in connection with each subdivision of an article. It is a work of reference indispensable for every revision committee in this and other countries for many years to come. *Charles Rice.*

PHARYNX, ANATOMY OF. See *Tonsils, etc.*

PHARYNX, DISEASES OF: ACUTE INFLAMMATIONS.—In the text-books, generally, the use of the term pharyngitis is somewhat confusing, as tonsillitis, uvulitis, and palatal inflammation, as well as inflammation of the pharynx proper, are loosely included in the term. While in nearly all inflammations of the pharynx the contiguous structures anteriorly are involved, yet, as diseases of these structures are considered elsewhere in this work, the term pharyngitis, as here used, will be definitely limited to inflammations of the pharynx proper, except in treating of the throat complications of the acute fevers.

Simple Acute Pharyngitis.—Acute inflammation of the pharynx is usually accompanied by inflammation of other portions of the upper respiratory tract, and there is commonly more or less nasal occlusion. Acute inflammation, not septic or traumatic, strictly limited to the pharynx, is very rare.

Etiology.—As a rule the acute disease is either the lighting up of a subacute inflammation or an extension of acute nasopharyngitis. As etiological factors may be mentioned: bad air, poor food, sedentary habits, alcoholic intemperance, excessive use of tobacco, and in general anything that tends to lower the vitality. Digestive disorders, nasal obstruction, sudden atmospheric changes, influenza, and tonsillitis are frequent causes. Heredity plays an important part, and rheumatism and gout are sometimes factors. As traumatic causes may be noted, irritant poisons, flame, hot water, steam, foreign bodies.

Pathology.—There are hyperæmia and congestion of the blood-vessels in the submucosa, with pressure on the mucous glands and lessening mucous secretion during the first stage. In the second stage, congestion is somewhat relieved and the secretion is poured out, the tenacity of the latter depending on the amount of fibrin present. If the amount of fibrin be very great, there is formed a false membrane which is non-infectious.

Symptoms.—The attack is usually sudden and is ushered in by a feeling of malaise and chilliness rather than a distinct chill. The temperature rarely goes beyond 101°–102° F. The digestive system is usually deranged, the appetite is lost, the bowels are constipated, the tongue is furred, and the breath is foul. Pain in the muscles of the neck and back is common; there is generally headache and often there is aching of the joints. At first there is dryness of the throat and the surface of the mucous membrane is shiny and smooth. Later, the secretion becomes abundant and the membrane thickened and rough from hypertrophy of the lymphoid follicles. The voice becomes thick and husky and there is fatigue on talking, even when there is no apparent involvement of the larynx. In the attempt to get rid of the mucus the patient hawks and hems rather than coughs, while the dryness, or later the thickening, causes frequent efforts at swallowing. The feeling at first is as though there was a hair in the throat; later, it is that of a larger foreign body. Pain is a constant symptom, being increased by the efforts at swallowing. When the group of follicles just back of the posterior pillar is much involved, pain referred to the ear is usual, being conveyed through Eustachian involvement or by means of the glossopharyngeal or Jacobson's nerve. The sense of taste may be decidedly obtunded, especially if the lingual tonsil is involved; but this symptom is rather an accompaniment of nasal obstruction. The color of the mucous membrane varies from pink to dark red, and the superficial blood-vessels show much enlargement. The attack may be limited to one side, but it is nearly always bilateral.

Prognosis.—This is favorable, but at the same time the disease manifests a strong tendency to become chronic, by reason of the continuance of the exciting causes and the impossibility of putting the organ at rest. The duration varies from three or four days to two weeks, according to the severity of the attack and the general health of the patient.

Treatment.—This should begin with a saline cathartic, preferably preceded by one or two grains of calomel in triturate. Tincture of aconite in one-minim doses hourly seems to have a special action in pharyngeal inflammation; but, if the pain is considerable, phenacetin, five to eight grains every three or four hours, or Dover's powder, may be given. If there be a rheumatic diathesis, the salicylate of strontium, five grains every three hours, will prove of value, while in tonsillar complications salol, five grains every four hours, or salipyrin, ten grains at like intervals, will be better.

Quinine is recommended, but it is most likely to be of service when the tonsillar involvement suggests mild sepsis. In the early stage cold externally by wet compresses or a cold coil will give relief; later, heat will be more agreeable. A four- to six-per-cent. solution of nitrate of silver brushed lightly over the pharynx is useful, but one of the newer albuminous silver compounds, as protargol in ten-per-cent. spray, will be less irritating and just as good. Lennox Browne pronounces guaiacol—fifty per cent. in sweet almond oil, used with brush or spray—to be the best of all local applications. This burns sharply, but is followed by an anæsthetic effect. While gargles do not reach much of the posterior wall of the pharynx they do reach the contiguous parts, and any one who has personally used a gargle knows the comfort which follows its use. If a patient does not know how to gargle it is not well to rely on the method, as in such cases it is nothing more than a mouth wash. The best gargles are on the order of the Dobell solution, used hot. If carbolic acid is disagreeable, it may be omitted and the solution made up with equal parts of cinnamon water and peppermint water. In the early stage a spray of mentholated benzoinol, from two to four grains of menthol to the ounce, may be more agreeable than a watery application. Later, a gargle or spray of tincture of chloride of iron will hasten recovery.

