

## CHAPTER VII

### THE UPPER RESPIRATORY PASSAGES AND THE THYROID GLAND

THE throat may be the seat of the same morbid processes as affect other mucous structures, such as catarrh, ulceration, or new growths. Moreover, in the throat several important constitutional diseases, such as diphtheria, scarlet fever and syphilis, have important local manifestations. These facts have long been known, but it is now recognised that the throat, and especially the tonsils—organs whose functions are still imperfectly known—may constitute the portal of entry of certain microbic conditions. It is probable that the organisms causing influenza, rheumatism, malignant endocarditis, and other infective conditions, may thus enter the general systemic circulation.

This chapter deals with the symptoms referable to the **pharynx** (§ 151), the **larynx** (§ 164), the **nasal cavities** (§ 178), and the **thyroid gland** (§ 184).

#### THE THROAT

§ 151. **Symptomatology.**—“The throat” may be said to consist of the fauces, tonsils, palate, pharynx, and larynx, and we are here concerned with the investigation of these structures. The symptoms indicating disease of these parts are principally two—namely, SORE THROAT and HOARSENESS. The examination of the mouth and tongue is described under Disorders of Digestive Tract (Chapter VIII).

(a) SORE THROAT is indicative mainly of disease of the *pharynx*, tonsils, and adjacent structures. If the patient complains of “sore throat,” turn to § 153.

(b) HOARSENESS AND OTHER ALTERATIONS OF THE VOICE are indicative of some affection of the *larynx* (§ 164). If NASAL INTONATION or NASAL DISCHARGE be present, turn to § 178.

There are also several minor symptoms which arise in conjunction with these, such as a dryness accompanied by tickling sensations, or an excessive secretion, which leads to “hawking” and “coughing.” Thus it happens that we may be consulted for what the patient believes to be pulmonary disease, when in reality the lungs are perfectly healthy. Dyspnœa and dysphagia may also be produced by local conditions of the throat and larynx. “Globus,” a paroxysmal sensation as of a ball in, or constriction of, the throat is a symptom of hysteria.

§ 152. **Clinical Investigation.**—The anatomy and relations of the throat are indicated in Fig. 51; the various parts may be investigated by (a) direct, and (b) indirect (*i.e.*, laryngoscopic) examination.

(a) For the DIRECT EXAMINATION of the fauces and neighbouring



structures all that is necessary is a good light and a spatula or spoon to depress the tongue. If direct light is not available—as for instance, when the patient is in bed—a head mirror can be used (*vide infra*). The patient should be instructed *not to strain*, and to “*breathe quietly in and out.*” The posterior wall may be seen by directing the patient to say “*Ha—ah,*” by which procedure the soft palate is raised. Note should be made of the colour of the mucous membrane, the presence of exudation or ulceration, of granulations in the pharynx, of mucous patches (syphilis), bulging of the pharyngeal walls; also of paralysis or weakness of the tongue, palate

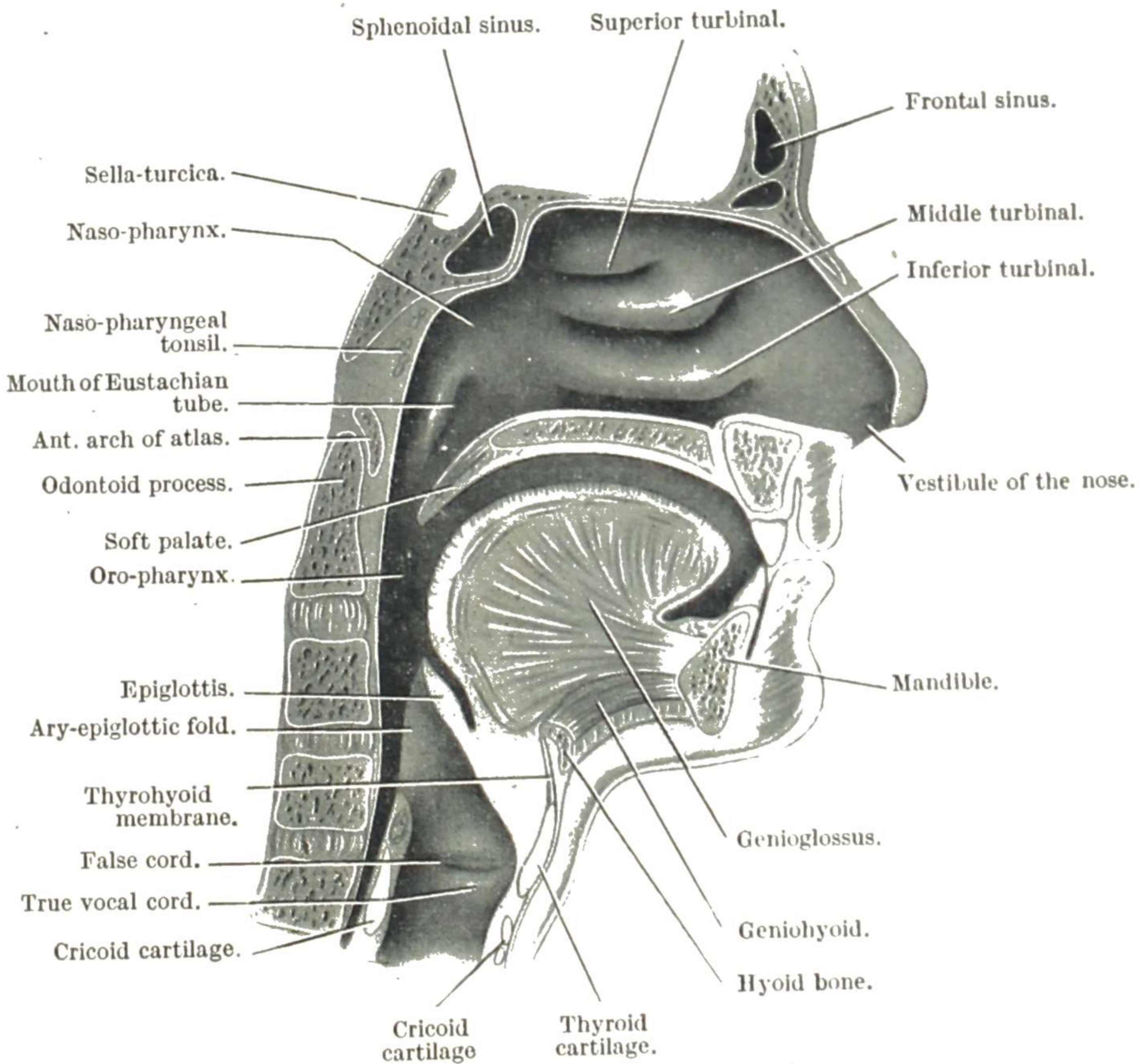


FIG. 51.—ANATOMY OF MOUTH, NOSE AND THROAT.

or pharynx. The size and length of the uvula should be observed; a long uvula may be the cause of a chronic cough and of symptoms such as the sensation of a foreign body and constant hemming and hawking. When a patient complains of cough coming on, or getting worse at night or when he lies down, *elongated uvula* should be suspected. It does not follow that such a uvula may appear too long at the time of inspection. The symptoms frequently ascribed to an elongated or “*relaxed*” uvula are often due to pharyngeal or post-nasal catarrh which, indeed, may be the cause of the elongation. Temporary congestion from various causes,



*e.g.*, much talking, produces undue elongation and nocturnal cough. Treatment should be directed to any catarrh or sepsis in the upper air-passages, with, locally, the use of astringent paints and lozenges. When conservative treatment has failed, part of the uvula may be amputated, but this is rarely done nowadays.

(b) The **INDIRECT or LARYNGOSCOPIC EXAMINATION** of the throat is described in § 164.

§ 153. **Classification, Diagnosis, Prognosis, and Treatment.**—**Sore Throat** is a symptom common to nearly all diseases of the throat. Mentioned in order of frequency, the diseases which give rise to sore throat are as follows (*laryngeal affections being excluded for the present*; see § 164):

TABLE IX.

<i>Commoner Causes.</i>	<i>Rarer Causes.</i>
I. Pharyngitis, including several acute and chronic varieties.	VI. Retro-pharyngeal abscess.
II. Tonsillitis (acute parenchymatous, acute follicular, quinsy, Vincent's angina, and more rarely agranulocytic angina, glandular fever and acute leukæmia). Chronic tonsillitis.	VII. Phlegmonous sore throat and acute œdema.
III. Scarlet fever.	VIII. Cancer, and other new growths.
IV. Diphtheria.	IX. Tuberculosis.
V. Syphilis.	X. Other acute specific fevers.

§ 154. **I. Acute Pharyngitis** is an inflammation of the mucous membrane of the pharynx and soft palate, and to a certain extent of the tonsils also. It may be so mild as to cause only slight discomfort in swallowing, dryness of the throat, tickling and hawking, and in such mild cases there is only a moderate congestion of the parts. But in more severe cases constitutional symptoms are more pronounced, and locally there may be œdema and marked congestion. The temperature in such cases varies from 100° to 104° F. The disease rarely lasts more than a few days, ending generally in resolution, although sometimes it passes into a chronic condition.

(a) **Chronic Catarrhal Pharyngitis** presents the same symptoms as the acute variety, in a milder degree, and extending over a longer period of time. It is often known as **Relaxed or Relapsing Sore Throat**, on account of the chronic congestion of the parts and the consequent predisposition to the repeated occurrence of subacute attacks. It forms one variety of clergyman's or school-teacher's sore throat.

(b) **Granular (Follicular) Pharyngitis** is a *chronic* condition, the local symptoms of which resemble the foregoing, with the addition of visible granulations on the pharyngeal walls due to the grouping of masses of lymphoid cells round the openings of the ducts of the mucous glands. The ducts may become obstructed and dilated, and later discharge yellow cheesy material, when the name **follicular pharyngitis** is given to the



condition. Anyone subject to this common condition, although apparently in good health, is liable to repeated attacks of sore throat whenever the weather is damp or his health a little below par. There is excessive mucous secretion, which collects in the throat, especially in the morning, and leads to chronic cough and hawking. When the disease has lasted some time, the throat becomes dry from atrophy of the glands (Pharyngitis sicca). With all forms of pharyngitis it is essential to make sure that there is no dental or nasal infection keeping up the condition.

(c) **Adenoids** may be regarded as a form of chronic pharyngitis limited to the naso-pharynx, but often associated with lymphoid granulations in the oro-pharynx. The lymphoid granulations may fill a large part of the naso-pharynx, occurring as a large grooved cushion or pedunculated growth, which, on examination, can be seen and felt behind the soft palate. This condition is common in childhood. The child *breathes with the mouth open*, and thus acquires a characteristic vacancy of expression. The intellect is often below the average. The voice has a dull or nasal twang, and there are snoring and disturbed sleep. The nares are narrowed, and the palate may be high from the negative pressure in the nose, the diminished air tension in the nose not counterbalancing the normal air tension on the buccal aspect of the hard palate. Pigeon-breast may follow. The condition is a pregnant cause of middle-ear catarrh and subsequent deafness. Adenoids in the naso-pharynx are usually accompanied by chronic enlargement of the tonsils. The disease often runs in families.

The *Causes of pharyngitis* vary somewhat in the different forms, although the several causes are largely interchangeable. (1) In certain persons exposure to cold and damp is immediately followed by an attack of pharyngitis, but this probably acts only as a predisposing cause. (2) Unhygienic surroundings, such as crowded conditions, bad ventilation, and work in the presence of dust or irritating vapours, undoubtedly predispose. (3) Bad health predisposes especially to granular pharyngitis, so much so that the throat in some persons constitutes a veritable barometer of the state of their health. (4) The gouty, rheumatic and tuberculous diatheses. (5) Chronic pharyngitis is often secondary to carious teeth, pyorrhœa or septic tonsils. (6) Nasal obstruction from any cause predisposes by inducing mouth breathing; nasal discharge, due to rhinitis or sinusitis, infects the pharynx and causes congestion by the constant efforts to get rid of it. (7) Wrong methods of production of the voice (clergyman's and school-teacher's sore throat), excessive smoking, the constant use of alcohol, spiced or hot foods. (8) The bristle of a tooth-brush, or a fish-bone impacted in the pharynx, is a not infrequent though unsuspected cause. (9) Chronic pharyngitis is often seen in people who live too well. The excessive secretion and the perpetual hawking direct the attention of the patient and of his medical adviser to the throat, larynx, or lungs; but the cure cannot be accomplished until dietetic and other measures are directed to the relief of the portal congestion.



(10) Pharyngitis, especially in its chronic forms, is often associated with anæmia (see the Plummer-Vinson syndrome, § 227). (11) The pharyngitis of influenza is slow to go, and is accompanied by a very irritating cough.

*Prognosis.*—Pharyngitis is one of the most frequent and troublesome of the minor ailments. The milder varieties of acute pharyngitis last only a few days, but the more severe forms may last many weeks, and be followed by considerable debility. All the chronic forms have a great *tendency to relapse*.

*Treatment.*—The indications are to relieve the local inflammation, to improve the general condition, and to prevent relapse. For the *acute forms*, most of the remedies mentioned under Tonsillitis are available. Penicillin lozenges and the sulphonamides are most useful. In all subacute and chronic forms, smoking, alcohol, and other causes of local irritation must be avoided. Excessive secretion may be removed by a gargle of bicarbonate of soda. For the “relaxed throat” a gargle consisting of a wine-glassful of water, to which a pinch of salt has been added, may be used; so, also, are gargles of alum, potassium chlorate, and ammonium chloride (Formulæ 15 to 19). Mandl’s paint is a good application, and carbolic acid employed as a spray, gargle, or lozenge, is of value. A good spray is that of menthol (1 in 50 of paroleine). Later, astringent paints should be used—*e.g.*, nitrate of silver (4 per cent.) or equal parts of solution of iodine (B.P.) and the glycerine of alum. Codeine in  $\frac{1}{2}$  gr. doses is the best remedy for the irritating cough.

The most efficient treatment for the granular forms of pharyngitis, where gargles are of little use, is painting with silver nitrate (8 or 16 per cent.), tannin (1 in 8), or with liquor ferri perchloridi, or iodine in glycerine. The galvano-cautery may be applied to the individual granulations. For a permanent and radical cure, when adenoids are present, these must be thoroughly removed under general anæsthesia. Nasal obstruction, if present, must also be relieved. Any sepsis in the nose, tonsils or teeth must be adequately treated. Especially in the granular varieties, the general health is often more important than the local condition, and many a relapsing and granular pharyngitis can be cured by Blaud’s pills. The rheumatic or gouty diathesis, dyspepsia or constipation, especially if associated with portal congestion, should be appropriately treated.

§ 155. II. **Tonsillitis**, or inflammation of the tonsil, is met with clinically in acute and chronic forms.

(a) **Acute Parenchymatous Tonsillitis.**—The whole substance of each tonsil is inflamed and appears red and swollen.

(b) **Acute Follicular Tonsillitis.**—The inflammation is more superficial and the crypts especially are involved, becoming filled with fibrin, leucocytes, bacteria, etc. The tonsils are not so swollen as in (a), but their surface is studded with yellow dots which may be wiped off without bleeding.

The *symptoms* of both varieties are the same. A sore throat is complained of and pain on swallowing may be severe. At the onset there



may be a slight rigor and the temperature varies between 100° F. and 104° F. General malaise, headache and pain in the limbs occur. In children the general symptoms are often more marked than the local. The tongue is furred and the breath offensive. The cervical glands on both sides are enlarged and tender.

The *Diagnosis* of both these forms of tonsillitis from scarlet fever and diphtheria is sometimes a matter of considerable difficulty, but one of great importance. It is given in the form of a table (X, p. 228).

*Etiology*.—Even in healthy individuals many micro-organisms may be found in the tonsils, *e.g.*, streptococcus, staphylococcus, pneumococcus, influenzal organisms and micrococcus catarrhalis. In tonsillitis one or more of these may be the exciting cause. (1) Any general cause of ill-health predisposes. (2) Unhygienic conditions, such as bad ventilation and overcrowding. (3) The tonsils become acutely inflamed in scarlet fever, in diphtheria, often in influenza and “colds,” and in so large a proportion of cases of rheumatic fever that they are regarded as the portal of entrance of the organism of that disease. (4) Many cases arise by “droplet infection” in schools and hospitals. (5) Fish-bones and bristles of a tooth-brush sometimes give rise to one-sided tonsillitis.

(c) **Quinsy or Peritonsillar Abscess**.—In this condition, which occurs usually after tonsillitis but occasionally primarily, an abscess forms just outside the capsule of the tonsil, as a rule only on one side. Severe pain is felt in the throat and swallowing may be almost impossible. The pain radiates to the ear and down the neck. The temperature may be high (103° F.); the patient looks toxic and speech is thick and muffled. Trismus often makes examination difficult. The anterior pillar of the fauces and the soft palate on the affected side are very red and œdematous and bulge forwards, while the tonsil is pushed inwards. Much sticky mucus is present. The cervical glands on the corresponding side of the neck are enlarged and tender.

(d) An uncommon form of acute tonsillitis is known as **Vincent's Angina**. It is often mistaken for diphtheria; it can occur during convalescence from diphtheria, and *vice versa*. As a rule only one tonsil is affected, occasionally both. It is characterised by one or more patches of exudation, often presenting a necrotic appearance, on the tonsil or adjacent anterior pillar, and sometimes encroaching on the palate. Later a deep ragged excavation may form. The pellicle is not easily detachable, and leaves a shallow ulcerated surface, the healing of which may be somewhat tedious. It is attended by some pyrexia and constitutional disturbance, usually slight. There is characteristic fœtor of the breath. A smear from the affected surface contains a large fusiform bacillus which stains with the ordinary aniline dyes, but will not grow on ordinary culture media, and a delicate mobile spirochæte. Both these organisms may be found occasionally in ordinary ulcerative stomatitis, in carious teeth, and in some cases of septic scarlet fever. Salvarsan powder may be applied locally or the anti-syphilitic arsenical preparations may be injected. Penicillin lozenges and systemic penicillin given together are effective. Nicotinic acid (100 mgm. per diem) seems to be beneficial.

(e) **Agranulocytic Angina** (Agranulocytosis, malignant neutropenia) is uncommon and has only recently been recognised. Women are much more susceptible than men. It occurs as a rule about middle age. In *acute cases* there is first soreness of the throat,



and malaise with pyrexia. The disease rapidly progresses and there is necrotic ulceration of the tonsils, fauces, buccal mucous membrane, and sometimes the vagina and any part of the intestinal tract, but especially the rectum. In the absence of polymorph cells in the blood, any invading micro-organism produces widespread local invasion of tissues as well as septicæmia. Prostration is marked and the patient commonly dies in a few days. A *chronic type* may also occur with recurrent mild attacks of sore throat, malaise and fever, often occurring at the menstrual periods. The blood picture is characteristic. The total white count is very low (it may be only a few hundred) and the polymorphonuclear granulocytes (neutrophils, eosinophils and basophils) are much reduced in number (absolutely and relatively), and may be absent. This is due to their non-formation by the bone marrow. Sternal bone marrow biopsy shows either that no cells of the granular series are formed at all, or that myeloblasts and myelocytes are present in large numbers but are apparently unable to mature to form polymorphs. Certain drugs cause this condition, particularly amidopyrine and allied compounds, especially when associated with a barbiturate; also arsphenamines, thiouracil, dinitrophenol, the sulphonamide group and occasionally compounds of heavy metals.

*Treatment.*—(1) Elimination of possible causes, *e.g.*, drugs; (2) treatment of local lesions with mouth washes (*e.g.* hydrogen peroxide) and sprays; (3) treatment of agranulocytosis by stimulating the formation of granulocytes by the use of nuclein derivatives, *e.g.*, pentnucleotide, which is injected daily intramuscularly in doses of 20–40 c.c. in divided doses until the white count rises. In certain cases intravenous pyridoxine 100–200 mgm. daily is helpful. (4) Penicillin injections are useful to prevent bacterial invasion.

(f) **Glandular Fever** causes (i.) a sore throat, with general reddening of the fauces and tonsils, enlargement of lymphatic glands and often some enlargement of the spleen. (ii.) In the anginose variety, after 1–2 weeks of malaise and fever, the throat becomes sore and a membrane indistinguishable from that of diphtheria forms on one or both tonsils. There is much peritonsillar œdema and cervical adenitis; the axillary glands and the spleen may enlarge. Diphtheria bacilli cannot be cultured from the membrane, and a rash with the typical blood changes (§ 499) helps to confirm the diagnosis.

(g) **Acute leukæmia** may cause a membranous form of acute tonsillitis as one of its earlier manifestations (§ 543).

**Chronic Tonsillitis.** (a) In *adults* it may follow repeated attacks of acute tonsillitis or it may develop insidiously. In both types there may be little surface evidence of deep infection of the crypts; the tonsils may be enlarged or small and buried; but there is usually redness of the anterior pillars of the fauces and some enlargement of the cervical glands. In a crypt infection of the insidious type the patient may be unaware of any throat trouble; he may have a chronic toxæmia, leading to arthritis, neuritis, nephritis and diminished vitality. (b) In *children*, the condition is indicated by local and general symptoms. *Local*: running nose, muco-purulent rhinitis, postnasal discharge, fœtid breath, enlarged cervical glands, unilateral or bilateral otorrhœa, associated with a history of frequent colds, sore throats and other infections, particularly exanthemata. On *examination*: the tonsils may be large or small and buried; the crypts often contain yellow debris or liquid pus. *General*: Pale, puny children, suffering from nerve, respiratory or alimentary disorders, restlessness, night terrors, etc.

**Chronic Enlargement of Tonsils** is generally associated with enlarged



adenoids and is regarded as a chronic hyperplasia. In children we find superimposed the symptoms due to adenoid enlargement (§ 154), and a chokiness at night when lying down, sometimes when swallowing. This hypertrophic type occurs especially in the presence of dental sepsis, or persistent mouth breathing, and also in the "catarrhal diathesis." In this latter condition the children are over-weight, subject to recurrent catarrh, and have a bright malar flush which gives the appearance of good health. Sudden death, described post-mortem as Status Lymphaticus (§ 37), rarely occurs in this type of child.

*Course and Prognosis of Tonsillitis.*—Acute tonsillitis, without complications, is a frequent, sometimes troublesome, but rarely fatal, disease. Sometimes the patient continues at work; at other times he is totally incapacitated. Chronic tonsillitis renders the patient liable to repeated attacks of acute tonsillitis and coryza and is a common source of recurrent pharyngitis, leading to otitis media and deafness. Enlarged tonsils in children occasionally resolve during adolescence; the mental and physical development of children who have chronic enlargement of the tonsils is sometimes impeded. The development of the child is more likely to be hindered by the presence of adenoids, which interfere with the respiration.

*Treatment of Tonsillitis.*—The indications are (a) to reduce local inflammation; (b) to reduce pyrexia; and (c) in chronic tonsillitis to prevent relapse and improve the general health.

(a) Penicillin lozenges should be kept in the mouth and gently sucked. A spray of anethaine (4 per cent.) relieves the pain. Cold or hot compresses externally, steam inhalations, warm gargles of potassium chlorate, sodium bicarbonate, aspirin, and carbolic acid in glycerine (1 in 40) or formalin (2 per cent.) relieve the congestion (Formulæ 15 to 19). Frequent very hot saline gargles are as useful as anything. In subacute cases the tonsils may be painted with Mandl's paint.

(b) To reduce the pyrexia a brisk saline purge should be given at the onset. Give copious drinks of warm fluid; then sodium salicylate, as in rheumatism, or liquor ferri perchloridi. The sulphonamides are often helpful in infections with hæmolytic streptococci, *B. Friedlander* and pneumococcal infections (see Tables XXVIII, XXIX, § 515). Penicillin injections are most useful when the organisms are susceptible. A quinsy should be opened by inserting a fine-pointed pair of sinus forceps into the abscess, and slightly opening the blades. Enter at the point of maximum swelling and softening. A guarded scalpel, with plaster wound round the blade to within half an inch of the point, may be used instead of the forceps. No anæsthetic should be used, other than cocaine locally, lest the cough reflex be abolished and pus inhaled.

