

the stroma may be greatly in excess of the normal degree. In the latter condition the lymphoid elements may be in excess, for a condition of general atrophy may be present. The external appearance of the tonsil in the first-named variety of disease is quite characteristic, the surface being rough and irregular in outline, dark red in color, and the substance of the gland being soft and compressible. The mouths of the crypts are usually more or less open, and the whole organ is deeply congested. Microscopical examination shows that while the lymphatic follicles are increased in number and size, the stroma is not markedly augmented. Such a tonsil may be removed easily, and, as a rule, without pain. In the other variety the surface is smooth and often glazed, the color is pink or even dull gray, the consistence firm and unyielding; while the mouths of the crypts are apt to be partly occluded, and the crypts themselves filled with broken-down excreta. Microscopically, the most striking feature of the section will be the remarkable proliferation of the fibrous stroma, which may be found more or less thickened at the periphery, and in the interior of the gland may be so greatly increased in amount as to encroach extensively upon the adenoid elements. In performing tonsillotomy in such a case great resistance to the knife or the tonsillotome may be experienced, and considerable pain caused by its passage through the tonsil. Again, the main blood-vessels ramify in the stroma. When the latter is normal or not excessive in amount, the walls of the vessels, when divided, easily close and bleeding is stopped. In fibrous tonsils, however, the excess of connective tissue surrounding the blood-vessels makes it difficult for the latter to undergo the normal process of retraction when divided, so that bleeding after the removal of such a tonsil is apt to be more prolonged than in the case of the first-mentioned variety.

The fibrous form is found during childhood, but is more common in adult life. Hence the greater liability of the adult to hemorrhage after tonsillotomy, the rule being that, in patients under twenty years of age, the operation is almost absolutely devoid of danger.

**Etiology.**—The causes of tonsillitis may be both predisposing and exciting. Of the former the most important factor seems to be youth, since it is most prevalent between the ages of fifteen and twenty-five years. It is rare in early childhood and after fifty, although a case is recorded in which suppurative tonsillitis took place in a child of only seven months. In many cases the tendency to tonsillar inflammations seems to be directly hereditary, and not referable to any mediate condition. Climate may play an important part.

Hypertrophy of the tonsils greatly increases the liability of the individual to acute attacks of tonsillitis. Sometimes this seems to be due to the retention, in the enlarged lacunæ, of excretory matter, which acts septicly and so excites the adjacent tissue that a tonsillitis supervenes. Again, the tonsil seems, in many cases, to be a vulnerable spot, which is apt to sympathize with various irregularities of the body, and to be subject to inflammation as the result of dyspepsia, menstrual irregularities, rheumatism, and gout. A general condition of ill health may predispose to tonsillitis, and it is a matter of common observation that it may be caused by mental depression and by unusual anxiety or care.

The exciting causes of tonsillitis are usually ascribed to exposure to wet and cold. Septic influences, however, play an important part in their production.

In the latitude of New York tonsillitis is most frequent in the spring, next most frequent in the winter, less so in the fall, and least prevalent in the summer. It is most frequent in March, and least frequent in September. The disease is uncommon in tropical and in very cold climates.

Tonsillitis may be present as a complication in scarlet fever, measles, and smallpox. It may also be caused by the inhalation of irritating vapors or the swallowing of caustic substances. Finally, it may arise from various traumatism, such as wounds, laceration from or impac-

tion of foreign bodies in swallowing, and from the irritation due to accretions in the tonsillar crypts.

**Classification.**—Tonsillitis may be divided into several varieties, a convenient classification being as follows:

1. Superficial or lacunar tonsillitis, characterized by diffuse inflammation of the mucous membrane of the tonsil and accumulation of fibrinous exudation and desquamated epithelium in the crypts, which appears at the surface in patches of whitish exudation.
2. Parenchymatous tonsillitis, in which the deeper tissues of the tonsil are inflamed, and there is considerable swelling.
3. Croupous tonsillitis, in which a false membrane forms upon the tonsil.
4. Acute ulcerative tonsillitis.
5. Gangrenous or phlegmonous tonsillitis.
6. Peritonsillitis, with or without the formation of abscess.

**Symptoms.**—The symptoms which usher in an attack of tonsillitis are, in general, much the same for all varieties of the disease. In fact, it is often impossible for the physician, or even for the experienced patient, to predict, at the outset, the probable course of the illness.

In lacunar tonsillitis, supposing the case to be one of simple catarrhal inflammation, and not diphtheritic, the swelling of the tonsil is less considerable than in the suppurative form, but the mucous membrane is of a bright red color, and a whitish exudation is seen issuing from the mouths of the lacunæ, giving to the surface of the tonsil the appearance of being covered with a number of small, rounded patches.

Sometimes the deposit extends beyond the mouth of the crypt, and, this happening in the case of two or more lacunæ, the surface of the tonsil may present a considerable area of exudation from the coalescence of several individual patches. Follicular tonsillitis usually undergoes spontaneous resolution in from two to five days.