Demulcents in the form of lozenges are often grateful. They may contain menthol in minute dose combined with guaiacum or eucalyptol.

Shurly recommends, for the mitigation of local distress, a tablet of biniodide of mercury (gr. $\frac{1}{60}$ to gr. $\frac{1}{30}$) to be held in the mouth till dissolved, the dose being repeated every two or three hours till five or six have been taken. In the second stage, if the secretion continues profuse for too long a period, atropine or aconitine, gr. $\frac{1}{1000}$ to gr. $\frac{1}{100}$ every two or three hours, will hasten recovery. Steam inhalations are generally worse than useless, although sometimes temporarily soothing in the earliest stage.

Gangrenous Acute Inflammation of the Pharynx.—This disease is ordinarily classed under infective or phlegmonous pharyngitis, the severer forms being accompanied by sloughing. Including all forms under this title, one writer will give the prognosis in infective pharyngitis as very grave, while another, limiting the term to the milder cases, will state that the prognosis is uniformly favorable. The gangrenous form of infective pharyngitis is very likely to arise from localization of the infecting germ in typhoid, diphtheria, scarlet fever, and other infectious diseases. In such cases the infecting material probably reaches the point of localization through the blood instead of from absorption through the mucous membrane, as seems to be the case in the milder, more superficial forms in which the streptococcus is the infecting germ. The prognosis is very grave, both from the severity of the local process and from the development of septicæmia. Treatment is directed chiefly to the systemic infection, elimination being encouraged and stimulants given. Locally, mild antiseptic solutions are of most use.

Gouty Pharyngitis.—This occurs as a manifestation of the general disease, but may appear quite independently of involvement of other parts.

Lermoyez and Gasne give the following diagnostic

data: (1) Sudden onset, acute evolution, and sudden disappearance. (2) Sharp febrile symptoms, depression. (3) Very acute pain, out of proportion to the local appearances. (4) Tendency of inflammation to diffuse itself over the pharynx and spread toward the larynx, ordinary quinsy being more localized. (5) Dark red and œdematous appearance of pillars of fauces, uvula elongated, and posterior wall of pharynx swollen. (6) Absence of exudation. (7) The glands at the angle of the jaw not involved. Colchicum is to be used in the treatment of such cases. Locally, soothing gargles, or preferably sprays, are indicated.

Herpetic Pharyngitis.—(Synonyms: Common membranous sore throat; Aphthous sore throat; Benign croupous angina.) Herpes of the throat, which is a milder disease than the skin affection, appears as a discrete eruption, the individual spots measuring 6–8 mm. in diameter and being located on the posterior wall of the pharynx or anterior surface of the faucial pillars. The *etiology* is varied. The local manifestation is probably due to a peripheral degeneration of the nerves of the affected area. The general condition has a very considerable etiological significance, disorders of the alimentary tract and many febrile diseases acting as causes.

The earliest *symptoms* are dryness of the throat and pain of a burning or stinging character. The constitutional symptoms are as a rule slight, fever if present being of mild grade. The eruption may be unilateral or bilateral. The vesicular stage is seldom observed, the vesicles rupturing early and the excoriated mucous membrane becoming covered with a thin, soft membrane which is easily wiped off. Labial herpes is usually also present. The disease lasts for from eight to sixteen days, but has a very considerable tendency to recur. *Diagnosis* is made from other membranous anginas by the mildness of the symptoms, the labial herpes, and the thinness and superficial character of the membrane.

Little local *treatment* is necessary; bland sprays or gargles, and applications of silver nitrate (two or three grains to the ounce), or of resorcin (ten grains to the ounce of glycerin) will be found useful. If pain is considerable orthoform may be used.

Membranous Pharyngitis.—Non-diphtheritic membranous pharyngitis, the term being limited to cases in which an actual pseudomembrane develops on the pharynx,—whether or not the tonsils and palate be also involved,—is a very rare disease. In nearly all individuals there is a well-developed strip of glandular tissue lying just back of the posterior faucial pillar. In ordinary lacunar tonsillitis it is quite common to find this follicular area involved in the exudative process. The exudation from the several follicles in the strip may coalesce and give the appearance of a narrow membranous strip on either side of the pharynx. This condition, which is frequently spoken of as a membranous sore throat, is properly only an acute exudative follicular pharyngitis. Kyle describes a membranous pharyngitis: "An acute infectious process in which there forms on the mucous membrane surface a highly coagulable albuminoid material which constitutes a false membrane and occurs along with desquamation of the superficial epithelium." Such a condition must be very rare.

Emil Mayer in 1900 described a case due to Friedländer's bacillus, and was able to collect thirteen of the same kind from the literature. In measles there is sometimes developed in the pharynx a streptococcal membrane which resembles very closely the membrane that is formed in diphtheria; its presence constitutes a grave complication.

The *diagnosis* of membranous pharyngitis is not always easy. Localized areas of epithelial necrosis, or herpetic pharyngitis after the vesicles have ruptured, cannot be distinguished by the naked eye from false membrane. This frequently leads to mistakes in diagnosis, and the terms herpetic pharyngitis and membranous pharyngitis are frequently used synonymously. The greatest care is needed in differentiating this condition from diphtheria, and it is commonly accepted that any case of membranous sore throat is to be treated as diphtheria until a diagnosis is positively reached.

