the tip of the nose deviates.

The dislocation of the septum is frequently overlooked at the time of injury, due to the difficulty in

examination occasioned by the profuse bleeding. In order to make an inspection after an injury to the nose, the bleeding should be controlled by styptics or pressure. When the cartilage is dislocated, it may be replaced shortly after the injury by careful insertion of the finger into the nostril presenting the convexity or greatest obstruction, and forcing the cartilage back into its median position. If a hæmatoma forms, it will be necessary to treat this. (See Hæmatoma of Septum.) If the case has been allowed to go for a period in excess of a few weeks, a sub-mucous resection of the nasal septum is usually necessary to correct the deformity.

Fracture of the nasal bones, if seen early, can be replaced with little remaining deformity. Examination at the time of injury is usually interfered with by pain, swelling and bleeding. Cocainization of the nose will permit palpation, using a flat elevator within the nose and the finger externally. Where the displacement is apparent in children it is wise to administer a general anæsthetic and correct the deformity immediately, introducing a small fibre splint between the septum and the outer nasal wall to give the necessary support. This may be renewed every forty-eight hours for a week. Old fractures will require mobilization of the nasal bones before they can be replaced. This may be accomplished under a local anesthetic and is usually performed through a small incision in the mucous membrane, at the lower end of the nasal bone. Through this incision the skin and periosteum are elevated to the frontal process and the muco periosteum is freed from the inner surface. With special cutting forceps,

the attachment of the nasal bones is completely broken up. The bone may then be placed in proper position and supported by a splint in the nose and a support protector externally consisting of tin and copper or dental composition moulded into proper shape. The intranasal splint should be renewed every forty-eight hours for a week when it, together with the external splint, may be discontinued.

Deformities of the Nasal Septum

Spurs or projections from either side of the septum and bendings or deviations of the septum are fairly common. Spurs usually result from overgrowth or extensive callous formation after injury. Deflections are commonly the result of traumatism, and the resulting deformity may be a combination of deflection and spur formation. Septal deviations also occur as the result of faulty development of the palatine arch. Spurs occur along the line of injury or along the suture line. Deviations vary greatly. They may be low, angular and completely blocking the anterior nares or the deflection may be high and obstruct the middle meatus or they may be "S" shape antero posteriorly obstructing the anterior portion of the nose on one side and the posterior nostril on the other, or they may obstruct the one side high up and the other side low down. The symptoms occasioned by spurs and nasal deviations will depend upon the degree of obstruction which they cause. In some instances the obstruction to nasal breathing is sufficient to cause the patient to seek relief. High deviations are responsible for interference with normal sinus ventilation and drainage

and produce pain and headache. These subjects also present marked sensitiveness to cold taking. The hearing is usually involved, especially on the side of obstruction, this being due to incomplete ventilation of the Eustachian tube and its influence upon the middle ear. Secretions tend to accumulate in the concavity and form scabs. The pressure of these, plus the repeated traumatism practiced in removing the scabs, produce erosions and at times perforations. The obstructed nasal breathing will produce sinus changes, congestive sinus headache or actual catarrhal sinusitis. There is usually present a marked pharyngitis which causes a dry, hacking cough. In old cases it is not infrequent to observe marked post nasal drainage of mucus, blunted or absent sense of smell and bronchial changes. This may be exhibited as a simple chronic bronchitis or a broncho spasm.

The prognosis in cases of nasal obstruction due to spurs or deflected septums is good. Properly executed surgical treatment re-establishes nasal breathing and in turn improves the catarrhal complications.

Treatment.—Various operations have been performed for the removal of obstruction due to spurs and nasal deflection, but the most satisfactory procedure is the submucous resection. This may be executed under local or general anæsthesia. An incision is made in either the left or right nostril just anterior to the limit of the anterior deviation, carried from a point just under the wing of the nose downward and backward to the floor of the nose. This incision should be carried through the skin or mucosa, as the case may be, and through the perichondrium to the cartilage.

Through this incision the soft structures are elevated from the cartilage and bone on the one side, passing well beyond the limits of the deviation. The cartilage is then incised at the line of primary incision to the opposite perichondrium, but not through it. The elevation of the soft structure of the opposite side is executed through this incision well beyond the limits of the deviation. The obstructing cartilage and bone are now removed by whatever method the operator prefers. Swivel knife or various types of bone and cartilage forceps are used. After all deviating parts of the septum are removed, the soft structures are approximated by the placing of a dressing, gauze or splint, in either nostril. These are removed at the end of forty-eight hours, when in the average case no further dressing is required. The nose is inspected and kept free of scabs for the next few days. At the end of ten days healing is usually completed. The beneficial result of this surgical procedure when it is indicated is one of the bright spots in nasal surgery. Failure is due to mistakes in judgment, selection of case and incomplete operation.

Fissures, Erosions, and Ulcers of the Nasal Septum

Fissures are painful cracks in the membrane on the septum at the mucocutaneous border, or in the skin of the extreme upper anterior portion of the vestibule. They occur as a result of colds in the head or sinusitis. These lesions may easily be overlooked if care is not exercised in examination.

Erosions appear upon the nasal septum and may be due to simple catarrhal processes.

Ulceration of the nasal septum is observed in nasal syphilis, typhoid fever, and diphtheria, lupus and tuberculosis. (See Syphilis and Tuberculosis of the Nose.)

Perforations of the septum are the result of ulceration. Those involving the cartilaginous septum are usually the result of traumatism, lupus, or tuberculosis, exposure to acid fumes and to the habitual use of cocaine. Syphilitic perforations usually occur in the bony septum. Perforations may be present without the patient's knowledge. A whistling sound when breathing causes a visit to the physician, whose inspection discloses the cause to be a perforated septum. If the perforation is large this whistling symptom is absent. The accumulation of scabs upon the edge of the perforation produces obstruction to breathing.

Treatment.—Fissures may be relieved very quickly by cauterizing the base with silver nitrate, sixty grains to the ounce. Simple ulcers will also respond to silver nitrate in solutions of ten to sixty grains to the ounce. Chromic acid and trichloracetic acid are also useful.

Perforations when clean require no treatment. Attempts at surgical closure are made at times. This is unnecessary. If the perforation presents granulating or raw edges, cauterization with trichloracetic acid or chromic acid will encourage the scar to heal over the edges of the perforation and lessen scab formation.

Hæmatoma and Abscess of the Nasal Septum

The occurrence of obstructed nasal breathing and swelling on either side of the vestibule of the nose following a blow or other traumatism to the nose should cause suspicion of hæmatoma or abscess of the

septum. Abscess may also occur in lues and phlegmanous infection. The occurrence of a chill and fever with the swelling in the nose is very suggestive of abscess formation.

A certain amount of permanent thickening usually follows hæmatomas irrespective of abscess formation. It should be remembered that pus in the septum is potentially dangerous, due to the venous drainage and its relation to the cavernous sinus. Meningitis and septicæmia may develop from this condition. In all cases there is a certain amount of deformity resulting and the patient should be informed of this.

Treatment.—In the case of hæmatoma, aspiration with a large needle should be tried and if this will not evacuate the blood the septal mucosa should be incised. In the case of pus formation free incision should be performed on each side of the septum.

Homœopathic remedies recommended are:

Arnica 3x is indicated in hæmatomas resulting from traumatism.

Hamamelis 3x.—Presents soreness of and bleeding from the septum.

Hepar sulph. 3x.—Should be prescribed where abscess forms.

Congenital Occlusion of the Nose

This is a comparatively rare condition and makes itself manifest by the difficulty which the young child presents in its efforts to nurse. If the occlusion is complete, nasal breathing is absent, hence mouth-breathing is constant. The occlusion may be in the anterior portion due to embryonic adhesions. Pos-

terior obstruction may be membranous, but usually consists of bone which springs from the floor of the nose. It is a vestigial structure, the persistence of the buccal—nasal membrane.

The *symptoms* are obstructed nasal breathing, and discharge of tenacious mucus, which leaks out and excoriates the upper lip. When observed later in life there is usually dullness of hearing present. These cases are frequently incorrectly diagnosed as adenoids or foreign bodies. Careful inspection and sounding with a probe will assist in the diagnosis. A colored solution dropped in the nose should appear in the pharynx in a short period of time. This test may be applied in suspected cases of occlusion.

The *treatment* of this mechanical impediment is purely surgical. In membranous partitions, division, followed by frequent dilation, will usually suffice. Posterior bony obstructions offer considerable difficulty in perpetuating a surgical opening. The bony partition must be completely removed, including section of margin of the posterior edge of the vomer. Painstaking after care for some time is necessary in order to prevent a membranous diaphragm from forming.

CHAPTER V

DISEASES OF THE PARA NASAL SINUSES

Acute nasal inflammation and especially that accompanying influenza stands out prominently as a cause of infection of the para nasal cells or acute sinusitis. Scarlet fever and measles are occasionally so complicated. Dental infections, particularly of the upper bicuspids and molars by reason of their anatomical position cause maxillary sinus infection. Chronic sinusitis is dependent upon local anatomic and pathological changes and systemic and nutritional deficiencies particularly when the diet is deficient in the proper vitamin content. Alergic conditions cause chronic sinus pathology. Necrosis of the upper jaw, lues and malignancy are responsible for a limited number of sinus involvements. Such obstructive conditions as a deviated septum, hypertrophied turbinates or polypi are etiological factors.

The *pathological changes* in acute sinusitis are those of acute inflammation of mucous membrane. This is at first swollen and œdematous, obstructing the sinus outlets. The secretion which in the beginning is serous, becomes mucoid and then purulent. Retention of this secretion causes pain and at times a foul odor is noted.

The early *symptomatology* in acute sinusitis is merged with that of the attending acute rhinitis. There is a variable febrile rise, fullness and pain over the sinus involved and a thin watery discharge which gradually becomes mucous and later muco pus.

The distinguishing features of *acute infections* of the *maxillary sinus* are pain in one or all divisions of the fifth cranial nerve. It may be localized in the cheek, the teeth of the upper jaw, the eyeball, the temporal or frontal regions. At times there is puffiness or swelling of the face on the affected side. The pain shows a periodicity, being worse in the morning, gradually subsiding as the day passes. The discharge is usually yellow and profuse unless drainage is obstructed. Transillumination will show a shadow on the affected side. Tenderness may be elicited over the cheek.

The presence of mucopurulent secretion in the middle meatus is an indication of infection in one or more of the anterior groups of sinuses—maxillary sinus, frontal sinus, or anterior ethmoidal cells. In order to determine the origin of the purulent secretion the following routine is followed: The pus is wiped from the nose with cotton and the area watched for a return of secretion. If this occurs within a few minutes it speaks for a retention of a larger quantity which is concealed, for it is not possible for the nasal mucosa to produce such an amount of secretion in so short a time. Since the maxillary sinus is more frequently affected than the others this cavity is irrigated either through the anatomical opening or through a puncture wound made in the inferior meatus beneath the in-

ferior turbinate. Obtaining pus with this washing is proof of the presence of secretion within this cavity (Maxillary Sinus). It now becomes necessary to determine whether this secretion found in the maxillary sinus originated there or merely drained into it from the sinuses above. In order to do this the patient is allowed to rest for an hour. If at the end of that time pus is again found in the middle meatus it is evidence that it came from either the frontal sinus or the ethmoidal cells or both. The frontal sinus now demands attention. In order to explore this the middle turbinate must be fractured outward toward the nasal septum and it is frequently necessary to resect a portion of middle turbinate to permit of the introduction of a cannula into the frontal sinus for the purposes of irrigation. If an appreciable amount of pus is recovered by this procedure it must be inferred that the frontal sinus is diseased, for its position precludes the possibility of acting as a reservoir for other sinuses. The resection of the anterior end of the middle turbinate allows secretion from the frontal sinus to drain directly into the nose and not drain backward into the maxillary sinus. If after a few days the maxillary sinus is washed and no pus recovered it may be considered free of infection. If pus is repeatedly recovered from the maxillary sinus it then becomes necessary to carry the procedure further. Both the frontal sinus and maxillary sinus are irrigated and a cotton tampon placed high up in the hiatus to prevent secretions from above draining downward. A period varying from several hours to a day is allowed to pass and an examination made. If pus is again found it is in

all probability draining from the maxillary sinus and this may be confirmed by irrigation with the needle. If no pus is seen in the nose after plugging the hiatus and waiting the prescribed period, the maxillary sinus is very likely not involved. It is advisable to prove this by irrigation.

The differentiation of purulent secretion from the frontal sinus and ethmoidal cells is not always possible. It is generally accepted that when the frontal sinus is involved the ethmoidal cells are also affected. The secretion from the bulla of the ethmoid drains further posteriorly in the angle where the middle turbinate joins the bulla.

Secretion from the posterior ethmoidal cells and the sphenoidal sinus drains into the olfactory fissure or posteriorly above the posterior end of the middle turbinate. Finding secretion in these positions which recurs rapidly after wiping away speaks for involvement of the posterior ethmoidal cells or the sphenoidal sinus. Following this secretion to its source necessitates the displacement of the structures which may impede instrumentation. This usually means removal of the posterior half of the middle turbinate, which permits of inspection of the anterior sphenoidal wall and the ostium. If pus is seen exuding from the sphenoidal opening a cannula is introduced and the cavity thoroughly irrigated. The patient is then placed in the recumbent position with the head well back for at least half an hour. The area is again inspected. If no secretion is found after this period of resting there is probably no involvement of the posterior ethmoidal cells. This experiment may be carried further by

irrigating the sphenoidal sinus, plugging the ostium with cotton and having the patient return the following day. If upon examination of the nose at the end of twenty-four hours no pus is found the ethmoidal cells may be considered free. If upon removing the cotton from the sphenoidal opening pus again flows it is conclusive evidence that the sphenoidal sinus is diseased. If pus is found both in the nose and also in the sphenoidal sinus, which has been plugged for twenty-four hours, it speaks for involvement of both the sphenoidal sinus and the posterior ethmoidal cells. Involvement of the sphenoid as a result of disease of the posterior ethmoidal cells is hardly possible on account of the anatomical position of these structures.

Acute frontal sinusitis causes intense pain over the eye and immediately under the brow. It is a sickening, agonizing pain, aggravated by stooping, coughing and blowing the nose. It is frequently referred to the ear and mastoid region. It is worse during the day. The eye upon the affected side frequently aches and the patient squints. At times the eyelids may be swollen. It should be remembered that the inner plate of the frontal sinus is the outer plate of the cranial cavity and that extension to the intracranial contents may result in a fatal meningitis or brain abscess. Tenderness may be elicited in the inner supra-orbital region and over the orbital plate just under the supra-orbital ridge.

The *ethmoidal cells* frequently become acutely involved in upper respiratory infections. It is a complication of scarlet fever, measles and influenza. It is a common occurrence in children and many obscure and

persistent fevers in children are due to infection of these sinuses. Infection of the ethmoid cells may pass into the orbit, resulting in orbital cellulitis or abscess, with displacement of the eyeball outward, downward and forward.

The subjective discomfort is expressed as a sense of fullness at the root of the nose. The eyes are frequently suffused and painful. Tenderness may be elicited over the orbital plate.

Involvement of the *sphenoid sinuses* and *posterior ethmoidal cells* occasions deep-seated pain in the occiput, the neck or coronal regions. It is a bursting type of headache, radiating to the ears. The pain, like that in other sinus involvement, is aggravated by motion such as coughing or bending over. The close proximity of the optic nerve and the nerves supplying the ocular muscles renders them liable to involvement with consequent blurring of vision, diplopia, difficulty in using the eyes for close work, vertigo and nausea.

The *treatment* of acute sinusitis is general and local. The general treatment should be directed to conserve the patient's physical resources, combat the infection and relieve the discomfort.

Patients suffering from acute sinusitis will recover more quickly if they will remain indoors in an evenly tempered room with proper humidity and ventilation. If febrile, the patient should be confined to bed. The alimentary canal should receive attention. A saline laxative should be administered. Local application of heat or cold is indicated. Heat is to be desired, but patients will not always tolerate it, indeed in some cases the distress is increased by heat. The therapeutic

lamp assists in alleviating the pain. Later, when drainage is free, diathermy directly over the sinus may be used. Medicated vapors are valuable in shrinking the swollen mucosa, thus facilitating ventilation and drainage. Compound tincture of benzoin, one dram, or a few menthol crystals in a quart of water may be used for this purpose.