(c) In chronic tonsillitis the most useful remedies are iron, cod-liver oil, tonic treatment, vitamin preparations and change of air. Salicylic acid and guaiacum are used in the relapsing form. Chronic enlargement may be diminished by painting the throat with glycerine of tannic acid, or other astringents (*vide supra*); but in most cases the



question of enucleation of the tonsils arises sooner or later, or their destruction by diathermy in cases where removal is contra-indicated. Recently in America repeated small doses of deep X-ray therapy have been used, with good effect, for children with infected tonsils and adenoids.

§ 156. III. In **Scarlet Fever** (§ 477) the tonsil is generally the chief seat of inflammation in the throat. Both scarlet fever and acute tonsillitis start more or less suddenly, with constitutional symptoms, and thus the diagnosis is often difficult. There are four distinguishing features of scarlet fever—viz.: (i.) The diffuse *scarlet* colour of the soft palate and pharynx, with complete immunity of the larynx; (ii.) sudden onset of the illness with high fever and often vomiting; (iii.) on the second day the rash; and (iv.) about the third day the “strawberry” tongue (see Table X and § 477).

TABLE X.

<i>Tonsillitis.</i>	<i>Scarlet Fever.</i>	<i>Diphtheria.</i>
<p>Swelling and redness chiefly confined to one or both tonsils. In the follicular form, tonsils covered with sticky mucus, with numerous small, separate yellow spots of secretion on one or both, which are easily removable. Nothing on soft palate.</p> <p>(i.) Onset moderately sudden, with moderate fever.</p> <p>(ii.) Temperature may be very high, but local symptoms are usually more troublesome than general symptoms.</p>	<p>(a) LOCAL SIGNS.</p> <p>Diffuse <i>bright</i> redness of throat and palate generally. The tonsils swollen, and may be covered with mucus and <i>sometimes</i> with multiple yellow points. Nothing on soft palate in ordinary cases.</p> <p>(b) GENERAL SYMPTOMS.</p> <p>(i.) Onset with fever and usually vomiting.</p> <p>(ii.) Temperature may be high. Local symptoms a subordinate feature.</p> <p>(iii.) Rash on first or second day.</p> <p>(iv.) Strawberry and cream tongue about third day.</p>	<p>Ashy-grey patch or patches on tonsils, uvula, and <i>soft palate</i> (latter situation is pathognomonic); patches <i>larger</i> than in follicular tonsillitis. Patches consist of membrane surrounded by red areolæ; difficult to remove, leaving raw surface. Characteristic smell. Klebs-Löffler bacillus found in membrane. Sometimes a muco-purulent, acrid <i>nasal discharge</i>. Comparative absence of pain.</p> <p>(i.) Onset insidious. Early and marked enlargement of cervical glands.</p> <p>(ii.) Temperature not so high at first, and may remain low during whole course.</p> <p>(iii.) Paralytic sequelæ sometimes.</p>

§ 157. IV. The sore throat of **Diphtheria** (§ 494) may be recognised at once if there be an ashen-grey patch of exudation *upon the soft palate*.



When this is absent, and the membrane is on one or both tonsils, there may be difficulty in diagnosing between diphtheria and follicular tonsillitis or Vincent's angina. In diphtheria the large size and the colour of the patches (grey with surrounding red areolæ), the raised, sharply defined margin, the difficulty of removing them, and the raw bleeding surface left, enable us to come to a conclusion. The membrane may become blackish with a very offensive odour, and hæmorrhages may occur. There may be considerable swelling of the tissues of the fauces and of the neck ("bull-neck"). The onset is more insidious, the pyrexia less marked, but the prostration is greater in diphtheria. A muco-purulent or hæmorrhagic discharge from the nose is characteristic of diphtheria. Albuminuria is frequent with acute tonsillitis as well as with diphtheria. When other diagnostic features are absent, the presence of *one* large patch on a tonsil, instead of several small patches, is in favour of diphtheria. A swab will reveal the presence of the bacillus. Vincent's angina usually affects only one tonsil (§ 155).

§ 158. V. **Syphilitic Sore Throat** is very characteristic. This and the other *secondary* manifestations of syphilis develop about 3-6 weeks after the appearance of the chancre, but they may appear much later. Symptoms may be slight but there is usually some pain and dryness in the throat and sometimes marked pain on swallowing. The symptoms last for some weeks. (1) Syphilitic *erythema* is the most constant change. Dusky red patches, isolated or symmetrical, appear on the soft palate, tonsil or pharynx. The whole throat may be involved. (2) *Mucous patches* (snail-tracks) appear later as grey-white, translucent or milky areas of variable size, surrounded by a narrow red areola. They are seen on the uvula, the pillars of the fauces, the tonsil and the soft palate and tend to be symmetrical. (3) All the lymphoid tissue in the throat enlarges. *Primary chancre* of the tonsil does occur, though rarely. Symptoms are slight, and it is characterised by great enlargement of the tonsil and the glands on the corresponding side of the neck. Spirochætes may be recovered from the small ulcer or erosion usually present.

*Tertiary syphilitic* ulcers may produce sore throat, their favourite position being the soft and hard palate, the tongue, the fauces and tonsil, and the posterior pharyngeal wall. They are usually preceded by gummatous swellings. (1) The ulcers are deep, with ragged floor, sharply cut edges, and covered with thick yellow-grey secretion. (2) They are progressive, and in course of time will destroy the hard palate or any other parts they invade. (3) They leave characteristic stellate cicatrices, which are indisputable evidence of the disorder.

*The less frequent causes of Sore Throat are*—RETRO-PHARYNGEAL ABSCESS, PHLEGMONOUS SORE THROAT, NEOPLASTIC and TUBERCULOUS ULCERATIONS, and ACUTE SPECIFIC FEVERS.

§ 159. VI. **Retro-pharyngeal Abscess** is an abscess situated in the areolar tissue between the pharynx and the spine. It may develop insidiously, or the onset may be comparatively sudden. It is known by



(1) the rigidity of the head, with difficulty of swallowing, alteration of the voice and inspiratory stridor; (2) evidence of swelling in the posterior pharyngeal wall on inspection and palpation, by which means it is diagnosed from other causes of dyspnoea in children.

*Etiology.*—Acute cases are met with mostly in the very young and are due to the formation of an abscess in the retro-pharyngeal lymphatic glands following an acute infection in the nose or throat. They are usually met with in feeble and undernourished children.

*Treatment.*—The acute abscess should be opened at once, through the mouth, the child being held with the head down and no anæsthetic being given.

*Chronic retropharyngeal abscess* is much less common and is almost always due to tuberculous disease of the bodies of the cervical vertebræ. The abscess tends to point in the posterior triangle, where it should be opened.

§ 160. VII. **Phlegmonous Sore Throat**—*i.e.*, Acute Septic Inflammation of the Pharynx and Larynx—and ANGINA LUDOVICI (when the inflammation is chiefly external, in the neck).—This very severe disease may start *inside* the throat, with symptoms of sudden pain, accompanied by considerable swelling, leading to severe dyspnoea, stridor, aphonia, and complete dysphagia in a few hours. There is much œdema around the fauces, followed by a brawny infiltration of the skin of the neck, spreading from under the jaw to the tongue and larynx. In some cases there is hæmorrhagic necrosis of the tonsils and surrounding parts, suggesting agranulocytic angina or diphtheria gravis. Sometimes the infiltration starts *externally*, and rapidly invades the internal structures. There is great constitutional disturbance, and a temperature of 102° to 105° F., but unless pus forms, rigors and delirium are generally absent. Pus formation is further indicated by widely and irregularly intermittent pyrexia. Mild cases begin with a stiffness and pain in the tissues around the jaw, and if recovery is to take place, the symptoms go no farther. But in many cases, and especially in alcoholic and debilitated subjects, the disease rapidly progresses, and death takes place in twelve to forty-eight hours from heart failure, coma, or asphyxia from œdema of the larynx. Suppurative forms are very fatal. Among the recognised complications are pneumonia, pericarditis, pleurisy, and meningitis. There is a more chronic form in which induration is in excess of pus formation; this may continue indefinitely until the pus is found and drained.

*Etiology.*—The condition, happily, is rare, and the causes consequently obscure. (1) It sometimes arises in association with scarlet fever, erysipelas, and small-pox (in former times being a common cause of death in this disease), or other acute specific fevers. (2) Dental suppuration or an alveolar abscess often forms the source from which rapid infiltration starts. (3) It may arise in people apparently in good health, and has then been attributed to the entrance of infection by the tonsils, or through the socket of an extracted tooth.

*Treatment.*—The indications are to control the inflammation, and to keep up the strength of the heart. A course of penicillin injections and one of the sulphonamides in full doses must be given. The general lines indicated in the treatment of acute tonsillitis should be followed. Use hot or cold applications to the neck. Remove carious teeth or stumps. Free and early incisions should be made if there is pus formation, and the practitioner should be at hand to perform tracheotomy if the dyspnoea be increasing. Stimulants must be liberally administered.

ACUTE ŒDEMA of the throat may be part of the above disease when the œdema is secondary to septic infection; or it may be part of a general dropsy or giant urticaria. It is dangerous, as it may spread to the larynx and cause death by suffocation (§ 167).

§ 161. VIII. **CARCINOMA** commonly affects the pharynx, more often in men than



in women. No part of the pharynx is immune, but most frequently the pyriform sinus, the ary-epiglottic fold or the epiglottis and base of the tongue and tonsil are involved. The main complaint is of soreness, and, later, of difficulty in swallowing. Metastases in lymphatic glands occur comparatively early, and frequently patients come for treatment when the condition is inoperable. SARCOMA is rare. The diagnostic features are more or less the same as those mentioned for the tongue (§ 216). Diathermy, deep X-ray therapy, radium and occasionally surgical removal are all employed with increasingly satisfactory results.

§ 162. IX. TUBERCULOUS ULCERS of the pharynx occur as secondary lesions. (1) They resemble syphilitic ulcers, but there is pallor of the mucous membrane, and a characteristic "worm-eaten" appearance of the pharyngeal wall: pain is usually severe. (2) *Their course is not nearly so rapidly progressive.* (3) It may be possible to obtain the tubercle bacillus from the scrapings; and (4) there are usually other manifestations of tubercle, especially in the lungs. *Lupus* is uncommon. For treatment, see Tuberculosis of the Larynx (§ 172).

§ 163. X. ACUTE SPECIFIC FEVERS other than those mentioned above, such as typhoid, give rise to inflammation and ulceration of the throat. In variola, for example, the pustules often form upon the palate, fauces, and buccal mucous membrane, leaving superficial circular ulcers. An examination of the throat is often useful as an aid to the diagnosis between measles, scarlet fever, and small-pox. The first named always affects the *larynx*, rarely the pharynx; scarlet fever always affects the *pharynx*, and very rarely the larynx; whereas small-pox affects them *both about equally*. Patches of *Lichen planus* may be found on the palate even before the disease occurs on the skin, and the eruption of varicella may be found in that situation. Other patches may be due to *thrush*, *herpes* or *pemphigus*.

## THE LARYNX

§ 164. Symptoms and Clinical Investigation.—It will be remembered that the two cardinal SYMPTOMS of diseases of the throat (used in its widest sense) were (a) Sore Throat, and (b) Alterations of the Voice. Both of these may be present in disorders of the larynx, but it is the latter especially which indicates derangements of the organ of voice. Diseases of the larynx are also sometimes indicated by Cough, Hawking, Dysphagia, Dyspnoea, and actual Pain. But in some cases all of these may be absent; there may, indeed, be pronounced disease of the larynx (*e.g.*, paralysis or papilloma) without any *subjective* symptoms.

The CLINICAL INVESTIGATION of the larynx (laryngoscopy) is a procedure of considerable technical nicety, and requires practice. The necessary appliances are a good steady light, a *reflecting mirror* mounted on a band or a spectacle frame for the operator's forehead, and a small circular *throat-mirror* mounted on a handle at an angle of 135°. The light should be placed on a level with, and a little behind, the patient's left ear. The operator takes his seat directly opposite; and it is advisable that his seat should be a little higher than that of the patient. Having directed the patient to open his mouth and "breathe quickly in and out," the first step is to adjust the *reflecting mirror* in order thoroughly to illuminate the back of the pharynx. The focal length of the head-mirror is generally 8 to 14 inches, and this should represent the distance of the



mirror from the patient's pharynx. Having warmed the throat-mirror over a small flame to prevent condensation from the breath, ask the patient to protrude the tongue: then hold the tongue gently, with the left hand, in the corner of a towel or in a piece of gauze. Take care not to hurt the under surface of the tongue against the teeth of the lower jaw. Then test the warmth of the throat-mirror against your cheek or the back of your hand, and, having pushed the patient's head a little backwards by pressing your right thumb against the upper teeth, introduce the mirror with the right hand, *taking care to avoid touching the top of the tongue*. Push the mirror obliquely upwards against the soft palate just over its junction with the uvula (Fig. 51, § 152). A good view of the vocal cords should be obtained by slightly lowering or raising the handle. An electrically illuminated laryngoscope may be used. In children and persons with very sensitive throats it is sometimes advisable to render the pharynx less sensitive before laryngoscopy, either by a spray of, or painting with, a 5 per cent. solution of cocaine hydrochloride, or by the administration of a few doses of bromide during the preceding twenty-four hours.



FIG. 52.—Quiet Inspiration.



FIG. 53.—Forced Inspiration.

In normal conditions the *epiglottis*, which is in reality anterior, appears at the *upper part of the mirror*. The *vocal cords*, which are of a pearly white colour, are close together at their anterior or epiglottic ends; and at their posterior ends are widely divergent during quiet respiration. Posteriorly they appear to terminate in two prominent knobs seen at the lower edge of the mirror, which mark the position of the *arytenoid cartilages* (Figs. 52 and 53). The *ary-epiglottic folds* stretch on each side from the arytenoids to the sides of the epiglottis. To the outer side of the cords appear the ventricular bands or false cords of mucous membrane. With a little practice, and under favourable circumstances, the bifurcation of the trachea may be seen.

DIRECT LARYNGOSCOPY, with or without anæsthesia (general or local), allows of careful examination of the larynx and has almost entirely replaced indirect laryngoscopy for the performance of intralaryngeal operations. Direct laryngoscopy is also used to expose the larynx preliminary to the introduction of the bronchoscope. By means of the *bronchoscope* (§ 112) the interior of the bronchi may be directly examined. When a foreign body has entered the air-passages, the patient should immediately be X-rayed, then examined by one who is expert in bronchoscopy.



In LARYNGOSCOPY there are FOUR POINTS to be investigated:

(a) The presence of *congestion* or *pallor* of the vocal cords and the parts around. Congestion of the vocal cords is an evidence of LARYNGITIS, sometimes of ulceration or new growth.

(b) The presence of *ulceration*. Ulceration occurring under middle age is often due either to SYPHILIS or TUBERCLE; after middle life it is not infrequently MALIGNANT.

(c) The presence of a *nodule* or *new growth*—most frequently a PAPILOMA.

(d) Whether the vocal cords move normally or not.

§ 165. **Classification.** It has been mentioned that there may be no *subjective symptoms* with disease of the larynx, and therefore it is well to adopt as a basis of classification the *physical signs* discovered by laryngoscopy. However, when symptoms are present there is always some ALTERATION OF THE VOICE (except, perhaps, bilateral abductor paralysis, in which there may be dyspnoea and stridor without alteration of the voice). The principal diseases giving rise to such alterations (*i.e.*, the **causes of alterations of the voice**) may be grouped as follows:

TABLE XI.

<p>I. LARYNGITIS—</p> <p>(a) <i>Acute Laryngitis</i>, including also— Edema of the larynx. Foreign Bodies in the Larynx or Trachea.</p> <p>(b) <i>Chronic Laryngitis</i>, including also— Perichondritis, and Congenital Laryngeal Stridor.</p> <p>II. ULCERATION of the Larynx—</p> <p>(a) Tuberculous Ulceration. (b) Syphilitic Ulceration, (c) Malignant Ulceration.</p> <p>VI. Diseases of the PHARYNX (§ 153); VII. Diseases of the NOSE (§ 178); VIII. Some severe PULMONARY affections; and IX. Certain NEUROSES also cause alterations in the voice.</p>	<p>III. NEW GROWTHS—</p> <p>(a) Benign, (b) Malignant.</p> <p>IV. PARALYSIS of the Vocal Cords—</p> <p>(a) Organic, (b) Functional.</p> <p>V. SPASM of the Vocal Cords— Laryngismus Stridulus (§ 177).</p>
---	--

I. *The patient complains of huskiness or loss of voice, a comparatively dry cough, soreness on swallowing, and there are local signs of congestion of the vocal cords. The disease is LARYNGITIS, of which two varieties are met with, ACUTE and CHRONIC.*

§ 166. **Acute Laryngitis** comes on somewhat rapidly, and usually runs its course in a week. As a rule it is not a serious affection, but in children it may be alarming. In children a slight laryngitis coming on suddenly is a frequent cause of what mothers describe as “croup.” The child wakes up suddenly at night with loud inspiratory stridor followed by an attack of coughing. This symptom is technically known as *laryngitis*



*stridulosa*, and is not to be confused with laryngismus stridulus (see § 177). Simple laryngitis is differentiated from membranous croup (laryngeal diphtheria) by the perfect general health of the child and the sudden onset in simple laryngitis.

*Etiology.*—The chief cause of acute laryngitis is exposure to cold—especially when combined with overuse and wrong production of the voice (*e.g.*, actors, music-hall artists, etc.). It is frequently a part of the “common cold.” Diphtheria or measles may start in the larynx. Persons who suffer from chronic laryngitis (*q.v.*) or nasal obstruction are predisposed to attacks. A foreign body in the larynx or trachea is a cause of irritation which may produce symptoms resembling laryngitis.

*Prognosis.*—The affection is troublesome and apt to recur. When occurring during the course of the specific fevers, the prognosis is less favourable, because œdema of the larynx may supervene.

*Treatment.*—All use of the voice must be forbidden. The patient must be kept in a warm, moist atmosphere, and should use warm inhalations (such as tr. benzoin co. ℥ 60 to the pint of boiling water, and see also Formula 110). Warm compresses or fomentations should be applied externally, and warm mucilaginous and alkaline drinks should be freely taken. The most efficacious medicine is one containing small doses of potassium iodide. See also formula in § 115. For laryngitis stridulosa, apply hot sponges to the throat, and give tinct. ipecac. in teaspoonful doses, with warm water, every ten minutes until emesis ensues. If much swelling is present, spraying with cocaine and adrenalin is valuable. In more severe cases one of the sulphonamides or subcutaneous penicillin should be given.

§ 167. **Œdema of the larynx**, or œdematous laryngitis, is a clinical phenomenon, not a definite disease. It is often called œdema glottidis, but the œdema is not of the glottis; it occurs above and below the cords affecting the epiglottis and submucous tissue of the larynx. The onset is usually sudden, and attended by considerable dyspnœa, dysphagia, and inspiratory stridor. The diagnosis is usually simple, on account of the swelling which can be seen and felt on palpation at the back of the tongue. If this be absent, some difficulty may be experienced, but the sudden onset of laryngeal dyspnœa should bring the disease to our minds. It may arise either as a primary or as a secondary affection. As a primary disease it may come on as part of an acute septic inflammation of the throat, or it may be part of angioneurotic œdema (§ 609) (see Acute Œdema of the Tongue (§ 215)). It may occur as a *secondary* condition in association with (1) one of the various causes of acute or chronic laryngitis; (2) a general anasarca; (3) injury of the glottis by boiling or caustic liquids, etc. Its rapid onset is the chief source of danger, but if the patient does not shortly succumb to asphyxia, recovery generally takes place in a few days.

The *Treatment* consists in the use of ice internally and externally. In severe cases, if a 20 per cent. cocaine spray or a local application of adrenaline with ephedrine fail, scarification of the epiglottis must be resorted to; and if this be unsuccessful, tracheotomy must be performed without delay. In infective cases penicillin and one of the sulphonamides are called for.

§ 168. **The Inhalation of a Foreign Body** will give rise to varying symptoms depending on its size and nature. A *large* foreign body will be arrested *in the larynx* and death from asphyxia will rapidly ensue unless it is removed or immediate tracheotomy



is carried out. A *small* foreign body is likely to pass into the trachea or one of the lower bronchi (usually the right).

*Symptoms.*—If a small foreign body is arrested in the larynx it will produce hoarseness or loss of voice and possibly some degree of dyspnoea. With a foreign body in the bronchus the symptoms differ markedly, depending on the nature of the material. There is usually some cough on inhalation, followed by a quiescent period. Later, cough will reappear and with it expectoration and possibly dyspnoea. *Non-vegetable foreign bodies* (pins, beads, etc.) on inhalation into the bronchus cause a cough of short duration and then may produce no symptoms for a considerable time—sometimes years: sooner or later, however, the cough returns. The bronchial obstruction produces collapse below the foreign body, and the collapsed lung becomes infected, giving rise to expectoration and, later, hæmoptysis: a lung abscess or bronchiectasis will eventually result. Unexplained attacks of cough and fever with unilateral chest disease should make one suspect the presence of a foreign body. X-ray examination and investigation by the introduction of iodised oil B.P. (lipiodol) and, if necessary, bronchoscopy should be carried out. *Vegetable foreign bodies* (peanuts, orange and apple-pips, etc.) in the trachea or a bronchus soon give rise to acute tracheo-bronchitis: an asthmatic type of wheeze may be heard at the patient's open mouth. Obstructive emphysema of the lung tissue below the foreign body may be produced, followed later by atelectasis with expectoration, dyspnoea, and pyrexia. X-ray examination will show no foreign body, but may show the emphysema or atelectasis. In cases where there is a reasonable suspicion of a foreign body, bronchoscopy should be carried out. In untreated cases lung abscess and eventually death will result.

*Treatment.*—The foreign body should be removed by direct laryngoscopy or bronchoscopy.

§ 169. **Chronic Laryngitis** is troublesome on account of the perpetual hoarseness and liability to acute laryngitis. Its causes are (1) repeated acute attacks; (2) excessive speaking, singing, teaching, overuse with faulty production of the voice (actors, clergymen, teachers, etc.); (3) masons and others exposed to dusty air; (4) nasal obstruction and mouth-breathing; (5) tubercle, syphilis, and new growths, evidences of which should always be sought for in cases of intractable laryngitis. These usually go on to ulceration (p. 236). (6) Spread of inflammation from adjacent parts. Many cases of chronic laryngitis are associated with a granular condition of the pharynx. Nasal sinusitis is a common cause, often overlooked. (7) Rheumatic and gouty diatheses predispose.

*Treatment.*—The indications are to avoid the cause and to relieve the local congestion. The removal of the cause is most important, and often most difficult to accomplish, for the living of many of these patients depends upon the daily excessive use of the voice. Much may be done to prevent and relieve the condition by proper voice-production and breathing exercises. This affection is extremely common among teachers, owing chiefly to faulty voice-production, and they ought to be specially trained to obviate this defect. The avoidance of tobacco and alcohol will aid, and residence in a dry climate will often accomplish a speedy cure. Locally, painting with strong astringent remedies, such as zinc chloride (1 in 16) or silver nitrate (1 in 24 or 1 in 16), are useful. These strong applications should not be made more than twice a week; weaker solutions can be applied more frequently. The patient himself may use sprays of alum (1 per cent.), zinc sulphate ( $\frac{1}{2}$  per cent.), menthol (1 per



cent. in paroleine), or argyrol (10 per cent.), two or three times daily, or inhalations of turpentine, creosote, iodine, menthol, etc., for fifteen minutes three times a day.

§ 170. **Perichondritis** is uncommon and is an inflammation of the perichondrium of the laryngeal cartilages. If considerable, it may lead to necrosis of the cartilages and abscess of the larynx. The differential features, besides loss of voice or hoarseness, are dull aching pain and acute tenderness. These may be accompanied by swelling in the neck. As regards its *Etiology*, apart from traumatism, it is rarely a primary malady. It more often occurs secondary to syphilitic or tuberculous laryngitis or to malignant disease, especially after treatment by radium or deep X-ray. Syphilis is its commonest cause. It may also follow typhoid and other specific fevers.

