scribes an independent affection of the recurrent nerve in the form of a chronic neuritis, and attributes it to inflammatory processes in the neighborhood of the nerve—particularly enlarged bronchial glands,—which arise, not uncommonly, in consequence of long-continued inhalation of dust. Complications of laryngeal paralyses with those of other cerebral nerves have been observed. Paralysis of the velum is frequently associated with, and has been observed to follow, influenza.

Pathological Anatomy.—The histological alterations in the larynx depend upon the etiology and the duration of the affection. The nerves may exhibit different degrees of atrophy, varying from simply fatty or amyloid degeneration to a complete disappearance of the nerve substance. Ziemssen has found post mortem, in cases of peripheral paralyses of individual muscles, a degeneration of certain nerve bundles. The alterations in the muscles depend upon the duration of the disease. In cases of long standing, they appear of a pale yellowish-brown color. The muscle fibres show interstitial proliferation of the nuclei, together with atrophy and fatty degeneration.

Having thus reviewed the laryngeal paralyses from a general standpoint, we pass to a more detailed consideration of the individual groups.

Paralyses of the Tensors of the Vocal Cords.—We have to do here with paralyses of the crico-thyroid and the internal thyro-arytenoid. The crico-thyroid muscle is supplied chiefly by the superior laryngeal nerve, with also a few fibres from the inferior laryngeal nerve. Although the crico-thyroid muscle possesses the function of rendering tense the vocal cords, it is aided by the simultaneous action of the internal thyro-arytenoid. When the former muscle alone contracts, the larynx is unable to produce the highest tones possible, and the margin of the vocal cords does not exhibit a straight line, but rather an outward bowing. In a case reported by Tuerck, of paralysis of the left thyro-arytenoid muscle, the ligamentous glottis had the shape of a strung bow with the convexity toward the left.

Cases of paralysis of the crico-thyroid muscles alone are not common, although Schrötter believes that many patients who have lost their singing voice, without exhibiting abnormalities in the configuration and color of the larynx, suffer from paresis of these tensors. In unilateral paralysis, the healthy cord has been found on a higher level than the paralyzed one. Moser observed a case in which the posterior portion of the paralyzed cord stood higher than the anterior portion. Kiesel and R. Wagner found an eversion of the arytenoid while at rest. Gottstein and Jurasz believe that all cases of phonation in which there is a normal closure of the glottis without the vibration of the vocal cords, depend upon paralysis of the crico-thyroid.

Paralysis of the Adductors.—The adductors of the cords are the lateral crico-arytenoid muscles, the transverse arytenoid and the external thyro-arytenoid, all supplied by branches of the recurrent. There may be a complete paralysis of all the adductors, or a paralysis of one or more in various combinations.

Paralysis of all the Adductors is found most frequently in hysteria, and is marked by complete aphonia, which may come and go irregularly. This complete paralysis may alternate with one or more of the partial paralyses shortly to be described. Examination of the larynx shows usually a bilateral paralysis, although one cord may exhibit a tendency to slight movement on phonation. Gottstein has called attention to the fact that the immobility of the cords exists only upon attempted phonation, since they may be induced to move by contact with the probe, this showing that the reflex irritability is preserved.

Paralysis of the Lateral Crico-arytenoid.—Isolated paralysis of this muscle is rare, since the transverse arytenoid and the thyro-arytenoids are usually affected to a greater or less degree. Laryngoscopic examination shows the opening of the glottis during phonation in the region of the points of the vocal process.

Paralysis of the Transverse Arytenoid.—This is a common form, found usually in consequence of acute inflammation, although also seen in cases of hysteria. Examination of the larynx shows a triangular cleft in the glottis, corresponding to the cartilaginous portions of the vocal cords, while the ligamentous portion of the glottis is closed.

The prognosis of these conditions is favorable, although in hysterical individuals, constant relapse is apt to occur.

In the treatment one must have in mind the general as well as the local condition. With regard to the latter, the application of electricity has been of service. The interrupted current is used. One pole attached to a metal plate is fixed over the thyroid, the other connected with a laryngeal electrode is introduced as far as the arytenoid region, and then a strong current is suddenly passed through.