The *prognosis* is generally favorable except in the streptococcal variety, in which the outlook is more serious.

Treatment.—The systemic treatment should be the same as for diphtheria in the severer varieties. Locally, disinfectants and detergents are indicated. A spray of pyrozone, hydrozone, or any high-class hydrogen peroxide solution is of value. The ordinary commercial solutions of hydrogen peroxide are sometimes very irritating to the throat and should never be used. Löffler's toluol solution is also effective. It should be applied with a swab, and care should be taken to squeeze out the excess.

Pemphigus.—Cases of pemphigus of the pharynx are occasionally reported. The bullæ are rarely seen before rupture. The acute disease is attended by headache, pain, and fever. The duration is from one to three weeks, but there is a strong tendency to recur and become chronic, especially in the aged. The disease is differentiated from diphtheria by the bacteriology, the easy removal of the exudate, the absence of glandular enlargement, and the mildness of the constitutional symptoms. Adhesions are very likely to form and should be carefully guarded against. The *treatment* is about the same as for herpes.

Rheumatic Pharyngitis.—Rheumatism of the pharynx is occasionally observed, but perhaps not so often as the descriptions would ordinarily lead one to believe. It is claimed that extensive ulceration of the pharynx may result directly from rheumatism. The diagnosis is made from the history of the patient; from the sharp pain, especially on swallowing, which is out of proportion to the redness of the mucous membrane, and varies in severity as a rule several times in the twenty-four hours; and from the prompt relief afforded by the salicylates. The local treatment should consist of hot gargles, together with the external use of a chloral liniment or a twenty-five-per-cent. ointment of ichthyol.

Traumatic Pharyngitis.—This is an acute inflammation of the pharynx due to wounds, foreign bodies, caustics, and the inhalation of dust or vapors. Children are especially liable owing to their frequent mistakes in swallowing hot or caustic fluids. Persons working in dust or in caustic vapors are also liable to pharyngitis of this type. Any foreign body that may become lodged in the throat or may lacerate the mucous membrane as it passes through the pharynx may give rise to inflammation with œdema and at times abscess formation. In any traumatic pharyngitis there is danger of the inflammation and œdema extending to the glottis with fatal results. In the aged or enfeebled the irritation caused by the swallowing of a bit of crust or a small piece of eggshell, or any such material, may give rise to fatal inflammation.

Treatment.—In the case of a foreign body, if it be still present, prompt removal should be effected through the natural passages if possible; if not, by external pharyngotomy. Often, however, it is found that the offending body has been removed or swallowed, and that only the effects are to be combated. Soothing applications should be made—oily sprays containing from three to six grains of menthol to the ounce, Dobell's solution, and adrenalin chloride, 1 to 4,000, to be repeated every two hours or oftener. Bland fluids only should be swallowed, all solid foods being avoided. If œdema threaten, scarification should be done to a sufficient extent to afford relief.

Urticaria of the Pharynx.—Urticaria may make its appearance in the pharynx either after or before its occurrence on the skin, but always in conjunction therewith. Those cases of supposed urticaria localizing themselves in the pharynx are probably cases of angioneurotic œdema (which see).

The causes of pharyngeal urticaria are naturally those of the affection in general, *e.g.*, shellfish, small fruits, stings of insects, drugs (copaiba, cubebs, quinine, capsicum, turpentine), the neurotic, rheumatic, and gouty states, genital disorders, pregnancy, constipation, etc. There is a form of acute febrile urticaria which develops suddenly and usually appears at the same time on the

chest and in the mouth. The characteristics of the affection in the pharynx are the sudden invasion with cough, dyspnœa, and local irritation. Locally the mucosa shows a condition resembling that of inflammatory œdema.

The *prognosis* is never bad except in those rare cases in which the malady extends to the larynx, when we may have a dangerous dyspnœa. At times the tongue is badly swollen.

At the onset of the attack the system should be cleared out with emetics and purgatives, enemata, etc., so as to remove the exciting cause. Large doses of the alkalies should then be given. Locally ice pellets, weak sprays of cocaine, adrenalin, antipyrin, etc., will generally give quick relief. The occurrence of dyspnœa must lead us to prepare for either intubation or tracheotomy. It must be remembered that articles of food ordinarily harmless may at times precipitate an attack.

Intubation or tracheotomy may become necessary if the swelling increases rapidly. Insufflations of morphine sulphate, gr. ¼-gr. ss. in an inert powder, may be required for pain, or, if there be much abrasion of the mucous membrane, orthoform may be more effective. In the case of escharotics the indications are practically the same; viz., to use anodynes and emollients.

Ulcerative Septic Pharyngitis.—(Synonyms: Infective pharyngitis; hospital sore throat; suppurative pharyngitis.) This is a form of infective pharyngitis which occurs in persons reduced in health by hard work in unsanitary employments. Work in the dissecting room, exposure to septic secretions from wounds, attendance on diphtheria or scarlet-fever patients, are frequent causes of the disease in medical students and physicians. The streptococcus is the usual infecting organism, but the staphylococcus is generally associated with it.