*Prognosis and Treatment.*—It is a serious affection, for even in the mild forms the voice is rarely restored. Stenosis of the larynx may result. If there be much swelling the dyspnoea is very marked, and the patient may die from pneumonia or gangrene of the lungs, or, in the suppurating forms, from pyæmia. Abscess and fistula may follow. Tracheotomy may be required: large doses of penicillin should be injected as early as possible.

§ 171. **Congenital Laryngeal Stridor** is a rare form of laryngeal stridor commencing at or soon after birth and generally passing off by the age of two years. It is due to a congenital malformation of the vestibule of the larynx, the epiglottis being folded on itself and the ary-epiglottic folds thus being approximated. Stridor is marked on inspiration, slight or absent on expiration. It is worse when the child is startled or excited, and may be absent during sleep. Cyanosis is rare and although there may be retraction of the thorax and abdomen the child is usually in good health. The cry and voice are normal. As a rule no treatment is required; small doses of chloral or potassium bromide help to quiet a restive child and to lessen attacks.

II. **Ulcerations of the larynx are met with chiefly in TUBERCULOSIS and SYPHILIS and, in persons past middle life, MALIGNANT DISEASE. The simple erosions present in CATARRHAL LARYNGITIS hardly amount to ulceration. Ulceration is also found in the later stages of LUPUS and LEPROSY, usually when cutaneous lesions are present.**

§ 172. (a) **Tuberculous Laryngitis** should always be suspected when a patient complains of constant hoarseness. This form of laryngitis is recognised by (1) the general pallor of the mucous membrane, accompanied by a thickening or swelling most marked over the arytenoids or the aryteno-epiglottic folds; (2) the occurrence of irregular, slowly growing ulcers, usually bilateral; and (3) the history or presence of pulmonary tuberculosis.

The *Prognosis* is always grave; it is not so very long since recovery was practically unknown. The course of the affection depends more upon the condition of the lungs (§ 131) than that of the larynx.

The *Treatment* at first is largely constitutional. Absolute rest from speech, a warm, dry climate, and sanatorium treatment, are essential (§ 131). Creosote in doses of 1 to 5 minims is recommended. Locally, menthol, one part to five of olive oil, used as paint, or an insufflation of menthol (1 in 7) in equal parts of iodoform and boracic acid, is valuable. In certain cases the application of the galvano-cautery is useful. For the pain, which may be severe enough to cause dysphagia, orthocaine B.P. (orthoform), or benzocaine B.P. (anæsthesin), gr. 3-5, may be inhaled



into the larynx from a Leduc's tube ; or the larynx may be sprayed with 10 per cent. cocaine. Alcohol has been injected into the superior laryngeal nerve with excellent results.

§ 173. (b) **Chronic Syphilitic Laryngitis.**—The laryngitis accompanying secondary syphilis may resemble simple catarrh, with the addition of whitish patches (§ 158). But that which occurs in the later stages nearly always takes the form of ulceration. The intensity of hyperæmia, the irritability, and the profuseness of the purulent discharge are features of syphilitic ulceration. It is distinguished from tuberculous ulceration by (1) the bright red colour of the mucous membrane ; (2) the presence of a deep, *rapidly growing ulcer*, with bright yellow surface, regular edges, often undermined, sometimes unilateral. (3) A history of syphilis and a positive blood Wassermann test.

*Prognosis and Treatment.*—This form of laryngitis is twice as rapid as, and far more destructive than, the preceding, and is liable to involve the cartilages (*vide* Perichondritis). Even when arrested considerable stenosis may result. The usual constitutional treatment must be carried out. Where neoarsphenamine cannot be given, full doses (60 to 100 grains) of potassium iodide must be taken.

(c) **Malignant Disease** and (usually in other countries) **Leprosy** give rise to ulceration of the larynx (see below).

III. **New Growths.**—*The diagnosis between benign and malignant growths often presents difficulty. SYPHILIS and TUBERCLE may very closely simulate new growths, especially malignant ones. The history of the case and a general examination are helpful.*

§ 174. (a) **Benign New Growths** are usually papillomata, fibromata or hæmangiomas. These are almost always unilateral and are pedunculated rather than sessile. They occur as a rule in children or young adults, whilst malignant disease is rarely seen before the age of forty. If the growth is on the vocal cord or prevents the cords meeting properly, hoarseness will result ; otherwise there may be no symptoms. Papillomata may be multiple and may cause stridor, especially in children. A form of chronic laryngitis is what is known as **singer's nodes**. These often affect the under surface of the vocal cord, and hence may be overlooked for a long time. They are distinguished from other nodules by their involvement of both sides symmetrically. Projections on the cords at the junction of the *anterior with the middle third* are probably Singer's Warts ; those situated at the *posterior* ends of the cords are probably pachydermia laryngis. In the latter case there is often a nipple on one cord which fits into a crater on the other. **Pachydermia Laryngis** is a localised chronic laryngitis (§ 169), usually most marked over the vocal processes. **Leprosy** may affect the larynx. Benign growths often cause but little inconvenience. They are generally removable, without ultimate damage, by snares or cutting forceps.

§ 175. (b) **Malignant Growths** of the larynx occur chiefly in men. They may be divided into two groups, (1) *extrinsic*, growing on the epiglottis, arytenoids, ary-epiglottic folds, pyriform sinuses and the pharyngeal surface of the cricoid, and (2) *intrinsic*, arising from the vocal cords, the ventricle and false cords, the interarytenoid region and the subglottic area. The *extrinsic* variety starts as a thickening of the mucous membrane, which may resemble a benign growth, or may be greyish-white, or have a ragged surface. It rapidly passes on to ulceration, with soreness or pain and perhaps hæmorrhage ; secondary enlargement of the glands follows. Death ensues unless early treatment is instituted. Laryngectomy or radiation therapy are available. *Intrinsic* cancer, on the other hand, is of slow growth, and low malignancy. It usually starts in the vocal cord, and causes a persistent huskiness. Every case of persistent hoarseness occurring in men over middle age should be sent to a laryngologist for examination. The diagnosis is often difficult, but a one-sided sessile lesion in a patient, especially if he is a man over forty, should raise suspicion, and the



case should be watched carefully. If the disease is malignant, ulceration will probably appear and the growth will spread along the cord. The movement of the affected cord will sooner or later be impaired. In many cases it is necessary to remove a piece of the neoplasm for microscopical examination. The operation of laryngofissure affords 80 per cent. of cures in these cases if seen early. X-ray and radium therapy, particularly telerradium treatment, afford excellent results in many cases.

IV. **Paralysis of the Vocal Cords** can only be detected by inspecting carefully both the POSITION and the MOBILITY of the cords during (i.) rest, (ii.) phonation and (iii.) deep inspiration.

§ 176. **Paralysis of the Vocal Cords.**—The larynx is supplied by two nerves, the superior laryngeal and the recurrent laryngeal branches of the vagus. The former supplies the crico-thyroid or tensor muscle and the mucous membrane of the larynx, while the recurrent laryngeal supplies all the other muscles. In progressive lesions of the recurrent nerve the abductors are paralysed first, and later on the adductors.

*The Signs of Laryngeal Paralysis.*—It is very rarely that a single muscle is paralysed; the paralysis nearly always affects a physiological group of muscles—i.e., the glottis-openers (abductor paralysis) or glottis-closers (adductor paralysis) on one or both sides. Paralysis is often accompanied by more or less catarrh, which modifies the appearance somewhat, but the evidences of laryngeal paralysis depend upon the position and mobility of the cords during phonation and respiration. The symptoms are given in Table XII.



FIG. 54.—MODERATE ADDUCTION.—The appearance seen during REST.



FIG. 55.—CADAVERIC POSITION of cords.



FIG. 56.—Typical position during PHONATION of high notes.

Normally, during rest the cords are midway between open and closed (Fig. 54); during phonation they are approximated so that practically no space is left between them (Fig. 56); during deep inspiration they are widely opened (Fig. 53).

When the cords are normal during phonation, but do not move out on inspiration, there is bilateral paralysis of the glottis-openers—*bilateral abductor paralysis* (Fig. 57). If both cords move during phonation, but one of them fails to move out fully during inspiration, there is *unilateral abductor paralysis* (Fig. 58).

When the cords neither move to the middle line with attempted phonation, nor move as far outwards as normal during deep inspiration, but remain midway between the two in the cadaveric position (Fig. 55), there is *total bilateral paralysis* of adductors and abductors (Fig. 59).

If during phonation and inspiration one cord remains immobile, there is *total unilateral paralysis*.

If there is aphonia, and on laryngoscopic examination the cords do not meet properly during attempted phonation, although they move outwards with inspiration there is *bilateral adductor paralysis* (Figs. 60 and 61).

The *Etiology* of laryngeal paralysees differs considerably in the various forms. They may arise from **organic** or **functional** conditions, but each is so characteristic that it can be readily identified. *Abductor paralysis*, whether unilateral or bilateral, is always organic in origin. If the left vocal cord cannot be abducted, it is almost certainly due to pressure on the left recurrent laryngeal, and this is frequently due to a mediastinal neoplasm. *Adductor paralysis* is always bilateral and functional in origin.



TABLE XII.—LARYNGEAL PARALYSES.

(From Gowers, slightly modified.)

<i>Lesion.</i>	<i>Symptoms.</i>	<i>Signs.</i>
Bilateral abductor (opener) paralysis.	Voice little changed; cough normal; inspiration difficult and long, and attended with loud stridor.	Both cords near together; not separated during inspiration, but even drawn nearer together.
Unilateral abductor (opener) paralysis.	Symptoms inconclusive; little affection of voice or cough. Brassy cough sometimes.	One cord near the middle line not moving during inspiration, the other normal.
Bilateral complete paralysis.	Weak voice; no cough; stridor only on deep inspiration.	Both cords moderately abducted and motionless ( <i>i.e.</i> , the cadaveric position).
Unilateral complete paralysis.	Voice low-pitched and hoarse; no cough; stridor absent or slight whilst breathing.	One cord moderately abducted and motionless, the other moving freely, and even beyond the middle line in phonation.
Bilateral adductor (closer) paralysis.	No voice; normal cough; no stridor or dyspnoea.	Cords normal in position, and moving normally during respiration, but not brought together on an attempt at phonation.

(a) BILATERAL ABDUCTOR PARALYSIS (Fig. 57) may be due to—

- (i.) The earlier stages of *pressure* upon both recurrent laryngeal nerves, as by mediastinal tumour, or œsophageal carcinoma.
- (ii.) *Central Causes*, as in lesions affecting the medulla or base of the brain, bulbar paralysis, disseminated sclerosis, syringobulbia, thrombosis, tumours, tabes dorsalis, chronic forms of meningitis (especially syphilitic pachymeningitis), etc.
- (iii.) *Peripheral causes* (rare), such as neuritis from toxins (diphtheria, alcoholism, influenza), certain drugs (*e.g.*, lead, arsenic). Myasthenia gravis may produce the same lesion.

(b) UNILATERAL ABDUCTOR PARALYSIS (Fig. 58) is due to the same causes acting on one side only. Thus, if on the *left side*, it is commonly due to aortic aneurysm, mediastinal tumour, or cancer of the œsophagus or bronchus: if on the *right side*, the commonest cause is cancer of the œsophagus, and (rarely) a thickened pleura. Pressure upon the vagus in the neck, as by an enlarged thyroid, or cervical glands, may affect one or both sides. (Very occasionally ankylosis of the crico-arytenoid joint is a cause: this may result from rheumatism, tuberculosis, trauma and other causes.)

(c) TOTAL (AB- and ADDUCTOR) BILATERAL PARALYSIS (Fig. 59) is always of organic origin. It may arise from any of the causes mentioned under Bilateral Abductor Paralysis, but is most frequently of *central* origin. It occurs later in the disease than abductor paralysis, the abductor fibres in the nerve being the first to be affected.

(d) TOTAL (AB- and ADDUCTOR) UNILATERAL PARALYSIS is due to the same causes as mentioned under unilateral abductor paralysis—*i.e.*, usually involvement of the recurrent laryngeal nerve. This condition, however, occurs at a later stage in the case, unilateral abductor paralysis being a feature of the earlier stage. Total paralysis is sometimes called "recurrent paralysis," because it is due to paralysis of the recurrent laryngeal nerve.

(e) BILATERAL ADDUCTOR PARALYSIS (Figs. 60 and 61) is always *functional* (*viz.*, unconnected with *gross lesions*): (1) hysterical; (2) simple catarrh, or over-use of the voice; (3) general weakness, as in anæmia. But the first of these is by far the most common.

*Diagnosis.*—Careful investigation of the chest and œsophagus should be made in all cases and the other cranial nerves should be examined.



*Prognosis.*—Laryngeal paralysis is generally only a minor element in the case. When occurring alone, however, the prognosis in adductor paralysis is good, because it is always of functional origin. In all forms the prognosis depends upon whether the cause is removable or not. Sometimes paralysis arising from syphilis is remediable if treated early.



FIG. 57.—BILATERAL ABDUCTOR PARALYSIS.—The patient is able to oppose the cords during phonation, but the cords do not move outwards during deep inspiration (as in Figs. 52 and 53).

The same appearance as the above is sometimes produced by acute laryngeal catarrh, but the cords would be pink instead of white.

*Treatment.*—Hysterical paralysis should be treated on lines laid down in § 888. Strong faradisation or static electricity to the larynx is sometimes indicated, the patient being instructed to call out loudly. In organic paralyzes the prognosis depends upon the cause. Syphilitic remedies should receive a fair trial. In organic cases, if dyspnoea be severe, tracheotomy must be performed.

ILLUSTRATIONS OF LARYNGEAL PARALYSIS.—It should be remembered, in studying these illustrations, that to test the motor power of the vocal cords it is necessary to make the patient INSPIRE deeply to OPEN the cords, then to PHONATE, so as to CLOSE the cords, for a given position of the cords conveys no informa-

tion unless it is first known which of these acts the patient is performing.

In laryngeal paralysis it is very important to decide whether a functional or organic cause is in operation, and the following hints should be remembered :

1. Glottis-closer (adductor) paralysis is functional; glottis-Opener (abductor) paralysis Organic.
2. Bilateral paralysis is often functional; One-sided paralysis is Organic.
3. Left Abductor (glottis-opener) paralysis suggests Aneurysm.



FIG. 58.—LEFT ABDUCTOR, or glottis-opener, paralysis.—DURING INSPIRATION the left cord remains fixed, instead of moving outwards as does the right cord. This occurs in early paralysis of the recurrent laryngeal nerve of ORGANIC ORIGIN—e.g., aneurysm.



FIG. 59.—TOTAL BILATERAL paralysis.—DURING INSPIRATION and DURING PHONATION both cords are immobile, and remain in what is practically the cadaveric position. Always of ORGANIC origin, and frequently central.

PATIENT'S RIGHT



FIG. 60.



FIG. 61.

PATIENT'S LEFT

FIGS. 60 and 61.—PARTIAL BILATERAL ADDUCTOR, or glottis-closer, paralysis.—It is the condition commonly met with in hysterical or FUNCTIONAL aphonia. DURING PHONATION the cords close anteriorly and posteriorly, but leave an elliptical space between them. Two muscles help to close the glottis—the crico-thyroid in front, and the arytenoideus behind. If the CRICO-THYROID is mainly affected, the condition depicted in Fig. 60 is seen, and it is met with in functional aphonia and exhaustion. The ARYTENOIDEUS closes the posterior angle, and when this is paralysed the posterior angle remains open (Fig. 61). Both of these forms are met with in acute and chronic laryngitis, and are generally independent of any actual nerve lesion, excepting perhaps peripheral neuritis and some rare cases due to a local lesion affecting the recurrent laryngeal nerve of both sides.



V. SPASM OF THE LARYNGEAL MUSCLES, and consequent INSPIRATORY DYSPNŒA, is not a very common occurrence, except in the form of *Laryngismus Stridulus*, a disease almost confined to childhood. It may arise when a foreign body passes into the larynx, and may occasionally occur in adults who are the subjects of acute laryngitis. Inspiratory dyspnœa may also arise in *Bilateral Abductor Paralysis*.

§ 177. **Laryngismus Stridulus or Nervous Croup.**—Syn.: Spasmus glottidis, spasmodic croup, child-crowing, is a form of paroxysmal inspiratory dyspnœa. This condition occurs in young children and it is considered to be due either to a spasmodic affection of the nervous system or to the indrawing by a more than usually deep breath, of unusually soft and yielding laryngeal tissues, so that the glottis is obstructed. The whole attack lasts from a few seconds to a minute or two. The child may become cyanosed or the spasms may spread to other muscles and give rise to general convulsions. Occasionally it terminates fatally. The attack usually comes on at night and starts with a few crowing inspirations followed by a period of apnœa. The attacks tend to recur, and their severity may increase at each recurrence. On the other hand, if the attacks are slight, they may gradually disappear as the child grows older. In the intervals the child is free from cough or hoarseness, and the larynx appears healthy.

*Etiology.*—It is a manifestation of infantile tetany (§ 778), and may be associated with infantile convulsions. It is practically confined to children of from four months to two years old, and is twice as common in boys. It is more frequent in the spring-time, and it is often hereditary. In older subjects laryngeal spasm and inspiratory dyspnœa occur sometimes in *tabes dorsalis*, when it forms the laryngeal crisis of that disease. Its rarer causes are epilepsy, hysteria, tetany, parathyroid deficiency, chorea, reflex irritation of the vagus or its recurrent laryngeal branch from mediastinal growths, a growth or foreign body in the larynx.

The *Diagnosis* is not difficult, though it is well to bear in mind the possibility of a foreign body in the throat, larynx, or trachea. There are, however, three pathological conditions to which the term "croup" is loosely applied and which are also characterised by a PAROXYSMAL INSPIRATORY DYSPNŒA.

1. *Laryngismus stridulus* is the non-inflammatory nervous affection described above. It is recognised by the absence of cough, hoarseness and other symptoms referable to the larynx in the intervals between the attacks. There is often a history of similar attacks.

2. *Catarrhal Laryngitis* (*laryngitis stridulosa*, false croup) is often associated with attacks of dyspnœa, coming on usually at night in children under ten who are suffering from cough and hoarseness during the day. It may last for an hour or so. It is due to the collection of thick secretion, to the relatively small size of the child's larynx, and to the readiness with which swelling occurs (§ 166). In addition, the nervous system of a child is more unstable.



3. *Membranous Croup*, or laryngeal diphtheria.—This is true diphtheria, and is attended by the constitutional and other symptoms of that disease. A non-diphtheritic membranous croup may occur. A severe injury (*e.g.*, drinking out of a boiling kettle) may certainly result in a membranous or “diphtheritic” inflammation of the mucous membrane.

*Treatment of Laryngismus Stridulus.*—(a) *For the Attacks.*—In severe cases cold water may be dashed in the face, or the patient plunged into a hot bath, or alternately hot and cold, or cold water douches applied. Inhalation of chloroform or ether relieves it promptly. Artificial respiration may revive, even after apparent death. In the rare cases in which the spasm is prolonged and continuous, tracheotomy may be necessary. Mild cases require no treatment except rest and warmth. (b) *For the Intervals.*—The patient should be kept very quiet, and any stimuli conducive to an attack should be avoided. Reflex causes of irritation should be sought for in the gums (*e.g.*, teething), the alimentary canal (*e.g.*, worms or gastric disorder), the lungs and elsewhere (*vide* causes). The general treatment of rickets should be adopted, and it is worth bearing in mind that children taken into the country very often cease to have these attacks. Calcium salts, vitamin D<sub>2</sub>, bromides and chloral in small doses, or injections of parathormone allay the irritability of the nervous system, on which the condition mainly depends.

VI. and VII. **Diseases of the Pharynx** (*ante*) and of the Nose (*post*) are generally attended by a certain amount of hoarseness and alteration of the voice. Nasal disorders give to the voice a characteristic nasal twang.

## THE NASAL CAVITIES

§ 178. **Symptoms and Physical Examination.**—Diseases of the nose will be considered under three cardinal SYMPTOMS: *Inodorous discharge* from the nose (Rhinorrhœa); *foul discharge* from the nose (Ozæna); *mouth-breathing* and snoring (Obstruction of one or both Nostrils). *Bleeding* from the nose also occurs in some nasal disorders, but it is *not* a cardinal symptom. It is perhaps more generally associated with some constitutional or general derangement. *Sneezing*, *tickling* in the nose and *sniffing* may also be present; the quality of the *voice* may be altered, particularly in nasal obstruction; and the sense of *smell* is always disturbed to some extent. In some instances, headache, vertigo, and other nervous derangements are met in association with disorders of the nose, especially when the free transit of air through the nasal passages is interfered with, and the air pressure within the tympanum disturbed. Various *constitutional symptoms* may result from septic conditions of the nose or the adjacent sinuses, and not infrequently a patient suffers from general toxæmia for a long time before our attention is directed to the true source of his troubles.



**Clinical Investigation.**—Rhinoscopy or examination of the nose may be effected through the anterior nares (anterior rhinoscopy), and the posterior nares (posterior rhinoscopy); and by digital examination posteriorly.

**ANTERIOR RHINOSCOPY.**—First examine the anterior nares for any obvious disorder, such as fissures, ulcers, scars from ulcers, any narrowing of the nares, or a deviation of the septum; secondly, introduce a speculum (Fig. 62), using either a direct light or one reflected from a mirror on the forehead, as in laryngoscopy. In this way an examination of the inferior turbinate bone can be made, to see if it be hypertrophied. The inferior or middle meatus should be examined for polypi or alteration in the mucous membrane. If, as frequently happens, the anterior part of the inferior turbinate is hypertrophied, and hides the view, this may be reduced by swabbing out with a cotton-wool pledget soaked in a 10 per cent. solution of cocaine.

**POSTERIOR RHINOSCOPY** is effected by depressing the tongue with a spatula and introducing a warmed postnasal mirror (like a very small laryngeal mirror) which should be placed facing upwards, below and behind the posterior edge of the soft palate. It is important to avoid touching either the dorsum of the tongue or the posterior wall of the pharynx. The patient should be instructed to breathe gently all the while through the nose. This depresses the soft palate and widens the field of observation. By moving the mirror slightly in different directions we are able to examine the posterior nares and turbinate bones, the inner end of the Eustachian tube for any swelling, and Luschka's tonsil (*cf.* Fig. 51). The pharyngeal or Luschka's tonsil is a mass of lymphoid tissue on the pharyngeal roof and posterior wall above and between the Eustachian tubes; when in a condition of hyperplasia it forms the cushion-like growth of post-nasal adenoids (§ 154).



FIG. 62.—NASAL SPECULUM.

Information may also be derived by passing the finger behind the soft palate; for this it is generally necessary to spray the pharynx with anethaine (4 per cent.). In young children, **POSTERIOR RHINOSCOPY** is often difficult. A **DIGITAL EXAMINATION** may be effected by introducing the forefinger behind the soft palate and guiding it along the wall up to the roof of the pharynx. If skilfully done, this causes nothing more than an unpleasant surprise and is not resented by the little patient.

**TRANSILLUMINATION** of the antra is a useful aid to diagnosis.—A bright light is placed in the mouth and with the room dark a crescent of light appears over the lower eyelids. With an infected antrum, the normal crescent will be absent on that side. Similarly the light may be placed on the floor of the frontal sinus. **X-RAY EXAMINATION OF THE SINUSES** is extremely helpful; disease in any sinus causes an opacity.

Our *first* inquiries concerning any given case of suspected disease of the nose should be relative to the **LEADING SYMPTOM**, especially whether there be any nasal discharge, and whether it is inodorous or foul smelling.



We cannot depend upon the patient's statement on this point, because often the disease which causes a foul discharge may blunt the sense of smell. *Secondly*, we must investigate the HISTORY, and whether any of the other symptoms above mentioned were present. *Thirdly*, we proceed to the PHYSICAL EXAMINATION. Test whether the patient can breathe freely through each nostril separately; then examine the anterior and the posterior nares.