Paralysis of the Abductors.—The posterior crico-arytenoid muscles have the function of opening the glottis in respiration. Unilateral paralysis is by no means rare. Among the causes of this condition we may enumerate tabes, bulbar paralysis, multiple sclerosis, injuries to the brain and cerebral tumors, injuries of the neck affecting the pneumogastric nerve, pressure from tumors or aneurism in the neck and thorax, and finally malaria and poisoning with lead, arsenic, or belladonna. Owing to the longer course of the left recurrent nerve, and its greater liability to involvement by tumors, left abductor paralysis is the more frequent. Inflammation of the pleura at the right apex has been found to affect the right recurrent nerve. Unilateral paralysis can of itself never progress to bilateral paralysis, inasmuch as there are no centripetal fibres in the recurrent. Laryngoscopic examination shows that the healthy cord on phonation often passes over the middle line, so that a weak, husky voice is often possible. Inspection reveals the paralyzed cord to be in the cadaveric position, with a concave inner margin. During phonation the healthy cord passes over the other arytenoid, and produces an oblique position of the glottis. At times the arytenoid of the paralyzed side makes a twitching movement during phonation, and may even pass over toward the healthy side. This phenomenon is probably due to the passing over of nerve fibres into the transversus from the healthy side.

Bilateral paralysis of the abductors may be produced by any of the causes enumerated above. As has been previously shown, the abductor fibres are the first to suffer from any lesion affecting the motor filaments of the larynx between the spinal accessory nucleus and their terminations. We may thus find abductor paralysis as a premonitory symptom of complete recurrent paralysis. Bilateral paralysis has been observed particularly in tabes and syphilis. If it is an early stage of recurrent paralysis, the severe dyspnœa which it produces is relieved as soon as both cords assume the cadaveric position. The symptoms are chiefly those of severe inspiratory dyspnœa, particularly during sleep. Examination shows the vocal cords lying more or less parallel with each other, separating slightly on expiration.

Treatment.—When the cause of the condition is unknown it is well to treat the case as one of a syphilitic nature, by the administration of iodide of potassium. For the relief of the dyspnœa tracheotomy or intubation may be necessary. Excision of the vocal cords has been done, but with unsatisfactory results.

Complete Bilateral Paralysis.—This extremely rare condition has been observed in compression of both recurrent nerves by cancer of the œsophagus, aneurism of the aorta, or tumors of the thyroid. Johnson, Bäumler, and others have noted bilateral recurrent paralysis as a result of pressure on the vagus of one side. This is explained by Johnson on the hypothesis of reflex paralysis; the compressed sensory fibres of the vagus transmit the irritation to the nucleus of the accessorii with the result of producing paralysis of the muscles on the opposite side. Gottstein thinks it more probable, however, that the irritations of longer duration which affect one vagus, result finally in central lesions and produce changes in both accessorii.

Joseph Lincoln Goodale.

LARYNX, DISEASES OF: NEW GROWTHS.—Classification and History.—Laryngeal neoplasms, like tumors in any other portion of the body, are clinically divisible into benign and malignant growths, and this division, although based upon purely clinical knowledge, may with propriety be retained, as may also the purely anatomical division of laryngeal neoplasms into extrinsic and intrinsic (Grieshaber), namely, those which start from without the true anatomical confines of the laryngeal cavity and those which start from within that organ. There is also another clinical division into primary and secondary or metastatic laryngeal tumors. One of the above classifications will serve a better purpose in a treatise on tumors of the larynx than would a strictly histopathological division of these growths, although the latter cannot be wholly ignored.

Prelaryngoscopic records furnish but few instances in which intralaryngeal neoplasms were discovered and successfully removed during the life of the patients, but there are a few cases in which a tumor located high up in the larynx, or attached by a long pedicle so that it could be brought into view when the tongue was depressed, was diagnosed and removed. Most of these tumors were, however, first discovered post mortem, the clinical signs to which they had given rise during the lifetime of the patient having remained unappreciated. Middeldorpf in 1854 collected the histories of all the cases then on record, sixty-four in number, in nine only of which had any attempt been made to remove the neoplasm. To Kaderik in 1750 is due the credit of having removed a laryngeal tumor *per vias naturales*. Seventeen years later, Lieutard reported two undoubted cases of the same nature. Brauers in 1833 attempted to remove a laryngeal neoplasm by thyrotomy, and Regnoli in 1836 succeeded after a preliminary tracheotomy in extirpating a growth through the mouth. A little later we find a description of laryngeal tumors in Ryland's classical work, and after a long interval Ehrmann's celebrated treatise appeared (1850), containing a description of thirty-one cases. To these, in 1851, Rokitansky added ten cases. Green followed in 1852 with thirty-nine cases, Gurdon Buck in 1853 with forty-nine, and finally Middeldorpf in 1854 with sixty-four, bringing the history of these neoplasms down to the date of the introduction of the laryngoscope into medical practice in 1858.