Pathology.—The ulceration is the result of the action of the infecting bacteria on the epithelium: they first cause necrosis of the superficial cells; then, entering the deeper layers, they obstruct the blood supply and cause further necrosis. According to the virulence of the infecting organism and the resistance of the tissues the ulceration may remain superficial or may extend deeply, in the latter case resulting in the phlegmonous or gangrenous form.

Symptoms.—The attack usually begins with languor and headache, quickly followed by a rigor, high temperature, rapid pulse, and other accompaniments of fever. If the deeper tissues are involved, all symptoms are graver and delirium occurs early. The tongue is heavily coated and the breath is foul. Locally, the first symptom will be dysphagia, the throat gradually becoming dry and swollen, and filling up with foul mucus, requiring constant clearing and causing the patient much suffering. The pain may be felt in the ear and may extend low down in the pharynx. Both tonsils are involved, the inflammation being as a rule superficial, but the cervical glands are frequently much swollen and painful. The ulcers which are usually lenticular in shape and covered with a grayish exudate are often seen on the tonsils and palate as well as on the pharynx. The local lesions are often so slight as scarcely to seem a sufficient cause for the great systemic disturbance.

Diagnosis.—Any acute pharyngitis may be accompanied by ulceration, but the local and systemic symptoms are not so severe as in the septic form. The rapid development and the determination of the precise character of the invading bacteria will aid in diagnosis.

Prognosis.—In the more superficial form this is favorable provided the sufferer be removed to more hygienic surroundings. If the disease penetrate to the deeper tissues, the prognosis is exceedingly grave on account of the liability to sloughing, to extension to the larynx, and to the development of septicæmia.

Treatment.—Constitutional treatment with active tonics—iron, strychnine, quinine, etc.—is very necessary. Alcoholic stimulants are often required. The antistreptococcus serum should be of especial value in these cases, but clinical evidence of this is not yet assuring. Locally, ice internally and externally is indicated in the earliest stage; but later, if the symptoms become more severe, hot applications should be used. Alkaline sprays or gargles should be used frequently. If any astringent applications be made to the ulcers they should be of the mildest character and very gently applied. A spray of four or five grains of menthol to the ounce of benzoinol will sometimes prove grateful. If the pain be very severe, orthoform in powder should be used two or three times daily. Careful attention to the cleansing of the throat by the nurse, who thus largely relieves the patient of the necessity for voluntary muscular action of the parts, will add greatly to his comfort.

Pharyngitis in the Exanthemata and in Other Fevers.—*Erysipelas.*—Erysipelas of the pharynx and contiguous structures may appear as an independent disease or as a complication of a cutaneous attack. If it occurs consecutively to erysipelas of the skin the infection may extend to the pharynx by way of the nose, mouth, or ears, or by metastasis.

The attack begins with fever, and there are sharp pain in the throat and difficulty in swallowing. Immediately, or after one or more days, the pharyngeal mucous membrane becomes swollen and glistening and covered with ropy mucus or muco-pus. Vesicles, filled with serum, blood, or pus, and varying in size from one-sixteenth to one-half of an inch in size may appear. In severe cases abscesses or gangrenous areas may develop. Involvement of the tonsils, accessory sinuses, and middle ear is very likely to occur. The glands of the neck are swollen and tender. Early *diagnosis* is difficult unless there have been a previous erysipelas of the skin. Later, the very general involvement of the pharynx and the characteristic appearance just described serve to make the diagnosis clear. The *prognosis* is grave, as extension to the larynx may occur with fatal result.

Treatment.—The general treatment should be the same as for erysipelas elsewhere; it should be of a supporting character, with large doses (twenty to thirty minims) of tincture of chloride of iron every three hours. Locally, ichthyol is of value; from ten to thirty per cent. in glycerin should be painted on the inflamed mucous membrane three times daily. Alkaline cleansing sprays should also be used. Ice internally and externally may be soothing and useful early; at a later stage heat will be better.

Influenza.—In nearly all cases of influenza of the respiratory tract the pharynx and fauces are involved. A reddened area passing down on either side of the soft palate is frequent enough to be of considerable value in the diagnosis of the disease. The tendency to pass into a chronic inflammation is rather stronger than it is in simple acute pharyngitis. The inflammation may be very intense, and superficial necrosis of the epithelium on the anterior pillar of one side, with whitish exudation which looks like a very thin membranous deposit, may be very suggestive of diphtheria. The local treatment is that of simple acute pharyngitis. The following formula, which is to be used as a spray every two hours, has been found by the writer to be very serviceable in this and other infectious forms of pharyngitis: ℞ Pyrozone, fl. ℥ i.; borolyptol, fl. ʒ vi.; water, q.s. ad fl. ℥ iij.

When the inflammation is more intense, soothing alkaline solutions will be found to answer better, while tincture of chloride of iron, two minims to the teaspoonful of glycerin and water, swallowed every two hours, will hasten resolution.

Intermittent Fever.—It is well recognized that a pharyngitis may be due to malarial poisoning. The *symptoms* are those of simple inflammation, except that pain may be sharper and redness less marked. *Treatment* is that of the systemic disease with simple alkaline gargles or sprays for the local condition.