**Classification.**—Diseases of the nose, like those of the throat, are best classified by the PHYSICAL SIGNS met with on examination—viz., **nasal discharge, nasal obstruction, epistaxis**—and their **causes**.

(a) ACUTE INODOROUS DISCHARGES (Acute Rhinorrhœa)—the causes of which are—

- I. Acute Rhinitis; II. Acute Sinusitis; III. Hay Fever; IV. Spasmodic Rhinorrhœa; V. Diphtheria, and other fevers; VI. Syphilis (snuffles); VII. Glanders; VIII. Myiasis.

(b) CHRONIC INODOROUS DISCHARGES (Chronic Rhinorrhœa)—the causes of which are—

- I. Chronic Simple Rhinitis; II. Chronic Hypertrophic Rhinitis; III. Post-nasal Catarrh; IV. Chronic Sinusitis and Polypi; V. Cerebro-spinal Rhinorrhœa.

(c) CHRONIC OFFENSIVE DISCHARGES (Ozæna), which have for causes—

- I. Chronic Sinusitis; II. Atrophic Rhinitis; III. New growths and foreign body; IV. Ulcerations and Bone Disease—Syphilis, Tuberculosis and Lupus.

(d) NASAL OBSTRUCTION (Snoring and mouth-breathing)—the causes of which are—

- I. Adenoids; II. Polypi; III. Deviated Septum; IV. Hypertrophy of Turbinate; V. Foreign body and neoplasms; VI. Hæmatoma and abscess of the septum.

(e) EPISTAXIS, the causes of which may be Local or General.

§ 179. **Acute** (or recurrent) **Inodorous Discharge from the Nose (Rhinorrhœa).**—*The patient complains of an ACUTE ODOURLESS DISCHARGE FROM THE NOSE, which should be confirmed as the disease may have blunted the sense of smell. The commonest causes at any age are ACUTE CORYZA and SINUSITIS. Apart from this, CONGENITAL SYPHILIS should be suspected in infancy; DIPHTHERIA in childhood.*

I. **Acute Rhinitis** may be set up by *irritation* of any kind, as by the vapour or dust of some trade, or by any injury. For instance, a profuse discharge from one nostril in a child should make us suspect his having inserted a pea, marble, or other *foreign body*, although the history may be wanting. But its commonest cause is a "cold." In **Acute Coryza**, "catarrh," or "cold in the head," there is profuse muco-purulent discharge attended by sneezing, running from the eyes, and febrile symptoms with frontal headache, extending over a few days. It is usually attributed to "a chill"; but it frequently prevails in an epidemic form, and is of infective origin due to a droplet infection (§ 523). It is predisposed to by cold and damp weather, by adenoids, septic tonsils, sinus trouble and other causes



of chronic rhinitis. It is not serious, but causes much discomfort and, if repeated or prolonged, may lead to middle-ear catarrh, or to bronchitis.

*Treatment.*—Prophylactic treatment consists in accustoming the skin to changes of temperature, in teaching every child to breathe correctly through the nose, in maintaining the general health during cold and damp weather, and in instructing the public that a cold is a contagious disease and that it is therefore the duty of everyone who has a cold to take precautions not to infect others. Sneezing and coughing during the early stages of a “cold” project the infecting micro-organisms many feet into the surrounding air; therefore a handkerchief must always be used. If a delicate member of the household catches the cold, it may become a serious illness. Hence, whenever possible, those infected with a simple cold should stay in bed: Dover’s powder may be given. Locally, inhalations, ointments and sprays aid cure and act as prophylactics for those exposed to infection. Anticatarrhal local remedies are ephedrine, amphetamine or menthol, camphor and borax, in paroleine. During the warm weather susceptible persons should be examined for sources of sepsis, such as adenoids, tonsils, sinuses, and have these dealt with. Vaccines, especially autogenous (because different organisms affect different individuals), are excellent both for prophylaxis and for cure, *when given in appropriate doses*. The doses usually recommended are too large for susceptible or delicate persons, and often precipitate a cold. When a susceptible person is threatened with a cold,  $\frac{1}{40}$  to  $\frac{1}{10}$  of the usual dose will often abort the malady.

II. **Acute Sinusitis** commonly occurs as a result of an attack of Acute Rhinitis, or during the course of influenza. (For other causes, see § 181, I.) The symptoms are nasal discharge and obstruction. In the case of the *maxillary* sinus pain may be felt in the cheek; with *frontal* sinusitis, severe frontal headache is felt. With *ethmoiditis* there is pain behind the eyes; occasionally orbital cellulitis with proptosis arises and severe complications may ensue. With *sphenoidal* sinusitis the characteristic headache is occipital or vertical; see § 181, I, and § 696, IV.

*Treatment* should aim at favouring drainage from the affected sinus. The application of cocaine and adrenalin, argyrol 10 per cent. or protargol 10 per cent., or the use of ephedrine hydrochloride (1 per cent. in normal saline) in a spray is often extremely useful. Inhalations with menthol or tinct. benzoin co. are helpful. In severe cases the sulphonamides and penicillin should be given. Short-wave diathermy is of value. In the case of the maxillary sinus, puncture and lavage may be necessary, and if the condition fails to clear up, an operation to establish drainage may be called for.

III. **Hay Fever** is a condition of allergy, affecting the nasal mucous membrane and conjunctivæ, due to hypersensitivity to grass pollen. It comes on fairly regularly in April, May, June or August of each year, depending on the particular pollens to which the patient is sensitive (in this country usually to timothy grass).

*Symptoms* may start between the age of 4 and 20 years, tend to recur each year, but usually die away by middle life. (i.) There is intense irritation of the eyes, nose and back of the throat; (ii.) considerable paroxysmal sneezing occurs, often with (iii.) periodic profuse watery discharge from the nose and eyes; (iv.) headache, mental depression and exhaustion may be present; (v.) Hay asthma, with bronchial spasm, may occur in the worst cases. Symptoms are always aggravated on hot windy days and markedly relieved in cool and wet weather.



*Physical signs.*—There is marked nasal obstruction, with a general swelling of the mucous membrane of the nose, which is pale and often “water-logged.”

*Etiology.*—The condition is due to an allergic state, often with an inherited disposition to other allergic manifestations. It is always aggravated by contact with the particular allergens, and those affected cannot go near a hayfield in summer months without developing the disease. It is *diagnosed* from simple coryza by its seasonal occurrence, the symptoms and by the appearance of the mucous membrane.

*Treatment.*—The first indication is to avoid the cause: in severe cases residence by the sea, or at an altitude may be necessary. A course of desensitising injections of a vaccine composed of the pollens to which the patient is most sensitive is best given before the hay-fever season commences: it should be repeated each year and in many cases gradually produces permanent desensitisation. Capsules of benadryl (25–50 mgm. t.i.d.) are often of great help, but occasionally produce mental depression and other symptoms. Argyrol (10 per cent.) is a useful application, and zinc ionisation of the nasal mucosa, the application of the electro-cautery or CO<sub>2</sub> inhalations often help. For the conjunctivitis give dark glasses and use estevin drops: or eye-drops containing ephedrine hydroch. gr. 1, dextrose gr. 5, liq. adrenal. ℥ 10 in N-saline ad. ℥ 100. Ephedrine internally or used as a spray usually cuts short an attack.

IV. **Paroxysmal or Spasmodic Rhinorrhœa** is an allergic disorder; it produces the same symptoms as Hay Fever, but may occur at any time of the year. Various causes are responsible for it in different patients—house dust, animal emanations, face powder containing orris root, etc., and sensitivity to certain articles of diet are the commonest known causes. *Treatment* is on similar lines to that of Hay Fever. Many cases respond to treatment by calcium gluconate (gr. 60 t.i.d., a.c.) and parathyroid (gr.  $\frac{1}{10}$  b.d.). Desensitisation may be successful: cauterisation of the nasal mucosa is useful. Benadryl or antistin may give relief.

V. **DIPHTHERIA.**—There is nasal discharge, often blood-stained, with excoriation of the nostrils and upper lip. Nasal obstruction is present but constitutional symptoms are slight; the condition is often present for some weeks before advice is sought. A greyish-white membrane is seen on the septum and inferior turbinals; diphtheria bacilli are found in the membrane and can be cultured. (See § 921.)

VI. **“The Snuffles.”**—In infants a few weeks old, congenital syphilis is usually attended by profuse nasal catarrh, known familiarly as the “Snuffles.” Syphilitic snuffles is obvious in the presence of a purulent rhinitis and other associated symptoms. Respiration is noisy and the discharge is usually blood-stained. (See § 181. IV.a.)

VII. **GLANDERS.**—The copious discharge of viscid semi-purulent matter from the nostrils is one of the earliest symptoms of Farcy, or Chronic Glanders (§ 491).

VIII. **Myiasis** is chiefly met with in tropical countries. It is due to the presence of maggots. The eggs from which they hatch are laid by a fly on the nasal mucous membrane, usually while the patient is asleep. Inhalation or local application of pure chloroform is the usual remedy, but insufflations of calomel are also successful.

§ 180. In **Chronic Nasal Discharges** it is still more difficult to draw the line between odorous and inodorous discharges, since many of the conditions, though odourless at the outset, become offensive later on, and it is generally necessary to pass in review all the conditions mentioned in this section and § 181. The following are the chief causes of INODOROUS DISCHARGE:

I. **Chronic Rhinitis** is a chronic inflammatory condition of the mucous membrane of the nose, attended by increased secretion, and usually by thickening. It occurs in three forms: (a) SIMPLE; (b) HYPERTROPHIC (*infra*); (c) ATROPHIC (§ 181). The first two give rise to an *inodorous*, but the ATROPHIC to an *odorous* discharge.

CHRONIC SIMPLE RHINITIS is a chronic, congested, and sometimes, later on, hypertrophied state of the mucous lining of the nose, with a



continuous mucous or muco-purulent discharge. There is generally some nasal obstruction, giving rise to altered voice and snoring.

*Etiology.*—(i.) It is *predisposed to* by cardiac and pulmonary disease, alcoholism, and the tuberculous diathesis. It may be *determined* by (ii.) recurrent attacks of neglected coryza ; (iii.) injury caused by an unsuspected foreign body, in which case the condition is generally confined to one side ; or (iv.) constant irritation of dust and noxious vapours—*e.g.*, in masons, fustian-cutters. (v.) Oversmoking. (vi.) It is often associated with adenoids, enlarged tonsils, a deflected septum, and other causes of obstruction in the nose. (vii.) Obscure antral or sinus trouble.

*Prognosis.*—The disease is chronic, and requires prolonged treatment. The chief fear is that middle-ear catarrh may result from the extension of the inflammation up the Eustachian tube. Even apart from this, it is very important to treat these cases in children, because the condition interferes with the respiratory functions of the body.

*Treatment.*—In the early stages alkaline washes—sod. chloride, gr. 10., sod. bicarb., gr. 10, and borax, gr. 5, or carbolic acid, gr. 3 to fl. oz. 1—should be sniffed up or given by the nasal douche. This is followed later on by a spray of menthol and eucalyptol (gr. x. to fl. oz. i. of aquol or paroleine), or argyrol (10 per cent.). Constitutional treatment is necessary, by means of tonics, cod-liver oil and other sources of vitamin A. Alcohol should be avoided, and a high and dry climate should be sought. In some cases, treatment by short-wave diathermy or the cautery is helpful.

**II. Chronic Hypertrophic Rhinitis** is a special form distinguished from the preceding by the fact that there is considerable hyperplasia of the nasal mucous membrane, especially over the inferior turbinate bone at its anterior and posterior ends. It presents the same symptoms as the preceding, but in a greater degree. Even in slight cases it is apt to be accompanied by headache and mental depression. It is frequently associated with adenoids. The *Prognosis* is on the whole less favourable. The *Treatment* is much the same, but more active measures are indicated—sometimes surgery and sometimes cauterisation.

**III. Post-nasal Catarrh** is usually due to some definite cause in the nose, or to pharyngitis. Occasionally a localised catarrhal inflammation of the naso-pharynx is responsible. *Treatment* should be directed to the primary cause if this can be found ; otherwise follow on the lines advised for Chronic Rhinitis.

**IV. Chronic Sinusitis** and **Nasal Polypi** often produce an inodorous muco-purulent discharge. The conditions are dealt with later, § 181, I, and § 182, II.

**V. Cerebro-spinal Rhinorrhœa** is a continual dripping of a watery, clear fluid (cerebro-spinal fluid) from the nose, due to the formation after injury or disease of a communication between the nasal cavity and the sub-arachnoid space. The fluid passes through the cribriform plate of the ethmoid. Its nature is at once recognised by the fact that it reduces Fehling's solution. The flow sometimes ceases spontaneously. Some cases have been successfully treated by applying to the nasal mucosa



irritants which cause swelling and occlusion of the fistula. By the insertion of a fascial graft the deficiency may be closed.

§ 181. **Ozæna** or a **Chronic Offensive Discharge** from the nose may occur in the later stages of MANY OF THE CONDITIONS mentioned in the preceding section. But the chief causes of foul discharge from the nose are as follows: the commonest and foulest occurring in ATROPHIC RHINITIS in the young; SYPHILITIC DISEASE in middle life; and CANCER in the aged.

Foreign bodies (which have already been referred to) may cause one-sided ozæna, and are described under Nasal Obstruction (§ 182), which is their leading symptom. It is here necessary to give some detailed account of—Chronic Sinusitis; Atrophic Rhinitis; and Ulcerations and Bone disease.

I. **Chronic Sinusitis** may occur in any or all of the accessory nasal sinuses. It is usually due to an extension of infection from the nasal cavities. Chronic maxillary sinusitis is the commonest form; sinus infections may be overlooked for months or years.

*Symptoms.* (i.) The most constant and cardinal symptom is discharge from one nostril, which is occasionally foul smelling. (ii.) Sometimes discharge is not noticed and nasal obstruction is the main complaint. (iii.) Pain may be localised over the area of the involved sinus, or may be referred to the various parts of the skull, particularly when acute attacks of sinusitis supervene (§ 179). (iv.) Various constitutional symptoms, due to septic absorption, are associated with sinus disease. Lassitude, headache, occasional elevations of temperature, and numerous nervous and vasomotor symptoms are amongst the commonest. They generally have a periodic or paroxysmal character. Facial neuralgia may result from sinus disease. (v.) If overlooked or neglected, sinusitis may excite middle-ear catarrh (with tinnitus, deafness, etc.), recurrent nasal catarrh, and nasal polypi: cases of chronic sinusitis are often associated with asthma, recurrent bronchitis and bronchiectasis.

*Physical Signs.*—(i.) Pus is seen in the nose, draining from the affected sinus. It is seen in the middle meatus under the middle turbinate when it comes from the maxillary antrum, or from the frontal or anterior ethmoidal sinuses: and flows over the middle turbinate and down to the pharynx when it is derived from the posterior ethmoidal cells and sphenoidal sinuses. (ii.) Transillumination (by putting a bright light in the mouth) shows an absence of the characteristic crescent of light through the lower eyelid, when one antrum is diseased. (iii.) X-ray examination shows an opacity in the affected sinuses, and sometimes a fluid level is seen in a diseased antrum. (iv.) Diagnostic puncture and lavage will further confirm the presence of pus.

*Etiology.*—Acute Rhinitis or “cold in the head” is probably the most frequent cause. Influenza is responsible for many cases. It may arise in the course of any of the acute specific fevers, and after injury or operation on the nose. Infection of the maxillary sinus frequently follows dental disease or the extraction of teeth.



*Prognosis.*—Chronic sinusitis is intractable, but very rarely fatal.

*Treatment.*—Relief is given by inhalations of 25 per cent. menthol in spirit, 10 drops to a pint of boiling water, by ephedrine in a spray or drops or by alkaline douches. Operation may be needed to establish drainage, before a cure is possible.

II. **Atrophic Rhinitis**, also known as idiopathic or true ozæna, is characterised by (i.) a thick, foul discharge, which is sometimes profuse, sometimes scanty; (ii.) the nasal cavities are often large, and the bridge of the nose broad and sometimes depressed. The mucous membrane is thin, pale, and covered with crusts, hard, adherent, and decomposing. Sometimes it is unilateral—*e.g.*, in cases of deviated septum. A certain amount of chronic pharyngitis is usually present. (iii.) The breath has a foul odour, which is not detected by the patient, as the sense of smell is blunted. It is *Diagnosed* from the other causes of ozæna by the absence of ulceration, the presence of atrophied mucous membranes, and wide cavities.

*Etiology.*—(i.) It is commoner in the young and in women. It usually starts before sixteen years of age. (ii.) Unilateral atrophic rhinitis is mostly due to some local cause, such as deviated septum or sinus disease, the narrower side being healthy. (iii.) The exciting causes of bilateral atrophic rhinitis are obscure. It is much less common than it was some years ago, and its disappearance seems to have occurred with the general improvement in the nation's health. (iv.) In some cases it follows too extensive operative interference.

*Prognosis.*—Prolonged treatment is necessary, and even this is not very hopeful if the disease be advanced. The disorder is generally most marked at about twenty years of age; it becomes less troublesome at middle age, and, as it gradually disappears with advancing years, we may presume that it tends slowly to spontaneous cure.

*Treatment.*—Alkaline and antiseptic douches and sprays are indicated, as in § 180. To stimulate the mucous membrane, nasal tampons of cotton wool, soaked in 25 per cent. glucose in pure glycerine, are used. These are useful in unilateral rhinitis, as they ensure respiration through the narrower cavity. The instillation of œstrin into the nose is said to help. Constitutional treatment is also advisable. Vaccines assist certain cases. Various operations such as cartilage grafting have been devised to narrow the nose, and while they do not cure, considerable improvement may result.

III. **Neoplasms and Polypi** (§ 182, II), and **Impacted Foreign Body** (§ 179, I, and § 182, V), are referred to elsewhere.

IV. **Ulcerations and Bone Disease** attacking the nose are mostly of traumatic or syphilitic origin. Neoplasms in the later stages ulcerate, but in the earlier stages give rise to discharge and Nasal Obstruction.

(a) **Simple perforation** of the nasal septum causes a small perforation in the front of the cartilage: it is probably due to repeated small traumata.

(b) **Syphilitic Rhinitis.**—In the early stages of syphilitic infection we may get an acute catarrh with superficial ulceration, which is the condition found in children with congenital syphilis, known as “snuffles.” In the later stages gummata form in various situations, which *rapidly involve the bone* and other parts; the discharge then becomes very foul. The ulcers have the same characters as those affecting the throat (*q.v.*). There is a positive Wassermann reaction.

(c) **Tuberculosis** of the nose is extremely rare except in the form of LUPUS, which is not infrequent. It is more common in women than in men, and occurs most often between the age of 15 and 30 years. The anterior part of the septum and the adjacent part of the inferior turbinal present characteristic apple-jelly-like nodules. Perforation of the cartilage of the septum may result; sometimes crusting and fœtor. The progress of the disease is very slow—much slower than with syphilis.

*Diagnosis.*—Atrophic rhinitis is distinguished from these ulcerations by the pallor and thinning of the mucous membrane, the absence of visible ulcers, and the absence of a history of syphilis or tubercle respectively.

The *Prognosis* of nasal ulceration is fairly good if the patient comes under treatment



early, otherwise it leads to considerable destruction of tissue. Lupus Vulgaris may slowly lead to the destruction of the *alæ* of the nose, but syphilis results in the most extensive destruction of the *bones* both of the septum and the palate; the bridge of the nose falls in, and the anterior nares may be represented by a single gaping orifice. It is this extensive and rapid destruction which is so pathognomonic of nasal syphilis.

*Treatment.*—Carbolic and astringent sprays are useful palliatives, but surgical measures may be called for if the bone is involved. All dead bone must eventually be removed. Neoarsphenamine or large doses of potassium iodide lead to rapid healing of syphilitic ulcerations. For Lupus, in the early stage, general and local light treatment is useful. The galvanocautery or diathermy may be needed in more advanced cases. Calciferol should be given.

**§ 182. Nasal Obstruction, Snoring, and Mouth-breathing.**—*Nasal obstruction may be partial or complete, and it may exist on one or both sides. It is met with in a greater or less degree in nearly all of the various nasal conditions previously discussed, and it is a marked feature in HYPERTROPHIC RHINITIS (§ 180, II). Its commonest cause in children is ADENOIDS (§ 154). It is also a cardinal symptom in NASAL POLYPI, DEVIATION OR SPUR OF THE SEPTUM, COLLAPSE OF THE ALÆ NASI, FOREIGN BODIES, NEOPLASMS, HÆMATOMA and ABSCESS of the SEPTUM.*

*Effects.*—Apart from the inconvenience of snoring, nasal obstruction renders the individual prone to pharyngitis, stomatitis, bronchitis and other results of entry of cold air into the lungs without its being properly warmed by its passage through the nose. Among the other consequences are a nasal quality of the voice, distortion of the chest (when arising early in life), and impeded respiratory functions of the body generally. The ultimate results are quite out of proportion to the degree of local mischief.

**I. Adenoids** are very common and are described in § 154. They are the most frequent cause of mouth-breathing and snoring in children, and are often overlooked by parents, a circumstance greatly to be regretted for three reasons. First, they are one of the chief causes of chronic otitis media and deafness in after-life; secondly, they impede breathing; and thirdly, the characteristic open mouth and vacant aspect produce an appearance of backward intelligence which, in point of fact, may result.

**II. Polypi**, or pedunculated tumours, are the most frequent new growths in the nose. Polypi are of three kinds: (a) MUCOUS; (b) NASO-PHARYNGEAL; and (c) MALIGNANT.

(a) Mucous Polypi are frequently seen. They may occur early in life; but are more common after puberty and more frequent in men than women. They are not neoplasms but œdematous mucosa associated with disease of the ethmoidal sinuses. There is often an allergic diathesis. They may be unilateral, but more frequently bilateral. The extent of polypiformation may vary from a few small beads along the under surface of the middle turbinate to enormous masses completely filling both nostrils. If carefully looked for they may be found in many cases of asthma, hay fever and spasmodic rhinorrhœa. In most cases their detection is not difficult; they appear as long, pedunculated, pale grey, glistening bodies.

Antro-choanal polypus is due to chronic infection in the maxillary sinus. The polypus grows out of the antrum and passes back to the naso-pharynx, where



it may be seen with the post-nasal mirror. It usually resembles a mucous polypus, but it may be rather pink in colour.

(b) Naso-pharyngeal polypus, or fibroma of the naso-pharynx, a rare but serious disease, grows from the periosteum of the naso-pharynx. It may expand the bones of the face and produce the deformity known as "frog-face." The main symptoms are: nasal obstruction, discharge, headache and epistaxis. They are considered benign tumours because they do not disseminate or involve glands, although they tend to recur locally.

(c) Malignant growths or polypi are not common in the nose and naso-pharynx, but epithelioma and sarcoma do occur. They grow rapidly and cause "frog-face," glands in the neck, pain, and a hæmorrhagic and offensive discharge.

Simple polypi may occur as a result of septic infection in cases of malignant disease of the ethmoid and antrum. These neoplasms may assume a polypoid appearance but are generally fleshy and bleed readily.

*Prognosis and Treatment.*—Simple polypi usually recur when removed with a snare or punch forceps. With the judicious use of cocaine this operation is easy and painless. Radical surgical treatment of the ethmoidal labyrinth is the only curative measure. Antro-choanal polypus may be removed by the snare but no satisfactory result is gained unless the antrum is at the same time opened and drained. The fibroma and malignant growths require operations of some magnitude and skilled use of X-rays and radium.

III. **Deflected Septum and Nasal Spur.**—The nasal septum is rarely quite in the median line, but the displacement is often considerable. Sometimes it results from injury. Various consequences may ensue, such as hypertrophied turbinate on one side, atrophic rhinitis on the other. When an angle is formed in the septum nasi, it is spoken of as a "spur," and this is most readily dealt with by the surgeon.