Another variety of tonsillitis is that in which there is observed upon the surface of the gland a distinct herpetic eruption, the mucous membrane and the parenchyma at the same time being violently inflamed. This condition generally runs the course of a simple acute tonsillitis, subsiding in two or three days. It is often associated with the earlier symptoms of some more serious affection, and particularly with those of pneumonia.

Acute ulcerative tonsillitis is sometimes seen in persons who have been exposed to debilitating influences, and who are at the same time surrounded by bad hygienic conditions. It is characterized by the appearance upon the tonsil of a deep, unhealthy, more or less extensive sloughing ulcer, which gives rise to much local pain and profound general disturbance. Its course is slow, and convalescence may be attended with much prostration.

Gangrenous or phlegmonous tonsillitis includes erysipelas and acute inflammatory œdema, grave conditions due to infection and described in Vol. VI, under the heading, *Pharynx, Diseases of: Acute Phlegmonous Pharyngitis*.

Peritonsillitis may end in resolution or in abscess. While abscess of the tonsil itself may occur, the pus generally discharging through one of the crypts, it is common for the abscess to be located outside of the tonsil, in the loose connective tissue upon which the latter rests.

Obstinate constipation almost invariably precedes and accompanies tonsillitis. The urine is highly colored, loaded with urates, contains an excess of urea, and is deficient in chlorides; albumin is sometimes found. The existence of albumin in the urine seems to be indirectly dependent upon the height of the temperature. When this is over 103° F., a trace of albumin is often present; but there are no casts, and the albumin generally disappears when the temperature begins to fall. Its presence is of no more importance than the transient albuminuria of pneumonia and erysipelas, although upon first finding it one is apt to feel uncertain as to whether the affection of the throat may not be diphtheritic.

In many cases of true suppurative tonsillitis there is from the first a sensation of deep-seated pain and throbbing,

which to the experienced sufferer marks the attack as one of quinsy. The general symptoms are malaise, chilliness, and febrile temperature, more or less pronounced, together with a sense of stiffness and dryness of the throat, and more or less pain in deglutition. As the soreness of the throat becomes worse the temperature tends to rise, until it may reach as high as 106° F. It is apt to rise most rapidly and to the highest point in the young, and, in the follicular form of the disease, may attain a maximum in a comparatively short time. Generally, however, the constitutional symptoms are more marked in the suppurative form. In patients of debilitated constitution the fever may assume almost a typhoid character, while the tonsils become dotted with a grayish exudation or are actually covered with sloughing, unhealthy ulcerations. In some instances the disease seems epidemic, attacking several persons in the same household and constituting the so-called "spreading quinsy," a disease suggestive of septic infection, and rarely observed without the coexistence of a definite source of infection. The progress of the disease may be unfavorable, leading to a true phlegmonous condition closely allied to genuine erysipelas, if not identical with it, and to extensive infiltration of the tissues of the neck in the vicinity of the tonsil, which has been known to extend downward as far as the clavicle; while the violence of the inflammation not infrequently produces an œdematous condition of the throat, which is occasionally fatal. The inflammation usually extends to the mucous membrane lining the Eustachian tube, causing decided temporary loss of hearing, and sometimes inflammation of the middle ear. Dysphagia in a severe case of quinsy is often intense, the patient being unable to swallow even his own saliva, and absolutely refusing to take food, because of the inordinate pain caused by every attempt at deglutition, and because, from the tumefied state of the parts, the stiffening of the muscles, and the general local disability, the act of swallowing is a physical impossibility. The patient may be unable to move the jaw, the mouth becomes covered with a thick yellowish-gray deposit, the breath is fetid, the teeth are covered with sordes, and the countenance presents an expression of great anxiety and suffering, characteristic of the disease. The location of the abscess may be either in the parenchyma of the tonsil or in the layers of connective tissue which lie between it and the outside of the pharynx. In the former case death has more than once been produced by the sudden rupture of the abscess during sleep, and the consequent strangling of the patient. When the abscess is peritonsillar this danger is also present. Instances are recorded in which, through the presence of a peritonsillar abscess, the walls of the internal carotid have become eroded, and rupture, with speedy death, has taken place.

**Differential Diagnosis.**—The diseases which may be mistaken for tonsillitis are diphtheria, phlegmonous pharyngitis, retropharyngeal abscess, scarlatina—when the rash is not well developed,—syphilis, cancer, and pharyngo-tonsillar mycosis.