For homœopathic remedies indicated in acute sinusitis see under Acute Rhinitis.

Quinine sulphate in one-grain doses repeated every hour for from seven to ten doses is useful in lessening the engorgement of the swollen mucosa.

Atophan and acetylsalicylic acid are valuable remedies in palliating the pain.

Local medicaments in the nose are to be used cautiously in the very acute stage. Patients are frequently made worse by too frequent and too heroic local treatment.

When the pain is not relieved by steaming and other measures, as suggested above, the tissues of the middle or superior meatus may be shrunken by gently applying cocaine solution, 4 per cent.

Hirsch solution (see under Examination Page 53) has a more lasting effect. After the first forty-eight or seventy-two hours good effect will be obtained by carefully placed argyrol tampons according to Dowling's method. If this procedure is resorted to too early, or roughly applied, it may aggravate the condition. When beneficial results follow, the treatment should be repeated every day until the tampons remain dark after having been in the nose the prescribed period.

If the maxillary sinus becomes painful and tender

and does not respond to general and local conservative treatment it should be irrigated either through the natural opening or through puncture with an antrum needle or trocar through the lateral nasal wall in the inferior meatus. This will bring about prompt relief of symptoms. Daily lavage of the antrum should be practiced until there is no longer pus in the return flow. Frequently this procedure is delayed too long, incurring unnecessary suffering and increasing the liability to complications or to chronicity of the pathology within the maxillary sinus.

Where the frontal sinus fails to respond to medical treatment it may be necessary to remove the anterior portion of the middle turbinate in order to facilitate drainage. This is accomplished by thorough cocainization of the anterior portion of the turbinate which is then divided high and as close to the lateral wall as possible and posteriorly for at least one-half inch. A wire loop of the nasal snare is made to encircle this divided portion of the middle turbinate and closed, bringing about an amputation of a section of the turbinate.

The surgical treatment of acute ethmoiditis is seldom called for, but when necessary, consists of removal of sufficient of the middle turbinate to permit of freer drainage. Puncture of the bulla ethmoidalis also provides better drainage.

At times it becomes necessary to improve the drainage from the sphenoidal sinus. This necessitates removal of the posterior half of the middle turbinate in order to give access to the anterior wall of the sphe-

noid. The ostium of the sinus is located with a probe and then enlarged by means of a curette or punch.

Chronic sinusitis may be divided into two types: (1) the suppurative, and (2) the hyperplastic.

Chronic suppurative sinusitis results from bacterial invasion and produces a mucopurulent discharge.

Chronic hyperplastic sinusitis is characterized by polypoid changes in the mucous membrane lining the sinus and that surrounding the ostium of the sinus. Frequently polypi will be seen in the nose.

Chronic sinusitis produces local and general symptoms. The *local symptoms* are nasal obstruction, discharge, blunted sense of smell, recurrent colds in the head, tonsillitis, pharyngitis, bronchitis and asthma or bronchospasm. Local pain over the region of the affected sinus may or may not be present.

Ear symptoms result from involvement of the Eustachian tube, when stuffiness in the ear, tinnitus and dull hearing will be present. Absorption of toxines may affect the auditory nerve, producing a toxic neuritis, causing progressive dull hearing and vertigo.

Eye symptoms in chronic sinusitis are not infrequently prominent and too often misinterpreted. Pain in the eyes with difficulty in use for close work is a common symptom of chronic sinusitis. Grave involvement of the optic nerve is a complication of sphenoid and ethmoid disease.

The *general symptoms* of chronic sinusitis are headache, dizziness, loss of ability to concentrate and other phenomena which are the result of absorption of the toxines elaborated in the diseased sinus.

In many instances the only symptom the patient

complains of and for which relief is sought is the chronic nasal or post nasal discharge. If these cases are not completely examined the sinus disease may be overlooked and the patient treated for the erroneously designated post nasal catarrh.

Examination of the nose in a patient suffering with sinus disease may show the presence of mucopurulent discharge and the following of this clue to its source will reveal the true state of affairs. (See Acute Sinusitis.) Polypi, pedunculated smooth glistening tumor masses, usually freely movable, may be found springing from the neighborhood of the outlet of the involved sinus or the nose may be completely obstructed by these growths. The only local suspicion of the existence of sinus disease may be the polypoid change in the mucosa covering the middle turbinate or the congested condition of the mucosa in the vicinity of the opening of a sinus. The use of transillumination will aid in the diagnosis in the case of the frontal and the maxillary sinuses. Much information may be obtained by careful interpretation of properly executed Roentgenograms. Sinus irrigation and examination of the return fluid may be necessary in order to discover the existence of certain types of sinus disease.

The treatment of chronic sinusitis that will bring about favorable results is based upon an accurate diagnosis of the local condition and a careful estimation of the patient's systemic status.

Intranasal, anatomical or pathological obstructive conditions must be eliminated in order to establish the proper airway and facilitate drainage. Such obstruc-

tions include a deviated nasal septum, hypertrophied turbinates or polypi.

Lavage of the affected sinus or sinuses is practiced. In order to carry out this procedure satisfactorily it may be necessary to enlarge the anatomical opening, as in the case of the frontal sinus or the sphenoid sinus, or create a new opening, as in the case of the maxillary sinus.

Estimation of the character of the pathology within the sinus is made by Roentgenographic study, transillumination and a study of the appearances of the mucosa about the opening of the sinus. This estimation determines the course of procedure. Where sufficient evidence is at hand to indicate that the changes within the sinus are not extensive, local conservative or minor surgical assistance is justifiable and will bring about satisfactory results.

The local conservative treatment includes nasal douching, sinus washing with an alkaline solution or the use of the Dowling argyrol (15 per cent.) treatment. The patient should be given instructions in cleansing the nose with an alkaline solution to be followed with an oily spray containing menthol in the strength of one grain to the ounce. The carefully selected homœopathic remedy will aid in increasing the patient's recuperative powers.

Minor surgical procedures include in the case of frontal sinus disease the intranasal enlargement of the infundibulum and naso frontal duct; in the case of the ethmoidal cells the removal of sufficient of the middle turbinate to facilitate drainage from the middle meatus and in the case of the maxillary sinus the cre-

ation of an artificial opening in the nasal wall of the sinus beneath the inferior turbinate. In the case of the sphenoid sinus the natural opening may be enlarged.

When such local conservative measures or minor surgical procedures fail to bring about results or when the primary examination indicates that the pathology within the sinus demands more radical treatment, it is necessary to perform a so-called radical operation upon the diseased sinus or sinuses. These operations have as their objective the entering of the sinus cavity and removal of all diseased tissue contained therein and the establishment of free outlet from the sinus into the nose.

Radical operation upon the frontal sinus is accomplished by entering the frontal sinus through an incision made in the eyebrow and extended over the root of the nose. An opening into the sinus is made through the bone just above the supra-orbital ridge and another opening just below the ridge, leaving a bridge of bone between. These openings permit the operator to deal with the interior of the sinus and to enter the naso frontal duct for enlargement of the same. At the completion of the work in the interior of the sinus the external incision in the soft structures is closed and drainage maintained through the nose.

In the case of the maxillary sinus the radical operation is performed through an incision made under the upper lip in the mucoperiosteum, covering the superior maxillary bone and extending from the second premolar to the canine tooth. The sinus is entered through an opening made in the anterior bony wall. In the nose beneath the inferior turbinate an opening

is made into the maxillary sinus, preserving a flap of mucous membrane, which is turned into the sinus and held in place by packing. At the close of the operation the incision in the mucoperiosteum in the anterior wall is closed and drainage continued through the inferior meatus of the nose.

Radical operative treatment of the ethmoid is carried out by removal of the middle turbinate and ablation of the cells by means of a hook or curette especially designed for this purpose.

When the sphenoid is operated upon it is usually necessary to remove sufficient of the inferior portion of the middle turbinate in order to view the anterior wall of the sphenoid. This procedure has usually been performed during the process of localization of the origin of the pus. The natural opening of the sphenoid is enlarged with a curette and the interior of the sinus dealt with as conditions demand.

The patient who suffers from a chronic sinusitis usually demands more than local attention. Frequently they are systemically ill and they may find their way to the physician not because of the nasal trouble, but because of some vague symptom complex which is caused by absorption. It is incumbent upon the physician that he make a most careful survey of the patient's general condition, paying particular attention to the dietary habits. Chronic suppurations are the result of dietary deficiencies and the exhibition of cod liver oil will aid in the treatment. In the case of maxillary sinusitis it is most important to eliminate dental pathology as a cause.

The homœopathic remedies suggested in chronic sinus disease are as follows:

Aurum metalicum 6x.—This remedy is indicated in patients who have had long standing purulent blood-tinged fœtid discharge and who complain of boring pains in the nose which are worse at night. The sense of smell is sensitive.

Hepar sulph. 3x.—This is a valuable remedy in the later stages of acute sinusitis and beginning chronic. It is valuable in the acute cases which are stubborn and threaten to go over to chronic. The discharge is variable, it may be serous or purulent. The nasal symptoms are worse when the patient goes out in the cold. It is an excellent remedy in the lymphatic type of child who has had its tonsils and adenoids removed, but who continues to have repeated head colds with thick secretion. These colds are really an expression of recurring exacerbations of sinusitis.

Kali bichromicum 3x.—Pressure and pain at the root of the nose and sticking pains in the nose. Tenacious greenish fœtid discharge which forms scabs in the nose. The sense of smell is lost. The pharynx is dry, although there is an abundance of drainage of mucopus into the pharynx and this will be seen adhering to the posterior wall of the oropharynx.

Kali sulphuricum 3x.—The discharge is profuse and yellow. It obstructs the breathing and the sense of smell is lost.

Phosphorus 3x.—Hypersensitive sense of smell and imaginary odors. Bloody, mucous discharge, the bleeding being frequently due to the presence of polypi.

Pulsatilla 2x.—Pressure at the root of the nose.

loss of sense of smell, large amounts of greenish discharge which obstruct the breathing. Pools of greenish mucus should always make one think of Pulsatilla.

Sanguinaria 3x.—Right-sided headache is characteristic. Chronic rhino-sinusitis with marked dryness and congestion of the membrane and pressure at the root of the nose constitute a good basis for this remedy.

Silicea 30x.—This remedy is indicated in very old cases that have gone on to periosteal and bone involvement. Hard, dry scales accumulate in the nose. Sneezing spells in the morning. Loss of sense of smell. The Silicea nose is better in the warmth.

Sulphur 30x.—Imaginary foul odors. Thickening of the wings of the nose due to the chronic discharge and its irritative effects. The nasal mucous membrane is dry and mucous scales accumulate. Polypi are frequently present.

CHAPTER VI

DISEASES OF THE PHARYNX

Acute Pharyngitis

Acute sore throat is the term commonly employed. It is an acute inflammation of the mucous membrane lining the pharynx and is frequently a part of a general inflammation affecting the nose and larynx. It is seen as a part of a general acute upper respiratory catarrh attending the so-called general cold or it may be associated as part of one of the acute infectious diseases.

The condition arises as a result of exposure, general debility, lack of exercise, improper clothing and living in quarters that are improperly heated and inadequately ventilated. Gastrointestinal derangements predispose to its occurrence. Gout, rheumatism, alcohol and tobacco are also etiologic factors. Secondary syphilis presents as pharyngeal manifestations, a general hyperæmia or mucous patches. (See Syphilis of the Nose and Throat.)

Traumatism caused by swallowing very hot food, drink, irritants, or foreign bodies, are also causes of pharyngitis.

The *symptoms* are dryness of the throat, difficulty in swallowing, pain radiating from the throat to the ears and changing from place to place. These local discomforts are aggravated by the frequent desire to

swallow, clear the throat and cough. The systemic symptoms include chilly sensations or chill, headache, backache and temperature ranging from 100° F. to 102° F. The tongue is usually coated and the patient complains of a bad taste. Later, cough with expectoration of grayish, viscid mucus usually brings relief.

Examination of the throat reveals a red, swollen mucous membrane, especially in the lateral regions behind the posterior arches of the tonsil fossa. The pharynx is covered with mucus and presents large follicles and there may be œdema of the soft palate and uvula. Rhinitis or laryngitis frequently co-exist with pharyngitis.

In very acute cases, the attack may last for a few days. In gouty, rheumatic or traumatic cases, the symptoms may persist for weeks.

Treatment.—If the patient is febrile, rest in bed will hasten the recovery. In severe weather all patients suffering from pharyngitis will recover more quickly if kept in a room of even temperature. The intestinal canal should be activated by a saline laxative. The pain and local distress will be mitigated by the use of a warm alkaline spray consisting of bicarbonate of soda, 15 grs. to 4 ozs. of water. Acid acetylsalicylic, 30 grs. suspended in 4 ozs. of water and used as a gargle, is also efficacious. Gargles usually give grateful relief. Troches, containing anæsthesine or red gum, temporarily relieve the dryness and pain.

The homœopathic remedies for acute pharyngitis are:

Aconite 3x.—The invasion is sharp, with active systemic reaction indicated by fever and repeated chills. There is apprehensiveness and sense of impend-

ing severe illness. The patient feels better when in the open air and worse from any stimulation. The throat lesion causes sticking and pricking pains.

Apis 3x.—Constricting, burning and sticking pains. The local condition presents marked œdema. The mucous membrane is shiny and puffed.

Arsenic 3x.—Restless and anxious, but with great weakness. The pain is of a burning character and the distress in the throat is relieved by hot gargles.

Belladonna 3x.—The mucous membrane of the pharynx is very red and dry, hence dysphagia is marked. The cervical glands become involved early, indicating the virulence of the infection. The throat is markedly hypersensitive.

Ferrum phos. 2x.—The mucous membrane is dry and the patient complains of burning pain. This remedy is to be exhibited in the cases that show less local change.

Gelsemium ϕ.—This is often the outstanding remedy, particularly in cases which have their on-set with creepy, chilly sensation after exposure to dampness. The patient is depressed and apprehensive of a severe illness, is emotional and easily disturbed. The general symptoms call for this remedy more frequently than the local. Itching of the soft palate and nasopharynx are prominent local symptoms.

Hamamelis 2x.—Bruised sensation is due to venous engorgement of the throat.

Mercurius iod. rub. 3x.—Sticking pain in the tonsil region. Follicles bear the brunt of infection and the lateral columns are swollen and red.

Nitric acid 6x.—Splinter-like pains extend from the throat into the Eustachian tubes. This remedy is particularly indicated in patients who are suffering from some co-existing constitutional disease.

Rhus tox. 3x.—Aching pain and soreness which is relieved after the throat has been activated by swallowing. It is useful in pharyngitis, which results from excessive use of the throat as well as from exposure to the wet and cold.

Sanguinaria 3x.—There is a sensation as if the throat had been burned. It is dry and constricted and the membrane appears, upon examination, very red. A Sanguinaria patient craves for acid drinks.

Chronic Pharyngitis

This is a simple catarrhal, granular or lateral hypertrophy of the pharyngeal mucous membrane. The causes include: repeated attacks of acute rhinopharyngitis, alcohol, tobacco, irritating dusts, excessive and improper use of the voice, unhygienic conditions of living, poorly heated and illy ventilated rooms, the presence of diseased tonsils and adenoids, nasal accessory sinus disease and nasal obstruction. It is found associated with certain systemic disorders, notably cardiac disease, pulmonary disease, rheumatism, diabetes and hepatic disease.

The *symptoms* are dryness, fullness, sticking, itching, burning and other abnormal sensations in the throat. Frequent hawking and clearing of the throat is practiced to dislodge mucus, and these efforts may produce emesis. The voice is frequently husky, weak and undependable, fatiguing easily. It is not uncom-

mon to find the ears involved; the patient presenting dull hearing and complaining of tinnitus aurium.

Examination usually reveals an irritable throat with a general thickening and velvety condition of the mucous membrane. The uvula is thickened. The mucosa may be streaked with tenacious mucus and present small, round elevations which stand out above the surrounding membrane. Blood vessels course through the membranes to these follicles. At times the thickening of the pharyngeal mucous membrane will be placed laterally behind the posterior pillars of the tonsil and come into view upon the act of gagging.

The prognosis of pharyngitis is good, providing the activating factors can be removed.