IV. **Hypertrophied Turbinate** is met with usually either as part of, or a consequence of, chronic hypertrophic rhinitis or nasal allergy. It may occur on one or both sides, and in either case, in narrow nostrils, produces partial obstruction, snoring, and mouth-breathing. *Treatment* should first be directed to the causative disease in the nose. Applications of the galvano-cautery are often useful and occasionally partial removal may be required.

V. **Foreign Bodies** within the nose, and **Malignant Neoplasms**, especially of the ethmoid and antrum, may also produce *unilateral* nasal obstruction and discharge. Epiphora is common even before a local swelling appears.

VI. **Hæmatoma of the septum** is almost always due to trauma. The septum swells so as to occlude both nostrils. If not drained, the contents suppurate and *abscess* results.

§ 183. **Epistaxis** (bleeding from the nose) may be a symptom of nasal disorders, but if in any appreciable quantity it is usually evidence of some general disorder. Frequently both general and local causes are in operation. The *nasal cavities should be carefully examined*. The blood-vessels give way in this situation (sometimes as a kind of safety valve) merely because they are thin-walled, numerous, near the surface, and liable to traumata great and small. So much is this the case that the diminished atmospheric pressure on high mountains may produce nose bleeding.

(a) **LOCAL CAUSES**, in which the hæmorrhage consists usually of little more than streaks, may arise from any marked congestion of the mucous



membranes, such as that which accompanies adenoids, polypi, acute rhinitis, multiple telangiectases, worms in the nose; or as a consequence of mechanical violence, applied either directly to the nose or to the base of the skull, traumatism or foreign body. Any destructive disorder—such as new growths, especially malignant, syphilitic, tuberculous, or other ulcerations (which if small are *very apt to be overlooked*)—may be attended by recurrent bleeding. When small in quantity the blood often passes backwards into the throat and is swallowed, or it may be coughed up, and be mistaken for hæmatemesis or hæmoptysis.

(b) With CONSTITUTIONAL CAUSES the bleeding is usually, although not always, of larger quantity, and it may, indeed, be so profuse as to endanger life. In this group the blood comes from a spot near the anterior part of the septum. Among the *predisposing causes*, there is in certain individuals an idiopathic family tendency to bleed from the mucous surfaces (not amounting to hæmophilia) with or without a wound. Epistaxis is more frequent in children, especially in boys. It is also met in the aged, but only when vascular disease and some other conditions about to be mentioned exist. The constitutional causes may be grouped under (a) *Alterations in the Cardio-vascular System*, and (b) *Altered Blood States*.

(a) Epistaxis occurring for the first time in an apparently healthy person over forty years of age should always give rise to the suspicion of chronic nephritis or hypertension. I have observed several patients who, after repeated admissions to hospital for epistaxis, have finally come in to die of cerebral hæmorrhage. Epistaxis frequently occurs with cardiac valvular disease, emphysema, chronic bronchitis, and cirrhosis of the liver: also with thoracic tumours, extremes of temperature, after violent exercise, with the menstrual period, mountaineering and in aeroplanes.

(b) *Altered Blood States*: Purpura, hæmophilia, scurvy, leukæmia, anæmia (simple and pernicious), deficiency of blood platelets (thrombocytopenia), and the specific fevers, especially typhoid, acute rheumatism, and the hæmorrhagic forms of the exanthemata. It is in children a not infrequent prodromal manifestation of whooping-cough and other fevers.

*Prognosis*.—Slight epistaxis in children is of no consequence, but when occurring for the first time in persons at or past middle life it should receive serious attention. Inquiry should always be made as to whether it has occurred previously because, as above mentioned, certain persons have this tendency, and in these the symptom is not important.

*Treatment*.—Epistaxis which accompanies nephritis and the congestion of cardiac and pulmonary disease should not be checked unless the amount be profuse. In such cases the epistaxis is usually preceded by headache, and is accompanied by high blood-pressure. In all cases of epistaxis, examine the blood pressure. So long as this remains high or moderate no harm can accrue from the epistaxis.

(a) The treatment of *the attack* resolves itself into checking the hæmorrhage. The patient should be kept perfectly quiet, sitting up in bed, the head being cool, the feet warm. With the head tilted slightly to one



side, palatal movements should be restricted by instructing the patient to breathe through the mouth, with a dental prop or cork between the teeth (Trotter). Morphia should be given if the hæmorrhage is severe. Pressure should be kept up over the anterior part of the septum with the thumb and forefinger externally. The cautery, at a dull-red heat, may be applied to the bleeding spot. Other useful measures consist of using an adrenalin spray, or in severe cases packing the nose with ribbon gauze soaked in adrenalin or adrenalin and cocaine (5%). Rarely is it necessary to tie, by operation, the anterior ethmoidal artery or even the external carotid artery. Serious anæmia may be suspected when there is extreme pallor of the skin and mucosa; this can be confirmed by a blood examination. In such a case it may be necessary to resort to blood transfusion (§ 537).

(b) *Between the attacks a thorough investigation* of the nasal and post-nasal cavities must be made. A deflection of the septum near the front of the nose on which dust or face-powder collects may be responsible and require correction. Minute lesions are easily overlooked. Vaseline or lanoline introduced into the nostril often helps to prevent attacks: this is most useful where children are prone to epistaxis.

## THE THYROID GLAND

This gland is anatomically connected with the upper respiratory passages, but is physiologically quite separate. The activity of the gland is in part controlled by the thyrotropic hormone of the pituitary. Deficiency of thyrotropic hormone leads to underaction of the thyroid gland, whereas excess may produce hyperthyroidism. From the colloid secretion of the thyroid thyroxin has been isolated; it contains iodine. When the thyroid secretion is increased the thyroxin stimulates the sympathetic nervous system, in part by acting on the suprarenal medulla. Together, these stimulate the liver to liberate glycogen, which circulates as glucose. The thyroid is in close relationship with the other ductless glands, especially the suprarenal, pancreas, and ovary. In health it enlarges at puberty, during menstruation, sexual excitement, pregnancy, lactation, and in the presence of most acute specific fevers, notably rheumatic fever. An unusual degree of enlargement at puberty is not pathological unless constitutional symptoms are present.

**Symptomatology.**—There are two opposite clinical conditions which may arise from disorder of the thyroid gland. In one there is a *diminished* thyroid action, a condition of *Hypothyroidism*, the symptoms of which (lethargy, lowered vitality, and impaired growth and development) are similar in kind but less in degree to those of Myxœdema and Cretinism. The other condition is one of *increased* (or perverted) thyroid action or *Hyperthyroidism* (thyrotoxicosis): this, with the exception of the proptosis, can be produced by the internal administration of thyroid extract or thyroxin in large doses to normal people. It is important to remember that the size of the gland does not necessarily aid diagnosis, for enlarge-



ment of the gland is consistent with diminution of its function; while what appears to be a small gland may be functionally very active.

§ 184. **Physical Examination and Classification.**—There are but two physical signs referable to the thyroid gland—viz., enlargement or diminution of volume, and altered consistency. When the change in volume is only slight it is difficult, if not impossible, to estimate it with accuracy, because it is partially covered by muscles, and is intimately connected with the trachea and other deeper structures. The patient should be instructed to let his head fall forwards and *to swallow* whilst we endeavour to palpate the gland. The thyroid rises during deglutition as does no other tumour in the neck. Note whether the enlargement is regular and diffuse, or irregular and localised. Some idea may be obtained of the progress of a case by measuring the neck from time to time, always exactly at the same level.

When the thyroid fails to develop normally, part of the thyroid tissue may be left at the base of the tongue. There it forms a painless, soft swelling in the mid-line, which may not attract notice until it enlarges at puberty or later. If the swelling be removed, myxœdema or hypothyroidism will follow in the event of there being no other thyroid tissue.

**Classification.**—There are six well-marked causes of *enlargement* of the thyroid, and several rare causes. *Diminution* of the gland occurs in two well-marked types.

(A) **An Enlargement of the thyroid** is—at some stage of the malady—the essential or pathognomonic feature in—

#### COMMONER CAUSES.

##### REGULAR ENLARGEMENTS:

without toxic symptoms	..	Parenchymatous Goitre.	§ 185.
with toxic symptoms	..	Graves' Disease, or Exophthalmic Goitre.	§ 186.

##### IRREGULAR or NODULAR ENLARGEMENTS:

without toxic symptoms	..	Simple Adenoma.	§ 187.
		Colloid Goitre.	§ 188.
		New Growths.	§ 189.
with toxic symptoms	..	Toxic Adenoma.	§ 190.

RARE CAUSES are: Anæmias; Specific Fevers; Leukæmia; Hæmorrhage; Granulomata and parasitic diseases; Reidel's disease; Menopausal goitre; Cretinism; Acromegaly (some forms).

(B) **Atrophy of the thyroid**—or at any rate a diminution of its function (and usually of its size)—is the essential feature in two diseases.

I. Cretinism	..	..	..	..	..	§ 191
II. Myxœdema	..	..	..	..	..	§ 559

It therefore follows that:

1. Increased or disordered thyroid secretion gives rise to profound disturbance of the general health, and neuro-vascular irritation (Graves' disease).
2. An innocent enlargement of the thyroid, unaccompanied by increased or dis-



ordered thyroid secretion, has no effect on the metabolism (as in many cases of simple goitre).

3. Simple absence or diminution of the thyroid secretion (*a*) when it is congenital or comes on in early life, causes deficient development both mentally and physically (*i.e.*, cretinism); and (*b*) when it supervenes in adult life, causes lethargy and deficient vitality (myxœdema).

(A) *There is a UNIFORM ENLARGEMENT OF THE THYROID GLAND, WITHOUT TOXIC SYMPTOMS: the patient is between the AGE OF 5 AND 20. The disease is PARENCHYMATOUS GOITRE.*

§ 185. **Parenchymatous Goitre.** This condition arises especially in endemic areas in England, as well as abroad (especially in Switzerland and certain parts of India).

*Symptoms.*—(i.) The patient is noticed to have a uniform smooth and rather soft enlargement of the thyroid gland, of small or moderate degree. One lobe or the isthmus of the gland may be enlarged more than the remainder. (ii.) The general health is good, but the patient is often somewhat anæmic. (iii.) Otherwise the symptoms are those of hypothyroidism rather than of hyperthyroidism. (iv.) If the enlargement lasts to adult life, it becomes a colloid or adenomatous goitre.

It may be *Diagnosed* from other tumours in the neck by the fact that it invariably rises with the larynx during deglutition. The enlargement generally increases steadily, but it is rare that there is any danger from tracheal obstruction and asphyxia.

The *Etiology* of the condition is not well known. It starts in childhood or may appear at or near puberty and last to adult life. It affects women more than men. The disease used to be endemic in certain districts in England and still is so in parts of America and the Continent, especially Switzerland and the Tyrol where the food and water are deficient in iodine. All cases however are not so simple. In some the assimilation of iodine is defective, possibly due to intestinal conditions such as absence of vitamin in the diet, or excess of bacteria; in others it may be that the thyroid cannot utilise the iodine. McCarrison's work proved that goitre in Chitral and Gilgit was due to faecal contamination of the drinking water. The work of McClendon and Hathaway (which has been confirmed by a recent Medical Research Council Report) showed that most forms of goitre were caused by deficiency of iodine. In ordinary diet iodine is obtained from milk, butter, fruits and leafy vegetables; vegetables lose two-thirds of their iodine content in cooking and when fish is canned its iodine content is lost.

*Treatment.*—Small doses of iodine cure most early cases. In parts of Switzerland, 1–2 grs. of iodide of potassium are given weekly, sometimes in salt, with resulting cure or prevention of goitre. Drinking-water should be boiled. McCarrison obtained cures by vaccines prepared from the stools, and by intestinal antiseptics, especially thymol and lactic acid bacilli. He found small doses of thyroid, gr.  $\frac{1}{4}$ – $\frac{1}{2}$ , with a local application of Ung. pot. iod. over the tumour usually brought about a cure. Surgical interference is necessary if pressure symptoms occur.



There are ENLARGEMENT of the THYROID, PROPTOSIS, NERVOUS SYMPTOMS and RAPID PULSE; the patient is usually a YOUNG WOMAN. The disease is EXOPHTHALMIC GOITRE.

§ 186. **Graves' Disease** (Syns.: Primary Thyrotoxicosis, Exophthalmic Goitre, Basedow's disease). Usually the onset is insidious, but it may be acute, after sudden shock or acute focal infections. There are five groups of symptoms, and the varieties of the disease depend on which of these predominate.

*Symptoms.*—1. *Cardio-vascular* disturbances are among the earliest and most important symptoms. They are never absent, and may exist for months before any other evidence appears: (i.) Palpitation. (ii.) Tachycardia is present during rest and sleep; a raised pulse rate during sleep aids diagnosis, as psychological causes are thus excluded. The heart rate may be 100 or more at rest, and may rise to 150 or more on slight exertion or emotion. (iii.) The pulse is forcible and the systolic blood pressure raised, with a corresponding rise in the pulse pressure. (iv.) Shortness of breath on exertion, is usual: paroxysmal dyspnoea and a distressing sense of suffocation are sometimes present. (v.) At first the heart is hypertrophied, with a widespread forcible cardiac impulse; later myocardial degeneration with corresponding electrocardiographic changes, premature beats, and in severe cases auricular fibrillation ensue.

(2) *Nervous* disturbances are always present. They are very variable: thus (i.) there may be nervousness, irritability, insomnia, depression alternating with excitement, increased reflexes, hysterical attacks, mania, or melancholia. (ii.) Hyperæsthesia, perverted sensations, neuralgic headache, vertigo, and hallucinations of sight or hearing. (iii.) Other signs are fine and rapid vibratile tremors of the outstretched fingers (always) and protruded tongue. (iv.) Vaso-motor disturbances of many kinds, intolerance of heat, sudden perspirations and cutaneous alterations such as pigmentation and loss of hair. The hands are usually hot and sweating even at rest. (v.) Diarrhoea may be an early symptom.

(3) *Thyroid Enlargement* is present at some stage of the disease, though it is rarely the first symptom noticed by the patient. It is always more marked in women of 15–30. In older subjects the degree of enlargement may be slight. The enlargement varies considerably in different cases, and is by no means proportionate to the other symptoms, because the symptoms depend more upon the histological element of the gland which is involved than the degree of enlargement. Mechanical effects of thyroid enlargement may be present (see §§ 81 VII, 187), and occasionally alteration in the voice from this cause is an early symptom.

(4) *Exophthalmos* (proptosis or protrusion of the eyeballs) is present in a varying degree, though sometimes not until late in the disease (Fig. 2, § 11). It is best detected by seating the patient in a chair, standing behind, and looking down the forehead. As a rule no changes can be detected in the fundi. Later on, ulceration of the cornea occasionally takes place, either from neurotrophic causes or from deficient protection.



Even when exophthalmos is not marked, the patient presents a staring expression partly due to true Exophthalmos (§ 833) and partly to retraction of the upper lids.

Four signs of Graves' disease referable to the eyes bear the names of different physicians. *Von Graefe's* sign is a condition in which the upper eyelid lags behind the eyeball when looking downwards, exposing the white sclerotic. *Mæbius's* sign is an insufficiency of convergence of the two eyes when looking at a near point. *Stellwag's* sign is a deficiency of blinking as an involuntary act. *Abadie's* sign is an involuntary twitching or spasm of the levator palpebræ superioris. All except the first are present only in advanced cases, and are not therefore of great diagnostic value.

(5) The *general health* of the patient is always disturbed. There may be no anæmia, but lymphocytosis is usual. Lack of energy, sleeplessness and undue fatigue are usually present and progressive emaciation is marked, owing to the increased rate of the basal metabolism, which may increase 75 per cent. or more. There is usually a lowered sugar tolerance; true diabetes may develop later. The menses are usually decreased and abortion is not unusual. The blood cholesterol is decreased.

In certain patients the cardiac symptoms predominate. In these cases (*formes frustes*, masked hyperthyroidism), the patient is usually older and complains of palpitation. There is a rapid, forcible apex beat, high pulse pressure and often auricular fibrillation: the thyroid may be little altered in size but is of firm consistence, exophthalmos may be absent; some tremor and vascular symptoms are present.

*Etiology.*—(i.) Upwards of 95 per cent. of cases are females. (ii.) A large number are young adults between the ages of fifteen and thirty. (iii.) Locality has no known influence. (iv.) Heredity sometimes plays a part. Other members of the family often show nervous instability or even disordered thyroid action. (v.) Fright, anxiety, love affairs, and mental overwork are potent factors in determining the disease. (vi.) Toxæmia (oral sepsis, etc.) undoubtedly aggravates the disease. Exophthalmos is believed to be due to overaction of the thyrotropic pituitary hormone.

*Diagnosis.*—The cardinal symptoms are: (i.) the characteristic facies (§ 11); (ii.) thyroid enlargement; (iii.) proptosis; (iv.) rapid and forcible cardiac action; (v.) fine tremors of the fingers; (vi.) mental and emotional instability; and (vii.) increased basal metabolism, sweating and emaciation.

*Prognosis.*—The duration of the disease varies from some twelve months to many years: two years may be considered an average. It may certainly shorten life, but many very severe cases recover with modern methods of treatment. The mortality has been variously stated; modern statistics give from 5 to 10 per cent. If the duration be prolonged, the disease will certainly leave its mark upon the cardiovascular system. Progress may be judged by estimating the basal metabolism. The prognosis in severe cases is worse with myocardial degeneration and mental instability. Those who recover may develop myxœdema in later years.

*Treatment.* Early recognition of the disease is very important, for much can then be done. Rest in bed with freedom from fuss and worry are the prime essentials, preferably in the country. Treatment in a general hospital ward is therefore undesirable, especially as these patients are



very susceptible to infections such as an epidemic sore throat. The diet should be of high calorie value to counteract the loss of weight. Sleep is most important, and sedative doses of phenobarbitone, chloral and potassium bromide should be used when necessary. All sources of toxæmia must be sought for and eliminated as soon as the patient's condition permits. *Liquor iodi aquosus* (Lugol's solution) 5–10 minims in milk, twice daily, appears to hasten the cure, but should be given in short courses of 3–4 weeks rather than for longer periods. If operation is contemplated, the course of iodine must be reserved as preoperative medication. Thiouracil, or the more satisfactory methyl thiouracil, reduces the formation of thyroxin and is most beneficial before myocardial damage has occurred. With initial doses of 0.2 G. t.i.d. or q.i.d. for 3 weeks, in the second and third week the thyrotoxic symptoms begin to subside with a gain in weight, reduced metabolic rate and rise in blood cholesterol. The dose should then be reduced to 0.1 G. daily or on alternate days for a period of 12 months: if treatment stops sooner, relapse is probable. Toxic symptoms develop in some 20 per cent. of patients, due to overdose or idiosyncrasy to the drugs, the dose of which must be reduced or stopped according to the effects produced: the commonest are granulopenia or agranulocytosis, skin rashes, toxic jaundice, drug fever and lymphadenopathy. These drugs have also been used in combination with iodine as pre-operative treatment.

Surgical treatment is indicated: (i.) when the gland is greatly enlarged and is producing pressure symptoms, (ii.) after failure of medical treatment, (iii.) when the heart shows myocarditis to be developing. When auricular fibrillation has occurred, this must be controlled with digitalis, and then operation resorted to. Excision of the greater part of the gland is usually most satisfactory, and is attended by a very low mortality in expert hands. In severe cases a preliminary ligature of the superior thyroid arteries is of help. Small doses of X-rays have given good results in many cases. Exophthalmos persisting or increasing after partial thyroidectomy may disappear after complete removal of the thyroid.

#### IRREGULAR or NODULAR ENLARGEMENTS.

*The patient is a MIDDLE-AGED or ELDERLY person (usually a woman), with a NODULAR SWELLING in the THYROID GLAND; otherwise she is in good health. The condition is SIMPLE ADENOMA.*

§ 187. **Simple Adenoma.**—This common condition comes on later in life than those mentioned above.

*Symptoms.*—(i.) There are one or more smooth firm nodules in the substance of the thyroid gland which very slowly enlarge over a period of years. (ii.) There are no toxic symptoms, but anxiety may be caused by the size of the swelling. (iii.) If the swellings are large enough there is pressure upon or displacement of the trachea, and occasionally of other structures in the neck. (iv.) Some of the swellings may be soft and even cystic as the result of colloid degeneration or hæmorrhage.



*Etiology.*—This innocent type of new growth is the result of focal hyperplasia in a gland previously damaged by chronic parenchymatous changes or by focal inflammation. A single adenoma occurring in younger adults may arise from an embryonic cell rest: this "foetal adenoma" is particularly liable to malignancy.

*Treatment.*—No treatment is necessary or desirable provided pressure symptoms are absent; otherwise surgical intervention is needed.

*The THYROID GLAND is ENLARGED THROUGHOUT and may be ENORMOUS; there are IRREGULAR LARGE CYSTIC SWELLINGS. The condition is probably COLLOID GOITRE.*

§ 188. **Colloid Goitre.**—Colloid change may arise in a simple parenchymatous goitre in areas where the disease is endemic, or it may be sporadic.

*Symptoms.*—(i.) The gland slowly enlarges and may form a tumour involving all parts of the gland and weighing many pounds. (ii.) It occurs generally in adolescent girls, but persists into adult life. (iii.) The surface is firm, but not hard, and localised cystic swellings can often be clearly distinguished. (iv.) The enlargement frequently surrounds the trachea, causing atrophy of the tracheal rings. Pressure on the trachea produces feelings of suffocation, and on the œsophagus difficulty in swallowing. (v.) The patient usually shows the early symptoms and signs of hypothyroidism.

*Treatment.*—If necessary for cosmetic reasons, or if pressure symptoms are troublesome, one or both lobes of the gland will have to be surgically removed. Thyroid will probably have to be prescribed later.

*There is a SMALL or MEDIUM-SIZED MASS of almost STONY HARDNESS in one part of the thyroid gland; with ENLARGED CERVICAL GLANDS and/or signs of MALIGNANT DEPOSITS ELSEWHERE. The condition is MALIGNANT DISEASE.*

§ 189. **Malignant Disease** of the thyroid gland is known by (i.) a very hard mass in the gland; (ii.) this grows and becomes fixed to surrounding structures; (iii.) the lymphatic glands in the posterior triangles of the neck are involved early. (iv.) Invasion of adjacent parts produces recurrent laryngeal paralysis, tracheal stridor, and/or dysphagia. (v.) When the primary growth is small, and found only after careful examination, the patient may show signs of deposits elsewhere in the body, particularly in the bones, with spontaneous fractures; (vi.) anæmia of the leucocythoblastic type occurs when the bone marrow is involved.

*Treatment* is surgical when the condition is diagnosed before metastatic deposits develop. Injection of radio-active iodine is on trial.

*There is ENLARGEMENT OF THE THYROID, diffuse or localised, which has LASTED FOR YEARS before the appearance of symptoms of hyperthyroidism; the patient is usually a woman of MIDDLE AGE—the disease is TOXIC ADENOMA.*

§ 190. **Toxic Adenoma** (Syns. Secondary Graves' disease, secondary thyrotoxicosis) is a condition in which the enlargement of the thyroid may be diffuse or localised, sometimes of considerable size, continuing for years before the appearance of symptoms suggestive of hyperthyroidism.

*Symptoms.*—(i.) The patient is usually a woman of middle age. (ii.) Cardiac symptoms usually predominate. Palpitation, tachycardia, and shortness of breath on exertion are early symptoms. Sometimes the patient first seeks advice on account of the symptoms of myocardial degeneration, or when auricular fibrillation and heart



failure are already present. (iii.) There are few nervous signs such as tremor, etc. (iv.) Exophthalmos is slight or absent. (v.) The condition is not improved, or is made worse, by the administration of iodine, whereas in primary Graves' disease iodine brings about dramatic early improvement.

In toxic adenoma the patient has had thyroid enlargement for some time. Mild types exist, according to the intensity of the toxæmia.

