Larvny.

wise absolutely hopeless cases, that one need never hesitate to advise it when the general condition outside of the larvnx is favorable

THE OPERATION.-The larynx may be removed in whole or in part; in other words, the resection may be complete or partial. We shall give in this place rather a general idea of the former, feeling that any one contemplating its actual performance would desire to refer to the special literature of the subject.

It has happened in many cases that the exigencies of the condition present have called for a tracheotomy, which has thus been made a preliminary to the more radical extirpation. Thus the question has been raised whether preliminary tracheotomy is not always advisable. Of course, if it have been already made, the question is at once settled, but when the matter can be taken under advisement the writer would be adverse to it, and on these grounds; when undertaken a few days previously, it leaves a certain amount of disturbance and adhesive inflammation, which may complicate subsequent dissection; whereas, if left till the extirpation, it can just as well be merged into and become a part of the latter. The surgeon must, however, be prepared to perform it instantly in case of impending suffocation.

The preliminary skin incision should be a long one, down even to the sternum. By making this long incision one may be spared the necessity for making others at right angles; it is also in the line of safety, and healing takes place much more satisfactorily. From the level of the hyoid bone to a point below the larynx this incision should be deepened, until the entire respiratory tract is exposed, and the deep fascia covering the same divided. Now the cutting edge should be replaced by the handle of the scalpel, or, better still, by a reasonably sharp periosteum elevator, by means of which all the lateral attachments of the laryngeal muscles are separated. Any small spouting vessel must be caught in the hæmostatic forligated twice and divided between the ligatures. The isthmus of the thyroid must also be treated in this way. By this process the larvnx is freed anteriorly and later ally. To free it and the upper rings of the trachea, if any are to be removed, from the esophagus, is perhaps the most difficult part of the operation. This must be done with extreme care. It must be remembered that the anterior wall of the œsophagus commences at the level of the cricoid cartilage.

After the larynx has thus been loosened from all lateral and posterior attachments, the thyro-hvoid membrane exposed, and the hemorrhage all checked, the operator is ready to begin its removal. There has been considerable discussion as to whether it is better to do this from above

just below the cricoid, or between some of the upper tracheal rings, as circumstances may dictate, the section is quickly made. The portion above being already loose, may be quickly lifted out of the way, and a tracheal cannula, arranged to suit the operator, may be rapidly inserted; through this, for the rest of the operation, the anæsthetic is administered. A rubber tube large enough to fit into it may be inserted; the outer end of the tube may then be slipped over a small funnel containing gauze upon which the chloroform is thereafter Everything having been so cared for as to prevent entrance of blood into the trachea, complete removal is now effected. The matter of removal of the eniglottis. if not already settled upon, must now be quickly decided If diseased, it must of course be removed; but when it is healthy one may easily waver in opinion. Here again the writer advises its removal, since in actual experience he has had cause to regret having left it. It has in many instances been found a detriment rather than an ad vantage. The thyro-hyoid membrane and also the folds connecting the epiglottis with parts above, as well as any remaining connections, should now be divided, and

the diseased mass lifted out. After this the surrounding tissues should be subjected after this the surrounding tissues should be subjected to a careful examination, and if any are found to be diseased they should be extirpated. Thus, a part of the hyoid bone, base of the tongue, lateral pharyngeal wall, esophagus, or thyroid, or some of the cervical or other lymph nodes, may, if clearly diseased or even if simply enlarged, be conveniently dissected out without much difficulty. Despite all this cutting the hemorrhage is not likely to be severe, and so long as blood is kept out of the trachea no great difficulty is met with.

After the completion of the excision a formidably large wound is left, whose most conspicuous features are the large pharyngeal opening, the upper gaping end of the esophagus, and the divided trachea. It is necessary first to prevent the trachea from retracting, as it naturally tends to do, by suturing it to the margins of the wound three silk or silkworm-gut sutures suffice for this. The upper end of the esophagus is then brought up to the hyoid bone and held there by silk sutures, if possible. It is now rarely the practice to retain the trachea tube; the trachea being united to the skin as described above, access to it from the pharvnx is shut off by the attach ment of the œsophageal margin to the body of the hyoid. In this way leakage into it from above is prevented. The large wound is now closed with sutures and suitably drained, and dressings are applied above and below the tracheal opening.