In suppurative tonsillitis, the inability to separate the jaws, the fetid breath, the coated tongue, and the peculiarly anxious and suffering expression of the countenance, together with the comparatively slight systemic disturbance which often accompanies its earlier stages, are fair evidence of its nature. Examination of the tonsil by palpation will often be of material assistance; the organ feels hard and prominent, while the slightest pressure upon it gives rise to intense pain. By means of the finger the presence of pus may be demonstrated, the tissues having a characteristically doughy feeling, or else actually presenting fluctuation. In cases in which pus is suspected, but in which fluctuation is not apparent, Stoerk has suggested that, while the exploration of the tonsil is being made with one hand, the gland be supported from the outside by pressing gently with the other hand, behind and below the ramus of the jaw.

It is in follicular tonsillitis that the greatest difficulties of diagnosis will present themselves, the desideratum

being to distinguish the simple forms of that disease from true diphtheria. While simple follicular tonsillitis is generally distinguished from diphtheria by the absence of glandular swelling of the neck, albuminuria, and subsequent paresis of the pharynx, nevertheless, all of these symptoms may be present. The nature of the exudation also may be misleading. Usually the catarrhal exudate is confined to the mouths of the crypts, and may be easily stripped from the surface of the mucous membrane and dragged from the crypts, leaving the subjacent membrane intact; while in diphtheria the membrane is deposited in patches upon the surface of the gland, is adherent, and, when torn from its place, leaves the membrane underneath distinctly eroded and bleeding. Nevertheless, these differences are not always to be depended upon. The relative height of the temperature and the quality of the pulse are important diagnostic signs. In follicular tonsillitis the temperature is usually high, rarely under 102° F. and occasionally as high as 106° F., rising suddenly and, in many cases, falling with almost equal rapidity. In diphtheria it seldom rises above 102° F., gradually attaining that point, and remaining in its neighborhood for a considerable length of time. In follicular tonsillitis the pulse, although perhaps rapid, is usually full, bounding, and regular. In diphtheria it is rapid, markedly depressed, and sometimes irregular.

If albumin be found for the first time on the second or third day, the temperature being at 103° F. or more, and if it disappear on the fourth, we are almost surely dealing with a case of simple tonsillitis. The diagnosis will, of course, be rendered more simple if a history of exposure to the diphtheritic poison can be obtained, or if the Klebs-Loeffler bacillus can be demonstrated.

Tonsillitis may be differentiated from the sore throat of scarlet fever by the absence of the characteristic exanthem and of the symptoms of the latter disease usually seen upon the tongue and pharynx. It must be remembered, however, that in true tonsillitis there is, rarely, a slight skin eruption.

Syphilis may be differentiated from tonsillitis by the symmetry of its manifestations and by the presence of ulceration, the latter being an unusual condition excepting in the former disease.

On several occasions the writer has seen primary cancer of the tonsil mistaken for quinsy. The gradual development of the former and its duration, extending over a period of weeks or months, will exclude tonsillitis, while the facts that cancerous disease is unilateral, that it almost invariably occurs in patients over forty years of age, and that it is unattended with febrile symptoms, point clearly to the true nature of the affection.

**Duration.**—The duration of an attack of simple parenchymatous tonsillitis is generally from three days to a week. In follicular tonsillitis the disease may run its course in a surprisingly short time. From two to five days would be a fair estimate of its average length. In quinsy the probable duration is most uncertain, and there is in many cases a tendency to relapse; or, the process having been completed on one side, the opposite tonsil may become affected, and the whole tedious history of suppuration be repeated. Thus, the time required may extend over several weeks.

**Prognosis.**—The prognosis in the milder forms of tonsillitis is almost invariably good, and the progress toward recovery often wonderfully rapid. This is by no means invariably the case. Follicular tonsillitis is often followed by marked debility, while an attack of suppurative tonsillitis may be succeeded, in persons of debilitated constitution, by a tedious convalescence and long-continued general depression. Moreover, one attack seems to predispose to others, and with some patients every year brings with almost certain regularity one or more exacerbations. Death from quinsy has been known to occur in one of three ways: By sudden rupture of a large tonsillar abscess during sleep, resulting in suffocation; by the violence of the inflammation causing infiltration of the neighboring parts, which, extending to the larynx, produces œdema of the glottis; and by erosion of

the walls of one of the large arteries adjacent to the tonsil, followed by fatal hemorrhage.

**Treatment.**—In all forms of tonsillitis the treatment, to be effective, must be both general and local.

**General Treatment.**—Rest in bed should be enforced. Since acute tonsillitis is almost invariably attended with constipation, the first and most important measure is the administration of an effective purgative. Attention to this feature must be paid throughout the course of the attack. This holds true for all varieties of the disease.

With regard to general therapeutic measures directed toward the disease itself, innumerable plans and drugs have been proposed. In almost every instance they have proved valueless. Some, however, have gained a fair reputation for usefulness. The effect of drugs upon tonsillitis varies greatly in different individuals. What may be almost a specific for one seems with another to be inert.