From this date the subject enters into an entirely new phase; its historical interest ceases, while its practical importance begins to develop. The rapid progress in special knowledge, resulting in an immense increase in the number of laryngeal tumors diagnosed, and the impetus given to intralaryngeal surgery by the success of von Bruns in removing a laryngeal fibroma by the natural passages with the aid of the laryngoscope (1861), have all been the natural outcome of the discovery of this instrument. Among the advantages derived from the intelligent use of the laryngoscope are the detection of approaching stenosis, the determination of the time when tracheotomy is necessary, and the ability to watch the result of medical and surgical treatment.

Malignant growths of the larynx, as primary affections, are extremely rare in the prelaryngoscopic history of laryngeal affections. The laryngoscope, however, has not only aided in the early recognition of these growths, but has also put it in the power of the physician to observe their gradual development. In 1837 an instructive case of primary cancer of the larynx was reported by Trousseau. Louis and Barth each recorded a case, the latter in 1854. A number of cases of so-called carcinoma extending from the œsophagus, tongue, tonsils, or pharynx to the larynx were reported at an early date, but Fauvel regards these as "cancers of vicinity" and not, properly speaking, secondary or consecutive tumors of the larynx itself. In the past ten years numbers of cases of primary laryngeal carcinoma have been reported; in most instances the diagnosis being confirmed by histological examination. The case of General Grant and that of Emperor Frederick of Germany both served to direct universal attention to cancer of the throat and to demonstrate the inestimable value of the microscope and laryngoscope as diagnostic aids, and also the utility of cocaine in diagnosis and treatment.

Etiology.—Before the introduction of the laryngoscope, it is natural that the number of intralaryngeal neoplasms was supposed to be extremely small, inasmuch as they could be diagnosed only post mortem; and besides, owing to the difficulty of making an examination of the parts, and to the disfigurement of the body necessitated by the removal of the larynx from the subject, many cases escaped observation. Since Czermak, however, demonstrated the possibility of inspecting the larynx upon the living subject, neoplasms have been frequently discovered in this organ, and their growth and development, together with the etiological factors, have become absorbing subjects of study for laryngologists.

From a review of the literature of this subject we are forced to the conclusion that chronic catarrhal inflammation of the laryngeal mucous membrane and of that of the neighboring cavities of the upper air passages stands in the first place among the etiological factors; it must be borne in mind, however, that this condition is not the only cause, for chronic laryngeal catarrh may often exist for some time without giving rise to neoplasms. The occurrence of tumors in the larynx has been referred to a variety of ultimate causes, such as occupation, climate, and irritation of the vocal cords by overstraining, as in speaking, singing, etc., and particularly by the persistent use of the voice in singing during the period of mutation, at the age of puberty in the male (Fauvel); but all these conditions are merely causes producing chronic inflammation and not direct causes of the growth of the tumors themselves. The same may be said of the exanthemata as direct causes of laryngeal neoplasms (Lefferts).

What might be termed chronic traumatism (Seiler)—that is to say, repeated irritation of the laryngeal mucous membrane by the abuse of the voice in singers and speakers, by the inhalation of acrid vapors, dust, etc.—is, like the factors above mentioned, of indirect etiological significance only; and all cases in which traumatism has been alleged as a cause, such as fracture of the larynx by attempted choking, gunshot wounds, inhalation of caustics, etc., must be excluded for want of conclusive evidence that the acute traumatism was the exciting cause of the neoplasm. A case cited by Fauvel, in which there was an external wound in the neck, is the only one that I know of in which we can with certainty refer the occurrence of the neoplasm to trauma. The French school of laryngologists mention a rather curious etiological factor, namely, the "polypoid diathesis," which evinces itself particularly in the young, by papillomatous growths in various parts of the body, and which Dr. Charles Nancrede, of Ann Arbor, some years ago explained on physiological principles in a paper read before the Philadelphia Pathological Society. Heredity has also been assigned as an important etiological factor, especially in cases of malignant growths, but confirmatory data on this point are wanting. There is, furthermore, no clear evidence that laryngeal neoplasms are ever congenital.

We may assume, however, with propriety, that in certain persons a condition of the system exists which predisposes them to localized cell proliferation and therefore to the formation of neoplasms. These will naturally form in such portions of the body and such tissues as are subjected to local irritation, and in this connection it is well to remember that some individuals are more prone to the development of local accumulations of embryonal cells (carcinoma and sarcoma), while others, probably of a more vigorous constitution, are more prone to the development of local hyperplasiæ of fully formed tissue cells (fibroma, lipoma, papilloma, etc.).