AFTER-CARE.—The requisite after-care is much the same, so far as surroundings are concerned, as in a case of tracheotomy. The air of the room should

be kept moist, and at a temperature not much

The patient is placed in the Trendelenburg osition, as after intubation, the foot of the twenty-four inches. In this position he may be fed after from twenty-four to thirty-six hours. At the expiration of from seventy-two to ninety hours his feet may be lowered and his head raised, and by the fourth day he may sit up. Until he can swallow food without much difficulty he may be fed by the rectum

With a wound thus closed the use of an artificial larynx is not contemplated and the tracheal opening remains. Experience has shown that patients learn to retain air enough within the oropharynx and parts below to whisper plainly or even to speak in an ordinary tone of voice. If desired later, the anterior wall of

THE ARTIFICIAL LARYNX.—This most ingenious instrument owes its present perfection more to the genius of Gussenbauer, of Vienna, than to any other individual. division shall be made being first decided on, whether | though it has been variously modified or adapted to spe-

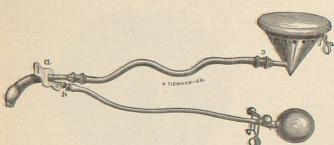


Fig. 3125.—Trendelenburg's Cannula. Easily supplanted by the rubber tube and glass funnel above described.

or from below. The writer's preference, based upon his own experience, is for the latter. It is perhaps a little mit the introduction of some form of artificial larynx. own experience, is for the latter. It is perhaps a little the more abrupt, but it provides for the proper care of the trachea at once, and the operator may proceed to complete his work with less haste. The height at which

cial cases by different surgeons. The model of the Gussenbauer apparatus, as the writer had it from him in

1882, is shown below in Fig. 1326. It consists of a tracheal tube of large size (A) with lobster-tailed rings at its lower end permitting a slight motion, corresponding to the natural flexibility of the trachea. Through its front plate, and through an opening on its upper curvature, passes a second or pharyngeal tube (B), also made flexible (or not, according to the case), with an opening on its lower curved surface so placed that a stream of air may play freely

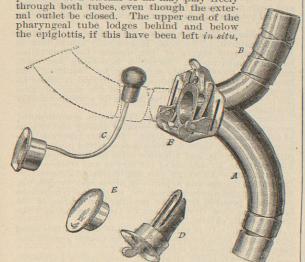


Fig. 3126.—Gussenbauer's Artificial Larynx.

or behind and below the base of the tongue, as the case may be. Around it the esophagus granulates and closes, so that after the healing process is complete the only passage from the pharynx into the larynx is by way of the metal tube. In order that fluids and solids may not pass through this, an obturator (C) is provided, which is passed through the external opening and up through the tube, so that its rounded upper end plugs the upper end of the pharyngeal opening, thus preventing passage of anything into the trachea. But since this would also shut off air, the obturator is attached below, not to a solid plug, but to a ring, as seen, which fits accurately into the external opening of the instrument, and through it the patient breathes so long as this plug is worn. Except at meal-times the simple stopper (E) is worn, so that the patient breathes through the nose and mouth. After a time, by an instinctive education of the pharyngeal and buccal muscles, the upper end of the tube is protected during the process of deglutition, and patients wearing these instruments learn to swallow readily without the assistance of the obturator

The feature of greatest interest about this apparatus is the vocal part. It will be remembered that the vocal cords have nothing to do with articulation, which is all performed above the larynx; they furnish only tone or sound. Possibility of articulation, then, not being interfered with, we have only to find a substitute for the vibrating cords. In the simple mechanism shown at D we have such a substitute—namely, a metallic reed, like a melodeon reed, playing freely in a movable slotted bar, and fitted inside of a stopper. This movable bar carrying the reed has an external lever, by means of which the wearer is enabled, with a touch of his finger, to throw it into or out of the air current, and thus, as it were, vol-untarily to open or close his glottis. Placing this part of the instrument in situ, and throwing the reed into the harp, and the sound thus produced is converted, by the articulating parts above, into something more than a whisper—into distinct speech. To be sure, the voice is now a monotone, but it is nevertheless a true spoken

Various modifications of this apparatus have been devised by different surgeons to meet the indications in individual cases.

Patients display very different degrees of toleration of these instruments. Some find them excessively inconvenient, others cannot use the reed, and still others wear them continually without much discomfort. A patient of Gussenbauer's, who was known to the writer, wore his apparatus without apparent incovenience; he was almost continually in the saddle as a riding-master, and still kept up his reputation as the best rider in Bohemia.

RESULTS.—The modified operation, as here described. affords, considering its severity, a usually satisfactory relief in otherwise desperate and fatal cases. Recovery may be expected in about two out of five cases, or even in a larger proportion if the operation is done early. Speech in some form is retained, and thus a great theoretical objection is removed. But, as in operations for cancer elsewhere, we get our best results here in cases which have not progressed too far.