To be effective, general treatment must be instituted as soon as possible after the commencement of the attack. For a simple case in an adult the best plan is to administer, alternately, every fifteen minutes, half a drop of tincture of aconite (Fleming's) and half a drop of tincture of belladonna, watching carefully for indications of the physiological effects of the drugs and stopping the medicine upon their appearance. This method promises much better results than the administration of opium in the form of a ten-grain Dover's powder, or of a large dose of sulphate of quinine, although both of the latter are occasionally serviceable.

In the cases which seem to be of rheumatic origin three remedies have been highly recommended. These are salicylic acid, guaiacum, and the bicarbonate of soda. Of these the first is, in the experience of the writer, the most reliable. A convenient form for its administration is in capsules, each containing five grains of salicylate of soda, with a small quantity of quinine, generally about one grain, one such capsule to be taken every two, three, or four hours, as the case may require. The use of guaiacum has never been popular in this country, and at present is practically abandoned. The use of bicarbonate of soda, taken internally and also applied locally to the tonsil, has gained many supporters.

In all forms of tonsillitis iron is invaluable. While there are many preparations of greater elegance, none is so effective and reliable as the tincture of the chloride, which not only acts constitutionally, but, in the process of deglutition, is applied locally to the surface of the tonsil, where its antiseptic and astringent effects are most salutary. It may be administered most conveniently in glycerin, in the proportion of three parts of the latter to one of iron; from half a drachm to one drachm of the mixture to be given, as the case may require. The addition to the dose of the iron and glycerin mixture of about one ounce of cold Vichy water makes a decidedly palatable drink, and prevents the iron from staining the teeth. Quinine may also be given in tonic doses, and the nutrition of the patient must be carefully maintained. During convalescence the administration of bitter tonics and iron will materially hasten recovery.

**Local Treatment.**—The employment of well-selected local measures in the treatment of acute affections of the tonsils is of the utmost importance. It is not too much to say that there is no case of tonsillitis, whatever may be its nature or its degree of severity, which cannot be benefited, and the more distressing symptoms palliated, by means of applications made directly to the affected parts; and while the use of local applications cannot do away with the necessity for the constitutional treatment of the general condition underlying a given attack, the two should go hand-in-hand, each being essential to the successful working of the other.

Local applications may be made either to the neck, in the region of the tonsils, or directly to the glands themselves. If the onset of the attack be recognized at an early period in its history, much may be done to abort it by the use of cold applied to the neck over the region of the tonsils. The application may be made in one of

several ways. The old-fashioned plan of dipping a folded handkerchief in cold water, wringing it out, and tying it over the neck in the neighborhood of the tonsils by two or three turns of a flannel bandage, is often productive of good results. Lennox Browne gives excellent directions for making a wet compress for the throat, and advises as follows: Take a piece of lint twice as large as may be required to cover the desired area—that is, from angle to angle of the jaw—or a piece of linen four times as large, the former to be folded twice, the latter four times. Saturate this with cold water, apply it over the region of the larynx (or tonsils), and cover it with a piece of oiled silk, rubber tissue, oiled paper, or other waterproof material, which must be at least half an inch larger than the compress in every direction. By lining the oiled silk with flannel, greater adaptability is obtained. Secure the compress by means of a handkerchief tied twice around the neck. Far more convenient is spongopiline, as commonly made and sold in this country. By means of this most convenient dressing, applications of either heat or cold can be made, and with the least possible annoyance to all concerned.

In the later stages of suppurative tonsillitis, poultices of linseed meal or spongopiline, are often of great benefit. The application to the throat of dry cold is a valuable therapeutic measure in a large variety of inflammatory conditions. The writer has employed it in certain cases by partly filling a small bladder with pounded ice and laying it over the neck so as to cover the space adjacent to the tonsils. Sitwell's improved surgical water bandage or temperature regulator, made of the best quality of soft india rubber, is extremely light in weight and elastic, and hence remarkably adaptable, convenient, and comfortable.

For outside application the use of pigments, counter-irritants, and leeching is, as a rule, not to be recommended, since they are far more likely to increase than to diminish the discomfort of the patient. When required, a simple stimulating liniment of ammonia well answers the purpose, while the use of cold, as already described, early in the attack, or of warm poultices later, will be found both grateful to the patient and beneficial.

When excessive secretion is an annoying feature of the case, some advantage may be derived from the external application to the throat of belladonna liniment.

Internally, the use of inhalations of steam and of hot sprays has become unpopular. Much better is the following process: Let the patient lie upon his back, partly fill the mouth with hot water, turn the head until the face is uppermost, and thus allow the water to gravitate toward and upon the affected parts. This will succeed as well as any ordinary act of gargling, and with little or no discomfort. It may be repeated as often as necessary. It is generally productive of so much comfort that the patient soon realizes its value and will desire its repetition. This is true even of children. If desirable, the fluid may be medicated, the addition of a small proportion of bicarbonate of soda, or of borax, being especially helpful in facilitating the removal of the viscid secretions common in such cases.