*Treatment* consists in the adoption of every measure which can improve the health, such as adequate rest and removal of sources of sepsis and toxæmia. Iodine is better avoided except pre-operatively: drugs of the thiouracil series diminish symptoms, but are not as beneficial as in primary thyrotoxicosis. X-ray treatment is not advisable; surgery is indicated in most cases, especially when carditis is present.

#### RARER CAUSES

**ENLARGEMENT OF THE THYROID** is also met with (i.) in anæmias, and (ii.) in acute thyroïditis, which may occur with the acute specific fevers. It may go on to abscess formation, as in typhoid fever. (iii.) Rarely, it enlarges during the course of leukæmia. (iv.) Acute hæmorrhage may occur in the gland. (v.) Syphilis, tubercle, lymphadenoma, actinomycosis and parasitic diseases. (vi.) **Riedel's disease** is a chronic inflammation which leads to the slow formation of a hard mass of fibrous tissue which is fixed to surrounding structures, and become dangerous to life from pressure upon the trachea. It is often aggravated by prolonged iodine administration; surgical treatment may be required when dyspnœa and dysphagia are marked. (vii.) **Lymphadenoid goitre** (Hashimoto's disease) occurs in middle-aged women with a long-standing adenomatous goitre. The gland is fairly uniformly hard and nodular but not fixed to surrounding structures: it is invaded by plasma cells. *Symptoms* of weakness, ready fatigue and obesity are accompanied by slight pressure symptoms and a low B.M.R. *Treatment* should be by radiotherapy. (viii.) **Menopausal goitre** is a soft, uniform enlargement of the thyroid, which sometimes occurs in women near the menopause; it is accompanied by a mild degree of hypothyroidism and it may pass on to myxœdema if the general health of the patient is not treated. (ix.) In some types of cretinism defective thyroid activity is associated. (x.) In acromegaly the thyroid is sometimes enlarged.

(B) *Diseases in which the thyroid may be DIMINISHED in size—viz., I. CRETINISM, II. MYXŒDEMA. The latter is described elsewhere, since the leading symptom is General Debility.*

§ 191. I. **Cretinism** is a condition of dwarfism and deformity attended by mental imbecility, due to an absence or perversion of the thyroid secretion, and is endemic in certain districts. In advanced and typical cases the face is characteristically broad and flat, the tongue protrudes from the mouth, the eyes are wide apart, and the head is brachycephalic (*i.e.*, broad transversely). The skin and hair are dry and coarse, and the mental condition is extremely backward. In severe cases the body may be so dwarfed that a person of twenty is the size of a child of five. X-ray reveals delayed epiphyseal formation. The limbs are shortened, the neck stunted; pads of fat are present above the clavicles; the hands are short and square (spade-like), the abdomen prominent and an umbilical hernia is often present. Constipation is an early and persistent symptom. Puberty is delayed indefinitely. The thyroid may be enlarged, small, or absent. In *juvenile myxœdema* development occurs normally till a certain age, then suddenly ceases, with signs resembling adult myxœdema. This usually follows an infection, such as measles.

*Etiology.*—Cretinism is endemic in certain districts, *e.g.*, the valleys of Switzerland, Northern Italy and India. Cases used to occur in certain parts of England. Some of these cases have a large thyroid, but in such patients the cretinism preceded the development of the goitre. Sporadic cases, with atrophic thyroid, are found in



healthy families. In other cases the cretin is the child of goitrous parents; when a goitrous mother has been cured with iodine, her subsequent offspring are healthy.

*Prognosis.*—The patient may grow up capable of doing light manual work, or may remain an idiot. Under treatment begun early, the child may recover completely, but in other cases, although the body is greatly improved, the mind does not improve in proportion.

*Treatment.*—Thyroid B.P., beginning with  $\frac{1}{2}$ -gr. doses, causes a rapid and remarkable change. The skin becomes soft, the general conformation normal, and if the treatment has not been too long delayed, the mind assumes its natural vigour. The patient must *continue* to take thyroid all his life, or else he will relapse. A case showing the remarkable efficacy of this treatment is figured in § 19, Figs. 8A, B and C.

II. Typical MYXŒDEMA is described in detail elsewhere (§ 559). It should be remembered that there are minor degrees of thyroid insufficiency which, though falling short of typical cretinism or fully developed myxœdema, are nevertheless sufficient to account for many of the minor troubles for which patients seek advice. In adults, especially in women about the menopause, increase of weight (especially deposits on the back of the neck and the shoulders), falling hair, intolerance of cold, constipation, muscular fatigue, a slow pulse, a dry skin with a tendency to chronic eruptions, are all suspicious features. In younger women premature greyness is also suggestive. Rarefaction amounting to complete absence of the outer two-thirds of the eyebrow is a fairly constant sign. The treatment is started with thyroid B.P. in very small doses— $\frac{1}{8}$  to  $\frac{1}{4}$  gr. three times daily, and the dose increased until the symptoms go and the basal metabolism becomes normal (Fig. 1).



## CHAPTER VIII

### THE MOUTH, TONGUE, AND ŒSOPHAGUS

#### THE MOUTH

(Lips, Breath, Saliva, Teeth, and Gums.)

INSTRUCTIVE information is afforded by a thorough examination of the mouth. Anæmia, lead and bismuth poisoning, scurvy and leukæmia may be recognised from an inspection of the mouth. Many of the indications of syphilis, hereditary or acquired, are here revealed. Make a thorough examination of the TONGUE, the LIPS, the BREATH, the SALIVA, the TEETH, and the GUMS. The symptoms referable to these structures are considered below.

§ 200. **The Lips.**—*Dryness* of the lips is often one of the most conspicuous evidences of gastric and intestinal disorder. *Swelling* of the lips is common with urticaria, angio-neurotic œdema, and with cheilitis. In one type the mucous glands of the lips and their ducts are swollen and dilated; in another, there is persistent exfoliation, with scaling and crusting of the lips. The lips are *pale* in anæmia; *cyanosed* in advanced bronchitis with dilated right heart, and other conditions (see Cyanosis, § 30). A *lilac blue* colour of the lips is often seen with constipation and intestinal dyspepsia. The hard chancre of syphilis, and in elderly men epithelioma, may occur on the lip. *Stellate fissures* around the lips are an almost infallible sign of syphilis, especially when surrounded by a dull red infiltration. This infiltration helps us to distinguish a syphilitic fissure from those due to streptococcal or fungal infections (*perlèche*). *Cracked lip* is seen in nervous people who lick and bite their lips and are exposed to cold winds. It also occurs with dribbling saliva, dyspepsia, constipation and cheilitis; it generally yields to vitamin B<sub>2</sub> together with some simple ointment, unless a secondary infection has occurred. By pressing the corner of the mouth inwards and forwards when the patient opens it, we may detect a mucous patch surrounding a syphilitic fissure inside the mouth. The *scars* left by syphilitic fissures, usually congenital, are white and stellate. (And see § 11.)

Certain *skin lesions* may invade the mucous membrane of the mouth, such as the rashes of small-pox, chicken-pox, measles, lupus erythematosus, pemphigus, and herpes. In measles, the spots, first described by Koplik, appear on the inner sides of the cheeks, opposite the bicuspid or molar teeth, before the skin eruption occurs. They appear as a greyish-white stippling on a slightly raised purplish base, and afford considerable aid in the early diagnosis of the disease. With Wood's glass under ultra-violet light they are readily seen. Lichen planus may affect the mucous membrane of the mouth and tongue long before it appears on the skin; in the mouth it has a whitish appearance resembling secondary syphilis, for which it has sometimes been mistaken. Lupus vulgaris chiefly affects the palate.



§ 201. **The Breath** should normally be quite free from any kind of odour. Offensiveness of the breath (halitosis) may arise from several sources: (1) A want of cleanliness *in the mouth*, particles of decomposing food, pyorrhœa, stomatitis, septic teeth and dental caries. (2) Septic *tonsils*, and other *throat* maladies. (3) Liver disturbance, dyspepsia constipation, and other conditions of the *alimentary canal* (§ 273), and the disordered digestion in *fevers*. (4) Some *diseases of the nose, antrum and sinuses*; it always accompanies ozæna. (5) A large cavity in the *lungs*, especially if *bronchiectatic*, fœtid bronchitis and gangrene of the lungs produce a putrid odour (§§ 143, 144). The odour of bronchiectasis is characterised by being intermittent; it comes on suddenly, lasts a day or two, and disappears gradually. (6) Certain general conditions are attended by a more or less characteristic odour of the breath. Thus, in *acidosis* it is sweet; in acute *alcoholism* it is alcoholic or ethereal. In *uræmia* it is often urinous. (7) Certain *drugs* cause a characteristic odour in the breath—*e.g.*, turpentine (a resinous odour), chloral (odour of chloroform), bismuth (odour of garlic), paraldehyde and opium (odour of the drugs). Alcohol, ether, chloroform, and other volatile substances are partly excreted by the breath. A **Bad Taste** in the mouth accompanies most of the conditions which give rise to foul breath.

§ 202. **The Saliva** may be *increased* (ptyalism) (i.) in inflammation of the mouth as in stomatitis, and during dentition; (ii.) in chronic gastritis there may be such a profuse flow of saliva during the night that it gives rise in the morning to vomiting of clear alkaline fluid (water-brash or pyrosis). Salivation may occur after a heavy meal, especially with exercise when the stomach is loaded, or after certain foods, such as excess of sugar or sour fruit. (iii.) During pregnancy, in mania, hydrophobia, and some other nervous diseases; (iv.) after the administration of mercury, physostigmine, iodides, bitters, and sometimes alkalies and acids. The saliva may appear to be increased, owing to defective swallowing, in bulbar paralysis, myasthenia gravis, encephalitis lethargica and other paralytic conditions; and with sore throat or other causes of difficult swallowing. “Dry mouth” (xerostomia) occurs with deficiency of saliva. The saliva is *decreased* in dehydration, especially (i.) in certain fevers, (ii.) in diabetes, (iii.) severe diarrhœa, (iv.) chronic nephritis, (v.) after atropine, morphine or stramonium, and (vi.) with emotions of fear or nervousness. (vii.) Sometimes it is associated with calculus of the salivary glands and with old age. (And see § 212.)

*Thirst* (polydipsia) accompanies all febrile conditions. It is met with also in diabetes, after various causes of loss of fluid, *e.g.*, diarrhœa, perspiration, hæmorrhage, and vomiting, chronic interstitial nephritis, after a diet excessively salted, and with dyspepsia and gastritis.

§ 203. **The Palate** may be “cleft” from childhood, otherwise a hole in this situation is practically always evidence of past syphilis. The *soft* palate shares in the diseases of the fauces (§ 153). It is a favourite position for the membrane of diphtheria, which distinguishes it from follicular



tonsillitis. The *hard* palate is sometimes involved in the diseases of the floor of the nose. A swelling here is commonly due to the presence of pus originating from the lateral incisor, second premolar or first molar tooth, to a gumma or, rarely, to the pointing of an antral abscess.

§ 204. **The Teeth** are subject to a certain amount of variation, even in health. The *average* dates of the eruption of the temporary and permanent teeth are as follows:

TABLE XIII.

<i>Temporary or "Milk" Teeth.</i>	<i>Permanent Teeth.</i>
6th to 8th month, central incisors.	6th year, first molars.
8th to 10th month, lateral incisors.	7th " central incisors.
12th to 14th month, first molars.	8th " lateral incisors.
18th to 20th month, canines.	10th " first premolar.
2 to 2½ years, second molars.	11th " second premolar.
	11th to 12th year, canines.
	12th to 13th " second molars.
	17th to 25th " third molars.

One quarter of the mouth may be represented diagrammatically thus:

Teeth ..	..	I.	I.	C.	M.	M.	Teeth ..	I.	I.	C.	PM.	PM.	M.	M.	M.
Month of eruption. }		6	9	18	12	24	Year of eruption }	7	8	11	10	11	6	12	24

The normal order of eruption of teeth may be represented thus: MILK teeth, 6, 9, 18, 12, 24 MONTHS; and PERMANENT teeth, 7, 8, 11, 10, 11; 6, 12, 24 YEARS. These details are worth remembering, because defective or deficient teeth are a frequent cause of faulty digestion. Every Mongol has an irregular order of dentition.

Septic teeth, dental caries and pyorrhœa alveolaris are common causes of dyspepsia and serious ill-health. The causes of dental caries are still debated. It is *predisposed* to by some underlying systemic factor and by deficiency of calcification of the tooth substance; to overcome the latter various preparations containing calcium and vitamin D can now be prescribed. The *exciting* cause is apparently the presence of acid-producing organisms which multiply in the food débris around the teeth. Soft, pulpy, sweet and farinaceous foods encourage the growth of these organisms. Hence the importance of adequate cleansing of the teeth after such food. Sim Wallace recommends that every meal should finish with firm raw fruit, such as an apple, which is a natural cleanser of the teeth. Hard foods, which require thorough mastication, act similarly.

The permanent teeth are altered in appearance by constitutional upsets occurring at the time of calcification. They present transverse ridges or lines of pits in the enamel as a result of exanthematous fevers or rickets. Those affected are the incisors, canines or first molars. "Hutchinson's teeth" are due to congenital syphilis—the upper incisors are narrowest at the free edge, which shows a semilunar notch; the molars are dome-shaped, and all the teeth are spaced and liable to caries owing to calcium



deficiency. The face often presents a typical syphilitic facies. The onset of acromegaly and of Paget's disease may sometimes be detected by the alteration of the "bite" of the teeth owing to an unequal increase in the size of the jaws.

§ 205. **Toothache** (odontalgia) is produced by acute or chronic inflammation of the tooth pulp or of the periodontal membrane. Irritation of the tooth pulp is due to (1) presence of a carious cavity, (2) exposure of dentine or cementum with or without caries, (3) filling too near the pulp, (4) a blow on a sound tooth. The pain is neuralgic in character, and intensified by extremes of temperature. It ceases on the death of the pulp and is followed by inflammation of the periodontal membrane (periodontitis) due to the passage of septic matter through the apex. The tooth then becomes tender on pressure. Later the gum shows signs of extension of the inflammatory process and the formation of pus. Lymphatic glands draining the area are enlarged and tender and diffuse swelling of the neighbouring soft tissues ensues. Situations in which an alveolar abscess may point are (1) usually in the mucous membrane overlying the affected tooth; (2) the palate, especially arising from lateral incisor, premolar and molar teeth; (3) antral cavity, from any tooth whose roots are in proximity to the antral floor; (4) on the face along the lower border of the mandible from lower premolar and molar teeth.

NEURALGIC PAIN, either local or referred from one jaw to the other, but never across the mid-line, may also be due to impacted teeth, chronic apical abscesses, odontomes, fragments of root remaining after incomplete extraction and to empyema and growths of the antrum. A not uncommon cause of neuralgia is pressure by a lower denture on the mental nerve exposed by extensive loss of bone subsequent to the extraction of heavily infected teeth.

The *treatment* belongs to the dental surgeon. For drops to apply for temporary relief of pain due to a carious tooth see Formula 23. If the tooth is tender on pressure, indicating periodontitis, hot mouth-washes such as carbolic (1-200) are advantageous, with or without the application of counter-irritants such as equal parts of the tinctures of aconite and iodine to the over-lying gum.

For Trigeminal Neuralgia see § 822, and Dental Causalgia § 823.

SWELLINGS OF THE JAWS. *Fluid swellings* are regular and smooth, enlarging the outer wall of the jaw as they increase in size. The most common are (1) acute or chronic alveolar abscesses; (2) odontomes, such as a dental cyst on a dead tooth or a dentigerous cyst on an unerupted tooth. Innocent *solid swellings* include fibroma, chondroma, osteoma and solid odontomes, but sarcoma and carcinoma are often seen.

TRISMUS of local origin may be due to a fracture of the body or the ramus of the mandible, or to the extension of the inflammation from an alveolar abscess or a septic wisdom tooth to the surrounding muscles.

The **Gums**. Examination of the gums gives important clues, apart



from the pallor of anæmia, in the diagnosis of disease. The forms of metallic poisoning are often recognised by the appearance of the gums; in bismuth and lead poisoning a blue line is seen below the free margin of the gums, due to deposit in the gum tissue itself. Various forms of stomatitis accompanying constitutional conditions, such as leukæmia, scurvy, purpura, agranulocytosis, syphilis, are described under *Etiology* in § 210. Localised swelling with a greenish discharge occurs with actinomycosis. Pigmented patches are seen with Addison's disease.

TUMOURS of the gums and mucous membranes are quite common and include: (1) polypus due to local irritation; (2) epulis, usually pedunculated, growing from the junction of the periosteum with the periodontal membrane; (3) papilloma—all of which are treated by excision; and (4) epithelioma and sarcoma; (5) gumma.

**Oral Sepsis** includes affections of the teeth, gums and alveolar bone.

§ 206. **Dental infections** present two different forms: (1) *Closed infection*—*i.e.*, where there is no drainage and where toxins are absorbed directly by the blood-stream from apical abscesses, granulomata and cysts on dead teeth. This type of infection may be serious because it is unsuspected and revealed only by radiographic examination, there being usually no local clinical signs. It may be responsible for joint, muscle, eye, heart and numerous other lesions. Dead teeth which are apparently normal on X-ray examination are commonly infected and must be regarded with suspicion. When all the teeth have been extracted "residual infection" may persist in the alveolar bone. This can be eliminated in mild cases by the application of diathermy or infra-red rays: in severe cases scraping of the infected areas is necessary. (2) *Open infection*—*i.e.*, where drainage permits the swallowing of the products of the inflammation, as in cases of broken stumps and carious teeth, infection of the gums, alveolus and mucous membranes of the mouth.

### § 207. Inflammation of the Gums—Gingivitis.

*Symptoms.*—The gum margins are slightly swollen, reddened, and bleed easily; they appear to have a smooth, glossy surface. Clinical and X-ray examination of the teeth do not reveal involvement of the periodontal membrane or alveolus.

*Etiology.*—The commonest cause is lack of oral hygiene, food stagnating round the teeth and gums. Putrefaction occurs, followed by infection. Deposits of tartar act as a predisposing factor. Prolonged administration of mercury, bismuth, arsenic, gold and epanutin are also common causes. It may also be associated with general diseases such as diabetes and nephritis.

*Treatment* consists in the maintenance of strict oral hygiene. It is essential to clean the teeth regularly and to use floss silk between the teeth to remove débris. Deposits of tartar must be removed from around the teeth by the dental surgeon. The regular use of a warm mouthwash of hydrogen peroxide (2 vols.) promotes cleanliness. Local astringents such as tannic acid or massage with glyc. acidi tannici are



extremely useful. Under normal conditions the disease can be completely eliminated.

§ 208. **Ulcerative Gingivitis** (Vincent's Infection) is due to infection of the gum margins by fusiform bacilli and spirillæ in symbiosis.

*Symptoms.*—The gums are inflamed and sore, with yellowish marginal ulcers. The breath is offensive and the tongue coated. The onset and spread of the disease are rapid, the tonsils are often involved. Constitutional symptoms may be severe, with pyrexia and enlargement of the submaxillary and cervical glands. The disease is highly contagious and there are often epidemics in institutions. A smear taken from around the gums, when stained and examined microscopically, confirms the diagnosis.

*Treatment* consists in isolating the patient. As the organisms producing the disease are penicillin-sensitive, the lesions disappear within 2-3 days if tablets containing 500 units of penicillin are allowed to dissolve slowly in the mouth every two hours. Meanwhile, no antiseptic mouthwashes must be used, but the mouth may be irrigated with warm saline. When the ulcers have healed any local factors predisposing to gingivitis must be treated, otherwise the disease is likely to recur.



FIG. 63.—PHOTO-MICROGRAPH OF SMEAR OF GUM AFFECTED BY VINCENT'S INFECTION, SHOWING FUSIFORM BACILLI AND SPIRILLÆ. (Lent by Dr. Arthur Bulleid.)

§ 209. **Inflammation of the Gums and Alveolus—Pyorrhœa Alveolaris.**—If untreated, the infection of gingivitis spreads to the periodontal membrane and the supporting alveolus. The bone becomes infected and subsequently absorbed.

*Symptoms.*—The gum margins are usually engorged and swollen; there are pockets of varying depth around the teeth from which pus can be expressed. The breath may be offensive and the swallowing of pus may be an exciting factor in the formation of gastric or duodenal ulcers. X-ray examination shows evidence of destruction of the periodontal membrane and alveolus.

*Treatment.*—When the loss of alveolar bone is not extensive, skilled dental treatment can accomplish much. Removal of all tartar and strict oral hygiene are of primary importance. The gum forming the pockets around the affected teeth is resected. With advanced disease and extensive loss of alveolar bone, extraction of the teeth is necessary, especially if it is suspected that the condition may be producing lesions in other parts of the body. It is unwise to remove many teeth at one operation; it is often necessary to extract only one at a time. The injection of 100,000 units of penicillin half an hour before the extraction and again an hour later is



often of advantage, especially when the patient has a rheumatic heart lesion.

§ 210. **Inflammation of the whole mouth—Stomatitis.**—This is a widespread inflammation of the mouth, evidenced by redness, swelling, pain, and tenderness of the mucous membrane, swelling and protrusion of the lips in severe cases, offensive odour of the breath, and usually excess of saliva. There are several forms: (a) *Catarrhal Stomatitis* is often associated with catarrh of the nose and throat, or with the acute specific fevers. The mucous membrane of the mouth is raised and reddened, and may develop into ulcerative stomatitis. (b) *Aphthous* and the allied *Herpetic Stomatitis* form small tender vesicles with a red base and sharply defined circular margin: the vesicles ulcerate and occur especially on the lower surface of the tongue, the lips or on the gums and cheeks. They often recur in crops, especially before the menses. The



FIG. 64.

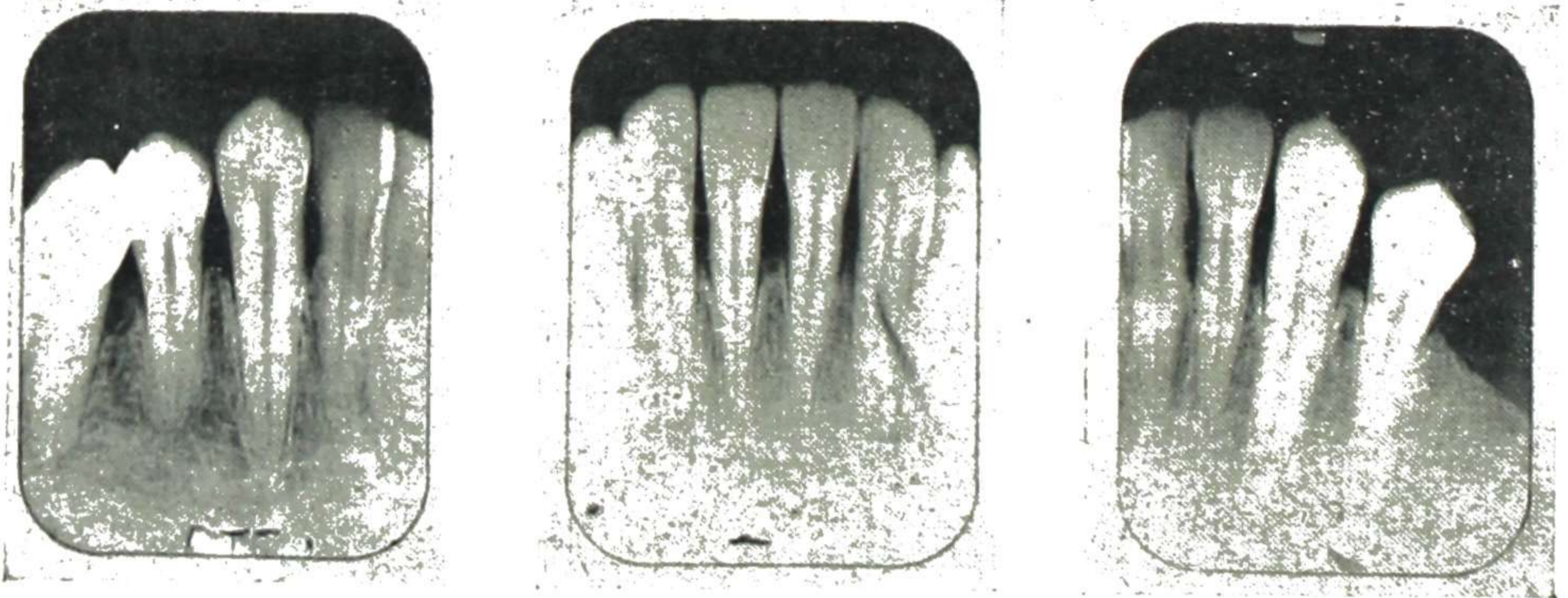


FIG. 65.