PARTIAL OR UNILATERAL LARYNGECTOMY.—Inasmuch as laryngeal cancers are more often confined to one side, at least at first, it may be possibly indicated to remove the affected half. Thus, of one hundred and nineteen cases of cancer of the larynx, including the epiglottis,

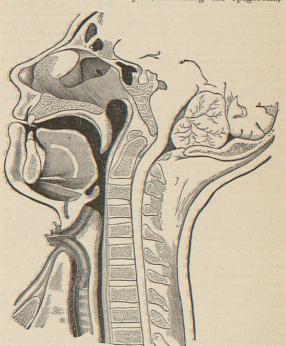


Fig. 3127.—Gussenbauer's Artificial Larynx in Position.

there were sixty-nine in which the disease was unilateral. That partial resection is feasible, some of the earlier cases have abundantly proved. Thus, in Billroth's third case he removed only a lateral half, and still the patient was thereafter able to phonate without mechanical aid. Hahn has advised, as the method of operating in such cases, that by an angular incision the larynx be air current, the metal strip vibrates as it does in the jew's posed, and then split open for examination. If only onehalf be involved, then it alone may be removed; if, however, the disease have advanced beyond the median limit, then the complete operation may still be made. In other words, he recommends an exploratory laryngotomy to be followed by whatever may be indicated. the operation a cannula is introduced and packed in the manner above described. If only half the organ have been removed, the patient will probably be able to make himself easily understood without artificial aid.

This partial operation has been successful in about three-fifths of the total number of cases in which it has been practised. Its mechanical difficulties are even greater than those of complete laryngectomy, while there is the added danger of incomplete removal. Roswell Park.

LARYNX, DISEASES OF: LARYNGOTOMY. See

LARYNX. DISEASES OF: LEPROSY .- HISTORICAL. —In the Ayur-Véda, one of the most ancient of medical writings, suppression of the voice is given among the signs of leprosy,1 and Hans von Gersdorff 2 states that in the Middle Ages a hoarse voice and shortness of breath were regarded as characteristic of the disease. At the commencement of the present century Martius 3 speaks of ulceration of the palate (velum) and also of the trachea which occasions great difficulty of respiration, as a symptom of the tauric lepra, which occurred in the Crimean war, and which was supposed to have been imported by the Russian troops engaged in the war with Persia. Among other subsequent writers, Struve 4 also alludes to alteration of the voice and difficult breathing; but nothing was known of the laryngoscopic appearances of the affection until their study during life was made possible by the introduction of the laryngeal mirror.

In recent times the disease, as it affects the larynx, has been described by Danielson and Boeck, Hillairet, Wolff, Gibb, Tobold, Schrötter, Virchow, 10 Hebra and Kaposi, 11 Elsberg, 12 Thoma, 13 Eppinger, 14 M. Mackenzie, 15 Mackern, 16 Basini, 11 Thin, 18 Virchow, 19 Plumout 20 Ballon, 21 Kaposi, 22 and others.

ert,20 Rake,21 Kaposi,22 and others. Lepra of the larynx is generally secondary to, or appears coincidently with, pronounced lesions of the pharynx or nose, and as a complication of a more or less advanced stage of the cutaneous affection. It may, however, occur without involvement of the skin, as in Elsherg's first case.

The anatomical appearances vary from uniform thickening and redness to extreme tubercular induration and proliferation, which may reach the cartilages and even the structures of the external neck (Virchow). The laryngeal disease develops as a diffuse hyperæmia and swelling of the mucous membrane, or the process may be limited to individual parts, as, for example, the epiglottis. At isolated spots of the hyperæmic laryngeal membrane there develop subsequently hard, nodular, ex-tremely vascular excrescences or tubercles, which are the anatomical analogues of the tubercles on the skin and other mucous membranes. In their incipiency these resemble, according to Virchow, the mucous patches of syphilis. The epithelium covering the tubercles which stud the mucous membrane, as if sprinkled there, is thrown off and granulating ulcers are formed, which finally cicatrize with the production of considerable deformity. Extreme destruction with necrosis of the cartilages is thus sometimes brought about, and the larynx is occasionally so constricted by cicatricial tissue as to threaten danger from suffocation.

The tubercles vary in size from a pinhead or millet seed to a small pea (Wolff). Their number varies considerably: sometimes only a few are found scattered here and there over the membrane, while in other cases they are so closely aggregated as to resemble a diffuse infiltration, which gives to the parts affected a pallid,

grayish appearance (Hillairet).

The cicatrices which result from the healing of the laryngeal ulcer of leprosy resemble in physical charac-

ters the stratiform scars of syphilis. The tubercular nodules, when examined under the microscope, are seen to be identical in structure with those found on the skin, consisting of a granulation tissue characterized by the presence of the granular lepra cell and bacillus, which shows a remarkable tendency to remain as such, and which ultimately becomes converted into a dense cicatricial mass. In rare instances papillomatous excrescences are observed similar to those which result from syphilitic ulceration.