An extensive area lies behind and above the tonsils, which may be more or less filled with irritating secretion, and which washes, applied as above, cannot reach. For cleansing these parts, no method is more satisfactory or more gentle than the careful injection of spray, through the anterior nares and backward into the pharynx. This may be done by the patient himself, or by an attendant, by means of any good hand-ball atomizer throwing a horizontal jet, and when properly employed it is capable of giving the greatest relief. The same spray may be used through the mouth, directly toward the tonsils and pharynx. The use of the post-nasal syringe in acute inflammations of the tonsils and pharynx is dangerous, and should never be allowed. Even the spray may enter the Eustachian tubes. In order to prevent this the patient should be directed to avoid blowing the nose, and always to draw the fluid from before backward and into the pharynx. While in chronic conditions harm has prob-

ably very seldom been done by the use of the spray, in acute cases it has been beyond question the cause of serious middle-ear inflammation. Applications of medicated fluid to the tonsils may be made to the best advantage with a hand-ball atomizer. One of the best applications in the early stages of tonsillitis is a saturated solution of the extract of suprarenal glands.

For purposes of cleansing and disinfection, an alkaline solution containing some good disinfectant will be most useful. Dobell's solution, if employed at all, should be largely diluted with water.

In suppurative tonsillitis, as in the formation of abscesses in other parts of the body, the most important consideration is the early recognition of the formation of pus and its speedy evacuation. A tonsillar abscess left to run its own course will, without doubt, and in due time, break. The question of surgical interference, however, must be considered, and for two reasons: First, because of the possibility of danger from the sudden rupture of a large abscess during sleep. Second, and far more important, because by a timely incision the abscess may be evacuated, the progress of the disease cut short, and the patient saved perhaps many days of extreme suffering and depression, and, possibly, the danger of blood-poisoning.

In the use of the knife in such cases, certain rules should be observed and precautions taken:

1. Scarification of the surface of an inflamed tonsil, while sometimes beneficial, is generally irritating, and not likely to afford more than a questionable amount of temporary relief.

2. In quinsy incision is indicated when, from the presence of distinct fluctuation, the spot at which the abscess is pointing may be evident; or, when the tissues are swollen and boggy, and there is reason to believe that pus may underlie them. The instrument most convenient for the purpose is a common scalpel, of medium size, the blade of which should be protected to within half an inch of the point, so that not more than the above amount of the cutting surface is exposed. In selecting the point at which incision should be made, it must be remembered that the abscess may be quite superficial and in the substance of the gland, or deep and involving more the connective tissue outside the tonsil. In the former case, it is best to enter the tonsil itself, making the incision horizontally and from without inward. When the abscess lies more to the outside of the tonsil, palpation of the gland may fail to demonstrate any sign of pointing. If, in such a case, the finger be applied to a point opposite the tonsil, outside of the anterior pillar of the velum, it will often be possible to detect distinct fluctuation; the space between the palato-glossus and the palato-pharyngeus muscles being covered simply with mucous membrane. If now the knife be entered at this point, and made to penetrate to only a moderate depth, pus may be found and the abscess opened, when incision of the tonsil itself would have failed.

In such a case the line of incision should be from above downward and slightly outward, following the direction of, and parallel with, the anterior pillar.

In cases in which the swelling of the tonsils is so great as to threaten suffocation, and in which simple incision does not seem sufficient to evacuate the abscess or reduce the tumefaction, one of two surgical procedures may be resorted to. Either the tonsil may be excised and its inflamed and swollen tissue removed, or tracheotomy may be performed. Intubation is, of course, inadmissible, since the obstruction is not in the larynx, but above and outside of it. The writer has seen two cases in which a timely tracheotomy would have saved the patient's life. On the other hand, when the tonsils themselves are enormously enlarged and the tissues around them not too greatly infiltrated, when the abscess is evidently in the substance of the gland or immediately in its vicinity, and when there is danger of septic infection, excision offers an effective, speedy, and tolerably safe means of relief. In acute exacerbations of tonsillitis, particularly in children whose tonsils are chronically hypertrophied,

instances are not wanting in the experience of most specialists in which a tonsillotomy, promptly performed, has averted a dangerous issue.

3. When, as is often the case in chronic hypertrophy of the tonsil, the patient suffers from recurrent attacks of quinsy, excision of the tonsil is of the greatest value, and in many instances the operation will effect a radical cure. As a rule, tonsillotomy should not be performed while the gland is in a state of acute inflammation.

4. In some cases the tonsils are sufficiently enlarged to admit of excision only during an acute attack. In these it is better to operate at once, and at the beginning of the acute inflammation. Thus, the redundant tissue may be more thoroughly removed, the present attack cut short, and future trouble avoided. Pain is greater from such an operation, and hemorrhage is more likely to be active. Experience, however, proves its value.