Measles.—Inflammation of the pharynx and fauces is generally so marked in measles that a diagnosis can often be made from the pharyngeal picture alone, before the eruption appears on the skin. The mucous membrane is deeply injected, the eruption appearing in blotches or points, while the surface presents a distinctly rough appearance. A membranous exudation due to the streptococcus sometimes forms on the pharynx and tonsils and

constitutes a very serious complication. True diphtheria may appear as a complication, rendering the prognosis much graver than in either disease alone. The *treatment* of the usual throat condition should be by alkaline sprays, such as Dobell's solution, followed by an oily spray of one or two grains of menthol to the ounce of benzoinol.

Pneumonia.—The pneumococcus seems at times to enter the blood through the pharynx and tonsils, determining an attack which is characterized by the irregular range of temperature, varying from 100° to 105° or 106° F. one or more times in twenty-four hours. There is little or no cough, the symptoms being purely those of a blood infection. The disease may run a course of seven to ten days without localizing in any organ, or it may after three or more days localize as a lobar pneumonia, much simplifying the attack; or it may localize in any of the parts of the body now recognized as subject to the invasion of the pneumococcus. Careful inspection of the throat will detect redness of the pharynx and fauces, the redness of the anterior pillars being not so bright as in influenza and following more closely the border of the tonsil. A culture taken from the throat will reveal the pneumococcus in almost pure culture and will render explicable some otherwise obscure fevers. The cases seen by the writer have been in children, ranging in age from fifteen months to five years. Local treatment is of doubtful value, mild detergent sprays being indicated if anything be used.

Scarlet Fever.—The pharynx and tonsils furnish almost the earliest manifestations of the disease. Before any rash has appeared on the skin the vivid red of the pharynx and fauces will suggest the onset of scarlet fever. A little later a bright rash will appear on the soft palate, while the previously reddened pharynx and tonsils will become darker and covered with thick mucus. The involvement of the tonsils and pharynx is fairly typical of the severity of the disease, the milder cases showing only slight redness and moderate tonsillar follicülitis, while in malignant cases there will be an intense inflammation of all the tissues of the pharynx with more or less membranous exudation and with great swelling of the glands below the jaw. Between these two extremes will be seen all grades of inflammation. The inflammation is very likely to extend to the pharyngeal tonsil and through the Eustachian tube to the middle ear. Ulceration of the tonsils may appear early, while ulceration of the pharynx or pillars is a later manifestation of the disease, rarely occurring before the fifth day and often much later. In the case of a membranous deposit the membrane may be diphtheritic, caused by the Klebs-Loeffler bacillus, or it may result from the action of streptococci or other micrococci.

Deep inflammation and even sloughing are more likely to result from streptococcal infection, and lymphatic involvement is more pronounced in such infection. It has been strongly urged recently that scarlet fever must be recognized as an etiological factor in perforations of the faucial pillars and the soft palate. Generally such perforations are accepted as positive evidence of syphilitic disease; and while in the vast majority of instances this is undoubtedly the causative factor, yet it is well to remember that scarlet fever may cause the condition.

Treatment.—Attention to the throat early and sedulously is essential in the management of this disease. In case of severe neck symptoms the ice-bag or a Leiter coil may be used, to be followed later by hot applications. The use of an alkaline spray alternating with an antiseptic spray, such as the pyrozone mixture previously mentioned, will prove very satisfactory. The tincture of muriate of iron in glycerin, as ordinarily prescribed in these cases, is very efficacious; two or three drops to the drachm of glycerin is quite strong enough.

Smallpox.—As in the other eruptive fevers the throat manifestations are quite marked in smallpox. Redness with inflammation may appear several days before the skin eruption, but the rash is usually apparent on the skin before it is seen in the throat. In hemorrhagic smallpox, however, ecchymoses may be seen in the pharynx before the skin eruption appears. In severe cases there may be pseudomembrane with much pain. The *treatment* is that of any acute pharyngitis—detergent and disinfectant sprays or gargles. Severe pain may require applications of orthoform, cocaine, or menthol.

Typhoid Fever.—Inflammation of the pharynx is not uncommon in typhoid. There is usually some injection of the mucous membrane, with dryness and sometimes a difficulty in swallowing. A faucial exudation is occasionally seen during the third week. This pseudomembrane is very thin, but is adherent and is characterized by the presence of staphylococci. As true diphtheria occasionally complicates typhoid a bacteriological examination may be necessary for diagnosis. In case of considerable involvement of the pharynx and fauces, detergent washes will be beneficial. Involvement of the larynx is much more serious than that of the pharynx.

Varicella.—Some involvement of the pharynx and palate is usual if the skin eruption be at all marked. The vesical stage is short, the vesicles breaking early and leaving excoriations. If there be much pharyngeal discomfort a gargle, such as the following, is of value: ℞ Sodii biborat., sodii bicarb., āā gr. l.; acid. carbol., gr. xvi.; tr. myrrhæ, fl. ʒ iv.; glycerinæ, fl. ℥ ij.; aq. cinnamom., q.s. ad fl. ℥ viij. M. Sig.: Dilute with an equal part of water and gargle every two hours.

Gustavus P. Head.