The leprous process develops slowly in the larynx, and years may elapse before ulceration takes place. The natural tendency is, however, to ulceration and scar for-

Symptoms.—The symptoms are those of ordinary chronic catarrh. The voice is generally hoarse, and in the subsequent stages of the disease the respiration becomes embarrassed. Secretion is notably increased, sometimes bloody, and, according to Lamblin, 2s the breath is exceedingly fetid, and the thyroid is tender on pressure. In the anæsthetic form of the skin affection the normal sensibility of the larynx is correspondingly

COMPLICATIONS.—The most dangerous complication, according to those who have resided among the victims of this disease, is acute cedema. In other cases the leprous infiltration leads to disturbances of the motor apparaus ratus of the cords, and, together with the development of fibrous tissue, to stenosis of the larynx and trachea.

DIAGNOSIS.—Although the anatomical diagnosis between this disease and syphilis or lupus may be difficult. from the gross appearances alone, its clinical recognition is always possible from the peculiar appearance of the larvnx, the slow development of the affection, and the

lesions of the external surface.

Prognosis.—It is sufficient to state that, as laryngeal lepra is the local expression of an incurable general disease, the prognosis is necessarily bad.

TREATMENT.—The treatment, therefore, is palliative, and must be guided by the general principles involved in the care of chronic laryngitis. Elsberg speaks favorably of the topical use of an ethereal solution of iodoform, and calls attention to gurjun oil (balsam, dipterocarpi) as a valuable local, as well as general, remedial agent. Should edema occur, the parts must be scarified, and in stricture of the tube, life may be prolonged by tracheotomy.

¹ Tom. i. Nidánast 'h'ana, id est Pathologia, cap. v., p. 181 (Hessler's

1 Tom. i. Nidánast 'h'ana, id est Pathología, cap. v., p. 181 (Hessler's translation, Erlangen, 1844).

2 Cited by Virchow: Die krankhaften Geschwülste, ii., 8. 519.

3 pe lepra taurica, specimen medico-practicum, Lipsiæ, 1806.

4 Ueber die aussatzartige Krankheit Holsteins, 1820. See also extract in the Edinb. Med. and Surg. Journ., vol. xviii., p. 92. See also the work of Ludwig Hunefield: Die Radesyge oder scandinavische Syphilod, Leipzig, 1828.

5 Traité de la Spedalskhed, p. 121, Paris, 1848; and Atlas, Pl. i., v. and vi.

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8 Mém de la Soc. de Biologie, 1862 (cited by Virchow).

7 Virchow's Archiv, Bd. xxvi., 1863, S. 44.

8 Dis. of the Throat, etc., p. 272, London, 1864.

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° Schrötter's Laryng. Mittheilungen, 1871-73, Bd. ii., S. 84 (cited by Ziemssen).

10 prohow's spec. Path. u. Ther., Bd. iii., S. 519.
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20 Wiener med. Zeitg., 1884, Nos. 34 to 37.
21 Trans. Path. Soc., London, 1885, vol. xxiii.
22 Wiener med. Wochenschrift, 1885, Nos. 47 to 49.
23 Etude sur la lèpre tuberculeuse, etc., Paris, 1871; Cohen; Dis. of the Throat, etc., p. 531, 1880.

LARYNX, DISEASES OF: LUPUS .- Lupus of the larvnx is a form of tuberculosis. It is nearly always consecutive on lupus in other parts of the body, especially in the nose, in the pharynx, or on the skin of the face. Primary lupus involving the larynx and no other portions of the body has been observed by John N. Mackenzie 11 in two cases, by Lefferts 8 in four, by Jonathan Wright in one, and by Rice in three. The epiglottis seems to be the seat of election.

Our positive knowledge of laryngeal lupus dates from the laryngoscopic studies of Türck.¹ The occurrence of the disease in the larynx has also been observed and dethe disease in the larynx has also been observed and described by Virchow, Tobold, Ziemseen, Grossman, Thoma, Stilling, Lefferts, Beringier, Eppinger, Morell Mackenzie, Knight, Asch, Breda, Ghiari, Bowen, Chiari and Richl, Hunter Mackenzie, Van Santvoord, 18 and others.

ETIOLOGY.-Very little is known as to the etiology of this disease. It has been observed more frequently in those who are the offspring of tuberculous parents or who have brothers and sisters suffering from the ordinary forms of tuberculosis. The slight tendency that this dis-ease has to spread and affect other regions of the body is accounted for in one of two ways: either that the type of tubercle bacillus producing lupus is less virulent than that found in the ordinary forms of tuberculosis, or else that the patient is possessed, by inheritance or otherwise. of a certain power of resistance or partial immunity to the action of the tubercle bacilli, the result being the peculiar pathological changes found in lupus.