**CHRONIC INFLAMMATION** of the tonsils, although generally associated with more or less hypertrophy, is sometimes observed as a disease of the crypts of the gland, the so-called chronic lacunar tonsillitis—an annoying, and often an obstinate, condition of disease attended with inflammation, dilatation, and obstruction of these follicles. The crypts are often found to contain white or yellowish masses of cheesy detritus which have a particularly bad odor. The presence of these masses is very irritating to the patient. They are likely to cause more or less inflammation of the surrounding parts, sometimes to the extent of producing abscess. Many large crypts open into the supratonsillar fossa, and there is often a large and deep sulcus formed by adhesion of the anterior pillar of the velum to the tonsil. These cavities are particularly liable to become diseased. The treatment of this condition is simple and effective. It consists in the free opening of each crypt, from top to bottom, by means of a sharp, specially constructed knife, or by the galvanocautery and the subsequent application of a strong solution of iodine to the walls of the crypt. Few operations are capable of giving more relief. The parts soon resume a healthy condition, and the symptoms, local and reflex, disappear.

**CHRONIC HYPERTROPHY.**—*Etiology.*—Hypertrophy of the tonsils is sometimes congenital. It is often noticed when the child is but a few months old. Sometimes it becomes developed about the age of puberty. In the experience of the writer, many cases owe their origin to diphtheria, an attack of which has left the throat inflamed and highly sensitive to irritating influences, in which state the tonsils become permanently enlarged or liable to recurrent attacks of acute inflammation, through which hypertrophy takes place. Scarlatina, measles, or whooping-cough may serve as a starting-point for it, and syphilis, congenital or acquired, and tuberculosis may also be its chief causes, while many cases seem to result from recurring attacks of quinsy. Often the condition appears to be excited by the irritating effects of acid indigestion.

It appears that the tendency to enlargement of the tonsils is in direct relation with the general activity of the gland, and that, active at birth, the susceptibility increases rapidly until at the time of puberty it is at its height. From this time there seems to be a decline, which becomes progressively rapid until, beyond thirty, the disease is more and more uncommon. While atrophy may and does occur at or about puberty in a few instances, in quite as many cases tonsils hitherto normal become enlarged; and hypertrophy may take place in them, not only at the time of puberty, but at any period within fifteen years or even more after the age of adolescence. If, therefore, it be true that even a healthy tonsil may become chronically hypertrophied after puberty, how much more probable is it that one already enlarged in childhood may continue in that condition.

*Symptoms.*—The symptoms of tonsillar hypertrophy are usually pronounced.

In a well-marked case the first signs to which attention will be called are those seen upon the countenance of the patient. The complexion is pale, cachectic, and trans-

parent, the veins standing out in distinct relief; the lips are often dull pink, or even blue; the eyes are heavy and lifeless and their lids are drooping; the mouth is partly open, and often the upper teeth project forward. When the child is stripped his body is seen to be emaciated, and his muscles flabby, the intercostal spaces are retracted, and the breast bone is prominent.

These appearances are such as would arise from obstructed nasal respiration.

**Voice.**—Another mechanical effect is the alteration in the voice, which in such cases is generally thin, nasal, and lacking in resonance. The explanation of this lies in the fact that the pharynx and the air cavities above act, in the production of tone, as resonators. Obstruction of the pharynx directly prevents the proper formation of tone and thus impairs the quality of the voice. Again, the voice is injured by the effect of the lymphoid inflammation upon the soft palate, which in such cases is generally relaxed, and hence unable to fulfil its functions in a proper manner. In consequence of this, articulation is interfered with, the patient speaking with thick utterance, and the palatal consonants being in particular mispronounced. When we add to the above the injurious effects upon the laryngeal mucous membrane of the catarrhal inflammation often associated with, and aggravated by, chronic hypertrophy of the tonsils and pharyngeal adenoid tissue, the deleterious influence of this condition upon the voice may be fully appreciated.

**Respiration.**—Mouth-breathing is one of the commonest symptoms of naso-pharyngeal obstruction, and it is associated with a variety of evils. Moreover, the amount of air admitted to the lungs is often entirely insufficient. A patient suffering in this manner almost invariably gives a history of respiratory difficulty, particularly well marked during sleep, at which time the mouth is widely opened and respiration is noisy, and nearly always accompanied with loud snoring; sleep is restless and broken, the patient being feverish and tossing about and dreaming incessantly, often muttering or talking, and sometimes, it is said, indulging in somnambulism. In severe cases intense reflex phenomena manifest themselves, among which a not uncommon symptom is for the patient to be awakened by sudden attacks of



FIG. 4731.—Facial Expression Characteristic of Pharyngeal Adenoid Hypertrophy. (After Gerber.)

dyspnoea, so severe in some instances as to threaten suffocation, and attended with severe exhaustion and alarm.

The patient awakens after such a night feeling dull

and tired, and often with a headache. The throat is dry and parched, the breath fetid, and the appetite impaired.