Treatment.—Cases of chronic pharyngitis call for most careful investigation and attention to the nose, nasopharynx and tonsils. Nasal obstructions from any cause, sinusitis or chronic tonsillitis are all common causes and if corrected have a beneficial effect upon the pharyngeal pathology. Alcohol and tobacco should be interdicted and any unhygienic conditions under which patient is living should be corrected. Alkaline sprays should be used to free the mucus, following which astringents are applied. Tannic acid, 5-10 grs. to the ounce of glycerine; iodine, 5 grs.; potassium iodide, 15 grs. to the ounce of glycerine, or silver nitrate, 10-20 grs. to the ounce, may be applied locally. The follicles may require cauterization with the actual cautery.

The following homœopathic remedies are suggested:

Arsenicum iodide 2x.—Follicular and glandular enlargement; the mucous membrane between the area of

hypertrophy is anæmic. The vessels are prominent; may rupture and cause some blood streaking in the expectorated mucus.

Æsculus 3x.—This remedy is particularly useful in cases which are associated with derangements of the hepatic system. The mucus is tenacious and ropy. The fauces present a dusky congestion.

Calcarea carb. 3x.—The throat feels small. The veins are enlarged; the discharge is thick. The remedy is applicable to sweating, fat, anæmic individuals who take cold easily; have a phlegmatic disposition; are sensitive to cold and indulge themselves in sweets. The patient is worse in cold air and better in warm, dry weather.

Capsicum 3x.—Burning in the throat; dusky, red mucous membrane in the very relaxed fiber individual; persons who are easily chilled. It has a special application in pharyngitis in patients who use tobacco or alcohol to excess.

Kali mur. 3x.—This is especially indicated in cases showing an involvement of the Eustachian tubes and middle ears.

Kali bich. 3x.—Thick, tenacious, yellow mucus is coughed out with difficulty. The posterior pharyngeal wall is thick and red and presents enlarged follicles.

Mercurius viv. 6x.—This remedy is indicated in the bluish, red throat. There is a constant desire to swallow which causes stitches to shoot to the ears. The throat is raw and smarts. The symptoms are worse in damp weather and in the warmth.

Sanguinaria 3x.—Burning and constriction in the throat. The tongue is coated white and feels burned.

This is aggravated by eating sweets and relieved by drinking tart or sour fluids.

Wyethia 2x.—Frequent desire to clear the throat, due to sensation of swelling and dryness. There is a frequent desire to swallow, although this act is difficult.

Atrophic Pharyngitis

This condition is characterized by abnormal dryness of the pharynx and is observed particularly in individuals who are anæmic or generally debilitated, in diabetics and those afflicted with tuberculosis and contracted kidneys. It is often observed in young adults.

The *symptoms* are dryness, soreness and constriction of the throat, relieved by swallowing. There is also cough or frequent desire to clear the throat. Atrophic pharyngitis is frequently associated with similar conditions in the nose and larynx. In cases that have existed for some time the ears become involved, with resulting dull hearing.

Examination of the throat discloses a glazed condition of the mucous membrane with crust formation upon the posterior pharyngeal wall. Removal of these crusts exposes a thin membrane through which the muscle fibers can be seen. The mucous membrane may also present ridges or erosions.

The *prognosis* as to cure is very poor, complete recovery is unusual.

Treatment.—Systematic local cleanliness with warm alkaline solutions should be carried out to free the membrane of crusts or dried secretions. Following this stimulating solutions are frequently applied. Iodine, ten grains to the ounce of glycerine, or silver nitrate

ten to twenty grains to the ounce of water, are useful. Attention to nasal pathology is very important. The patient's general condition should be very carefully scrutinized.

Homœopathically, China tincture and the Iodide of arsenic 2x, are frequently indicated because of the type of patient and the usual systemic condition with which atrophic pharyngitis is so frequently associated. (See also under Atrophic Rhinitis.)

Iodide of potassium, three or five grains, three times a day, relieves the dryness of the membranes.

Nasopharyngeal Adenoids

Hypertrophy of the post nasal adenoid occurs in children presenting a lymphoid or a tubercular diathesis. It also frequently undergoes hypertrophy after acute infectious diseases. This structure is normally somewhat enlarged in early infancy, tends to atrophy with the approach of adolesence so that in adult life a very small amount of soft, friable tissue remains.

Symptoms.—Obstructed nasal breathing, snoring and restlessness at night are prominent symptoms. It is possible, however, to have enlarged adenoids with an absence of these symptoms. This occurs where the post nasal space is large. When mouth breathing has existed for a long period the so-called adenoid facies is observed. This is characterized by the partially open mouth, short upper lip, prominent eyeballs, broad face and a flat expression. Other symptoms observed are impairment of the intellect, interference with speech, chronic cough with nocturnal aggravation, and nasal discharge of mucopus. Asthmatic manifesta-

tions are not infrequently observed. Usually, a variable degree of chronic rhinitis and pharyngitis is associated and evidenced by the muco-purulent discharge and frequent clearing of the throat. Children affected with enlarged adenoids may also present early fatigue, irritability, fitful appetite, epistaxis and gritting of the teeth in sleep. Ear symptoms are commonly caused by adenoids due to a low grade secretory catarrh of the Eustachian tube and middle ear. Recurrent attacks of otitis media are common. These aural complications are to be considered as very important evidence in the clinical history.

Examination reveals a contracted nose, and a chronic catarrhal rhinitis. The palatal arch is narrowed and high. The follicles on the posterior pharyngeal wall are enlarged. By means of a post nasal mirror, in tractable patients, a pinkish grooved mass will be seen in the vault of the pharynx. Digital examination will disclose a soft gelatinous mass in the post nasal space. The examining finger will, upon withdrawal from the post nasal space, be covered with glaring and at times a blood streaked mucus. Enlargement of the posterior chain of the cervical chain of lymphatics is usually associated.

Prognosis.—Adenoids are apt to recur after removal if the patient is operated upon before the fourth or fifth year of age or when measles or scarlet fever are contracted after their removal. Following the surgical removal of adenoids the child usually improves in every way. Nasal respiration is established, the local catarrhal symptoms clear up, the appetite improves, there is a gain in weight and the intellect be-

comes keener. When these results do not follow the removal of adenoids it usually means that something has been overlooked. At times a sinus disease has been established and will require attention. (See Sinusitis.) Dietetic supervision is sometimes necessary. Excessive indulgence in sweets and starches must be corrected. If a child is ingesting large quantities of milk to the limitation of a diversified diet, lack of appetite will ensue with resulting malnutrition. The milk allowance should be so regulated that it will not lessen the appetite for the proper amount of a varied diet. Incomplete removal of adenoids is usually followed by incomplete cure.

Treatment.—Surgical removal of the adenoid is usually indicated when the mass is of sufficient size to cause symptoms. (See The Tonsil and Adenoid Operation.)

Post Operative Treatment.—No local treatment is necessary. The ears should be inspected and the hearing tested. Where a tubal catarrh has existed Politzer inflation will encourage better function. This should not be practiced without checking the hearing. When this improves and remains good, inflation should be discontinued. If inflation has no influence upon dull hearing it should be withheld. The nose and throat should be inspected and if the catarrhal condition does not clear up, appropriate treatment should be instituted. (See Chronic Rhinitis and Pharyngitis.) If nasal breathing is not established the child should be given exercises and directions in nasal breathing. It may even be advisable to use a chin strap at night until the natural breathing is restored. The clothing of

these children should be given reasonable attention. Light cotton, lisle or silk underwear is all that is necessary in our present way of heating the homes. In weather changes proper protection should be afforded by adequate over-clothing. The practice of sending children out of doors in cold and inclement weather with bare knees, with the other parts of the body heavily clad, is not countenanced.

Homœopathic remedies have a very definite place in the treatment of adenoid patients.

Baryta carb. 3x.—Mental retardation, bashful, undersized, scrofulous, offensive, sweaty children with enlarged glands in the neck and over-sized tonsils and adenoids are beneficially influenced by this drug.

Calcarea carb. 3x.—Is indicated in fat children who sweat easily, and especially about the forehead. They take cold readily, present enlarged cervical glands and may have recurring corneal ulcerations.

Calcarea phos. 3x.—This remedy has many symptoms like Calcarea carbonica but the patient is not the fat type but the lean individual with poor bony development as evidenced by poor teeth.

Mercurius 3x.—Glandular enlargements, acrid discharges, offensive sweating, especially about the extremities and at night, are the indications for this agent.

Acute Tonsillitis

Acute inflammation of the faucial tonsils occurs more frequently between the ages of ten and thirty years of age and rarely after fifty. Enlarged, diseased and incompletely removed tonsils predispose to inflam-

mation. The condition is seen in the early stage of measles, scarlet fever, diphtheria and syphilis. It occurs more frequently during the spring and fall months. Infective secretions from the nose and nasal accessory sinuses drain posteriorly into the nasopharynx and over the surface of the tonsils and this may be the cause of recurrent infection of the tonsils. It is seen as a complication following operations in the nose. The exciting cause is microbic and it is seen to occur in epidemics, particularly where numbers of individuals live in closely confined groups and in poorly ventilated places. Certain hæmolytic streptococcic cases can be traced to infected milk.

The *pathology* may be mild and superficial or it may invade the parenchyma. If the crypts of the tonsil are actively involved an exudate appears at the outlets as patches and these may coalesce giving the appearance of a membrane. When the parenchyma of the tonsil is involved pus formation is not unusual. The peritonsillar area may be coincidentally involved but more often this occurs secondarily and a peritonsillar abscess or quinsy results.

The *symptoms* are abrupt in onset being ushered in with a chill or chilly sensations, headache, pain in the back and limbs, dryness and soreness in the throat, stuffy fullness in the ears, huskiness of the voice, blunted sense of smell and taste. There is usually fever, the temperature ranging from 100° to 105° F. The urine is scanty, highly colored and contains an excess of urates. Albumin is seldom present early but may appear as a late manifestation.

Upon examination the tongue is found to be coated

and the breath foul. The throat is red. The process usually starts on one side, the other tonsil becoming involved later. The crypts of the tonsil may be distended with yellowish masses which can be wiped away without much effort and do not leave a bleeding surface. The uvula is at times swollen. The anterior chain of cervical lymphatic glands may be swollen and painful.

The *diagnosis* is usually not difficult. Severe cases of streptococcus tonsil infection with extensive exudate may be confused with diphtheria. Bacteriological and cultural examination is the only positive differentiating evidence. It is generally accepted, however, that tonsillitis has a more abrupt onset, the temperature is higher, the early prostration more profound and the exudate can be wiped from the surface without leaving a bleeding surface. The urine does not show albumin early but this is found in severe streptococcic tonsillitis. Diphtheria has a more deliberate onset, the temperature is less marked, albumin is found in the urine early. The membrane in diphtheria is darker in color, intimately adherent to the surface of the tonsil and when wiped away leaves a bleeding surface. Tonsillitis of scarlet fever usually attacks both tonsils at the same time. The patient is usually younger, the temperature high, the skin hot and dry and the pulse disproportionately high. The tongue shows enlarged papillæ, giving it the so-called strawberry appearance.

The ears should be inspected regularly during an attack of tonsillitis. Tubal catarrh and otitis media are complications and the latter may be quite virulent, not infrequently terminating in mastoiditis and its

complications. Thrombosis of the cavernous sinus has been recorded as a sequell of tonsil infection. Appendicitis has some clinical connection with tonsillar inflammation. Other complications are erythema, purpura, erysipelas, orchitis, oophoritis, pleuropneumonia, osteomyelitis, septicæmia and pyæmia.

It is particularly important to remember that in children endocarditis may be present with no clinical suggestion until the heart becomes badly damaged. The incidence of rheumatism calls for caution. Peritonsillitis or quinsy follows tonsillitis and may appear as the inflammation of the tonsil is subsiding. Uncomplicated tonsillitis usually terminates within a few days, but the prostration following demands care during the convalescence. These patients should be kept housed and at rest until this prostration has cleared up. Examination of the urine should always be made before allowing these patients to resume their usual activities.

Treatment.—Acute tonsillitis is a general infection with the local manifestation in the tonsil. These patients should be at rest in bed and isolated. The condition is unquestionably contagious and its appearance in a house may be followed by other cases. The alimentary canal should be activated by a saline laxative.

Grateful relief is experienced by spraying the throat with a warm alkaline solution. Some patients prefer and obtain the same relief by using a warm gargle. The local application of medicaments should be limited to mild non-irritating agents such as argyrol, 20%, carefully applied to the tonsil. Warm external appli-

cations give relief and appease the mental condition. Antiphlogistine and plain dionol ointment are excellent for this service. Equal parts of alcohol, glycerine and water make a most pleasant cleansing solution and may be used as a spray or gargle. Caroid, drams two; glycerine, drams two; to the ounce of water, sprayed on the tonsil dissolves out the sticky exudate. Acetylsalicylic acid, thirty grains, suspended in four ounces of water and used as a gargle, will at times relieve the aching when other applications fail.

The homœopathic remedies recommended are:

Apis mel. 3x.—Rosy red œdema of the tonsil arches and the uvula. Stinging pains and constriction of the throat.

Belladonna 2x.—Red face and hot dry skin, severe headache all over the head, sensitive to light and noise and generally hyperæsthetic. The throat is dry red and glazed and swallowing is very difficult.

Capsicum 3x.—Burning pains in the throat with a chilly feeling over the body.

Guaiacum 2x.—This remedy is used in cases presenting marked muscular or joint pains in association with acute tonsillitis. The throat burns.

Merc. iod. rub. 3x.—Stiffness of the muscles of the throat with early glandular enlargement.

Phytolacca 3x.—The peritonsillar region shows marked involvement and the tonsil is swollen. Pain at the root of the tongue extending into the ears. Hot gargles and swallowing hot fluids greatly aggravate. This is a useful remedy in the cases which go on to perotonsillar abscess.

Peritonsillitis
(Quinsy)

This is one of the most distressing of acute throat conditions and is frequently observed as a complication of an acute cold or tonsillitis. It is not generally considered contagious. It occurs especially in late winter and early spring. Persons between eighteen and thirty years of age seem more susceptible, although it attacks children and the aged. One attack predisposes to another and it is not infrequent for quinsy patients to have annual attacks.

Symptoms.—The condition begins with a scratching, fullness, soreness and deep aching, which is reflected in the ear on the affected side. These symptoms gradually increase in severity until the patient presents a dejected spectacle, unable to lie down, swallow, or even to open the mouth sufficiently to expectorate the thick tenacious, rope-like mucus which accumulates in the mouth. The jaws are frequently locked, the head bent forward and to the side involved. The breath is very foul and the tongue thickly coated. The prostration of the patient is very great. If left to natural processes, the abscess usually ruptures spontaneously within from five to ten days, with rapid relief from suffering. It may be unilateral or bilateral and not infrequently, as one side subsides, the other side becomes involved.

Examination of the throat early shows a redness about the affected side, extending from the tonsil forward. Later the tonsil appears buried, being pushed downward, inward, and forward. The uvula is usually

markedly œdematous, forming a sac-like mass hanging in the throat and causing marked annoyance. Palpation with the finger can be performed, if done carefully and will give the greatest amount of information with a minimum amount of discomfort. The examiner's finger should be protected by a steel finger protector or the introduction of a mouth prop.

The *prognosis* is good. If the abscess is low down in the tonsillar fossa, œdema of the larynx may occur. Septic infection of the jugular and erosion of the external carotid artery have been reported. One attack predisposes to another.

Treatment.—Peritonsillar abscess usually comes to the practitioner's care after it is well established and efforts to abort are usually not indicated. Should the case be seen within twenty-four hours after the onset of the symptoms, the use of ice externally and having the patient dissolve small pieces of ice in the mouth, may aid in aborting the condition. Where the case has progressed for a few days and the tumefaction is definitely indurated and no fluctuation discoverable by palpation, the use of local heat will encourage localization and suppuration. Hot antiphlogistine is applied to the affected side and renewed as often as necessary to insure the proper amount of heat. Hepar 2x given hourly will aid the process at this stage. When pus formation has definitely occurred an incision should be made in the soft palate midway between the uvula and the first molar tooth. The point of the knife should be directed toward the median line and made to go well into the tumefaction. Failure to reach pus will occur if the incision is superficial. After the

abscess has been evacuated the incision should be kept open by daily dilatation until the cavity is pus free. The evacuation of the pus in these cases brings about a spectacular relief and when this does not follow it usually means that the incision is inadequate.