PHARYNX, DISEASES OF: ACUTE PHLEGMONOUS PHARYNGITIS.—(*Ludwig's Angina.*) Various names have been applied to this affection. Among them may be mentioned the following: erysipelas of the pharynx, diffuse cervical abscess or phlegmon, submaxillary bubo, infectious submaxillary angina, sublingual abscess or phlegmon, subhyoid phlegmon, gangrenous induration of the neck, cynanche cellularis maligna, cynanche sublingualis rheumatica. While early writers asserted a specific individuality for this disease, later authorities regard it as a septic sore throat with a peculiar localization, not differing etiologically from phlegmonous pharyngitis, erysipelas of the pharynx, or acute œdema of the larynx, all of which seem to represent merely different degrees of virulence of the same infecting agent.

The question of primary development and localization depends probably upon the seat of original infection, and it is difficult to distinguish definitely a line of demarcation between the purely local and the less complicated, as distinguished from the œdematous and purulent forms. The application, clinically, of general bacteriological principles to this group of septic inflammations harmonizes to a certain extent former conflicting views.

Ludwig's angina is a diffuse phlegmonous inflammation of the floor of the mouth and of the intermuscular subcutaneous tissue of the submaxillary region. It may end in resolution, abscess, or gangrene.

Gerster defines it as a phlegmonous destruction of the submaxillary gland characterized by alarming and extensive dense œdema, caused by the unyielding character of the fascial envelope of the gland, which œdema is most manifest about the latter vicinity, namely, the floor of the mouth.

Its possible epidemic character can be explained by the simultaneous exposure of various patients to the same septic influence. As a sequel to or complication of infectious maladies, it has been observed more often in typhus fever.

As yet no special pathogenic germ of the disease has been found, and where examinations have been made only the ordinary microbes of suppuration have been present. It is only in respect to the site of the disease that it may claim special consideration. The location in which the pus originates is a triangular pyramidal space with the following boundaries: The apex (below) corresponds to the point where the mylohyoid muscle borders the genioglossus. The base (above) stretches along under the tongue. The external wall (oblique) is made up of the internal face of the inferior maxilla and the mylo-

hyoid muscle; the internal wall (vertical) by the genioglossus and the hyoglossus. The mucous membrane of the floor of the mouth and the *glandulæ sublinguales* close its cavity on top. It is through this channel, however, that the infection gains entrance, so that the affection of the submaxillary gland is in many, if not all, instances secondary.

The *symptoms* are constitutional and local. The former are in general those of pus formation, but it is important to bear in mind that the pathological process may also give a distinctly asthenic type of symptoms, with an overwhelming prostration and low temperature.

The local symptoms, in addition to the prominent swelling of the neck, present the following diagnostic points: First, and most diagnostic of all, there is a peculiarly hard and wooden-like induration of the affected region, sharply defined from the surrounding normal tissue; second, the thrusting forward and upward of the tongue toward the palatal vault by the accumulating inflammatory products; third, severe dyspnœa, with the possibility of laryngeal œdema; fourth, the sensation of pressure as from a hard pad or button-like swelling at the inner aspect of the dental arcade. With all of these there are associated the ordinary features of a phlegmon. Swallowing is painful, if not impossible, on account of the muscular infiltration, and the patient may not be able to open the mouth.

The *prognosis* is always grave and the rate of mortality high, one series of cases reporting over fifty per cent. of deaths. Death most frequently results from sepsis, or from suffocation due to laryngeal œdema.

The condition must be differentiated from osteomyelitis of the lower jaw, simple adenophlegmon of the submaxillary gland, and the rare disease known as Fleischman's hygroma. In the first there is no limited focus of inflammation. The entire bone is affected, the inflammatory process is more generalized, and the subhyoid region is rarely involved. In the second, adenophlegmon, the inflammation is superficial, the gland and its capsule are easily accessible, there is no wooden-like hardness, superficial incision gives exit to pus, and the process is localized at the outset behind the internal face of the maxilla. In the third the diagnostic points are suddenness of onset, location in the median line, and lack of either constitutional or local evidences of inflammation.

The *treatment* must be based upon three principles: First, early and free incision; second, careful subsequent antisepsis; and third, constitutional support. The condition is one of ptomaïn poisoning. The cause must be removed, and the effects already produced must be vigorously counteracted.

Gerster demonstrates that the object of the incision is not so much to evacuate pus as to relieve tension. He supports the modern view that the submaxillary gland is the focus of the disease, and attaches much importance to the fact that pressure over the œdematous area rarely causes pain except directly over the gland. If such evidences appear, delay in operating is not justifiable.

The operation must be done under general anæsthesia, for deep tissues must be explored, in close proximity to important vessels and nerves.

Fluctuation may be delayed because of the pus being confined within a fibrous capsule. Early incision may evacuate nothing more than an ichorous discharge, while pus may form later, but tension is thus relieved and the consequent dangers of suffocation are much lessened.

Deep lateral incision over the submaxillary gland, operation through the mouth, and even external incision in the median line are all to be condemned.

The most effective method is that suggested by Gerster, namely, to lay bare the entire submaxillary region by a careful dissection before making the incision for evacuating the abscess.

To be effective the incision must penetrate the mylohyoid muscle.