Pathology.—The portions of the larynx involved by

lupus are usually but slightly reddened and present a nodular appearance with frequently an admixture of cicatricial tissue. The nodules are very slow in formation and consist of numerous, fairly well-organized, round-cell infiltrations with the formation of a few giant cells in this new tissue. The giant cells, when stained by Gram's method, do not always show the presence of tubercle bacilli, a fact which may be accounted for by the sparsity of the micro-organisms. Ulcers may be found over the site of the nodule, and it is not uncommon to find new nodule-formation upon the periphery of the inrading inflammatory process, while ulceration is going on just within this border, with complete cicatrization somewhere near the centre of the affected area. The larvngeal surface of the epiglottis is the point where the pathological changes are most frequently observed, although the vocal cords and ventricular bands have been seen to be implicated in the process. The epiglottis is often markedly deformed, and, when the interior of the larvnx is involved, considerable stenosis may result from ulceration and cicatrization.

Symptoms.—The symptoms of lupus of the larynx are not very marked. There is ordinarily very little pain, but usually a feeling of constriction in the throat and slight difficulty in swallowing due to the deformed epiglottis. When the interior of the larynx is involved, the changes in the voice and, later, the dyspnœa may cause the patient to seek relief at the hands of the physician.

Prognosis.—This disease is an exceedingly chronic one and especially liable to relapses. It may have existed for months before the patient has been led to seek relief, and even after a quiescence of several years it has been known to break out again. Stenosis of the larynx may occur, demanding relief by tracheotomy to save the patient from asphyxiation. There is also danger that in the process of ulceration some of the bacteria may be carried into the lung, causing pulmonary tuberculosis, or into the circulation, causing the disease to manifest itself in other parts of the body.

DIFFERENTIAL DIAGNOSIS.—Lupus may be mistaken for epithelioma, syphilis, or the ordinary forms of tuber culosis. In the article, Larynx, Diseases of: Tuberculosis, there will be found a table indicating the differential diagnosis between tuberculosis, syphilis, and lupus, and to this the reader is referred. The differentiation from epithelioma is not so easily made. Lupus is common in early life, while epithelioma rarely occurs before the thirty-fifth year. Epithelioma is accompanied by considerable pain: lupus by little pain. Epithelioma grows rapidly; upus is of slow development. Removal of a small piece of the growth and microscopical examination will confirm

that experience shows to bring the best results in that as a solution of sodium bicarbonate, five grains to the ounce, followed by an application of a ten-per-cent, silver-nitrate solution to the ulcerated area, will give good results. In other cases the disease seems to be stimulated to greater pathological activity by this treatment, and in these the use of the sharp curette or the application of the galvano-cautery to the nodules and ulcers is the better treatment. In recent years a number of good reports have been recorded from the use of tuberculin in the treatment of lupus. If this method is adopted it is wise to begin with a dose of 1 to 2 mgm., to be repeated once every four days, unless the reaction is exceedingly marked, in which case the hyperæmia and swelling should be allowed to subside before the injection is repeated. The dose may be increased as the patient becomes tolerant, until one of 10 mgm. is reached. In the case of larvngeal stenosis resulting from cicatrization, tracheotomy is the wiser procedure, as cutting operations and the pressure resulting from intubation tend to aggravate the disease.

The use of the x-rays has been suggested for the treatment of this disease, and, when the epiglottis is much involved, it is possible by this procedure to limit its advance. but the treatment has not yet been employed sufficiently to allow us to speak with any degree of positiveness as to its therapeutic value.

Cornelius G. Coakley

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LARYNX, DISEASES OF: NEUROSES.—NEUROSES OF SENSATION.—Under this heading we distinguish three groups: (1) Hyperæsthesia and neuralgia; (2) anæs-

thesia; (3) paræsthesia.

Hyperæsthesia may occur as the result of external irritation, or as the expression of some internal pathological process, or as an intrinsic alteration of the nerve. The external irritants consist usually of acute inflammatory affections, such as simple acute catarrh, or that resulting from traumatism. When no macroscopic changes are evident, the causative factors are found usually to be hysterical and general nervous affections which are freuently associated with anemia and chlorosis.

Symptoms.-Under normal conditions, the degree of ensitiveness of the larynx varies greatly in different individuals. Local disturbances from other causes are apt to increase the sensitiveness to a striking degree. Schrötter reports a case of a man with a tumor on the right vocal cord; this was excised, when the patient was suddenly attacked with tonsillitis, which was followed by a great increase of sensitiveness, persisting for several

The degree of sensitiveness which accompanies acute and chronic laryngitis stands in no direct relation to the macroscopic changes, for in neurotic individuals local alterations of even slight intensity may be accompanied by the most conspicuous hyperæsthesia. The reverse is iso the case.