Deglutition is at times impossible due to the intense pain and to the swelling. In these instances alimentation should be carried out through a rubber tube passed through the nose into the nasopharynx and œsophagus. This tube is allowed to remain in situ until the condition subsides sufficiently to allow the patient to swallow.

The homœopathically indicated remedies are:

Apis mel. 3x.—Pinkish œdema of the arches and the soft palate with burning and stinging pains.

Belladonna 3x.—Dusky red throat, pillars inflamed and the throat glazed. Swollen and tender glands. Systemic symptoms marked, intense headache and high fever, hot dry skin.

Hepar sulph. 3x.—Splinter-like pain in the throat extending to the ears. Plug-like sensation when attempting to swallow.

Lachesis 30x.—Marked constriction of the throat aggravated by the slightest pressure. Intense swelling of the throat.

Phytolacca ϕ.—Pain at the root of the tongue extends to the ears. Throat is swollen and painful and feels rough and narrow. Hot liquids aggravate. Glandular enlargement is marked.

The prostration attending peritonsillar abscess is very marked and it is important that these patients be kept under careful medical supervision until they have

fully recovered. Resumption of the usual activities too early may result in recurrence of the condition. As soon as the patient is in condition, a complete tonsillectomy should be performed. This is the only insurance against recurrences of the trouble.

Hypertrophied Faucial Tonsils

Hypertrophy of the faucial tonsils is usually observed from the third to the fourteenth year, although very young children are sometimes afflicted. They may be considered as an expression or a part of a lymphatic tendency and as a family diathesis. Enlargement of the post nasal adenoid is a common accompaniment.

Symptoms.—Large tonsils may offer obstruction to breathing, swallowing and speech. The ears may present dullness of hearing or suppurative disease. There is lack of mental acuteness, the sleep is disturbed and the breath foul due to the accumulation of caseous material in the crypts. The faucial tonsils usually tend to atrophy so that by the thirtieth or fortieth year they have shrunken to small soft masses. They may, however, fail to undergo these changes and remain large into late life.

Examination of the throat will show enlargement of the tonsils, varying from the size of a small walnut to such size that they meet in the median line and obstruct most of the oral opening of the pharynx. They appear as soft pinkish irregular masses with large crypts containing caseous debris, or the enlargement is a hard fibrous mass. They may be present as free tonsils where they stand out prominently in the

throat or they may be submerged, in which instance very little of the surface of the tonsil is seen due to an extensive development of the plica. The submerged type will be overlooked unless the anterior arch is drawn forward with a hook or retractor. This causes some gagging and the tonsil is seen to bulge outward. Enlargement of the anterior chain of cervical lymphatics may accompany hypertrophy of the tonsils.

Treatment.—Surgical removal of the tonsils in their entirety offers the only satisfactory method of dealing with the condition. (See Tonsil and Adenoid Operation.) Tonsillotomy or partial removal is unsatisfactory and cases so operated usually eventually come to the radical operation. The use of X-ray, electrocoagulation and violet-ray are methods used only where surgical removal is contraindicated because of some physical impediment or where surgical operation is declined. Following the operation any existing constitutional deviation should receive adequate attention. (See After Treatment of Adenoids.)

Chronic Tonsillitis

Since the discovery of focal infection, chronic tonsillitis has received considerable attention for the tonsil has proven to be the primary source of many forms of chronic systemic infections. Rheumatism, chronic arthritis, cardiac disease, nephritis, disease of the gall bladder and many ocular and aural diseases are traceable to chronic tonsillitis. It is commonly observed in adults, although children are frequently affected. It may result from repeated attacks of acute infection and

especially where there is a history of peritonsillar abscess.

The *symptoms* of chronic tonsillitis are local and general. The local manifestations are not always prominent; in fact, a great many cases have little local discomfort. Soreness and aching in the pharynx, increased secretion, crackling and snapping in the ears are among the more common local symptoms. Caseous, offensive masses are forced out of the tonsil crypts by the act of swallowing or the patient learns to express them with the finger. These concretions, if they cannot be expelled from the tonsil, give rise to annoying sensations in the throat or to a troublesome cough. They may become sealed within the crypt and ultimately cause an abscess. Chronic tonsillitis is very commonly discovered during the routine investigation of the patient for the focus of a rheumatic or arthritic condition, cardiac disease, gall bladder trouble, nephritis or hypertension. The association of chronically infected tonsils with various thyroid gland disturbances, deserves very careful consideration. Many cases of simple goiter are relieved by the removal of diseased faucial tonsils.

Examination of the throat reveals a redness or streaking and a thickening of the anterior pillars. The tonsils may be insignificant in size and it will be necessary to elevate the anterior pillar or arch in order to make an inspection of the structure. At the same time it is possible to make pressure against the tonsil which will express the contents of the crypts. In chronically infected cases, it is not uncommon to obtain from the

crypts flocculent fluid, caseous masses or free pus. The chronically inflamed tonsil may be soft with large or small crypts, spongy, irregular, with small capillary-like elevations or they may be small fibrous masses deeply imbedded in the fossa and covered by the plica.

The cultural study of material from chronic tonsillitis will reveal either pneumococcus associated with diphtheroid or micrococcus catarrhalis or some variety of streptococcus. Hæmolytic streptococcus infections are less frequently observed in the chronic cases. Associated with chronically infected tonsils will be found varying degrees of chronic rhinitis and pharyngitis.

Treatment.—Tonsillectomy is the only satisfactory surgical procedure worthy of consideration. The use of X-ray, violet ray, radium or electrothermocoagulation is applied only to such cases where the radical operation is contraindicated. Operation in this class of cases is usually a much more formidable undertaking. These tonsils are frequently found to be adherent, necessitating careful dissection, and the reaction following the operation is often marked, due to the liberation of toxines or bacteria at the time of the operation.

Local treatment of chronically diseased tonsils by means of suction or washing out the crypts will have little influence upon the condition, except in cases that are merely crypt retention. Usually the infection is in the deeper structure of the tonsil. Local probing, compressing or suction of the chronically infected tonsil is not without danger. Devastating or fatal acute or chronic systemic sepsis has resulted.

Retropharyngeal Abscess

This is a suppurative process occurring between the posterior wall of the pharynx and the spinal column. It is the result of a breaking down of the prevertebral lymph nodes in the adjacent cellular tissue. It is most commonly located in the oropharynx lateral to the median line. It may, however, occur above the line of the soft palate or low down opposite the larynx. Tonsillar infections, tuberculosis and syphilis are the common etiological factors. Caries of the cervical vertebræ may be associated. In adults the penetration of foreign bodies, especially fish bones, are frequently the cause.

Symptoms.—The symptoms in very young children may be limited to obstruction of nasal breathing, difficulty in swallowing and retraction of the head. Interference with breathing is very marked, especially where the abscess is located in the laryngopharynx. In older patients there is marked salivation, difficulty in talking and swallowing. A mild fever may be present.

Diagnosis.—Retropharyngeal abscess presents as a smooth swelling in the posterior pharyngeal wall lateral to the median line and usually in the oropharynx. It has been misdiagnosed quinsy, but this should be readily differentiated since retropharyngeal abscess occurs posterior to the posterior faucial pillars.

Prognosis.—The prognosis is usually favorable, except in those cases associated with caries of the vertebræ. This will not be overlooked if an X-ray is taken, and this should be done in all cases of retropharyngeal abscess.

Treatment.—Free drainage should be made in the most dependent portion of the abscess. Where marked dyspnœa is present the use of the bronchoscopic tube permits of operation without danger of suffocation. The incision in the abscess should be kept open by dilatation every twelve hours until pus no longer appears.

These patients require attention to their constitutional condition which predisposes to the abscess or spinal caries. Syphilitic and tubercular cases will require the usual specific treatment for these conditions. Cases resulting from tonsillar infection should have the tonsils and adenoids removed.

The homœopathic remedies recommended are:

Calcarea iodide 2x.—Tubercular patients presenting enlarged glands and chronically diseased tonsils.

Calcarea phosphorica 3x.—Patients who exhibit bone deficiencies in addition to glandular enlargements.

Arsenicum iodide 2x.—This remedy is indicated in tubercular cases, especially where there is the corrosive discharge from mucous membranes.

Mercurius 6x.—Glandular involvement, associated with profuse oily perspiration, marked prostration and foul body odor.

Silicea 6x.—Rachitic subjects, presenting large heads, open fontalelles, offensive sweating and history of suppurating readily.

The Lingual Tonsil

A mass of lymphoid tissue, located at the base of the tongue and designated the lingual tonsil, is subject to acute inflammation and to chronic hypertrophy. It

may also manifest syphilis, benign or malignant neoplasms and keratosis. Obstruction of the foramen cæcum causes dilatation of the duct and the formation of a small cyst. Large veins coursing through the lingual tonsil are frequently observed, the so-called lingual varix, and these cause local discomforting symptoms and may occasionally ooze blood.

Acute inflammation of the lingual tonsil results from the same causes as ordinary acute tonsillitis. It produces dysphagia, thick voice, trismus, difficulty in talking, pain upon extension of the tongue and if the swelling is great, difficulty in breathing.

Examination with the laryngeal mirror will disclose a swollen, highly colored irregular mass at the base of the tongue pressing against or hiding the epiglottis. It may be covered with an exudate, or if abscess forms it will present as a yellowish tumefaction. The glands at the angle of the jaw may be enlarged and tender.

Treatment is the same as for acute tonsillitis. If abscess forms it should be opened with a guarded laryngeal knife.

Hypertrophy of the lingual tonsil occasions a cough and an annoying sensation of a lump in the throat and a frequent desire to swallow.

Examination with the laryngeal mirror will reveal an enlarged pinkish uneven mass at the base of the tongue.

Treatment.—The local application of a solution containing iodine, five grains; potassium iodide, ten grains to the ounce of glycerine, should be made. Zinc chloride, ten grains to the ounce of water, or tannic acid, ten grains to the ounce of glycerine, are also of use for local application. It may be necessary

to excise some of the excessive tissue. This is accomplished by means of a curved serrated scissors.

Pharyngeal Keratosis

Pharyngeal keratosis or mycosis consists of discrete horny or cornified epithelial projections, appearing on the surface of the faucial or lingual tonsil and from enlarged follicles on the pharyngeal wall. These masses may be milky white or gray, chalk-like, sickle-shaped and do not coalesce. The surrounding mucous membrane is not altered. They crumble when attempt is made to remove them and the base is only detachable through vigorous scraping which leaves a bleeding surface. These masses consist externally of granular material and leptothrix, while in the center are seen masses of densely packed horny epithelial cells. The cause is not known. The condition may exist without symptoms or it may cause local irritation and cough. It is readily differentiated from chronic lacunar tonsillitis by the difficulty in removing the masses from their attachment.

Treatment.—Local application of tincture of iodine or trichloracetic acid will usually bring about a cure. Some resistant cases may require the actual cautery.

Homœopathically Thuja in 6x is indicated.

Vincent's Angina

This is an ulcerative condition of the mucous membrane, involving any portion of the upper respiratory tract, but showing a predilection for the alveolar processes and the tonsils. It is due to the action of the bacillus fusiformis and the spirrilum denticola acting

in symbiosis. It may be confused with syphilis or diphtheria. It usually occurs in the debilitated and in persons who are unsanitarily housed. Children or adults may be affected and it is mildly contagious.

Symptoms.—Dryness of the mouth, metallic taste and pain in the involved area are the outstanding symptoms. Children may exhibit a high fever and great prostration. Adults may be similarly affected, but more commonly the condition is unaccompanied by marked systemic involvement. The submaxillary glands are enlarged and tender, the breath foul and the tongue swollen and coated. The lesions are superficial, dirty ulcerations with sloughs.

Diagnosis.—Vincent's angina must be differentiated from syphilis, tuberculosis and diphtheria. While the lesions are usually superficial ulcerations, a positive diagnosis is made by the finding of the fusiform bacillus and the spirillum denticola. (For further differentiation see under Syphilis.)

Prognosis.—The condition may last from seven to fourteen days. Relapses are common. Rarely extension to the larynx and trachea has resulted fatally.

Treatment.—Cleansing with a saturated solution of sodium perborate will frequently clear up the condition. Silver nitrate solution, 5 to 10 grains to the ounce, is valuable. Acid nitrate of mercury in a five per cent. solution painted on the lesions has cleared up stubborn cases. Salvarsan mixed with a small amount of glycerine is applied to the lesions and in severe cases neosalvarsan is used intravenously.

The homœopathic remedies for Vincent's agina are:

Lachesis 30x.—Purple livid throat, swallowing diffi-

cult, due to a sensation of a lump in the throat. Cannot stand anything about the throat or neck because it causes a strangling sensation. The tongue is swollen and the gums puffed and bleed easily.

Mercurius corr. 6x.—Gums purple, bleed easily, marked salivation, tonsils painful and glands enlarged.

Phytolacca ϕ.—Tonsils and palate swollen, throat feels constricted and swallowing causes shooting pains into the ears. Pseudo-membranous deposits on tonsils. Increased saliva.

The Uvula

The uvula is the pendulous termination of the muscular fibres that make up the pillars of the soft palate and is covered with mucous membrane. It is therefore subject to the inflammatory reaction of the pharyngeal mucous membrane. It attains tremendous size through *œdema.* This may be so severe as to interfere with breathing. Under such circumstances the uvula should be painted with cocaine and scarified in a number of places.

Ulcerations may attack the uvula from the same causes as ulcers occurring elsewhere in the pharynx. (See under Vincent's Angina and Syphilis.)

Bifid or splitting of the uvula is frequently observed. It varies from a small cleft at the end of the body to a complete division simulating two uvulæ. It may be considered an incomplete cleft palate, as the cause is the same. It usually does not produce any symptoms and therefore treatment is unnecessary. It may, however, be corrected by denuding the opposing surfaces of the cleft and suturing.

Elongation of the uvula may occur as a distinct hypertrophy of the muscle fibres and the mucosa, or it may simply be a relaxation of the mucosa. It results commonly from the chronic hawking which accompanies a chronic pharyngitis. The chief annoyance is usually a harassing cough, which may be so severe as to produce emesis. Relaxation during sleep occasions snoring and disturbs rest.

The correction of an elongated uvula is accomplished by the amputation of the excessive mucosa. It is seldom necessary to include the muscle fibres, and when this occurs, the contraction following the operation is excessive. The operation is readily performed by cocainizing the uvula with a four per cent. solution, after which the lower end is grasped with a fixation forceps and the appendage placed on the stretch. With a pair of long curved scissors the amputation is made so that the raw surface presents to the posterior wall of the pharynx. A very small amount of local reaction follows, but frequently the subjective disturbance is excessive.

CHAPTER VII

DISEASES OF THE LARYNX

Acute Laryngitis

This is an acute inflammation of the mucous membrane lining the larynx. It occurs as a result of sudden changes in temperature, lowered resistance, mouth breathing, inhalations of dust, abuse of voice and excessive use of tobacco or alcohol. It is frequently a part of a general cold involving the upper respiratory tract, rhinitis and pharyngitis frequently co-existing.

The *symptoms* are dryness of the throat, alteration in the voice, ranging from slight huskiness to distinct hoarseness. Œdema may interfere with respiration. This is particularly liable to occur in young children when it is associated with a nocturnal, croupy cough.

Acute inflammatory reaction of the larynx in young children may produce a very annoying and alarming condition. The child's larynx is small, the cartilage softer and yielding and the mucosa less closely adherent to the underlying tissue so that effusion occurs more rapidly and easily with the production of stenosis. The lymphatic supply in a child's larynx permits of early submucosal infiltration. In these young subjects the symptoms may appear quite abruptly at night, producing a severe spasm which lasts a variable length of time, subsides abruptly and frequently occurs for three consecutive nights, diminishing in severity with each nocturnal occurrence.

The systemic symptoms are usually those seen with a cold; general depression, chilliness and slight temperature.

Examination of the larynx shows a general smooth, redness of the mucosa. The true cords may be so inflamed and swollen as to appear merged with the false cords.