Following incision irrigation with bichloride (1 to 1,000) or boric acid (1 to 100) must be carefully carried out, and stimulants and tonics administered according to indication. The application of cold to the neck, if of any value at all, can be of service only in the very earliest stages.

Hydrogen peroxide may assist in the separation of the sloughs.

A good *résumé* of the literature of this subject is given by J. E. Newcomb in the New York *Medical Journal*, November 23d, 1895. *D. Bryson Delavan.*

PHARYNX, DISEASES OF: CHRONIC AFFECTIONS.—1. Simple Chronic Inflammation.—In this form of inflammation the morbid process usually localizes itself on the pharyngeal mucosa proper, the surrounding structures escaping. Occasionally it localizes itself in the faucial pillars and may then be properly called chronic faucitis.

A frequent cause is the continuous action of irritants such as excess in alcohol, tobacco, dusty occupations, etc. Many cases are associated with chronic nasopharyngitis. In many cases also the malady is but one feature in a general catarrh affecting the entire food tract, for to the latter and not to the respiratory tract does the pharynx functionally belong. Acid fumes, over-use of the voice, abnormal humidity of the air, high temperatures, are all to be reckoned as possible causes. It may be difficult to isolate the exciting factor, for many of the cases come on so gradually that it is difficult to determine any special reason for their occurrence. Undoubtedly the modern method of living in overheated houses is a powerful predisposing agent.

The changes set up in the mucosa are those of a proliferative inflammation. The vessels may show an initial hyperæmia, but the essential change is the formation of new connective tissue in the deeper layers of the membrane. Mucous glands are here scanty, but secretion from the membrane as a whole is increased, and in view of the abnormal surroundings it soon becomes viscid. Occasionally nodular veins may be seen coursing over the posterior wall of the pharynx.

The most prominent symptom is local irritation, but actual pain in swallowing is rare. Owing to the co-involvement of the stomach, there are more or less morning retching, nausea, and even vomiting. These conditions may make examination of the throat extremely difficult. The breath may be sour and offensive. Constipation and flatulency are frequent. Cough and huskiness of the voice are not uncommon. Hemorrhage occasionally takes place from a ruptured capillary. The mucosa is dark and beefy in appearance, but this feature does not extend farther forward than the posterior pillars. The pharyngeal wall may be covered with tenacious secretion. The grade of severity of the symptoms is generally conditioned on the amount of accompanying nasopharyngitis.

Treatment should be first directed toward the correction of any vicious habits in eating or drinking. Excesses in tobacco and all alcohol must be cut off short. The former are indicated by a dry glazed look, and the latter by a red, angry appearance of the mucosa. To facilitate a thorough examination of the throat, we may use ice-water gargles, bromide sprays, bromides internally, and even weak cocaine sprays. I have generally found it necessary to interdict, during treatment, tea, coffee, and all very hot or highly seasoned fatty and greasy foods. All food must be thoroughly masticated, and but little fluid should be taken at meals. Attention is now to be given to the gastro-enteric tract. Cholagogues, salines, alkalies with bitters, etc., here find a proper application. Attention in detail to the foregoing matters will often obviate the necessity for local treatment. For topical use we may employ solutions (twenty grains to the ounce) of silver nitrate, the zinc salts (the chloride excepted), alumnol, or protargol. For such remedies as are applied by cotton carriers, the oleostearate of zinc, made of zinc stearate in mentholated albolene, forms an agreeable viscid menstruum. Before any of these are applied, the mucosa should be thoroughly cleansed with a

warm, alkaline spray. Gargles are of secondary value here, as the puckering of the throat surfaces, incident to their use, gives only a partial contact with the mucosa.

2. Chronic Follicular Inflammation.—This variety practically limits itself to the pharyngeal wall proper, the faucial structures not being involved. It is of clinical importance because the symptoms are out of all proportion to the mild appearance of the lesion.

The brunt of the process falls on the lymphoid follicles and is one expression of "lymphatism" or the tendency of all lymphatic structures to take on overgrowth during the earlier periods of life. While during the very early years this tendency is more noticeable in the nasopharynx, it may become localized, as time goes on, in the pharynx proper. Bad hygiene is an important causative factor. The subvariety of the disease called "granular," because the smallness of the follicular enlargements gives the mucosa a granular appearance, has been referred to a systemic hyperacidity; but this view is objectionable, in that it invokes the relation of the mucous glands to the condition, they becoming stopped up by the action of the acidity which precipitates their mucin. Improper vocal effort, both overuse of the voice and use under improper conditions, may lead to follicular enlargement; hence the familiar name of "clergyman's sore throat."

As noted above, the follicular enlargement may be granular or may occur in the form of large masses like red beads on the pharyngeal wall. At times it may be localized behind the posterior pillars, the appearance presented being not unlike that of columns or bead-chains. This is the "pharyngitis lateralis" of some writers. These longitudinal deposits may fuse with the pillars, but are generally of a darker hue. The follicles nearest the mouths of the muciparous glands are the most involved. In all cases the process is essentially a hyperplasia, an actual increase in the number of lymphoid elements, especially about the efferent channels of the nodes themselves. This hyperplasia may involve the entire thickness of the mucosa or it may confine itself to projections from the surface. At first the enlargements are soft, but they harden and become smaller with time. The process seems to involve the tendrils of the sensory nerve fibres, though whether merely by compression or in some other way not understood is uncertain. This nerve involvement accounts for the relative severity of symptoms.