FIGS. 64 and 65. RADIOGRAPHS to illustrate (Fig. 64) chronic apical abscesses, with destruction of the periodontal membrane and lamina dura around the apices of the teeth, and infection of surrounding bone: (Fig. 65) destruction of periodontal membrane and alveolus around the necks of the teeth typical of pyorrhœa alveolaris.

condition is believed to be due to a virus. *Pemphigus* is distinguished by the formation of blisters, which in the early stages are not surrounded by a red margin, and by lesions elsewhere. (c) *Ulcerative Stomatitis* is due to infection with Vincent's organisms from the gums, spreading widely over the mouth. The symptoms are those of ulcerative gingivitis (§ 208), only more severe. (d) *Gangrenous Stomatitis* (*Cancrum Oris*) occurs especially in those suffering from measles and other acute specific fevers. Ulceration, usually starting on the cheek or lip, sometimes spreads to the gums and gives acute pain, but as this passes off a black spot forms (usually both internally and externally), which spreads and leads to perforation of the cheek. There is considerable prostration, and high fever. (e) *Parasitic Stomatitis* (Thrush) occurs in infants suffering from gastrointestinal disorders, and in adults suffering from tuberculosis or other wasting diseases.



The mucous membrane of the mouth is covered with white spots which coalesce to form large areas. The surface epithelium is lost, leaving large red areas (§ 214). (f) *Stomatitis* due to *Drugs and Chemical Substances* is a more severe stage of gingivitis produced by the prolonged use of mercury, bismuth, gold, epanutin, phenobarbitone, phosphorus, and occasionally arsenic. Mercurial stomatitis, now uncommon, produces fœtor of the breath, with swollen bleeding gums, and later ulceration spreading to the cheeks, tongue, and floor of the mouth. Phosphorus produces ulcerative stomatitis, with necrosis of the jaw. *Electrical action*, due to the presence of dissimilar metals used in dentistry, can cause stomatitis and leucoplakia. (g) *Foot-and-Mouth Disease* (Syn.: epidemic stomatitis; aphthous fever) is an acute infectious disease attacking pigs, sheep, cattle, and other domestic animals. Epidemics have been reported in which the disease was transmitted to man, with symptoms of fever, gastro-intestinal derangement and vesicles on the lips, mouth, and pharynx, and sometimes near the nails of fingers and toes. (h) With *Espundia*, in S. America, oro-pharyngeal ulceration follows the primary skin lesion, which is due to a type of Leishmann-Donovan body, transmitted by a bug. Tartar emetic is specific for this condition.

*Etiology*.—(1) LOCAL CONDITIONS, especially faulty dentition, tartar, ill-fitting and dirty dentures, the irritation of a jagged tooth, excessive smoking, dirty feeding-teats, hot fluids and caustics, new growths (simple or malignant), and gummata. In most of these cases the stomatitis takes the form of (a) or (b) above. (2) CONSTITUTIONAL CONDITIONS: (i.) lowered vitality, met with in tuberculosis and other wasting disorders, or in badly-fed children, in whom the stomatitis may be aphthous, ulcerative, or due to thrush. Epidemics of ulcerative stomatitis have occurred in gaols, hospitals and camps. (3) Certain BLOOD DISEASES (e.g., *scurvy* and *purpura*) are attended by swollen, spongy gums and ulcerative stomatitis. *Acute leukæmia* shows marked stomatitis due to the presence on the gums of small pin-head to sago-grain-sized lymphoid nodules which readily ulcerate. Not infrequently such cases are treated without any suspicion of their true nature, although the nodules in question are very characteristic. The degree of swelling is usually much greater than in lesions due to infection. *Agranulocytosis* (§ 155e) is seen in the mouth, often in the region from which teeth have been extracted a few days previously. *Sprue*, *Pellagra*, *Pernicious Anæmia* and other conditions associated with *Vitamin B deficiency* predispose. *Local streptococcal infection*, especially in women, and certain *skin diseases* such as herpes simplex, lichen planus, lupus erythematosus, erythema multiforme and pemphigus, may be mistaken for aphthous stomatitis, because they show grey streaks or patches. *Syphilis* causes a special variety of the catarrhal form (§ 211).

*Prognosis*.—Stomatitis is not serious, except the ulcerative type and that form known as cancrum oris, in which the mortality is 80 per cent. Catarrhal and aphthous stomatitis generally end in recovery in a week or two. Cases due to constitutional conditions are usually more serious and obstinate than those due to local or removable conditions. The complications of cancrum oris are diarrhœa, broncho-pneumonia, and gangrene in other parts of the body, especially the organs of generation (noma pudendi); death is usual in seven to ten days. The stomatitis of mercury may be extremely severe, but is rarely seen nowadays. Stomatitis in children, especially the mercurial form, is apt to cause discoloration, pitting and transverse ridges along the permanent teeth which are calcifying at the time. When aphthous stomatitis occurs in adults, accompanying a lingering disease, it is very obstinate, and is, in itself, a very grave omen. The prognosis is grave in epidemic stomatitis.

*Treatment*.—In all varieties (1) remove the cause, (2) alleviate the local inflammation, and (3) attend to the general health. The teeth should be scaled after acute symptoms have subsided, and any septic stumps removed. After every meal the mouth should be cleaned of débris with a soft brush, by rinsing repeatedly with warm water, then with an antiseptic solution. One of the best is hydrogen peroxide (2½ to 10 vol.) or glyc. thymol. co. (B.P.C.). In aphthous, herpetic, or parasitic stomatitis glycerin and borax gently applied or potassium chlorate as a mouth-wash, are useful; tablets containing formalin may be sucked at frequent intervals, and are of especial use



in children. The ulcers are best treated by touching them with solid silver nitrate or copper sulphate. In gangrenous stomatitis prompt measures are necessary to avert a fatal issue. The affected area should be excised as freely as possible, and plastic operations will be necessary later. Nourishing fluids and the free use of stimulants are called for. Vitamins B and C should be administered freely in all forms of stomatitis.

§ 211. **Other Lesions of the Mouth.**—(i.) *Leucoplakia* (§ 214, II) of the hard palate, tongue and cheeks may occur, usually in syphilitics and heavy smokers. Patches of white epithelium appear on the surface; they begin with sensitive red areas, which soon become white, hard and raised, then fissured and malignant. (ii.) *Syphilis* in any of its stages may affect the mouth: (a) the primary lesion may, on rare occasions, show itself on the gums and tongue; (b) the mucous patches, secondary lesions, occur on the inner side of the cheeks and the edge of the tongue; ulceration may follow, producing typical "snail-track" ulcers (§ 158). (c) The gummata of the tertiary stage, with typical deep, excavated ulcers are sometimes seen (§ 646, II).

## THE TONGUE

Apart from the local diseases which may affect the tongue, its appearance aids in the diagnosis and prognosis of certain general diseases. Examination should be made of its surface as regards (a) furring, moisture and dryness; (b) its colour, and other alterations of the surface; (c) the presence of white patches; (d) altered size, warts, growths and fissures; (e) ulcers; (f) note also the method of protrusion. A mother sometimes speaks of her child being "*tongue-tied*" when the frenum is too short: in some cases this is really so, or the structure may be attached to the tongue too far forward, but it exists much less frequently than parents suppose.

§ 212. (a) **Furring and Moisture of the Tongue.** In health the tongue is clean and moist, although a slight deposit over its posterior third is not unusual. *Furring* occurs when the greater part of the tongue is covered by a white or greyish layer; when a thick brown and dry crust forms over the surface, the tongue is said to be *coated*. Furring or coating therefore occurs with (i.) local irritation or *sepsis in the mouth*—excessive tobacco smoking, tonsillitis or pharyngitis, dental caries, gingivitis or pyorrhœa. An unpleasant taste in the mouth, or unpleasant breath (halitosis, § 201), may accompany such conditions. (ii.) In most *febrile states* some degree of furring is the rule. Its degree is often in proportion to the toxæmia present and it is therefore a guide to prognosis; with defervescence of fever the tongue cleans. Special importance attaches to the tongue in typhoid fever. In the first week the dorsum is covered with a thin dirty-white fur, but soon the tip and the edges begin to clear so that by the third week the fur has disappeared, and the tongue becomes glazed and dry, or red and smooth. In scarlet fever the fur with the initial tonsillitis rapidly strips, especially from tip and edges, so that by the fourth day there is a bright red raw tongue, with prominent fungiform



papillæ (strawberry tongue, § 477). In measles the tongue is dry and heavily coated at first, but later it peels, leaving a papillated tongue very similar to that of scarlet fever. In typhus the tongue is at first flabby and coated with a thick brown layer; later it becomes extremely dry, often tremulous, and in severe cases dark and shrivelled. (iii.) The condition of the tongue gives much help in the diagnosis of *abdominal conditions*. In acute gastritis and enteritis, the tongue is heavily coated, and is associated with heartburn and an unpleasant taste in the mouth, whereas in chronic gastritis, cirrhosis of the liver, atonic and gouty dyspepsia, the tongue shows a thin white coating, is large, pale and flabby, with a broad tip and indented edges. A red tongue, with sharp red tip and edges, in which the hyperæmic papillæ contrast strongly with the slight white coating in the centre, is found in diabetes and hyperchlorhydria. In acute appendicitis, the tongue is almost invariably furred at an early stage, and later is coated and dry, especially when peritonitis follows. (iv.) *Toxic absorption* usually produces furring. The commonest cause is constipation, which may be "occult." Any bacterial focus, *e.g.*, intestinal obstruction, pyelitis, sinusitis, or chemical poisoning—*e.g.*, chronic alcoholism, chronic arsenical poisoning—act similarly. (v.) *Deficient secretion of saliva* causes a tongue which is dry and often furred. A dry tongue, in the absence of fever, indicates a lack of appetite (except in diabetes mellitus) or a depletion of water, as in diabetes insipidus, after profuse perspiration, diarrhœa (especially cholera) or vomiting. In asthenic states the tongue becomes very dry and coated, *e.g.*, coma, abdominal cancer, advanced phthisis. (vi.) In these extreme conditions a *denuded red tongue* generally follows as the crust falls off—the tongue is red, shining, smooth, dry and often cracked. It is found in the advanced stages of any chronic ailment, and indicates a grave prognosis. Aphthous stomatitis or thrush may supervene. (vii.) A rare condition, *black* or "hairy" tongue, is due to elongation of the papillæ at the back of the tongue; they resemble dark hairs. The hyperplasia of the papillæ permits growth of organisms, usually a streptothrix variety. Discontinuance of tobacco smoking has cured some cases.

§ 213. (b) **Other Characters of the Surface of the Tongue.** The *colour* of the tongue is an important indication of the state of the blood. It is *pale* in all anæmic conditions except when the tongue is also inflamed. With the modern use of cosmetics in women, the colour of the tongue is a much more reliable indication of anæmia than is the colour of the lips, cheeks or even conjunctivæ. The tongue is stained *black* when a patient takes iron mixtures. *Blueness* occurs in cyanotic states, and during nitrous oxide anæsthesia. *Excessive redness* occurs (i.) with polycythæmia, (ii.) scarlet fever, typhoid, advanced cachectic conditions, and hyperchlorhydria (see § 212); (iii.) with acute or chronic inflammatory changes (glossitis). In the early stages the papillæ hypertrophy, but later atrophy, and the tongue becomes *smooth* or *bald*. This may occur in local patches; later, the whole tongue is involved and still later



*fissuring* occurs, from the contraction of subepithelial scar tissue. There may be local *ulceration*, *tenderness* or *soreness* with streptococcal invasion along the margins, especially with oral sepsis or in association with *achylia gastrica*, pernicious anæmia, subacute combined degeneration, sprue, pellagra and other allied conditions. Diffuse soreness of the tongue and cheek with no visible lesion may be met in cancerphobia. The "Geographic" tongue and leukoplakia are described in § 214.

The *treatment* of these conditions is to remedy the cause. In persistent furring local conditions are often overlooked and an abdominal cause sought for. It is an old saying that a red tongue requires alkalies and a white tongue acids. A dry tongue indicates either dehydration, or no appetite and deficient gastric secretions, therefore the patient should be fed on fluids, soups, jellies and other foods requiring little digestive power. In painful conditions of the tongue, condiments, acid, rough and irritating foods must be forbidden, and in achylic conditions, hydrochloric acid administered regularly: local painting with silver nitrate 4% is helpful.

§ 214. (c) **White Patches** are not infrequently met with on the tongue, and may result from: I. Thrush; II. Leukoplakia; III. Geographical tongue; IV. Aphthous Stomatitis (§ 210); V. Syphilitic Patches (§ 158).

I. In THRUSH (parasitic stomatitis) there are white membranous patches, like milk curd, sometimes with an areola round them. They are distinguished from other similar affections by (i.) leaving a bright, bleeding surface when scraped off, and (ii.) by the detection of the fungus *Oidium albicans* (Fig. 66) on microscopical examination. It usually starts on the tongue or cheek, but may invade the lips and the whole interior of the mouth and pharynx. The ulceration and the salivation seen with aphthous stomatitis are absent. The disease occurs chiefly in infancy. It generally arises in bottle-fed children under bad hygienic conditions and is often attended by diarrhœa. It is contagious from child to child. In the adult it may occur at the end of wasting disorders. It yields to glycerine and borax, or weak carbolic lotion (1 in 500), but not to penicillin. In children excoriations may be seen around the anus,

and the mother thinks the "thrush has gone through the child." Occasionally it attacks the skin of adults, spreading rapidly over groins, abdomen and axillæ; it is usually mistaken for eczema intertrigo, but readily yields to a weak solution of iodine. Rarely, the nails are affected.

II. LEUCOPLAKIA LINGUÆ is a term applied to flat, whitish patches on the tongue. At first the areas are red and sensitive, with hypertrophy of the papillæ; later these atrophy and become slate coloured or white due to a heaping up of the epithelium. The disease may appear in small patches or may involve a considerable area. The patches may also invade the cheeks, gums and palate, and give rise to discomfort and tenderness. This condition is variously attributed to excessive smoking, jagged teeth, drinking strong spirit, and syphilis. Syphilis is the usual cause in cases which show a glazed and atrophic tongue. In 30% of these cases malignant disease supervenes. The

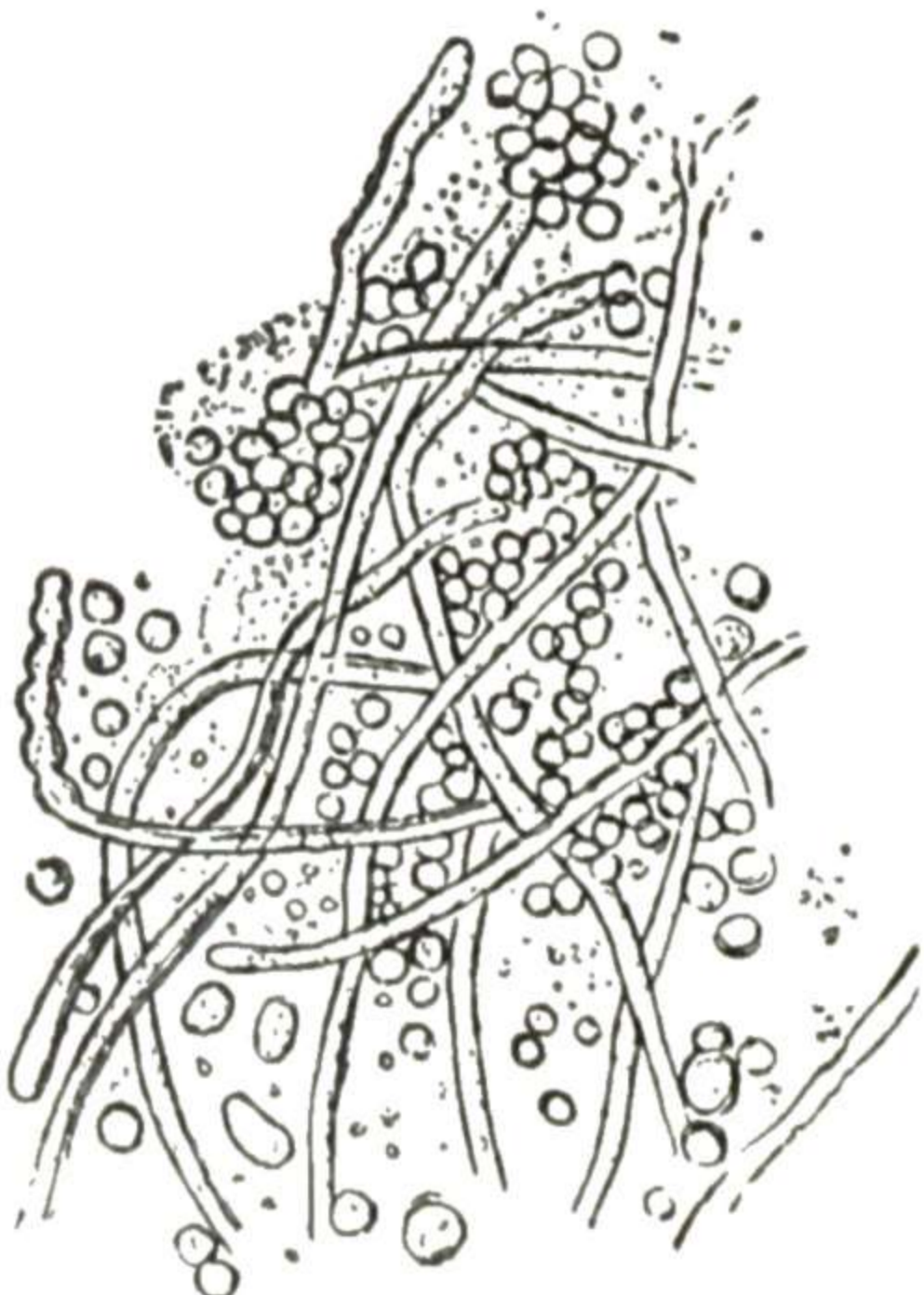


FIG. 66.—OIDIUM ALBICANS OR THRUSH FUNGUS.

*Treatment* is, as a rule, very unsatisfactory, unless the disease be met in the early stages. A mouth-wash, consisting of bicarbonate of soda (1 in 24), or a



saturated solution of chlorate of potash, sometimes relieves the symptoms. Superficial cauterisation or diathermy fulguration are good methods of treatment; zinc or salicylic ionisation is of value. Antisyphilitic remedies should be tried, but are not often successful. Alcohol, smoking, and other irritants must be avoided.

III. In GEOGRAPHICAL or "Mapped" tongue the normal desquamation of the tongue takes place irregularly, with the formation of more or less circular patches surrounded by margins of slightly proliferating whitish-grey epithelium. Although the cause is unknown it indicates impaired health. It may disappear spontaneously.

§ 215. (d) **Alterations in the Size of the Tongue.** An **Enlarged Tongue** may be due to ACUTE SWELLING, HYPERTROPHY, MACROGLOSSIA and TUMOURS.

ACUTE SWELLING OF THE TONGUE may be due to (I) *Acute Glossitis* or (II) *Acute Œdema*. In both the tongue rapidly enlarges, and may even protrude beyond the teeth. Much pain is present, and difficulty in swallowing and speaking.

(I) ACUTE GLOSSITIS may be due to local causes—*e.g.*, the sting of an insect, streptococcal infection from the teeth or throat, biting or wound of the tongue, acute ulcers or to constitutional conditions—*e.g.*, mercurial salivation and acute specific diseases, such as erysipelas and pneumonia. It may be, like Angina Ludovici (§ 160), of an erysipeloid nature. The onset is rapid, though not so rapid as in acute œdema; the swelling extends to the neck, and the glands become involved. *Treatment* must be prompt, to avert a fatal issue—ice to suck and cold compresses to the neck. Penicillin injections or sulphonamide compounds must be given early. Tracheotomy may be necessary.

(II) ACUTE ŒDEMA OF THE TONGUE is serious, because of its liability to involve the glottis. It may be associated with urticaria and angio-neurotic œdema. The œdema comes on suddenly; in the course of a few hours the tongue may protrude from the mouth. The swelling rapidly extends to the throat, nose, and down the œsophagus and trachea. There is inability to speak, to swallow, sometimes even to breathe. It is *diagnosed* from simple acute glossitis by (i.) its rapid advent; (ii.) the rapid extension to the throat and other parts; (iii.) the presence sometimes of urticaria, or a history of sensitiveness to some article of food (§ 609).

*Prognosis and Treatment.*—The disease comes on rapidly, and runs a very rapid course, subsiding in the course of twenty-four hours. It is apt to cause suffocation. Prompt measures are necessary. A strong purge or a turpentine enema should be given at once. Adrenalin B.P. should be kept constantly painted on the tongue and injected (0.25 to 1.0 c.c.). Benadryl may be very helpful. The practitioner must be ready to perform tracheotomy if necessary.

HYPERTROPHY AND MACROGLOSSIA. Simple hypertrophy occurs in cretinism, myxœdema, acromegaly, mongolism and with acquired syphilitic lesions. MACROGLOSSIA is a congenital condition of an enormously enlarged tongue due to an overgrowth of the lymphatic, muscular, arterio-venous or neurofibromatous tissues. If persistent application of mild caustics or the galvano-cautery fails to relieve the condition, operation must be resorted to.

TUMOURS of the tongue are rare; for diagnosis and treatment of these a surgical work must be consulted. Overgrowth of the *lymphoid tissue* at the base of the tongue (the "lingual tonsil") is found in local septic conditions and acute blood diseases. Rarely, *thyroid tissue* remains at the base of the tongue as a developmental defect.

A SMALL TONGUE which is tremulous occurs in hyperthyroidism. ATROPHY of the tongue (microglossia) usually arises from nerve lesions (§ 864).

WARTS are simple or syphilitic. *Simple* warts are distinguishable by the fact that they are soft; they are raised, and often pedunculated, and there is but little secretion. The glands are not shotty to the touch. *Syphilitic* warts are hard, with infiltration; they are never pedunculated, secretion is present, and the glands in the neck and elsewhere are shotty.

FISSURES may be simple or syphilitic. The *simple* can generally be accounted for by some such cause as the irritation of a ragged tooth, and are never infiltrated.



On pinching *syphilitic* fissures between the fingers, infiltration is felt. CICATRICES.—Simple ulceration rarely leaves a scar, but if so, it is never hard. Hard, stellate scars invariably indicate syphilis.

(e) § 216. **Ulcers of the Tongue** may be Simple, Syphilitic, Malignant, or Tuberculous.

I. SIMPLE ULCERS of the tongue are known by their superficial character, by the presence of some local cause, such as a jagged tooth or other local irritation. They also occur in chronic glossitis and ulcerative stomatitis (§ 210). The *frenum* is apt to be ulcerated in whooping-cough, due to friction against the lower teeth; this is a useful aid in diagnosis.

II. SYPHILITIC ULCERS are of two kinds: (a) superficial, (b) deep.

(a) *Superficial Syphilitic Ulcers* of the tongue are met with usually at the side, or in the form of fissures on the dorsum (*cp.* § 158) or superficial circular "punched-out" ulcers.

(b) *Deep Syphilitic Ulcers* are preceded by the formation of a roundish nodule (a gumma) which ulcerates. They are recognised by (i.) their site, which is usually on the centre of the dorsum; (ii.) their raised, ragged, and sometimes undermined edges; (iii.) the yellow slough which covers the base; and (iv.) the fact that they leave deep stellate scars. Syphilitic ulcers are usually multiple; difficulty in diagnosis arises in the case of a single ulcer as to whether it be syphilitic or cancerous. Syphilitic ulceration is differentiated by (1) the relative absence of surrounding induration, and consequently less interference with the movements of the tongue; (2) the dorsal site; (3) less glandular enlargement, and the glands have a shotty feel; (4) the age of the patient, malignant ulcers rarely occurring before forty; (5) little or no pain; and (6) a history of syphilis, a positive Wassermann reaction and the lesion *heals with iodide of potassium*.