The *prognosis* in adults is good. At the end of forty-eight hours, as a rule, secretion appears, bringing about the relief of the acute symptoms. The condition may last from three to ten days. In children, the obstruction due to œdema may become so alarming and serious as to require tracheotomy.

Treatment.—A patient with acute laryngitis should be at rest in an evenly ventilated room with a temperature of 70° . The voice should not be used. Alkaline sprays will relieve the local distress. In the acute stage, medicated steam inhalations, using compound tincture of benzoin, one dram to the quart of water, will give considerable relief. Externally, a turpentine stupe or mustard plaster may be used. To make a stupe, turpentine should be placed in a vessel and immersed in a second vessel containing hot water. This should be cautiously heated. A piece of flannel should be wrung out of very hot water until the flannel no longer drips water. It is then dipped in the hot turpentine and again wrung out thoroughly. It is now ready for application to the larynx, externally. Care should be taken that the turpentine is not allowed to remain sufficiently long to cause too intense a degree of hyperæmia. A mustard plaster is made by using one part of mustard with four parts of white flour for a

child. This should be mixed with warm water or vinegar and the white of an egg added. The mass is then placed between layers of muslin and applied to the area. As soon as a well-marked area of hyperæmia is seen, the mustard plaster should be removed. Later in the stage of the disease an oily spray, containing two grains of menthol and two grains of camphor should be used.

Diathermy applied to the neck muscles is useful in relieving the distress.

The homœopathic remedies recommended are:

Aconite ø.—Give cautiously to the point of sweating, is frequently efficacious in shortening the attack.

Causticum 3x.—The voice is reduced to a whisper and great effort must be exercised in attempting to speak. There is painful cough, rawness and soreness extending down into the trachea and the patient desires cold drinks.

Ferrum phos. 2x.—This remedy is very popular and efficacious in the early stages of the condition. The larynx is painful. In prescribing this remedy, it has been my practice to have the patient allow the triturate tablet to dissolve on the tongue and repeat at frequent intervals.

Hepar sulph. 1x and *3x.*—A tablet of the 1x trituration dissolved in one-quarter glass of water and one dram given every five minutes is a specific in acute laryngitis of young children. It is not necessary to combine this remedy with Aconite and Spongia as is so often done. In older patients who can express themselves, Hepar 3x is used where laryngitis results from overuse and abuse of the voice. The larynx is pain-

ful. These pains are described as splinter-like. A hepar patient desires warmth and is relieved by warm applications.

Iodine 3x.—A painful spot in the larynx which is very sensitive, is the outstanding complaint. With this there is a spasmodic cough with scanty, thick, lumpy mucus.

Phosphorus 3x.—The larynx is painful and hyperæsthetic. The cough is dry, tight and racking. Phonation is painful. The chest feels tight and the Phosphorus patient craves cold food.

Spongia 3x.—Intense dryness, burning and stinging with a sensation of a plug in the larynx which is sensitive to touch. It is indicated in spasmodic dyspnœa with hoarseness and croupy cough, which is worse with every inspiration.

Acute Œdema of the Larynx

This occurs as a primary or secondary condition. The primary type arises as a result of taking cold, traumatism due to lodging of foreign bodies in the larynx, inhalations of steam or irritant fumes, the ingestion of hot liquids and prolonged or improper use of the voice. Secondary œdema of the larynx occurs as a complication of cardiac or kidney lesions, diabetes, tuberculosis, septic infections, peritonsillitis, phlegmanous sore throat, Ludwig's angina and erysipelas. It also occurs as part of an angioneurotic œdema or an expression of allergy.

The *symptoms* usually develop suddenly and vary in intensity depending upon the amount of swelling. Varying degrees of dyspnœa and cyanosis, croupy

cough, alteration of the voice and dysphagia are present. Death may ensue in marked cases if not relieved by tracheotomy.

The laryngoscopic picture is a dull, purplish tumefaction bathed in masses of translucent mucus.

The *prognosis* should be guarded. Recurrences are common. Severe cases may die rapidly.

The *treatment* of œdema of the larynx in the less severe cases includes the application of cold to the external larynx and the inhalation of steam, either plain or medicated, with compound tincture of benzoin, one dram to the quart of water or a few crystals of menthol. Spraying the larynx with adrenalin solution, 1 to 2000, or with cocaine 2%, will relieve temporarily. These measures may be repeated at intervals as necessary. When the condition does not improve the mucosa of the larynx should be scarified to reduce the swelling—this failing, a tracheotomy, will be necessary.

Pilocarpine, one-twelfth grain hypodermically, may be tried. In allergic cases the hypodermic administration of one half to one cc. of adrenalin solution followed by atropine sulphate, one two-hundreths of a grain, is usually efficacious.

The homœopathic remedies suggested for acute œdema of the larynx are:

Apis mellifica 6x.—Suddenly appearing œdema resulting from burns or complicating acute diseases such as scarlet fever or erysipelas.

Arsenicum album 6x.—This is the remedy for œdema complicating heart and kidney incompetency.

Belladonna 2x.—Very acute attack associated with pain, prostration and anxiety. The local manifestations are severe and complicated by involvement of the muscles of the neck.

Chininum arsenicosum 2x.—This remedy is indicated in secondary œdema of the larynx; extension from neighboring infected areas. The general septic condition emphasizes the indications for this remedy.

Lachesis 6x.—Constriction of the throat and sensation of suffocation when anything is around the throat. Dry, suffocating cough started by a tickling in the larynx. The patient always sleeps into an aggravation.

Chronic Laryngitis

This condition is also called chronic laryngeal catarrh and consists of a thickening of the mucous membrane lining the larynx. It results from extension of upper respiratory catarrh and particularly chronic sinusitis, mouth breathing from any cause, the use of tobacco and alcohol. It frequently accompanies the following systemic conditions: gastrointestinal derangements, hepatic, cardiac and renal disease, rheumatism, gout, asthma and hay fever. The laryngeal mucous membrane is particularly irritable in young girls at the time when the mensea are established and in boys at the onset of puberty. Abuse of the voice is also followed by a chronic laryngitis.

Symptoms.—The outstanding symptom is intermittent alteration in the purity of the voice and this is more noticeable during weather changes. The next most prominent symptom is frequent clearing of the

throat, although the secretion is scanty. There may be a sensation of rawness or dryness in the region of larynx.

Local examination with a laryngeal mirror shows a diffuse of circumscribed congestion. The vocal cords are dull and the upper surface appears rounded. Small vessels may be seen upon the surface of the cords. Motility may be impeded by thickening. *Singers' nodes* are at times observed. These epithelial accumulations usually following upon a small ulceration of the glottic edge of the cord. Public speakers and singers are particularly affected. These nodes interfere with vocalization.

Treatment.—Recovery is frequently slow. The upper respiratory tract must be carefully investigated for deviations from the normal and where these are present, proper treatment instituted. The voice production should be carefully regulated. The individual should be thoroughly examined for the existence of any of the general conditions noted under the causation of this disease. Candy and concentrated sweet food should be eliminated. Local treatment consists of cleansing of the larynx with an alkaline spray, followed by the application of silver nitrate varying in strength from 10-40 grs. to the ounce. Care should be exercised in applying this solution as an excess will produce a spasm. Organic silver preparations in 15-20% aqueous solutions may be used. A stimulating oily spray of menthol gr. 2, oil of cassia 1 gtt. to the fluid ounce of albolene is given for home treatment and the patient directed to spray the larynx twice daily.

Singers' nodes will frequently disappear if the voice is corrected and the proper treatment applied. If these measures fail they are removed surgically by a direct laryngoscopy.

The homœopathic remedies suggested are:

Ammonium chloride 3x.—Hoarseness, associated with burning in the larynx. Dry cough and hacking. There is considerable prostration and a history of recurring respiratory trouble.

Causticum 6x.—Hoarse voice in the morning with soreness in the larynx. The vocal cords lack tone; do not approximate properly. These patients state that their voice is better in damp weather and worse when it is clear.

Ferrum phos. 2x.—This remedy is particularly useful in laryngitis due to overuse of the voice, especially in singers and public speakers.

Kali bich. 3x.— Rough, hoarse voice; tickling in the larynx; sticky, tenacious discharge; ulcerative tendency. The symptoms are worse in the morning.

Phosphorus 6x.—Hoarseness and rawness; worse after using the voice and toward evening. Pain and tickling in the larynx, aggravated by use of voice. Cough worse in the cold air.

Rhus tox. 3x.—Hoarseness due to excessive use of the voice but clears up after using the voice for awhile.

Rumex 1x.— Rawness in the larynx with constant desire to clear the throat. Spasmodic cough which seems to originate in the chest under the sternum where there is soreness.

Wyethia 3x.—Uncomfortable irritation in the

larynx causing constant clearing and scraping without relief.

Atrophic Laryngitis

This condition is also called laryngitis sicca or ozænatous laryngitis. It is a chronic inflammation of the larynx with the production of crust formation in the larynx similar to that found in the nose and throat in atrophic conditions, and with which it is usually found associated.

It produces a husky voice due to the accumulation of crusts upon the cords. Considerable coughing is necessary to dislodge these crusts and not infrequently blood streaked expectoration results from erosions in the mucosa beneath the crusts.

It is generally conceded that this condition in the larynx results from preexisting similar pathology in the nose.

The *prognosis,* like that of atrophic rhinitis and pharyngitis, depends upon the discovery and elimination of the underlying causes.

The *treatment* includes careful cleansing of the larynx with alkaline solutions to assist in the expulsion of the crusts. The application of stimulating medicaments such as iodine grains vi, potassium iodide grains xxx, olei menthæ piperitæ minims v, Glycerine ounce i, or silver nitrate in strengths of from five to ten grains to the ounce are useful. Internally, sodium or potassium iodide in three to five grain doses three times daily often give considerable relief.

For homœopathic remedies in this condition see under Atrophic Rhinitis and Atrophic Pharyngitis.

CHAPTER VIII

LUPUS AND TUBERCULOSIS OF THE NOSE, PHARYNX AND LARYNX

The nose, pharynx and larynx, of all cases of tuberculosis of the lungs should be examined at regular, frequent intervals for the early recognition of lesions as applied local treatment will frequently prevent further progress.

Tuberculosis usually manifests itself in the nose as lupus: in the pharynx as lupus and acute miliary tubercules. In the larynx tuberculosis causes the more aggravated lesions.

The lesions of *lupus in the nose* present as pinkish gelatinous-like elevations on the septum just inside of the vestibule and near the floor of the nose. The turbinates are also at times involved. These lesions cause crusting and bloody mucous discharge, perforation of the nasal septum and atrophy of the turbinates. Nasal obstruction will be present when the nodules assume unusual size. The progress is usually slow, healing at one place and spreading at another. Lesions of a similar nature are found in the skin about the lip and wings of the nose.

The *treatment* of lupus of the nose consists of the use of the galvano cautery applied by means of a fine point electrode to the lesions. If the nodules have broken down the necrosing area should be treated. Larger lesions should be excised. Applications of

iodine and weak mercurial ointment consisting of unguenti hydrargri nitratis diluti, 1 dram to the ounce of vaseline, are indicated.

Lupus of the pharynx is the chronic form of tuberculosis. It appears as minute discrete, pinkish points with a gelatinous like crater. The process destroys the epithelium giving a worm-eaten appearance. The favorite location is the anterior faucial pillar and soft palate. The tonsil is rarely involved. There is very little subjective discomfort. Its insidious onset and slow progress will aid in differentiating it from luetic lesions.

The treatment of lupus of the pharynx is the galvano cautery or curettage.

Acute miliary tuberculosis of the pharynx is probably always a part of a general miliary tuberculosis. It occurs as small tubercles appearing just beneath the mucosa. It extends from the fauces to the hard and soft palate, the base of the tongue and the epiglottis. If it invades the tonsil it appears as a lacunar tonsillitis. When the tubercles fuse, they form a greyish white deposit which when wiped away leaves a bleeding surface. This condition causes pain, salivation and difficulty in swallowing. It is sometimes confused with diphtheria but the history and culture from the area will differentiate. The tubercle bacilli may be obtained from the lesion.

The areas should be cleansed with alkaline solutions and dusted with orthoform powder. The pain is so intense at times that it will be necessary to give the patient morphia. These cases are usually hopeless.

Lupus of the larynx is relatively rare and is secondary. The favorite location is the epiglottis where the nodules stand out prominently. The entire epiglottis may be deformed and twisted. Its progress is slow and quite symptomless. Anæsthesia may cause difficulty in swallowing. It frequently heals spontaneously. It requires no treatment except the galvanocautery applied to the nodules.

The general treatment in lupus is important and includes careful regulation of the hygiene and diet. Foods rich in proteins and fats are important.

Homœopathic remedies: *Arsenicum 3x* and *Arsenicum iodide 2x*.

Tuberculosis is the most common of the specific diseases affecting the larynx. It is usually secondary to pulmonary tuberculosis although cases occur which seem to be primary. Probably a third of the cases of pulmonary tuberculosis develop laryngeal involvement. Sex has little influence and it occurs between the ages of twenty and forty years. Syphilis is not uncommonly associated.

In early and mild cases there may be an absence of subjective symptoms. This emphasizes the importance of frequent examination in cases of pulmonary tuberculosis. Alterations in the voice vary from a weak tonelessness to marked hoarseness and in unfavorable cases the changes in the voice are progressive. Cough, when present, is of the hacking type. Pain on swallowing is present when there is extensive infiltration of the arytenoids or of the epiglottis and may be so severe as to cause the patient to refuse food or

drink. The secretion is mucoid or mucopurulent and rarely blood streaked. Dyspnœa will occur when there is fixation of the vocal cord.

The posterior half of the larynx is favored by tuberculosis and occurs as to choice of location in the following order: the interarytenoid space; the arytenoids, assuming a pear-shaped swelling; the middle and posterior segment of the vocal cords and the epiglottis. Lesions are also seen in the false cords. Deep ulcerations are seen in the late cases. A waxy appearance of the larynx or chronic hyperæmic areas or limited swellings should arouse suspicions of tuberculosis. Roughness in the interarytenoid space, thickening of one arytenoid or its fold, irregular swelling of the epiglottis, rounding of the surface of the vocal cord and interference with motility are some of the more common findings in the tubercular larynx.

Syphilis and malignancy must be differentiated from tuberculosis of the larynx. (See Syphilis of the Larynx).

The *prognosis* of laryngeal tuberculosis depends upon the activity in the lungs, the patient's general resistance and general clinical behavior. The tuberculoma or infiltration lesions offer a fair prognosis, while ulcerative lesions are less favorable. Lesions of the vocal cords, ventricular bands or interarytenoid folds offer a higher percentage of recoveries.

The *treatment* of tuberculosis of the larynx demands the usual general treatment of tuberculosis. In infiltrative lesions the local treatment should be simple. Great care should be exercised not to traumatize.

Rest of the larynx is accomplished by having the patient use the voice as little as possible or, better, practice strict silence, making communication by writing. Irritants, such as tobacco and alcohol and an irritating atmosphere must be removed. The larynx should be sprayed with a warm alkaline solution before applying a local medicament. Menthol, five grains to the ounce of albolene, used as a spray, is used in infiltration lesions. Lactic acid is the remedy for ulcerative lesions and this is applied in a 25% solution directly to the lesion. Formaldehyde sprays, 1 to 2000; Chaulmoogra oil twenty per cent. in olive oil, one cubic centimeter dropped in the larynx is recommended for pain. A very useful and efficient remedy for pain is the following emulsion of orthoform: menthol, 0.6 to 6.0, formaldehyde 0.6, orthoform 6.0, ol. amygdalæ 15.0, pulv. acaciæ 15.0, and aqua ad 60.0. One cc. of this is dropped into the larynx by means of a long glass dropper.

In cases where the pain resists all other treatment injections of the superior laryngeal nerve with alcohol is often successful and gives the patient relief.

Tracheotomy is now seldom practiced except in cases presenting increasing stenosis.

Homœopathic remedies used in tuberculosis of the larynx are as follows:

Arsenicum iodide 2x.—Preponderance of catarrhal symptoms, weak voice, mucopurulent secretion, hacking cough. The local condition in the larynx is one of infiltration.

Drosera ϕ.—Deep, hoarse voice, local irritation

causes much effort to relieve by forcible and frequent clearing of the throat.