In the majority of instances in which laryngeal hyper-TREATMENT.—Each case must be treated in the way pharynx. We may say, as a rule, that the local alterations consist usually of inflammation, with a tendency to hyperplasia, and that hyperæsthesia in atrophic conditions of the mucous membrane is extremely uncommon. One finds, generally, on examination, a granular condition of the posterior pharyngeal wall, which is due to hyperplastic inflammation of the lymphoid tissue in that vicinity. Gentle contact with the probe is exceedingly apt to excite laryngeal contraction or cough. In such individuals, we find usually either anæmia or neurasthenia, representing one type, or plethora or gout constitut-

ing another well-marked class.

In hysteria and hypochondriasis the cause is to be sought in functional disturbances of the central nervous system. In such individuals, the act of swallowing often produces marked discomfort, and patients sometimes complain of a noise which they perceive during the act of swallowing, and which arises from the rubbing of the calcified portions of the larynx on each other.

Neuralgia of the larynx is referred to by various authors as a well-defined affection. It is difficult, however, in many cases to exclude the possible existence of some pathological alteration elsewhere, which may cause the pain. In a case which came under the writer's observation, a severe intermittent, neuralgic pain, extending from the base of the tongue on one side downward in the direction of the cricoid cartilage, was complained of for many years. A true neuralgia was, for a considered to exist, but careful inquiry elicited the fact that there had once been a deep-seated abscess in the throat which ruptured externally, the slight scar being completely hidden by a heavy growth of beard. As a rule, such pains do not appear spasmodically, or follow the direction of a definite nerve. Many other causes of laryngeal hyperæsthesia may be enumerated, such as swelling of the veins at the base of the tongue and enlargement of the lingual tonsil. Smoking is also a frequent cause, particularly when strong tobacco is smoked either in a cigar or in a pipe. This condition is found usually in men who are otherwise strong and well, except, perhaps, for certain neurotic tendencies. Such hyperæsthesia is generally associated with symptoms of paræs-

Prognosis.—This depends upon the causative factor. In the catarrhal cases, and in those in which anæmia alone exists, the prospect of relief or recovery is naturally better than in those due to hysteria or hypochondriasis.

Treatment.—This is naturally determined by the eti-

Treatment.—This is naturally determined by the etiology. In cases of hyperæsthesia dependent upon or associated with hyperplastic alterations of the mucous membrane, much may be done for the patient by appropriate local treatment. Relief may often be afforded by encouraging the patient to tolerate local applications to the back of the pharynx, which can be carried out at home. The application of Mandl's solution (iodine 0.5 to 1, glycerin 10), on a cotton-tipped probe, may be advantageously practised several times a week. In the case of hysteria and hypochondriasis, general treatment by the family practitioner and neurologist is directly indicated.

Paræsthesia occurs in the form of subjective sensations of constriction, heat, pricking, etc., in the throat, and is usually associated with hyperæsthesia. It is not uncommon as the result of the penetration of foreign bodies into the mucous membrane of the vicinity, and persists often after the foreign body has been removed. In such cases, either as the result of the efforts of the patient to dislodge the foreign body, or in consequence of manipulative efforts of the physician, the mucous membrane of the larynx is often acutely inflamed, particularly in the region of the epiglottis, and this inflammation is almost invariably accompanied by acute lingual tonsillitis. In such cases, it is difficult to determine which region of the throat is responsible for the persisting symptoms of discomfort.

The treatment of such conditions follows closely the lines laid down for hyperæsthesia. In addition to such general measures as will suggest themselves to every physician in the way of diet, hygiene, and appropriate sary to feed the patient through a tube.

tonics, much relief may be obtained from local treatment. A frequent application of Mandl's solution in cases characterized by hyperplasia of the lymphoid tissue is serviceable. When the pain is very severe, Gottstein recommends the application to the neck of cloths wrung out of very hot water. The prognosis in cases not due to the entrance of a foreign body is undoubtedly less favorable than in hyperæsthesia.