III. MALIGNANT ULCER is known by (i.) its site, usually on the side of the tongue; (ii.) its hard, raised, everted edges, and uneven warty base, with foul discharge and tendency to hæmorrhage; (iii.) the induration around, and the early involvement of the glands; and (iv.) the early impairment of the movements of the tongue with great pain. These characters in an advanced case render the diagnosis from syphilis relatively easy. In an early stage the diagnosis may be very difficult. In that stage a cancerous ulcer has flat sloping edges and scanty secretion, *its progress is very slow*, and it does not yield to iodides. Before an ulcer has existed for any length of time, a Wassermann test should be made and a piece excised for microscopic examination.

IV. TUBERCULOUS ULCERS are not common. They are superficial, with a yellowish discharge, usually near the tip, and they only occur in advanced stages of tuberculosis of the lung or throat. The tubercle bacillus may be found in the scrapings and a biopsy is usually confirmatory.

*Prognosis.*—Simple ulcers are easily dealt with, but other ulcers of the tongue are dangerous chiefly from their liability to hæmorrhage and because of the important structures around. The diagnosis of syphilitic from malignant lesions is as important as it is difficult, for however



advanced the former may be, they yield to appropriate remedies, but the latter are necessarily fatal unless removed early. The deep ulcers often seen in advanced syphilitic glossitis are dangerous, as the deeper parts may be affected by malignant change.

*The Treatment* consists in removing local sources of irritation. In syphilitic cases, potassium iodide in large doses, and the normal anti-syphilitic remedies must be given. Malignant disease must be treated surgically or by radium.

(f) **The Method of Protrusion of the Tongue.**—The tongue usually protrudes evenly between the teeth, and is equally developed in its two halves. In health there may be constant slight deviation to one or other side, of no organic significance. *Tremor* of the protruded tongue occurs in paralysis agitans, general paralysis of the insane, chronic alcoholism, and lead and mercury poisoning. *Coarse jerky movements* are one of the early signs of rheumatic chorea. *Deviation* of the tongue to the paralysed side, forming a sickle-shaped tongue, occurs in hemiplegia or unilateral hypoglossal paralysis. *Failure to protrude* is evidence of an organic lesion involving the nerve supply or the muscles of both sides of the tongue. *Fibrillary twitchings and wasting* should also be looked for (and see § 864).

## THE ŒSOPHAGUS

§ 217. **Symptomatology.**—Diseases of the œsophagus have practically one symptom which is common to all—namely, *dysphagia*—*i.e.*, a difficulty in swallowing. It is necessary to distinguish between pain on swallowing and real difficulty due to obstruction. There are certain features which aid diagnosis:

*First*, does the difficulty apply to both liquids and solids? This gives us an idea of the *degree* of the obstruction. *Secondly*, does the food return? and if so, after what interval? This is sometimes a guide to the *seat* of the obstruction. Obstruction of the *œsophagus* has to be distinguished from obstruction at the pyloric end of the *stomach* (i.) by the easy way in which food regurgitates as compared with the vomiting which accompanies pyloric obstruction; and (ii.) by the absence of acidity or bile or evidence of digestion in the material returned. *Thirdly*, is there any pain? Its situation aids diagnosis of the position of the lesion. Is it present only after the ingestion of food? Constant pain may occur in malignant disease. *Fourthly*, what is the duration of the dysphagia? Has it been persistent, and become progressively worse? The last named is the leading feature of organic, as distinguished from functional, dysphagia, which is frequently intermittent, and by no means progressive. *Fifthly*, is there any regurgitation through the nose? This feature implies paralytic dysphagia, with paralysis of the soft palate. *Sixthly*, is there loss of weight, or any symptom referable to other organs? Emaciation coming on early in a patient beyond middle life is characteristic of carcinoma.

§ 218. **Physical Examination.**—Patients may complain that they have *difficulty in swallowing*, yet the condition may not be true dysphagia.



Thus, for example, tenderness and painful lesions of the mouth, throat and larynx may make it impossible to take solid or liquid food. The hysterical symptom *globus* may be mistaken for dysphagia; the patient complains of a sense of constriction in the throat or high in the epigastrium, or of a "ball rising up in the throat" (§ 888). A careful *inspection* of the throat should be made with and without a tongue depressor and a laryngeal mirror. The dysphagia may arise from tonsillitis or other pharyngeal or laryngeal conditions. Paralysis of the palate which succeeds diphtheria, or the paralysis of the face, tongue and palate in bulbar palsy, may thus be detected. Any swelling should be carefully examined, such as retro-pharyngeal abscess, tumour or foreign body in this situation. A toothbrush bristle in the pharynx can cause serious difficulty in swallowing. In children dysphagia is often due to pain on swallowing; in adults tuberculous laryngitis is a not uncommon cause.

*Special Examinations.*—In cases of dysphagia a skilled *X-ray examination* is necessary. First, the chest should be examined with the fluorescent screen, which enables one to identify extra-œsophageal causes of dysphagia such as aneurysm, mediastinal tumour, etc. Then an opaque meal is given: a thick emulsion allows more detail to be made out, especially if the patient is lying down or in the Trendelenberg position. On the screen the progress of the meal is watched and any obstruction noted; its characteristics will usually make the diagnosis clear. The use of the bougie is dangerous and is now almost abandoned. It is safer to use a soft stomach tube if anything of this nature has to be carried out. Bouginage should only be performed under direct vision through an œsophagoscope. The œsophagus starts at the cricoid cartilage, opposite the sixth cervical vertebra, and ends opposite a point between the ninth and tenth dorsal vertebræ, a distance of 10 inches.

The *œsophagoscope* is most useful in skilled hands. With it the exact site of the obstruction may be viewed, and when doubt exists as to its nature, a piece of tissue may be removed for microscopical examination. Early œsophagosopic examination for any œsophageal symptom, however slight, probably offers the best chance in the future for improvement in the results of treatment. The œsophagoscope is also useful for (i.) the removal of foreign bodies, (ii.) the treatment of malignant stricture by the introduction of Souttar's tubes, radon seeds, or radium, (iii.) the treatment by dilatation of non-malignant strictures.

*Auscultation* affords an additional means of detecting both the presence and position of an œsophageal stricture. Place the chest end of a stethoscope over the interval between the xiphoid cartilage and the left costal arch. Two gurgling sounds can be heard in this situation if the patient swallows *one* gulp of fluid; the first is when it passes from pharynx to œsophagus, the second is when it passes from œsophagus to stomach. The normal interval between these two is *six seconds*, but if there be any obstruction in the gullet this interval becomes increased. If the first sound cannot be distinctly heard, the moment of its occurrence can be judged by looking at the throat. Again, by placing the stethoscope on the left side of the neck in a healthy person a gurgling sound will be heard during the act of swallowing. This normal sound may be *traced round and down the back* on the left side of the



vertebral spines as low as the tenth dorsal vertebræ. But if a stricture be present it will be delayed or *absent below the seat of stricture*.

§ 219. **Causes of Dysphagia.**—*When a patient complains of DIFFICULTY IN SWALLOWING, or that the food returns to his mouth, the practitioner should first think of CANCER, secondly of ACHALASIA. The COMMONER CAUSES are—*

I. Cancer of the gullet .. .. .	§ 220
II. Achalasia of the cardiac orifice .. .. .	§ 221
III. A tumour pressing upon the gullet from the outside .. .. .	§ 222
IV. Cardio-vascular disorders .. .. .	§ 223
V. Simple or non-malignant stricture .. .. .	§ 224
VI. Foreign bodies, acute œsophagitis, and simple ulcer .. .. .	§ 225

LESS FREQUENT CAUSES are—

VII. Paralysis of the pharynx .. .. .	§ 226
VIII. Plummer-Vinson syndrome .. .. .	§ 227
IX. Diverticulum or pouch of the pharynx .. .. .	§ 228
X. Functional dysphagia .. .. .	§ 229
XI. Congenitally short œsophagus .. .. .	§ 230

§ 220. I. **Malignant Disease** of the œsophagus is in the large majority of cases an epitheliomatous growth in the wall, usually primary, which goes on to ulceration, and forms a stricture from 1 to 4 inches long; or it may be due to extension upwards of malignant disease at the cardiac end of the stomach. Rarely the growth is sarcomatous. It is important to emphasise that any œsophageal symptom, even the slightest, should be carefully investigated. Dysphagia is a late symptom of cancer of the œsophagus. A lumen of 5 mm. is sufficient to swallow chewed food. The favourite sites of malignant stricture are opposite the cricoid cartilage, 6 inches from the teeth (this is especially common in women—post-cricoid carcinoma); opposite the bifurcation of the trachea, 10 inches; and at the lower end of the œsophagus, 16 inches from the teeth. The diagnostic features of epithelioma of the œsophagus are: (i.) The patient is past middle life and is usually a male. (ii.) The dysphagia becomes steadily and progressively worse; in rare cases it may be intermittent. At first a difficulty exists only with solids, but later on fluids will not pass or also are returned. In some cases sudden complete obstruction to swallowing occurs when a large piece of food blocks the narrowed lumen. There may have been no previous symptoms. The duration of the whole illness rarely exceeds 12–18 months. (iii.) Emaciation and other evidence of cachexia occur quite early in the illness, owing to deficient nourishment. (iv.) There is usually no evidence of metastasis, but there may be enlarged glands, especially above the left clavicle. (v.) Pain and sometimes a dry cough may be persistent, independent of although aggravated by food. It may be slight or very severe. (vi.) When the cervical œsophagus is involved, weakness or loss of voice may occur from recurrent laryngeal paralysis. (vii.) A fistula into the trachea or left bronchus or a peri-œsophageal abscess may form. (viii.) X-ray examination may be conclusive. (ix.) Œsophagoscopy and biopsy clinch the diagnosis.



*Fibroma* and *Myoma*, and other benign growths in the œsophagus, sessile or pedunculated, are very rare. They may cause no trouble, or only vague and trifling symptoms. Their discovery is usually accidental.

§ 221. II. **Achalasia** (often called *Cardiospasm*) is a condition in which there is long-standing obstruction at the lower end of the œsophagus, and in which simple stricture and new growth can be excluded. The exact site of the obstruction is thought to be at the point where the œsophagus passes through the diaphragm; in this area there is often fibrosis of the œsophageal wall with kinking.

*Symptoms.*—(i.) Achalasia is usually met with in men from the ages of 30 to 50. (ii.) The food is felt to stick at the lower end of the œsophagus. (iii.) At a variable time after a meal, the food may pass on into the stomach or it may be vomited in an undigested condition. (iv.) On X-ray examination, the barium meal does not pass into the stomach but accumulates above this in a tremendously distended and rather coiled œsophagus. The amount of dilatation is much greater than is found from any other cause of dysphagia. A height of about 8 inches of barium collects above the sphincter, and if still more barium (or food) is taken, the weight of the food is often sufficient for the obstruction to be overcome until the level is reduced to the original height. The *etiology* of the condition is not yet settled; there is degeneration of the cells of Auerbach's plexus of the œsophagus. According to some the obstruction is caused by the crural fibres of the diaphragm, fibrosis of the œsophageal wall resulting in some cases at the region where they press upon it. Achalasia is differentiated from stricture or new growth by passing a heavy tube filled with mercury: this forces the sphincter open, and if the tube be alternately moved up and down, one finds that it is not gripped.

§ 222. III. **Pressure** upon the gullet from outside is a fairly common cause of dysphagia. Any intrathoracic tumour may, by its pressure, narrow the lumen of the gullet. Other tumours are cancer of a neighbouring organ, enlargement of the bronchial glands, lympho-sarcoma or other mediastinal tumour, goitre, pericardial effusion, and diverticulum of the pharynx filled with food (§ 228). The features common to all such tumours are the slowly progressive character of the dysphagia, the symptoms of pressure on other viscera, and the physical signs of the tumour in question. The differential features vary according to the nature and position of the tumour.

§ 223. IV. **CARDIO-VASCULAR DISORDERS**, which occasionally cause dysphagia, are a saccular aneurysm of the descending aorta, a large left auricle due to mitral stenosis and a large pericardial effusion. The *signs* of these conditions usually determine the cause.

In *aortic aneurysm* the amount of dysphagia is rarely very great at any time, although it is slowly progressive (§ 80). Rest in bed generally improves the dysphagia. The physical signs of aneurysm are commonly absent on account of its deep-seated position.

§ 224. V. **Simple or Non-Malignant Stricture** of the œsophagus is most



frequently caused either by the narrowing due to after effects of swallowing foreign bodies or a corrosive liquid, the cicatrisation which follows a simple ulcer of the œsophagus, syphilitic infiltration or the contraction which it subsequently leaves. Dilatation may take place above the stricture. The differential features of this condition are: (i.) The dysphagia comes on gradually, and, having reached a certain degree, is apt to remain stationary; the patient may be unable to swallow solids, but lives for many years on liquid food. (ii.) The patient may be young, or he may be of any age; the cachexia of cancer is wanting; and pain is not a prominent feature in the case. (iii.) The œsophagus is apt to dilate above the stricture, and the food returns after an interval, which becomes progressively longer as the dilatation becomes greater. (iv.) There is nearly always a history of one of the three causes above mentioned.

§ 225. VI. **Foreign Bodies, Acute Œsophagitis, and Simple Ulcer.**—The symptoms of these conditions are much alike. Acute œsophagitis occurs after traumatism, as after swallowing corrosive fluids, or in a localised form from the presence of foreign bodies or malignant disease. It sometimes occurs in the course of the specific fevers, and in infants at the breast from unknown causes. A slighter degree of *localised* inflammation arises by no means infrequently when a fish-bone, needle, pin, bristle of a tooth-brush, an impacted denture, or other solid particle, sticks in the folds of the œsophagus. This dysphagia takes the form of a difficulty and pain during the act of swallowing, at one particular spot. The symptoms here start suddenly and reach a maximum at once. This source of trouble is very apt to be overlooked when the patient has forgotten the incident which led to the lodgment of the foreign body. When the inflammation is *generalised*, there is great pain, with consequent spasm and regurgitation on attempting to swallow. Thirst and, if the condition be severe, feverishness are present. Mucus, pus, and blood may be vomited should ulceration ensue.

A *Peptic Ulcer* of the lower end of the œsophagus is rare. An ulcer is sometimes due to syphilis. Acute pain and tenderness are prominent features, with spasm on swallowing or on attempting to pass a bougie. The affection can sometimes be demonstrated by X-ray.

We now turn to the **rarer causes of Dysphagia.**

§ 226. VII. **Pharyngeal Paralysis.**—Paralysis of the *pharyngeal constrictors* is not uncommon as an accompaniment and complication of diphtheria. Difficulty of swallowing under these circumstances may be one of the first evidences of diphtheritic paralysis. It also occurs in polioencephalitis, syphilitic pachymeningitis, syringobulbia, bulbar paralysis, polyneuritis and myasthenia gravis. Thrombosis, hæmorrhage and new growth at the base of the brain are other causes. It differs from the other causes of dysphagia in being attended by regurgitation of fluids through the nose, owing to the paralysis of the soft palate. There is often associated paralysis of the tongue. Solids are often swallowed with less difficulty than liquids.

§ 227. VIII. **Plummer-Vinson Syndrome.**—The dysphagia is associated with anæmia, a smooth, bald tongue and pharynx, and usually also achlorhydria. It



occurs in association with the hypochromic anæmia of women and in pernicious anæmia. The condition seems definitely to predispose to post-cricoid carcinoma.

§ 228. IX. **Diverticulum, or a Pouch of the Pharynx.**—(i.) A *pressure* diverticulum forms by herniation of the mucous membrane through the muscular wall. These pouches usually arise in the lowest part of the pharynx, probably from incoordination of the muscles of the pharynx and the cricopharyngeus guarding the entrance to the œsophagus. (ii.) *Traction* diverticulum of the œsophagus, due either to adhesion between the œsophagus and neighbouring glands, or other structures, pulling out the œsophageal wall as they contract. This variety does not usually give rise to symptoms.

The *symptoms* are : (i.) Regurgitation of food after an interval varying from a few minutes to a few hours after ingestion. It is apt to be mistaken for persistent vomiting, but the ease with which the food is returned, and the absence of acid in it, should make us suspect this condition. (ii.) The regurgitation gradually increases in amount, and the breath is sometimes foul from the decomposition of food in the gradually enlarging pouch. (iii.) Sometimes the pouch forms a definite tumour in the neck. (iv.) X-ray reveals the pouch.

§ 229. X. **Functional Dysphagia** is not infrequently associated with hysteria and other functional neuroses. Its differential features are fairly characteristic : (i.) The dysphagia is never progressive. It may come on somewhat suddenly, dating perhaps from an emotional shock or trouble, and it is very often intermittent, the patient being well enough in the intervals. Sometimes solids can be taken, while fluids are regurgitated, or *vice versa*. (ii.) It is unaccompanied by emaciation or cachexia ; indeed, the patient sometimes appears to be in perfect health, a feature in which it differs from all other causes of dysphagia. There is usually little or no pain, and never any bleeding. (iii.) The dysphagia may last intermittently for years. (iv.) The passage of the œsophagoscope, or mercury bougie, or flexible stomach tube, generally results in curing the condition, at any rate for a time. (v.) The patient is usually of the female sex, and often presents other evidences of hysteria ; but it occurs also in males. There is often great fear of malignant disease. (vi.) X-ray examination reveals no organic disease.

§ 230. XI. A **Congenitally Short Œsophagus** with partial intrathoracic stomach is a rare cause of dysphagia. The patient has regurgitation, and sometimes discomfort after a meal is relieved in one special position. In some cases the symptoms are those of dyspepsia only. The condition can be diagnosed by X-ray examination of the œsophagus and of the stomach in the Trendelenberg position.

§ 231. **PROGNOSIS OF DYSPHAGIA.**—Dysphagia is in most cases a symptom of considerable gravity, and in severe cases it often results in death by starvation. Of all causes, malignant stricture is the most serious, and, in spite of the methods of modern surgery, patients rarely live more than a year or eighteen months. The length of time depends on the maintenance of the nutrition of the individual. Next in order of gravity come tumours pressing on the œsophagus, when the prognosis depends on the nature of the tumour and its amenability to treatment. Patients with simple stricture, and with dilatation, may live for many years on fluid diet, with or without gastrostomy. Diverticula may or



may not require operation. Some patients can manage, with a little trouble, for years. Of all cases functional dysphagia is the most curable, although it is apt to return.

The cause of death in dysphagia is usually starvation or a low form of pneumonia. This may arise from perforation into the bronchus or by the food passing into the glottis. In either case death is expedited by the lowered vitality of the patient. Perforation may occur in other directions—*e.g.*, a case of malignant disease of the gullet may die from hæmorrhage consequent upon perforation into the aorta.

**TREATMENT OF DYSPHAGIA.** The indications are to remove the cause of the obstruction, to maintain the strength and nutrition of the patient and to relieve any concurrent symptoms. In *malignant disease* the introduction of a Souttar's tube through an œsophagoscope may give much relief and the patient may continue to swallow normally for some months, when it may be necessary to introduce another tube. Octyl nitrite inhalations during a meal often make swallowing easier for a time. Treatment by deep X-ray therapy is at present the commonest form of treatment. The insertion of radon seeds or the introduction of radium is often useful. Radical cure, by surgical removal, is being attempted more and more; the mortality of the operation is between 20 and 50 per cent. Deep X-ray therapy and early gastrostomy offer the best chance of prolonging life in every case of malignant stricture. If, when the case comes under treatment, debility is very marked, complications are present, and there are evidences of cancer elsewhere, gastrostomy is the only treatment of any avail. Morphia should be used freely for pain in the terminal stages. In *achalasia*, a heavy rubber tube filled with mercury should be passed just before meals. At first this must be done before every meal, but as the symptoms are relieved, it is required less and less often, until, in most cases, once a week or once a fortnight suffices. Operations are better avoided. In *simple stricture*, bougies of gradually increasing size should be passed under direct vision through an œsophagoscope; force must not be used in so doing. If syphilis be suspected as the cause, anti-syphilitic treatment must be given. *Foreign bodies* in the œsophagus need prompt attention, else they may perforate and produce mediastinitis. With the aid of the œsophagoscope they may be readily removed. In *acute œsophagitis* the pain must be soothed by morphia hypodermically, by cocaine lozenges, or by opium given with tragacanth. Thirst may be allayed with spoonfuls of iced water, in which small doses of opium, cocaine, and milk may be administered. During the acute stage the patient may require nutrient enemata; with the œsophagoscope local treatment can be administered. In *pharyngeal paralysis* the patient must be fed by a nasal tube; semi-solid foods are swallowed more easily than solids or fluids. In the *Plummer-Vinson Syndrome* the anæmia should be treated by massive doses of iron and vitamin B complex or riboflavin, or by liver injections if pernicious anæmia is present. The passage of the œsophagoscope usually relieves the dysphagia. For a



*diverticulum*, operation may be necessary if the dysphagia is too great. In *functional dysphagia* the passage of the œsophagoscope is helpful. The general condition may be treated; belladonna and valerian are effective in hysteria.

*Feeding by a stomach tube* is a most useful measure when dysphagia is marked: it is also used for continuous drip feeds in cases of gastric and duodenal ulcer. A rubber tube (size 6) or a latex tube is most comfortably passed into the stomach through the nose and need only be changed each 3 days: milk and milky foods, milk and eggs, chocolate, etc., may have malt or sugar added to increase the caloric value.



## CHAPTER IX

### THE ABDOMEN

THE abdomen contains a large number of very important organs and structures, but just as their physiology and pathology are in some instances obscure, so also are the means at our disposal for their thorough clinical investigation imperfect. It is in this region that we have to deal with symptoms which on the one hand may be of trivial order, or on the other of extreme gravity; symptoms and conditions the issue of which will largely depend on the promptitude, knowledge, and skill of the medical practitioner and upon his adequate comprehension of their true meaning.<sup>1</sup>

#### PART A. SYMPTOMATOLOGY

§ 238. **Local Symptoms.**—The symptoms referable to disease situated within the abdomen are necessarily of the widest and most varied kind, but there are only three which are sufficiently constant to be regarded as cardinal symptoms, all of which are referable to the abdomen itself—viz., ABDOMINAL PAIN, GENERALISED ENLARGEMENT, and LOCALISED TUMOUR.

VOMITING is a fairly constant accompaniment of all acute abdominal conditions, whether the stomach is involved in the lesion or not. Its causes are discussed in § 271.

The presence of DIARRHŒA and CONSTIPATION depends very largely on whether the intestinal canal is affected, and these are fully dealt with in Chapter XI. The other symptoms also depend largely upon which of the abdominal organs is affected, with one important exception—viz., “INDIGESTION.” In all chronic abdominal disorders, no matter which organ is affected, we are often consulted for “INDIGESTION”; in fact, nausea and all the other symptoms of pronounced dyspepsia may be due to disease quite unconnected with the stomach, and located, for instance, within the uterus, appendix, gall-bladder, colon, kidneys, prostate, liver, lungs, pancreas or other organs.

ABDOMINAL PAIN, if acute and sudden, is a medical emergency of the most important kind; if chronic, it presents many difficult questions for diagnosis. It therefore merits the most careful study and analysis (§ 242). The diseases *outside the abdomen* which may cause it are:

1. *Diaphragmatic pleurisy*, or a basal pleuro-pneumonia, may give rise to acute abdominal pain of sudden onset (often referred to the correspond-

<sup>1</sup> Although in one particular patient there is usually only one pathological process at work, it must not be overlooked that a patient with *tabes dorsalis* may also be suffering from a perforated peptic ulcer, or that a patient with pneumonia does occasionally develop acute appendicitis at the same time.