Iodium 2x.—Hoarse voice, very painful, sensitive larynx, the slightest irritation produces a croupy cough. Respiration is labored and accompanied by wheezing and oppression of the chest.

Silicea 6x.—Violent cough with thick masses of tough, offensive mucopus. Ulceration of the larynx. Night sweats.

Stannum 6x.—Talking causes great weakness in the throat and chest. The cough at night is dry but during the day it is loose with free expectoration of greenish sweetish mucopus. Respiration is short and oppressed by sticking pains in the chest.

CHAPTER IX

SYPHILIS OF THE NOSE, PHARYNX AND LARYNX

Chancre of the nose is very uncommon. It has been recorded as occuring on the septum, anteriorly, near the floor as a result of introduction of the infection either from the finger or surgical instruments. Secondary manifestations are likewise uncommon. The tertiary lesions are common and serious. The septum is the most favored site, although any portion of the nose may be attacked. Gummatous, tumor-like masses distend the mucosa. If these are not treated early and adequately, they break down, forming ulcerations which destroy bone, cause perforation of the septum and later atrophy of the surrounding mucosa. Perichondritis and necrosis of bone may occur as an individual tertiary expression or may follow gummatous ulceration. This may be suspected where there is external swelling and tenderness accompanied by characteristic nocturnal headaches. Intranasal tertiary lesions usually present crusting with foul odor and a discharge of sequestra. External nasal deformity frequently occurs; the characteristic and common one being the syphilitic saddleback or sunken nose. Syphilis also manifests itself in the nose as a generalized thickening of the mucous membrane with multiple small nodules and an excoriating serous secretion.

Increasing nasal obstruction with nocturnal headaches should arouse a suspicion of syphilis.

Pharynx.—Syphilis manifests itself in the pharynx in any of its clinical stages. Chancre of the tonsil is more commonly observed than formerly reported. It frequently occasions insignificant discomfort and may be discovered only upon inspection. It may be obscured because it is hidden behind the anterior arch and confusion may result because of the general involvement of the tonsil and the absence of induration. It may present an ulcer with a sloughing, diphtheroid base. It causes early and indolent involvement of the submaxillary glands. The spirochæta pallida can be recovered from the lesion. Chancre of the tonsil must be differentiated from Vincent's angina, tuberculosis, malignancy, leukæmia, and other blood diseases, diphtheria, ulcerating tertiary lesion and tonsillitis. Vincent's angina is quickly differentiated by making a scraping from the lesion and recovering Vincent's organisms, B. fusiformi and the spirillum denticola. Tuberculosis of the pharynx is rare and it favors the soft palate, the uvula and is secondary to tuberculosis of the lungs. Malignancy usually occurs in older people as a slower growth, the glandular involvement occurs later and there is a tendency to hæmorrhage. Leukæmia and other blood diseases will be differentiated by having a complete blood picture made. Diphtheria is differentiated by culturing and the demonstration of the Klebs-Loeffler bacillus. Tertiary ulceration of the pharynx favors the soft palate, the roof of the nasopharynx, the lateral walls and the base

of the tongue. Tonsillitis is usually bilateral and accompanied by emphasizing systemic symptoms, headache, generalized bodily aching and fever and more localized discomfort, with recovery taking place within ten days.

Secondary syphilis of the pharynx appears from the fifth to the twelfth week after a primary lesion. Recurrences are common during the first and second year of the disease. It presents, as a general erythema, mucous patches and lymphoid hypertrophy.

Erythema occurs in symmetrical, dusky red, sharply circumscribed patches anywhere in the pharynx. Mucous patches occur on the uvula, soft palate, pillars of the faucial tonsils, lips, gums, inside of the cheek and along the margins of the tongue. The mucous patch is a slightly elevated, dusky red lesion which quickly becomes eroded superficially. They occur in symmetrical arrangement on both sides of the median line. Mucous patches will persist for a few months if not treated and they are highly contagious.

Tertiary syphilis of the pharynx appears in the form of a serpiginous ulcer, gumma and diffuse gummatous infiltration. The ulcer is an early expression of tertiary syphilis and appears in any portion of the pharynx. The gumma favors the soft palate, the roof of the nasopharynx, lateral walls of the pharynx and base of the tongue It appears as a bright red, elastic swelling. If it occurs in the soft palate it produces a marked nasal voice, difficulty in swallowing and salivation. If not treated early and adequately, it breaks down forming an ulcer which eventually perforates

the soft palate after which healing takes place with stellate scar contraction. Gumma of the posterior wall of the pharynx may involve the vertebra and when it occurs in the upper nasopharynx it may invade the sphenoid bone. Diffuse gummatous infiltration may be found anywhere in the pharynx.

Larynx.—The primary and secondary manifestations are so rare that they will not be commented upon here. Tertiary lesions occur as gumma, ulceration, perichondritis and necrosis, post syphilitic infiltration, scars and adhesions. The gumma is not common and favors the epiglottis, the aryepiglottic folds, the arytenoids and the cords. It appears as a purplish or deep red, smooth tumefaction. Gummatous infiltration occurs as diffuse nodules. The ulceration is usually deep, irregular, punched-out or crater form, having sharp edges. The epiglottis is a favored location for this and may be entirely destroyed by the process. Syphilitic perichondritis may cause necrosis and destruction of any of the cartilages. The epiglottis is especially liable to this. Healing takes place with scar contraction and anklyosis of the cartilaginous joint. There is a form of hypertrophic induration of the larynx which is a parasyphilitic laryngitis. It may be general or circumscribed and tends to cause contraction and sclerosis. Post syphilitic changes are adhesions (causing deformity of joints), webs between the vocal cords, permanent thickening of the cords and fixation of the larynx to the base of the tongue or the lateral walls.

Symptoms.—Changes in the voice are characteristic.

The voice has a hollow or raucous tone. Pain and dysphagia are not necessary accompaniments but become marked if the epiglottis is ulcerated. Dyspnœa will occur if the vocal cords become fixed or a sloughed cartilage becomes impacted. In diagnosing lues of the larynx it should be remembered that it is not impossible for a syphilitic patient to have a simple, tubercular or malignant laryngitis. The prognosis of syphilitic laryngeal disease should always include a reservation for the recovery of a clear voice. The husky voice of the luetic laryngitis is frequently permanent.

The *diagnosis* of syphilis of the larynx is made upon the history, the appearance and location of the lesion and the result of serological studies. When ulceration has occurred syphilis must be differentiated from tuberculosis and malignancy. Syphilis is more commonly seen upon the lingual surface of the epiglottis. Tuberculosis seldom attacks the epiglottis and when it does it chooses the laryngeal aspect. Syphilis occurs more often upon the anterior portion of the cords although the vocal processes are involved. Tuberculosis is seen more frequently in the middle or posterior third of the cords. Syphilitic ulcers are surrounded by an inflammatory induration, are clear-cut, punched-out or undermined with dirty base and show little tendency to granulate. Tubercular ulcers have irregular frayed-out margins, are more superficial and have a yellowish base. The voice of the syphilitic is raucous, painless and strong while that of the tubercular is weak, hollow and low. Syphilis

causes less pain than tuberculosis. It must be remembered that the two processes may exist at the same time or follow each other. Malignancy occurs later in life, has a slower clinical course and, usually, later glandular involvement. Intrinsic growths are more frequent in the cords. A unilateral defined growth, especially if it causes impairment of motility and is situated in the median or anterior third of the larynx should suggest malignancy. Extrinsic malignancy is less rapid than syphilis and is more painful.

Treatment.—The general constitutional treatment of syphilis is of paramount importance. The earlier the diagnosis is made and proper medication instituted, the less permanent damage results. The arsenical preparations, salvarsan and neosalvarsan, are favored in the primary and secondary manifestations. In the tertiary lesions, energetic treatment with potassium iodide, augmented by mercury still occupies a favored position. The local treatment consists of simple cleansing with the alkaline solutions. Silver nitrate, ten to twenty grains to the ounce is useful in alleviating the annoyance of mucous patches. Ulcerative lesions respond to the local application of a 20% solution of mercuric nitrate. Orthoform or anæsthesin powder may be used for the relief of pain. Syphilitic deformities of the nose are correctable by cosmetic surgery after the syphilis is brought under control. Laryngeal stenosis may require surgical intervention.

CHAPTER X

TUMORS OF THE NOSE, PHARYNX AND LARYNX

The most common growth found in the nose is the *nasal polypus*. This is a proliferation of the mucous membrane and is a benign growth. It occurs under two forms, the soft, or so-called mucous polypus, and the firm or fibrous.

Nasal polypi arise as the result of continued nasal irritation through the drainage of discharge from a sinusitis, or as the result of bone pathology.

These growths occasion obstructed nasal breathing, increased discharge, alterations of the voice, cough, bronchial spasm, headache, blunted or lost sense of smell and taste and a marked susceptibility to cold catching. Polypi are usually attached to the mucous membrane by a pedicle and are differentiated from an enlarged turbinate by the freedom of movement. An enlarged turbinate is fixed. A polypus is soft, pits on pressure, and does not shrink when adrenalin is applied as do hypertrophied turbinates.

The *prognosis* of nasal polypi depends upon the discovery of the cause and the removal of same. The mere removal is, in a great many cases, the removal of the result of an existing disease, usually a sinusitis.

Treatment.—The treatment of a polypus is removal by means of a snare, cauterization of the base with

silver nitrate and the careful search for and correction of the primary nasal trouble.

Papilloma occurs infrequently in the nose and is found attached to the septum or more rarely to the inferior turbinate. It appears as a wart-like growth and bleeds upon the slightest manipulation. It should be removed by a snare and the actual cautery applied to the point of origin.

Sarcoma is rare. It appears as a sessile growth of light reddish color. Obstructed nasal breathing and offensive bloody discharge are early symptoms. It grows rapidly and produces great deformity of the face.

Carcinoma of the nose as a primary growth is very rare. It is usually due to the breaking through into the nose from the nasal accessory cavities.

Naso-Pharyngeal Fibroma is a fibrous tumor richly supplied with vessels. It occasions obstructed nasal breathing and facial deformity. It appears particularly during childhood and early adolescence and is very resistant to treatment. When removed, it recurs quickly. Surgical treatment is rendered difficult because of the inaccessibility and vascularity. The galvano cautery is perhaps the best method of removal.

In the pharynx *papilloma* not infrequently occurs on the soft palate, uvula, faucial pillars or from the surface of the tonsil. It appears as an irregular white, grey or pale pink, sessile or pedunculated mass varying in size from a millet seed to a hazelnut.

Adenoma is found in the pharynx springing from

the palate, uvula and tonsil. It occurs as a smooth, round, firm or sessile, greyish or pinkish growth.

Fibroma is very rare but when present is found growing from the tonsil or palatine arches.

Malignant growths in the pharynx are rare as primary lesions but as part of later extension from the tonsil, base of the tongue or larynx. *Sarcoma* of the tonsil is uncommon while *carcinoma* is more common. It begins as a mulberry like growth which ulcerates and fungates early, bleeds readily and produces early glandular enlargement. As it enlarges, breathing may be seriously interfered with. The sputum is blood-tinged and the mouth becomes septic and foul. These cases are hopeless.

In the *larynx* the tumors most commonly observed are papilloma, fibroma, angioma, myxoma, cysts, sarcoma and carcinoma. Laryngeal tumors give rise to interference with the voice, obstruction to breathing, laryngeal spasm and cough. If the growths are small, and located on a cord, there will be difficult vocalization. If located between the cords, vibration will be so interfered with as to induce an aphonia. If the lesion is located above the cords, the symptoms are usually slight. Tumors are so located at times that a small amount of further growth will produce rapid asphyxiation.

Papilloma of the larynx occurs in both children and adults. It occurs frequently as the result of laryngeal irritation, the result of chronic laryngitis and in association with luetic and tubercular ulcers. Not infrequently papillomas become malignant. These

tumors occur in the so-called pedunculated type, having a pedicle, or the sessile type, having a broad base. The pedunculated type can be removed by means of the snare. The sessile type is treated with X-ray and the local application of Thuja. Surgery is usually employed only when the breathing is interfered with.

Malignant growths of the larynx are divided into two classes. Those arising from within the cartilaginous framework are called *intrinsic* and those growing from outside the laryngeal box, the *extrinsic*. Malignant growths in the interior of the larynx spring from the ventricular band, ventricles, vocal cords, and interarytenoid space. They are usually of slower growth and the lymphatics are not involved early. Extrinsic malignancy springs from the epiglottis, arytenoids, the arytenoid folds, the pharyngeal surface of the cricoid cartilage and the pyriform sinus. These are of rapid growth and show early glandular involvement and metastasis.

The symptoms of laryngeal malignancy vary with the size and location of the growth. Small lesions upon the cords will so alter the voice as to call attention early. A growth in the aryepiglottic fold may attain considerable size before causing great annoyance. *Any discomfort in the throat, with or without hoarseness, which persists for a few weeks in patients over forty years of age, demands a careful examination by one skilled in laryngoscopy.* Obstinate hoarseness is the common symptom in intrinsic malignancy. Pain may not be present until late in the disease. It is more prominent in extrinsic cases.

Obstruction to breathing is a symptom of advanced cases. Glandular enlargement usually means extrinsic malignancy or extension of intrinsic malignancy beyond the cartilaginous framework of the larynx. The mouth and pharynx become foul and hæmorrhages are common. Obstructed breathing is present in advanced cases. In the terminal stages cachexia becomes marked.

Non-malignant growths of the larynx may be removed. While papilloma are considered benign they will at times behave like malignancy or undergo malignant change.

Malignant growths of the larynx are very hopeless because of the advanced stage in which they reach the hands of the experienced laryngologist. The intrinsic cases offer a better prognosis than the extrinsic if the proper surgical procedure is performed early. Total laryngectomy performed at the proper time has prolonged the life of many victims of laryngeal malignancy.

Palliation in inoperable cases will call forth all therapeutic reserves. The dysphagia may be relieved by the use of diathermy. When swallowing is difficult or impossible gastrostomy may be called for. Respiratory difficulty may be relieved only by a low tracheotomy. The mouth should receive careful cleansing and antisepticizing. Antiseptic washes of carbolic acid or hydrogen peroxide, followed by an alkaline mouth wash, will give grateful relief. The insufflation of orthoform may be used to relieve pain. Most cases come eventually to morphia and this should

not be withheld. These cases are far beyond the danger of forming a habit and with careful regulation the dosage can be kept within reasonable bounds.

Homœopathic remedies may be used in the symptomatic treatment of malignancy.

Acetic acid 3.r.—Pale waxy emaciation, profuse hæmorrhages and marked debility.

Arsenicum album 6.r.—Cachexia, debility, exhaustion, restlessness and irritability, fear, dyspnœa, bloody expectoration and great thirst.

Calendula ø is used in a twenty per cent. solution as a local application and for cleansing purposes.

Kresotum 3.r.—Profuse bleeding, excoriating discharge and putrid mouth.

CHAPTER XI

NEUROSES OF THE NOSE, PHARYNX AND LARYNX

The common *neuroses of the nose* are anosmia, hyperosmia, parosmia, hyperæsthesia, anæsthesia, paræsthesia and cacosmia.

Anosmia, or loss of sense of smell, may be congenital or acquired. The acquired type may be hysterical, luetic and the result of meningitis or brain tumor. It may occur following nasal operations, and the too frequent douching of the nose with solutions containing carbolic acid, zinc and other astringents. In a transitory form it is observed during acute colds and influenza. It is a result of continued nasal obstruction due to deflected nasal septum, hypertrophied turbinates and polypi. The prognosis of anosmia should be guarded except in cases accompanying acute inflammation of the nose.

Treatment.—Where mechanical conditions exist they should be corrected by proper surgical operation or, when possible, local medication. Internally, *Ammonium muriaticum 3x* is indicated in cases of loss of sense of smell, particularly when due to obstruction caused by hypertrophied mucous membrane. These indications are accompanied by derangements of the hepatic and intestinal organs which are so often seen in association with chronic congestive states in the nose.

Argentum nitricum 3x.—Loss of sense of smell,

associated with marked neurotic manifestations of a depressive character.

Ignatia 2x, Strychnia 2x and *Sulphur 30x* are used and prescribed upon the general symptomatology.

Hyperosmia, oversensitiveness or excessively acute sense of smell, occurs in highly nervous or neurotic individuals and especially in women. This symptom should be treated as part of a neurotic or hysterical state.