Anæsthesia.—Diminution of sensibility in the larynx

may be partial or total. In the first instance, the condition is called hypesthesia, in the second, anæsthesia proper. These conditions are to be distinguished from loss of the sense of pain, or analgesia. In the diagnosis of anæsthesia, it is often difficult to determine the boundary between normal degrees of tolerance and pathological conditions. In certain individuals it is possible to introduce laryngeal instruments without previous anæsthetizing of the parts, and yet no evidence exists pointing to any abnormality, either general or local. A frequent cause of anæsthesia is to be found in diphtheria, and this may at times be associated with anæsthesia of the soft palate and uvula. There seems to be no relation between the severity of the infection and the degree of paralysis The time of onset of such nervous alterations n the larvnx ranges from two to six weeks after recovery from the diphtheria, but it may extend to from two to four months. Paralysis in this affection is probably due to alterations produced in the nerves by the diph theria toxin. Syphilis of the central nervous system may produce anæsthesia in the larynx. Ott observed anæsthesia of the right half of the larynx in a case of paralysis of the right vocal cord, due to syphilis of the central nervous system. The roots of the vagus showed no medullary nerve fibres. Schrötter has reported a case of malignant lymphoma of the throat in which individual tumors extended up the left side of the neck between the mastoid process and the ramus of the lower jaw. In addition to paralysis of the left vocal cord, there was also anæsthesia of the left half of the larynx. In this case the root of the vagus must have been subjected to pressure before giving off its individual branches, since, in addition to paralysis of the left laryngeal muscle, there existed also an acceleration and irregularity of the heart's

Both anæsthesia and hypæsthesia occur in hysteria, although they are rare manifestations in this disease. The anæsthesia may be total or unilateral, and may be associated in the latter instance with unilateral cutaneous anæsthesia. Unilateral anæsthesia has been reported in cases of hemiplegia, although this is less common than cutaneous anæsthesia; it has been noted also in association with unilateral lesions of the medulla, bulbar paralysis, tumors of the base of the skull, gummata, progressive muscular atrophy, railway spine, and tabes. Krause reports a case of tabes in which there was anæsthesia of the laryngeal mucous membrane with, however, well-preserved reflex excitability, as shown by probing, which caused closure of the glottis. In another patient, the reflex irritability disappeared, while sensation was preserved.

When the anæsthesia is complete, there is a marked tendency for food and drink to enter the trachea, with the production of glottic spasm or cough. It has been stated that the epiglottis in this condition is more erect than usual, owing to paresis of the thyro- and aryepiglottic muscles, which are said to be supplied with motor filaments by the superior laryngeal nerve.

The prognosis of laryngeal anæsthesia is dependent upon the etiology in each case. In diphtheria the condition usually passes off spontaneously. In the functional nervous diseases the prognosis may or may not be good, according to the underlying general disease.

In organic diseases of the nervous system the same is true, so that it is useless to formulate any definite statements. Treatment consists in that which is appropriate to the general underlying cause. It is important to prevent food from entering the larynx, and it may be necessary to feed the patient through a tube.

SPASMODIC AFFECTIONS. - Spasm of the Glottis. - Glottic spasm may affect the abductors as well as the adductors. But a single case, however, of the former condition is known, namely, one reported by Pitt as occurring in a patient with hydrophobia, in whom the glottis remained wide open for several seconds during the attack. Almost universally the term spasm of the glottis is employed to designate spasm of the adductors. It occurs ost commonly in children, and is then usually dependent upon or related to rachitis. As contributing causes we may mention general disturbances of nutrition, improper feeding, and acute local inflammations. In adults there is usually an associated chronic laryngitis. although new growths have been observed to produce such attacks. Lichtwitz has described hysterogenic zones in the larynx, contact with which excites glottic spasm. The laryngeal surface of the epiglottis seems to be especially sensitive. Spasm of the glottis is common in tabes, and may be an initial symptom. It may also occur in association with chronic catarrhal inflammation of the parts, particularly in alcoholics. Lesions of the naso-pharynx, particularly those of a hyperplastic nature, often give rise to a spasmodic contraction of the nerves. Tetanus has been occasionally found to exhibit this condition. The symptoms vary according to the de-gree and duration of the attack, as well as to the underlying cause. The attack is ushered in usually by cough. with simultaneous sensation of contraction in the throat, followed by cyanosis and even unconsciousness. In a few seconds, a spasm may be interrupted by deep inspiration, which is followed by another contraction. The patient experiences marked anxiety and a sense of impending dissolution, and sometimes a fatal termination may act ually ensue. Examination of the larvnx shows a close approximation of the vocal cords throughout their whole length, although at times their cartilaginous portions may remain open, producing a triangular cleft posteriorly. The ventricular bands may also share in the contraction. The epiglottis may be depressed, but usually stands erect

The diagnosis is readily made from a consideration of the symptoms, although the condition must be differentiated from that following secondary contractions which take place in paralysis of the postici

take place in paralysis of the postici.

Prognosis is usually favorable, but is dependent upon the underlying cause and the treatment. In children, the condition is more serious, and a considerable number of fatal cases have been reported.