The most prominent symptom is pharyngeal dysæsthesia increased by swallowing or vocal effort. Secretion is not as a rule increased. It may be blood-streaked by the rupture of a superficial vessel. The tonsils often become adherent to the faucial pillars, and from the frequent efforts at hawking the uvula becomes elongated. The voice is husky and a nervous, irritable cough is present. The patients become very neurotic, and this fact in turn aggravates pre-existing symptoms. The disease continues indefinitely unless treated, though it does not seem to predispose to lesions of the air tract below.

Treatment calls for the same general measures as for simple chronic pharyngitis, and in addition for the destruction of the enlarged follicles. Any of the caustic acids or the electro-cautery may be used for this purpose. A small iron wire, heated in the flame of a spirit lamp, will answer. A drop of a two-per-cent. solution of cocaine injected into the area of puncture makes the latter practically painless. Six or eight punctures may be made at each sitting, an antiseptic spray being used on the intervening days. The minute sloughs should be allowed to come away before treatment is resumed. Curetting of the entire area has been advised. Internally we may give the iodides in small doses and the various alkaline mineral waters freely. It is unlikely that the latter are of real service unless they correct some underlying diathesis. Tobacco should be cut off. Alcohol may be used sparingly. Nervous patients need arsenic, strychnine, and phosphorus.

3. Chronic Atrophic Inflammation.—In this variety there is an actual atrophy of glandular tissue and of the other elements of the mucosa. Some authorities look on the process as merely the terminal stage of the ordinary catarrh; others as a separate affection. It may occur alone, but is more often associated with similar lesions in the nose and nasopharynx. It may be a sequel of severe local acute conditions such as occur in the exanthemata and diphtheria, and is not infrequently a feature of diabetes and chronic Bright's disease.

There may be a proliferation of new connective tissue, so that in the earlier stages, before the follicles have atrophied extensively, they appear to lie on a whitish bed and the whole membrane is very dry. This is the so-called "pharyngitis sicca."

The main symptoms are an uncomfortable feeling of dryness with more or less pharyngeal dysæsthesia. The mucosa may be covered with thick, dry, tenacious secretion. Removal of this, which strings down from the nasopharynx, may uncover a rather red subacutely inflamed area.

Treatment calls for restoration of the nose and nasopharynx to the normal and for the correction of any vicious habits. Persistent dryness should always lead to an examination of the urine, for the underlying cause may thereby come to light. The dried mucus should be removed by warm, alkaline sprays, and for home treatment the patient may inhale mentholated steam or the vapor of menthol in association with eucalyptol and compound tincture of benzoin. For topical application we may use ichthyol in glycerin (ten to thirty per cent.) or the familiar Mandl's solution—iodine gr. v., potassium iodide gr. x., carbolic acid ɱij., and glycerin ℥ ss. The writer has had much satisfaction with solutions of mucin. This comes in the form of tablets containing gr. v. each of mucin and bicarbonate of soda, and gr. i. of menthol, the latter giving an agreeable odor and flavor, and serving to keep the solution in warm weather. For the latter purpose thymol may also be used. Mucin seems to restore moisture to the mucosa and maintain it simply in virtue of its hygroscopic properties. The above tablet, which has the appearance and odor of pepsin, may be added to half an ounce each of sterilized water and sterilized lime water, shaken well, and applied either on a cotton carrier or in spray. If the latter be used, the spray tube should be flushed out with clean water at intervals so as to prevent clogging. The tablets may also be given to the patient for use as troches.

It must be remembered that treatment is at best only palliative, for advanced stages of the affection present a condition practically irremediable.

4. Rheumatic and Gouty Inflammations.—*A. Rheumatic Inflammation.*—Rheumatic pharyngitis occurs in two forms: (1) acute, and (2) chronic.

In the acute form we find the same list of predisposing and exciting causes as for rheumatism in general. The local changes follow the same sequence as in acute catarrhal inflammation, except that the grade of inflammation is less severe, is apt to be localized in patches, and causes an amount of pain out of all proportion to its apparent intensity. An inflammation of the fibrous fascia of the pharynx is possible.

The course of an attack is somewhat as follows: Local symptoms—burning, dysphagia, and dryness—first appear, and are followed by a mild attack of fever and constitutional depression. After two or three days these disappear, the pain suddenly shifting to the muscles of the neck, back, or extremities, possibly to some joint. The swallowing of the saliva continues to be annoying. Inspection may show livid patches or streaks in the throat. The pain is somewhat peculiar and stinging, so that those affected learn to recognize it. The sudden onset, the character of the pain, the history of rheumatism, and the sudden shifting of the local storm area form a fairly definite clinical picture which lasts for four or five days. In the writer's opinion, a diagnosis from mere inspection of the fauces cannot be made. Some writers have reported pharyngeal ulcerations which proved to be resistant to every other mode of treatment, but healed under anti-rheumatic measures.

Treatment calls for the exhibition of the usual remedies