The respiratory function of the nose being abolished, the air in its passage to the lungs is neither moistened, nor warmed, nor freed from impurities. In consequence of this the respiratory passages are rendered abnormally dry, the lungs are subjected to the danger of irritation from cold, and the whole tract, from the naso-pharynx downward, is made liable to the effects of whatever foreign matters may be inhaled. The effect of obstruction to nasal respiration is such as to exert an important influence upon the nutrition and development of the nose itself. Without question, a proper supply of air and the normal exercise of the part are necessary for its proper and complete development. Hence, as long ago suggested by the writer, deformities of the bony structures of the nose, so commonly found in mouth-breathers, are caused by the effect of the mouth-breathing upon the development of the nose, and that asymmetry of the nasal cavities, and indeed of the superior maxilla itself, may be due to the same influence when exerted unilaterally.

In many children in whom obstruction to breathing is serious, there will be noticed a marked effort on the part of the walls of the chest to complete the act of respiration, the intercostal and infraclavicular spaces sinking inward with each attempt. Under such circumstances serious changes in the thoracic parietes may take place.

**Hearing.**—The effects of nasal obstruction upon the hearing are highly injurious. They are exerted in two different ways, each of which is capable of producing marked results. The catarrhal inflammation commonly present in the pharynx of such a patient produces a general chronic swelling and congestion of its mucous membrane, with thickening and retraction of the drum membrane and loss of hearing. This same retraction of the drum head is caused in certain cases by the mouth-breathing habit, the upper pharynx not being properly supplied with air. This opinion is sustained by the fact that after removal of the obstruction the hearing distance is often greatly increased, and with as much promptness as it is after the use of the Politzer inflator. The danger to the auditory sense from hypertrophy of the lymphoid tissue, particularly that at the vault of the pharynx, is decided, and its importance cannot be overestimated. When, therefore, there is reason to suspect that deafness may be due to it, the necessity for the thorough investigation of the pharynx becomes strongly emphasized.

**Smell and Taste.**—Owing to the catarrhal inflammation present in lymphoid hypertrophy of the pharynx, the senses of smell and taste are often impaired or altogether lost. In the case of olfaction the diminished special sensibility is also due to the occlusion of the pharynx and to mouth-breathing, by reason of which the odoriferous particles are prevented from reaching the olfactory region. On the other hand, the constant presence of fetid discharges makes itself apparent to the patient himself and to those about him. With lymphoid hypertrophy there is generally associated much chronic catarrhal irritation of the neighboring mucous membrane. Removal of the hypertrophied tissues will be followed in most cases by marked amelioration of the catarrhal symptoms, the improvement commencing immediately after the operation and continuing more or less steadily for months.

In the diseased state of the pharynx, the secretion becomes greatly increased in amount, and it, together with the abundant supply of mucus given off by the neighboring membrane, is a source of much disturbance. Not only does the pharynx become filled with it, by which respiration is rendered more difficult, but when swallowed it is apt to give rise to indigestion. Again, through failure to enjoy it, the act of eating is accomplished rapidly, and the food is swallowed in large masses without having been properly masticated. Thus the nutrition of the patient is directly attacked; for, through loss of taste and smell, and through the depressing influences of a lack of oxygen, the appetite is gener-

ally impaired at the outset, while, by reason of the faulty mastication and of the dyspepsia, the food ingested is not properly utilized.

When it is remembered that loss of oxygen, loss of sleep, and loss of nourishment may all arise from the disease under consideration, its influence upon the general health cannot but be recognized.

Lymphoid hypertrophy may occasion various reflex nervous phenomena. Of these, the most important is the occurrence of attacks of dyspnoea, generally during sleep, which seem to be due to a veritable spasm of the glottis, and in the course of which the patient is awakened suddenly from a sound sleep to find himself choking. For a few seconds inspiration is almost impossible, and efforts to accomplish it are accompanied by loud, stridulous breathing, and intense apprehension and alarm. It may be urged that such accidents might arise from the presence of a deposit of thick, tenacious mucus in the larynx, and such, no doubt, is often the explanation of them. However, in certain instances, observed by the writer and others, there can be little doubt as to the spasm being of a purely neurotic nature.

Severe spasmodic cough is sometimes seen in children and in young adults. It is generally dry and hacking in character, and in some cases is almost incessant.

Again, chorea and even epilepsy are sometimes observed.

The influence of lymphoid hypertrophy upon the circulation is a matter of importance, deficient oxygenation of the blood not being the only result which may be traced to this condition in such cases. Anæmia is a common symptom, and one which is often particularly well marked. Some believe that enlargement of the heart by dilatation may be directly due to this impoverishment of the blood. Disturbed cerebral circulation, as a result of pressure exerted by the enlarged masses, has been suggested by Chassaignac.