Treatment.—The first indication during an attack is to produce relaxation of the contracted muscles, which may be effected by the inhalation of chloroform, ether, bromide of ethyl, sudden application of hot water to the neck and back, or of cold water to the epigastrium. Tracheotomy has been found necessary at times. For the prevention of the attack, appropriate general measures must be instituted. In children this is particularly important. Heroin in small doses has been found particularly serviceable. Schrötter recommends the introduction, in hysterical cases, of a hard-rubber tube.

Chorea of the the Larynx.—True laryngeal chorea is characterized by a choreic movement of the vocal cords, in association with a true general chorea minor. The designation "chorea of the larynx" is superfluous, since the laryngeal muscles move in sympathy with the general muscular system. Onodi therefore proposes to drop the name "chorea laryngis" and recommends, in cases of choreic movement of the cords, without general chorea, that the term "choreiform movement of the cords" be used. Cases of nervous cough upon which chorea supervenes are to be termed "chorea minor, with nervous cough." The name "chorea laryngis" is therefore inapplicable to many cases of nervous, reflex cough, which have been described by various authors under that designation

Nervous Cough.—By this term is denoted a cough which arises without demonstrable alterations in the mucous membrane, and is occasioned by reflex irritation from without, or by an increased irritability of the central quently as a cause of laryngeal paralysis. Bäumler de-

nervous system. Although no macroscopic alterations may be found on examination, it is possible that the condition is due to some previous disease, such as acute inflammation or new growths. Among other external sources of irritation, we may enumerate diseases of the nose and pharynx, particularly chronic follicular pharyngitis. The condition under these circumstances is closely allied to that which exists in hyperæsthesia of the larynx. Reflex irritation due to the presence of wax or foreign bodies in the external auditory meatus is somewhat frequent

Among the factors associated with increased excitability of the central nervous apparatus, we find, first, anæmic conditions, secondly, hysteria. A form of cough which occurs in tabes may also be included here.

Symptoms.—The attack of coughing is usually preceded by sensations of tightness or constriction in the throat, which cause a desire to clear the parts. The cough may occur only once or be repeated, and there may even be spastic contractions of the abductors, associated at times with energetic contraction of the diaphragm. The character of the cough varies, but it is usually dry and tight, although at times there is a rough or bellowing quality. There is little or no expectoration. The prognosis and treatment depend upon the underlying causes.

Motor Paralyses.—These may be divided into three

general classes as follows: 1. Paralysis of the closers of the glottis, namely, the lateral crico-arytenoid muscles (or adductors proper), the thyro-arytenoid (or internal tensors of the vocal cords, which also aid in closing the glottis), and the interarytenoid muscle. 2. Paralyses of the abductors or posterior crico-arytenoid muscles. 3. Paralyses of all the muscles supplied by the recurrent laryngeal nerve. Paralyses of the laryngeal muscles are occasioned either by disturbances of the nerves which supply the organs, namely, the recurrent laryngeal and the superior laryngeal, or by lesions of the vagus and the accessorius, from which these nerves arise. These we term peripheral disturbances. Paralysis may also arise in consequence of intracranial diseases affecting the nuclei of the roots of the vagus and the accessorius, giving rise to central paralysis. Finally, we distinguish myo-pathic paralyses, produced by diseases of the muscles hemselves. These paralyses are scarcely separable from the peripheral, inasmuch as their etiology and manifestations are as yet imperfectly understood. In view of the long course of the vagus and its exposed situation, it may experience a variety of injuries through lesions of the structures in the vicinity. Among these we may enumerate traumatism, pressure from mediastinal tumors, enlarged bronchial glands, aneurism of the innominate and subclavian arteries on the right side and of the arch of the aorta on the left, carcinoma of the esophagus, and enlargement of the thyroid. Diseases of the pleura and of the right apex may produce paralyses of the pleura and of the right apex may produce paralyses of the recurrent nerve. Paralyses of the vocal cords have also been observed in consequence of the pressure of malignant tumors on the accessorius, within the cranial cavity. Remak has described traumatic paralyses of the sympathetic, hypoglossus, and accessorius. In diphtheria paralysis of the superior laryngeal nerve has been found, though it is extremely rare

Among the peripheral paralyses we include those of myopathic and neuropathic nature, which affect usually only individual muscles, and arise in consequence of overexertion. These are most frequently due to catarrhal diseases. Certain infectious diseases are followed at times by more or less complete paralyses on the part of the laryngeal muscles. We find this particularly in diphtheria, typhoid fever, smallpox, scarlet fever, and erysipelas. These are due probably to the action of the toxins upon the nerves in question. Those paralyses which occur in consequence of tuberculosis and syphilis are, on the other hand, usually due to alterations of the tissue in the vicinity, rather than to a toxic action. Lead and arsenic poisoning have been observed to occasion laryngeal paralyses. Rheumatism has been cited frequently as a cause of laryngeal paralyses.