Parosmia, or paræsthesia, is a perversion of the sense of smell, in which imaginary odors are perceived. It is observed during pregnancy, hysteria, epilepsy and mental conditions. The treatment depends upon the cause.

Cacosmia is the perception of offensive odors in the nose and frequently due to the presence of a foreign body or to sinus disease. It may be an aura in epilepsy.

Hyperæsthesia.—(See Vaso Motor Rhinitis.)

Neuroses of the Pharynx

Anæsthesia of the pharynx may follow diphtheria. It may be a symptom of bulbar paralysis or progressive paralysis of the insane. Deglutition is interfered with and food may enter the larynx, necessitating feeding through an oropharyngeal tube. Galvanism and faradism are recommended.

The homœopathic remedies are *Gelsemium 3x* and *Strychnia phos. 2x.*

Hyperæsthesia is the term applied to a hypersensitive condition of the throat. These individuals cannot tolerate the slightest manipulation in the throat.

It is seen in individuals who indulge excessively in tobacco or alcohol. Chronic catarrhal conditions of the nose, producing tenacious mucous secretions, also contribute to the irritability of the pharynx.

Treatment of hyperæsthesia of the pharynx is that of the coexisting or contributing conditions. (See Rhinitis, Sinusitis and Pharyngitis.) Internally, homœopathically, *Hyocyamus 3x, Ignatia 2x* and *Nux vomica 3x* are to be considered.

Paræsthesia of the pharynx is a frequent symptom and expressed as burning, sticking, tickling, itching, crumblike sensation or a lump which cannot be relieved by swallowing. It is encountered in the nervous and hysterical patients and accompanies chronic catarrhal conditions of the pharynx.

Treatment.—(See Chronic Pharyngitis.) In the absence of pathology in the pharynx *Ignatia 2x* and *Cimicifuga ϕ,* in 5 to 10-drop doses, internally are useful in quieting the irritable pharynx.

Neuralgia of the pharynx is not infrequently met with and it proves to be a very distressing and at times a stubborn symptom. Usually no definite local pathology is discoverable to explain the distress. Sensitive spots may be detected with a probe. The condition is presented by very nervous individuals and particularly females who are sufferers from menstrual difficulties.

Treatment should be directed to the general condition. Homœopathically, *Cimicifuga ϕ, Ignatia 2x, Kali phos. 3x* and *Magnesia phos. 3x* are indicated.

Paralysis of the pharyngeal muscles occurs most

frequently as the result of diphtheria and is usually associated with paralysis of some other parts. If the epiglottis is involved there will be passage of food into the larynx with resultant choking and coughing. Involvement of the œsophagus renders swallowing difficult or impossible and food will be regurgitated. When the palatine muscles are involved the voice is altered and there will be regurgitation of food through the nose. The soft palate and the uvula will be found to hang downward and cannot be elevated. If only one side is involved the uvula and soft palate may be drawn to the unaffected side. Paralysis of the pharynx may be a part of a bulbar paralysis which offers an unfavorable prognosis. Post diphtheritic paralysis offers a favorable prognosis.

Treatment.—The application of galvanism to the affected muscles hastens the recovery. Internally, homœopathically, *Gelsemium 2x* and *Strychnia phos. 2x* are indicated.

Neuroses of the Larynx

Anæsthesia of the larynx is a symptom which may be caused by, accompany, or follow, many diseases, such as diphtheria, syphilis, long standing chronic catarrhal conditions, hysteria, bulbar paralysis, cerebral hæmorrhage, intracranial tumors or tabes.

Hyperæsthesia of the larynx is often associated with acute inflammatory diseases. It is noted in neurotic individuals and as a result of fear of tuberculosis or cancer. It may be an early indication of tuberculosis. It is associated with a loud, nervous, bark-like cough.

Paralysis of the laryngeal muscles arises from central lesions (brain and brain stem), involvement of the nerves in their course or from local changes in the nerves and muscles themselves. The central causes are cerebral hæmorrhage or tumor, encephalitis, disseminated sclerosis, syphilis, tabes dorsalis, lead and arsenical poisoning. Paralysis due to interference with the nerve in its course is common and due to aneurism, tumors in the mediastinum or œsophagus, cervical adenitis, enlargement of the thyroid gland, pleuritis in the right apex and syphilis. Local affections in the larynx causing paralysis include traumatism resulting from foreign bodies, degeneration of nerves and muscles resulting from thickening, ulceration, tuberculosis and syphilis. Paralysis may be unilateral or bilateral or may affect the superior or recurrent laryngeal nerves or both.

Paralysis resulting from the involvement of the superior laryngeal nerve causes an anæsthesia of the laryngeal mucosa and paralysis of the cricothyroid muscle. The voice is altered and food may be aspirated into the larynx.

Paralysis due to involvement of the recurrent laryngeal nerve may produce few subjective symptoms. The voice is weak, uncertain or lost. The vocal band occupies a median position and does not move during acts of respiration or vocalization. Inspiration causes the unaffected vocal cord to abduct widely (move outward) and attempts to phonate bring the unaffected cord to or beyond the median line in an effort to produce voice which is accomplished to a fair

degree. Involvement of both recurrent laryngeal nerves causes both vocal cords to occupy the median position and they do not move during respiration or attempts at vocalization.

Paralysis of individual laryngeal muscles:

Cricothyroid muscle: Paralysis of this muscle causes a wavy vocal cord, which results in a weak, unsteady voice.

Thyro arytenoid muscle: Paralysis of this muscle brings about a thin arched band, which does not adduct to the complete median position. The resulting voice is weak.

Lateral crico-arytenoid muscle: When this muscle is affected on one side there are no subjective symptoms. It produces an abductor paralysis, the cord does not move outward, abduct, from the median line. When both sides are involved both cords occupy the median position and are immobile. This type of paralysis is dangerous because of interference with breathing and requires tracheotomy. It is caused by pressure, stretching, or injury to the nerve, aneurism or tumors of the mediastinum and tuberculous deposits in the right apex. Its onset is slow and progress persistent and unchangeable. The prognosis is poor.

Transverse arytenoid: Paralysis of this pair of muscles causes a small triangular separation of the vocal cords in the posterior extremity during vocalization. It is usually due to a local cause in the larynx.

Prognosis of laryngeal paralysis. This depends upon the removability of the cause and the duration. If the cause is removable before great damage has

been done to either the nerve or the muscle affected there is some return of function. Syphilitic cases offer such favorable outcome.

Treatment.—Removal of the cause. When syphilis is the cause the treatment is antisyphilitic. The galvanic current is applied to the affected muscle, the negative pole in the larynx and the positive pole in the hand. Caution should be observed in abductor paralysis by using a very weak current and applying it but a few seconds and gradually increasing. The current may also be applied with the poles on either side of the larynx externally. In cases where there is anæsthesia of the larynx and there is the troublesome aspiration of food, the patient may be fed through an œsophageal tube. Care must be exercised in passing this tube not to introduce it into the anæsthetic larynx. Bilateral abductor paralysis calls for tracheotomy.

Hysterical Laryngeal Paralysis

This is also designated functional or nervous paralysis and is observed in nervous hysterical subjects, although it may occur in persons without other hysterical manifestations. It more commonly affects females. It usually occurs suddenly after a shock, fright, grief or disappointment and it is believed to be at times, a forerunner of tuberculosis of the larynx.

The loss of voice is sudden. Laughing may be normal and cough, if present, lacks the laryngeal element. There is usually no dyspnœa.

Upon examination the vocal bands will appear normal, but widely separated. Upon attempt to vocalize, the cords move toward the median line, but do not

approximate sufficiently to produce voice. The vocal cords move during respiration. The condition may last for long periods. Recurrences are frequent.

Treatment.—This is largely mental management. At times the voice will return as suddenly as it left and under conditions similar to those which caused the trouble. Electrical treatments have held favor. A strong faradic current is applied to the interior of the larynx with the positive pole in the hand. Any form of local shock may be attended by sudden return of the voice. This is a splendid opportunity for the application of suggestion.

The homœopathic remedies recommended are:

Gelsemium 2x.—Loss of voice due to fright, excitement or great fear.

Ignatia.—Emotional inco-ordination. Individuals presenting general hysterical symptoms.

Phosphorus 6x.—Loss of voice in the nervous, debilitated, mentally depressed, irritable and sensitive individuals.

Laryngeal vertigo is a rare neurosis which occurs in neurasthænic individuals. It is characterized by a sensation of irritation in the larynx, followed by a fit of coughing and deep inspiration. The epiglottis is closed and the patient becomes cyanotic, giddy and at time loses consciousness. Examination of the larynx shows nothing abnormal. The condition does not endanger life, but may recur over a period of years.

The treatment of laryngeal vertigo is that of any other neuroses. Galvanism is credited with good results.

CHAPTER XII

FOREIGN BODIES IN THE NOSE, PHARYNX AND LARYNX

All manner of foreign bodies may be placed in the nose by children, feeble-minded patients and the insane. They may also be forced into the nose from the pharynx during coughing in an attempt to dislodge a foreign body in the pharynx, or food particles may be thrown upward into the nose during vomiting.

The presence of a foreign body in the nose may be suspected by the sudden appearance of obstructed nasal breathing and unilateral discharge, which excoriates the vestibule and the upper lip. Sneezing, reflex cough, headache and asthmatic symptoms may be present. If the foreign body remains in the nose for a long period of time it acts as a nucleus upon which the inorganic salts of the nasal secretion are deposited and a rhinolith is formed.

Foreign bodies should be removed from the nose as soon as possible. In adult patients the nose should be sprayed with Hirsch solution. This will cause a shrinkage of the tissues and facilitate localization. In children a general anæsthetic may be required. Great care must be exercised in accurate localization and gentleness in the manipulations for the removal. The methods and instruments will vary with the foreign body present.

A history of the introduction of a foreign substance into the air or food passageways may be wanting, especially when the accident occurs in children, during sleep, syncope or intoxication. A vivid description of the sensations experienced through the introduction of a foreign body may be given and later investigation disclose the fact that the foreign body had never been swallowed. A patient presenting a one-sided chest condition, with or without purulent expectoration, or one who gives a history of having choked while swallowing some small object, should receive the benefit of the usual process of examination for a foreign body in the respiratory tract. Foreign bodies in the pharynx or larynx may be confused with spasm of the larynx or laryngitis.

Foreign bodies in the pharynx may produce acute pharyngitis or more severe septic infection with hæmorrhage. The majority of foreign bodies complained of as in the pharynx are imaginary. When a foreign body causes obstruction to breathing or swallowing the mischief is obvious. The unpleasant, painful sensations occasioned by foreign substances entering the pharynx persist after the substance has either been expelled or swallowed. A foreign body may rest in a bronchus for some time before its presence is suspected.

Foreign bodies entering the larynx usually produce alarming symptoms such as dyspnœa, alteration in the voice, cough and suffocation. Large objects may completely cut off respiration and cause immediate death. Smaller foreign bodies may lodge in the

pyriform sinuses or upon the ventricular bands and cause inflammatory reaction.

When a foreign body passes the vocal cords and enters the trachea it produces early irritative symptoms. These subside and a period of calm is established, to be followed by later symptoms which will vary, depending upon the character, size and location of the object. A foreign body entering the trachea may move about or become fixed at the bifurcation and produce only a paroxysmal cough. Violent coughing may dislodge such a foreign body and force it upward into the larynx, causing a fatal closure of the glottis.

Foreign bodies lodge in the right bronchus more frequently than in the left and more frequently in the upper right lobe bronchus, resulting in decreased expansion. Later, dullness, râles, crepitation, fibrosis, abscess formation and bronchiectasis result. Certain types of foreign bodies may lodge in a bronchus and be present for long periods of time, producing only a recurring winter cough.

Foreign bodies passing into the œsophagus, if they are too large to pass through, will lodge in the upper half, causing pain and obstruction to the passage of food. Later, pressure ulceration with perforation occurs.

The prognosis of foreign bodies in the larynx, trachea, bronchi and œsophagus depends upon the early removal. If the bulk of the introduced substance does not cause immediate death and adequate assistance can be given, the outcome is usually good.

Foreign bodies in the larynx are removed by direct laryngoscopy, those from the trachea and bronchi through the bronchoscope and from the œsophagus through the œsophagoscope.

Cases of foreign bodies in the larynx, trachea, bronchi or œsophagus, should be placed in the hands of the bronchoscopist as quickly as posible. If the patient is threatened with suffocation an emergency tracheotomy should be performed with whatever instruments are at hand. Wherever possible these cases should not be tampered with by one not experienced. Emetics should not be administered and blind efforts to dislodge the foreign body should never be attempted.

CHAPTER XIII

NOSE AND THROAT MANIFESTATIONS IN ACUTE SPECIFIC FEVERS

Acute inflammatory reaction of the upper respiratory tract marks the onset of measles, scarlet fever, chicken pox, influenza, diphtheria and the now infrequently seen, small-pox and typhoid fever.

Measles is ushered in with an acute coryza or catarrhal invasion of the nose, throat, larynx, trachea and conjunctiva. The mucous membrane of the palate shows a dark, dry congestion and is studded with small, red, discrete spots. On the buccal mucous membrane the Koplik spots occur. These are minute, white spots which are surrounded by a red areolar. They occur as early as the second day and fade as the rash appears. The catarrhal condition is severe and attended by aggravated sneezing and copious discharge from the nose. This continues through the various stages of a catarrhal inflammation with at times complicating aural inflammation or suppuration and lower respiratory involvement. The larynx is painful and there is a persistent dry, croupy cough. In more severe cases an adductor neurosis occurs.

Scarlet fever.—Sore throat is a constant and early symptom of scarlet fever, antedating the rash by twenty-four hours. It is a bright, red injection of the fauces and both tonsils. It is accompanied by inflamed and prominent papillæ of the tongue, giving

the tongue the so-called "strawberry" appearance. Vomiting, followed by the above described throat and tongue together with a hot, dry skin and high fever, should suggest scarlet fever. In more severe cases a pseudo-membrane appears upon the tonsils and at times on the fauces. This occurs a few days along in the disease and it is usually associated with a sharp rise in temperature and enlarged cervical glands. Acute septic or phlegmanous sore throat is less frequent and produces sloughing or necrosis of the soft palate, fauces and tonsil. Laryngeal complications may occur and cellular invasion of the neck may ensue. This usually occurs in fatal cases.

Chicken-Pox presents small vesicles upon the palate, tongue and pharyngeal wall. The nasal mucous membrane is involved and epistaxis is frequent. Some cases present a severe pharyngitis, the patient complaining of intense sore throat.

Pertussis is ushered in by a general diffuse upper respiratory catarrh which frequently only the time element or the development of the whoop will differentiate. Hæmorrhage has occurred in the larynx. The whoop is an adductor spasm.

Influenza is not necessarily attended by catarrhal conditions of the upper respiratory tract but when it so develops it differs in no respect from the onset of an acute rhinitis or pharyngitis, except that it is more than ordinarily troublesome. Epistaxis is frequently encountered. Tonsil and peritonsillar symptoms are common. Laryngitis and tracheitis are usually more severe and persistent and there is an inordinate

amount of soreness due to muscle involvement. Influenza favors the nasal accessory sinuses which may occur as an extension of the coryza. It is attended by a great deal of neuralgic pain and frontal headache, especially when the frontal sinuses are involved although extension to the maxillary sinus may produce frontal headache as well as pain in the cheek. (See Sinusitis.)

Diphtheria

Diphtheria is a highly contagious disease characterized by the formation of a membranous exudate. It shows a preference for the mucous membrane of the upper respiratory tract and more especially the faucial tonsils. It is caused by the Klebs-Loeffler bacillus. While the disease favors child life, adults are frequently susceptible. A natural immunity enables certain individuals to harbor the bacillus without producing clinical symptoms. Such persons are known as carriers and are dangerous disseminators of the disease.

The *Shick* test is valuable in determining the susceptibility to the disease. This is generally recognized by Boards of Health and physicians. It consists of injecting intradermally one-fiftieth of the minimum lethal dose of diphtheria toxin for a guinea pig, diluted with one c.c. of salt solution. A control injection of salt solution is made. A positive reaction consists of an area of redness about the site of the injection of the toxin. This appears within twenty-four to forty-eight hours and reaches its maximum in

three days then disappears leaving a desquamating, itching, brownish, discolored area. It will be seen that the test requires time and therefore cannot be used in an emergency. It is, therefore, good practice for family practioners to have those under their care Shick tested and recorded. Such information would be of value in an outbreak of diphtheria.