**Diagnosis.**—The diagnosis in chronic hypertrophy of the faucial tonsils may usually be made with the greatest ease, the history of the patient, his general appearance, and his symptoms pointing almost invariably to the source of the trouble. Any doubt may be dispelled by the simple inspection of the pharynx. Upon opening the mouth and looking into the throat, the tonsils will appear extending beyond the normal limit and toward the median line, and their relative size, their consistence, and the condition of the crypts may be ascertained. During easy, deep inspiration the tonsils will assume their normal position behind the anterior pillar of the velum, a minimum of their volume being projected toward the median line. If now the patient be made to gag, the tonsils will be rotated forward and thus brought out from behind the velum and into plain view. Any doubt which may exist as to the real size of the gland may be removed by placing one forefinger just below the angle of the jaw externally, and the other behind the tonsil, when the whole extent of the enlargement may be recognized.

**Prognosis.**—Hypertrophy of the tonsils may exist to a considerable degree, both in children and in the adult, without giving rise to serious symptoms. In some cases the presence of this condition may pass unnoticed. Usually, however, the contrary is the case. It may be said, in general, that the younger the child the more injurious is the effect likely to be. While the tonsils may sometimes regain their normal condition at puberty, the occurrence of this atrophy is uncertain, as has already been pointed to in the section relating to the etiology of the disease. Meanwhile the general health of the patient may be undergoing serious injury, and irreparable damage may be inflicted upon adjacent parts. The prognosis, therefore, in pronounced cases of tonsillar enlargement is unfavorable as to the ultimate subsidence of the difficulty.

As to the effect of enlarged tonsils upon the life of the patient, there can be no question that they may be an indirect cause of death. The writer has seen a case in which, operation having been refused, death from asphyxia resulted in a child two and one-half years old,

suffering from enormous hypertrophy of both tonsils. Such a thing, fortunately, is extremely rare; but it is worthy of record if for no other reason than to prove the possible danger of the condition, and to emphasize the folly of temporizing with it.

In cases of moderate hypertrophy of recent standing, in which there is little deposit of fibrous tissue, and in which the enlargement depends upon an increased vascularity and dilatation of the crypts, much good may be done by general and local hygienic measures and by local medication. Careful attention should be paid to the dietary, physical exercise, and general surroundings of the child, and any diathesis discoverable should be diligently treated.

In some cases the administration of the iodide of iron and of cod-liver oil will be found beneficial. Externally, a valuable measure is the habitual application, every morning, of a cold bath of salt water. This should be applied to the neck and throat by means of a sponge, the water being at a temperature sufficiently low to produce a reaction, but not so cold as to shock the patient. Meanwhile, the throat should be well rubbed, and special attention paid to the region over the tonsils, which, by a process of massage gently applied, may be successfully stimulated, and the blood-vessels caused to act with greater liveliness and tension. The application of massage directly to the tonsil has been recommended, but has not generally commended itself. The application, to the inflamed tonsil, of the constant galvanic current is a measure deserving of attention.

Local applications to the tonsil are usually ineffective, as are the measures suggested above. Sooner or later, in the great majority of cases, their futility will be recognized and surgical measures accepted.

Removal of the tonsils has been practised from earliest times. For its accomplishment several methods have been employed, some of which are still in vogue.

An exhaustive history of the subject is given by Sir Morell Mackenzie in his classical work.

In 1757 Caqué proved indisputably that the great dread of hemorrhage which had existed was chimerical, and that the resulting wound healed readily in a short time. From this date excision of the tonsils became one of the recognized operations of surgery.

The surgical treatment of this condition extends backward for many centuries. When we add to this the fact that the disease is common, and that it has been extensively studied in recent years, it will also appear that our present knowledge of the subject is based upon the views of a vast number of distinguished and highly experienced authorities. Of the methods for removing the tonsils most commonly used at the present time may be mentioned cauterization, by chemical or electrical escharotics; écrasement, by means of the galvano-caustic loop or of the cold wire; abscission, by means of some modification of the knife or scissors. Both the tying off of the tonsil by means of a ligature, and the injection into its substance of various supposed absorbents, only need be mentioned to be condemned. The practice of enucleating the tonsil with the finger has been lately revived in some quarters. It is of questionable value and propriety.

The use of the galvano-cautery, as advocated by Vololini, has had many supporters. As compared with the knife or cold snare, however, the process is slow and painful, the reaction often severe, and the resulting cicatrices in no small number of cases a permanent source of irritation and disability. The method is distinctly inferior.

Écrasement by means of the galvano-caustic loop is sometimes an effective and valuable method, although in simple hypertrophy, uncomplicated with malignant disease, it will be found less convenient and far more painful than other methods. When this instrument is used two precautions are necessary: The electric current should be employed intermittently, and traction should be made upon the loop only during the passage of the current. Thus hemorrhage may possibly be avoided and the danger of injury to the pillars of the fauces by diffusion of heat may be prevented. Any unevenness re-