The onset of diphtheria has no individual characteristics. *A sore throat may be complained of but in young children this is lacking, hence the necessity for careful inspection of the throats of all children when they are ill.*

The throat, early, shows a deep red reaction with an exudate upon one or both tonsils. As the case advances this exudate will spread over the tonsils to include the arches and the uvula. The breath is characteristically offensive and the submaxillary glands enlarged. A moderate fever is present and increases with the progress of the disease. In severe and untreated cases the toxins produce varying degrees of myocarditis with heart block and possibly death. Paralysis of the soft palate, the muscles of deglutition, the upper or lower extremities and ocular muscles (producing strabismus or paralysis of accommodation), are sequellæ of diphtheria.

The process may originate in or extend to the nasal cavities (Nasal Diphtheria) producing obstruction to breathing and an acrid, sanguinous discharge. The expanse of the nasal mucous membrane allows a spreading of the diphtheritic process from which great absorption of toxin occurs with resulting over-

powering prostration. The appearance of an offensive bloody acrid discharge from the nose should arouse a suspicion of diphtheria.

The larynx (Laryngeal Diphtheria) may be involved by extension. More rarely diphtheria may occur as a primary disease in the larynx. Difficulty in breathing (inspiratory), cyanosis and croupy cough occurring during the course of a case of diphtheria, indicates an extension to the larynx. Primary laryngeal diphtheria makes its appearance with little or no faucial evidence. These cases are usually very toxic and call for energetic treatment. The symptoms are croupy cough, increasing hoarseness and inspiratory dyspnœa. Laryngeal diphtheria must be differentiated from spasmodic croup. In diphtheria the croupy condition is a progressive one while in spasmodic croup the symptoms are manifestly worse at night and tend to disappear during the day.

Diagnosis.—The diagnosis of diphtheria is made upon the history, the clinical findings and confirmed by finding the Klebs-Loeffler bacillus in culture. The clinical manifestations should be the guide in determining the early administration of the initial dose of antitoxin. Too much valuable time is lost in waiting for the report of a culture.

Diphtheria must be differentiated from pseudo-diphtheria or streptococcus angina and follicular tonsillitis. In pseudo-diphtheria or streptococcus sore throat the onset is usually abrupt, attended by greater distress and prompt systemic involvement. There is an absence of glandular involvement and the local

distress is greater. The exudate does not tend to spread and can be removed readily without leaving a bleeding surface. Small, round whitish plugs of exudate confined to the mouths of the tonsil crypts characterize the local condition in follicular tonsillitis. The early systemic symptoms, such as headache, generalized aching and high fever are more pronounced.

Prognosis.—The prognosis of diphtheria depends upon the early recognition of the disease and the prompt administration of an adequate dose of antitoxin. Cardiac failure is a common complication during convalescence. Post diphtheria paralyses usually clear up.

Treatment.—Careful isolation of the patient is very important as a protection to others. The dishes used by the patient and attendant must be kept in the sick room. Soiled clothing, bedding, towels, etc., should be disinfected before being removed from the sick room. The use of paper napkins and handkerchiefs is recommended as these may be burned after using. Where isolation cannot be carried out satisfactorily, the patient should be removed to a hospital for contagious diseases. Members of the family and others who have been exposed to the patient should be safeguarded by an immunizing dose of antitoxin. This varies from five hundred to one thousand units.

The remedy for diphtheria is antitoxin and the earlier it is administered the more brilliant the results. The initial dose when timely administered and in proper amount, will usually effect a prompt cure. Secondary doses are indicated by a persistence of the

fever and a spreading of the exudate. The initial dose of antitoxin in children should be 20,000 units. This is usually sufficient if the exudate is confined to the tonsils. In more severe cases where the arches are involved, or where the nose is the seat of the disease, 20,000 to 40,000, or more, units should be used. Laryngeal cases call for 40,000 units as the first dose.

Antitoxin is administered intramuscularly or in severe cases intravenously. When using the intramuscular administration the buttocks or thigh are the favorite sites for injection.

Antitoxin causes a prompt subsidence of the temperature and a progressive improvement in the local manifestations. When these results are lacking it is probable that the initial dose has been too small.

Rest in bed is especially important in warding off the cardiac complications. Spiritus frumenti diluted in water or milk gives excellent support. Caffeine and morphia are also indicated where there is threatened failure.

The croup kettle is an aid in laryngeal diphtheria. Intubation should not be postponed until the patient is in the extreme. When this becomes necessary and where possible, the patient should be removed to a hospital for contagious diseases where constant expert services are immediately available.

Homœopathic remedies:

Merc. iod. rub. 3x is a favorite homœopathic prescription in these cases although any of the remedies quoted under acute tonsillitis may be indicated.

For post diphtheritic paralyses:

Causticum 3x.—Useful in paralysis of the throat muscles.

Gelsemium 2x.—Group muscle paralysis especially useful in eye muscle paralysis and where the extremities are involved.

Phosphorus 6x.—Paralytic symptoms associated with nervous debility.

Strychnia phos. 2x is used as a general tonic remedy in paralysis.

CHAPTER XIV

THE TONSIL AND ADENOID OPERATION

Removal of the tonsils and post nasal adenoid is the most frequently performed operation upon the human body. It constitutes a little over fifty percent of all surgical operations. It is classed as a major operation by the American College of Surgeons. It is followed by brilliant results when indicated and skillfully performed.

Indications.—The size of the tonsils and adenoid may be the sole indication for removal. This is true when they obstruct breathing, impede the function of the Eustachian tube or interfere with swallowing. Chronically infected tonsils are usually a source of local or systemic disease and furnish a very important and frequent indication for removal. The local disturbances occasioned by chronically diseased tonsils are: recurring tonsillitis, peritonsillitis, chronic catarrhal conditions of the nose and nasal accessory cavities, pharyngitis, laryngitis and cervical adenitis. Acting as a focus of infection, chronically diseased tonsils cause rheumatism, neuritis, nephritis, cholecystitis, prostatitis and cardiac disease. The ocular manifestations of such focal infection include scleritis, iritis and choroiditis. The aural apparatus may present catarrhal inflammation of the Eustachian tube and middle

ear, suppurative middle ear disease or toxic neuro-labyrinthitis.

Selection of Cases.—This operation is one of selection or election and should be executed under the most favorable conditions possible. It demands the same preliminary examination as would be made for any other major surgical operation. This includes an examination of the urine, the heart and circulatory system, blood pressure and lungs. The blood should be examined for its coagulability, the bleeding time and hæmoglobin. In very young children the condition of the thymus should be included. Here a careful history will be of great value for a child presenting periodical attacks of breath holding or convulsions may be a thymic individual. X-ray examinations should assist in making a diagnosis.

Contra indications.—The tonsils and adenoids should not be removed during or too shortly after an acute inflammatory condition of the respiratory tract. A safe time limit would be at least three weeks after the close of the acute condition. This time limit may also be applied in cases recovering from scarlet fever. Active tuberculosis is a contraindication to operation. In latent cases, where it is deemed necessary to remove the tonsils, the operation should not be performed under ether anæsthesia, but under local or nitrous oxide and oxygen. The tonsil operation should not be performed in the presence of active syphilis, decompensated cardiac lesions, diabetes or on patients with badly damaged kidneys. In the presence of a history of abnormal bleeding or true hæmophilia or marked

anæmia it will be found advisable not to consider tonsillectomy or adenectomy.

Choice of Anæsthesia.—The anæsthetics used in the tonsil and adenoid operation are local and general. The most generally employed local anæsthetic is novocaine. This type of anæsthesia is usually the operator's choice. Few patients will choose this form of anæsthesia. It has the advantage of an almost bloodless field and the cooperation of the patient during the time of operation. The objections to local anæsthesia are: the introduction of a volume of drug fluid into the local tissues and the psychic disturbance of the patient which frequently persists for long periods. Its use, of course, is limited to adult patients. A 1% solution of novocaine is injected at the upper pole between the capsule and anterior pillar, at the center of the tonsil and again at the base and another injection may be made between the tonsil and the posterior pillar. This is repeated on the opposite side.

Ether anæsthesia is the safest general anæsthetic for the average or occasional anæsthetist who is so often employed in this operation. Intratracheal administration of ether is used in the tonsil and adenoid operation, but this requires the services of an anæsthetist who is skilled in the passage of the intra tracheal tube or the surgeon must place it for the anæsthetist. It carries with it a very decided advantage of an absence of respiratory interference. Its objections are the longer period of induction, post-operative recovery and vomiting as occurs in ether anæsthesia.

Nitrous oxide and oxygen anæsthesia.—This is

the ideal anæsthetic because of its rapid and pleasant induction, prompt post-operative recovery, less nausea and vomiting and favorable psychological effect. The only disadvantage of nitrous oxide and oxygen is that it requires a most expert anæsthetist and one who has had much experience in anæsthesia for operations upon the throat.

Object of the Operation.—The object of the tonsil and adenoid operation is thorough removal of the structures named with a minimum of traumatism.

Types of Operations.—(1) Sharp dissection of the tonsil to the palatopharyngeal bundle and completion of the enucleation by the means of snare: (2) Sharp and complete dissection of the entire tonsil: (3) Blunt dissection using the finger or snare: (4) Eversion of the tonsil and extirpation by sharp blade as in the Sluder or LaForce operations and extirpation by means of the snare as performed by Davis.

Position of the Patient.—The patient, seated in an ordinary treatment chair, is favored by many who employ local anæsthesia. Other operators choose the semirecumbent position. This is more comfortable and assuring for the patient. The recumbent position, with the patient's head extended over a pillow placed under the shoulders, is usually employed for general anæsthesia, either ether or nitrous oxide. The modified Killian position may be employed where nitrous oxide and oxygen is used. In this latter position (Hollis, Clay, Ruth Operation) the patient is seated and secured in an adjustable chair with the body inclined slightly forward and the head directed forward and downward so that the drainage of blood and secre-

tions from the mouth will gravitate forward and out of the mouth into an emesis pan held beneath the patient's chin. The operator is seated in front of the patient so that the operator's head is just below the level of the patient's head. This position insures an unobstructed air way and lessened bleeding because of the absence of gravitational hyperæmia. The operative field is free of blood and there is less tendency for aspiration of blood and infected material.

Technique of Operation.—The mouth should be held open by a suitable mouth prop. This will usually vary according to the individual operator. Care should be exercised in placing the prop, not to pinch the lips against the teeth or to use undue force in opening the gag which might dislodge deciduous teeth or injure the permanent ones. The tongue is held downward bringing into view the tonsil region. If the patient is in the recumbent position, the left tonsil is grasped with a tenaculum and put upon stretch. This gives the sharp outline of the anterior pillar. The instrument to be used for separating the arch from the pillar is insinuated, anteriorly, between these structures at the inferior pole and passed upward to the superior pole, around the pole of the tonsil and down between the tonsil and posterior arch. When the upper pole of the tonsil is free and can be readily brought out of the fossa, the wire of the snare is made to encircle the semi-free tonsil and the remainder of the dissection is completed by closure of the snare. The operator, if he elects to do so, may continue the sharp dissection to include the palatopharyngeus bundle until complete enucleation has been accomplished.

Snaring the tonsil may be accomplished either by the precipitant or the slow method. Advocates of the slow method claim less bleeding. The assistant, with the suction apparatus tip in the buccal cavity, will keep the excess of blood from collecting. A cotton tampon is inserted into the tonsil fossa to control the active bleeding. This should be left in place for several minutes and then removed. If there are any active bleeding points, they should be grasped with hæmostatic forceps. Much time will be saved and greater safety insured if active bleeders are ligated at once. Active bleeding will usually be found to come from a vessel in the extreme upper portion of the tonsillar fossa (the tonsil vessel) from a vein in the posterior arch about its center, or from a plexus of veins or a small artery at the base of the fossa. As the hæmostasis is established after the removal of one tonsil, the second tonsil may be removed.

The adenoid is removed by using either an open curette or a so-called basket curette. The adenoid may also be removed by direct view. A self retaining soft palate retractor is introduced so that it gives a direct view of the post nasal space. In the case of the open curette it should be held in the hand after the manner of holding a pen. The curette should be introduced behind the soft palate and the handle depressed to bring the dull edge of the curette forward against the posterior extremity of the nasal septum. The curette is then pressed upwards and backwards to engage the adenoid in the curette and a sweeping motion made downward, backward and outward. Fragments of adenoid in the fossa of Rosenmüller may be removed

with the finger or by means of a punch. A reasonable amount of time must be allowed to elapse for the physiological control of bleeding from the adenoid area. This, sometimes, is protracted but seldom is it necessary to pack the post nasal space. It is unwise, however, to allow the patient to leave the operating room until this post nasal bleeding has entirely ceased.

Post Operative Treatment.—Position in bed: If the patient has been operated under local anæsthesia, the position he assumes after operation is immaterial. Many of these patients may be allowed to sit in a chair out of bed. If the patient has been etherized, they are usually unconscious and should be placed upon the abdomen with the head to one side. In patients operated under nitrous oxide and oxygen, the semirecumbent position in bed is used as these patients return to their rooms, conscious and able to take care of any secretions which may collect in the mouth. Aconite 3x or Arnica 3x will be found useful in the post-operative soreness. Acetyl salicylic acid, 30 grs. of powder is suspended in one-half glass of water; the mixture stirred well and the patient given one teaspoonful every hour to control the local soreness. Orthoform in troches is beneficial. Most patients find great relief from the use of chewing gum and the application of an ice collar.

Diet.— Liquids and soft foods are usually about all that the patient will take, but there is no contraindication to anything that the patient might desire. It is important that the teeth be kept scrupulously clean and an alkaline mouth wash used frequently.

Post-Operative Complications. — Hæmorrhage: When bleeding occurs from the tonsils it will usually be expectorated or swallowed and later vomited. Continued expectoration of bright, red blood or vomiting of blood several times after the operation should call for inspection of the throat. If the post nasal space bleeds it will frequently manifest itself from the nose although it may also trickle down the post nasal space and be swallowed. Frequently the application of a hæmostatic agent such as adrenalin will control the oozing but a distinct bleeding should receive adequate surgical attention at once—a suture. If the bleeding occurs from the post nasal space a post nasal packing should be applied.

Hyperpyrexia.—Occasionally, after a tonsillectomy, the temperature will mount to a high point, 103° F. to 104° F. This is usually not of serious moment and subsides within twelve to twenty-four hours.

Acidosis.—Young children should be watched carefully following tonsil and adenoid operations for this complication. Its earliest manifestation is persistent vomiting accompanied by a rapid pulse, restlessness and air hunger. This complication will usually respond to the withdrawal of all fluids and solids and the administration of the following combination: orange-juice 4 ozs., sodium bicarbonate 1 dr., sugar 1 dr. These should be placed in a bowl and surrounded by ice. The patient is given a teaspoonful of the mixture every ten minutes until the vomiting ceases: Ipecac 6x every half hour is a valuable adjunct.

Other post-operative complications noted will be ecchymosis of the pillars and œdema of the uvula and soft palate. These latter are very annoying to the patient.

Thymic death has been reported following tonsillectomy. These cases have usually died suddenly on the operating table or shortly afterward and at autopsy enlargement of the thymus gland has been found.

Late complications.—Perhaps the most common late complication is bleeding occurring from the third to the sixth day after operation. Three to four percent of the cases operated will show some bleeding. This, usually, is very slight in amount and occurs as the result of a peeling off of the membranous exudate which forms over the operated area. Where it is persistent as an ooze, the application of 50% silver nitrate to the bleeding point will control most cases. Occasionally it is necessary to introduce a suture. Rarely will late bleeding occur from the adenoid area, but when it does and is persistent, it may require a post nasal pack.

Ear involvement may develop and manifest itself as a middle ear suppuration with mastoiditis or its complications. Lung abscess as a late complication of tonsillectomy is reported rather frequently from bronchoscopic clinics. Pneumonia is also reported as a late complication following tonsillectomy and cerebral embolus has been reported.

INDEX