It is in the instance of papillomata that we find a line of demarcation distinctly drawn between the benign and the malignant tumors, for, as Nancrede has pointed out, a given subject with a predisposition to the development of papillomata will develop such growths only in early life; but this dyscrasia, if it exerts its influence in later life, when the superficial epithelial layer of the skin and

mucous membrane have become hardened and indurated, while, at the same time, the connective-tissue layer of the subdermal and submucous tissues has become weakened, will result in a malignant epitheliomatous growth, the cell proliferation following the line of least resistance and invading tissues where epithelial cells do not properly belong.*

Chronic systemic intoxication, like alcoholism, syphilis, tuberculosis, and even the excessive use of narcotics, has been mentioned as a cause; but it must, from the standpoint of both the clinician and the pathologist, be looked upon only as a predisposing cause and not as a direct one.

Syphilis, as well as tuberculosis, by giving rise to temporary local hyperplasias or tumors (gummata and condylomata) may mislead the observer in his diagnosis. Although, strictly speaking, these are tumors or neoplasms, yet, owing to their very nature, they are self-evidently only pseudo-neoplasms.

One important etiological factor in the production of carcinomata or malignant growths of the larynx is said by some writers to be the local irritation resulting from repeated attempts at removal of a benign tumor through the natural passages. A striking illustration of this, according especially to certain German laryngologists, is to be found in the case of Emperor Frederick III., who was operated upon nine days in succession with the galvanocautery by one of the German military surgeons for a papilloma, the nature of which as a benign tumor had previously been demonstrated by no less an authority than Professor Virchow. Still the majority of close observers are agreed in declaring that a benign growth will not of itself change into a malignant one, and cannot be made to do so, and this opinion is borne out by the pathologist.

Finally, invasion of the laryngeal cavity proper by extrinsic neoplasms and the deposit of metastatic foci of cancerous growths must be mentioned as a factor in the production of intralaryngeal neoplasms.

Of late, much has been written about the parasitic nature of cancer; but this has been by bacteriologists and not by pathologists. I mention this only to register my belief that the theory is utterly without foundation.

Frequency.—The relative frequency of laryngeal neoplasms, among all the diseases of the upper air passages, is extremely difficult to establish with any degree of accuracy, because, as already stated, before the introduction of the laryngoscope, no data were obtainable, except post mortem, and consequently the statistics were misleading. On the other hand, in the early days of laryngology, before the different laryngeal diseases were thoroughly understood, when expert laryngologists were few and far between, a neoplasm was naturally the most easily detected lesion in the living subject, and consequently the number of cases reported rose to a very high percentage. The advances made in the diagnosis and treatment of chronic laryngitis (one of the chief causes, as we have seen, of laryngeal neoplasms), since the discovery of the laryngoscope, and the more general instruction in its use given in the medical schools, have as a direct consequence reduced the relative frequency of new growths of the larynx.

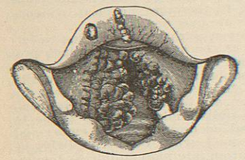

Fig. 3128.—Papillomata on the Vocal Cords.

As experience has proved, Lefferts was perfectly correct in his statement, in the first edition of this Handbook, that laryngeal neoplasms, both of the benign and of the malignant type, are much more frequent in the male than in the female, and that also, with the exception of singers and public speakers, vocation, heredity, and climatic influences are of very little consequence numerically speaking.

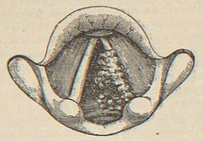

Fig. 3129.—Papillomata on the Right Ventricle of Morgagni.

The one exception—that, namely, of public speakers and singers, who suffer most frequently from laryngeal neoplasms—does not prove that the proper use of the voice predisposes to new growths, but rather that the cause lies in the frequent *abuse* of the voice (Labus, E. Seiler).

As uncertain as statistics have proved to be in regard to the frequency of tumors in the larynx in the general run of cases, both in public and in private practice, so also have statistics collected by me for a period of over thirty years proved unsatisfactory in establishing any trustworthy data in regard to the frequency of occurrence in the different nationalities and races.

Clinical and Pathological Aspect of Laryngeal Neoplasms.—From the foregoing the reader will very readily gather that at the present time and in the present state of laryngological and histopathological knowledge the diagnosis of the nature of a neoplasm, no matter where situated, must go hand-in-hand with that of its presence. I have thought best, therefore, in this brief article, to combine the clinical aspect, the location, and the histological distinction between the different growths under one head, and I will begin my description with the neoplasm most frequently met with, namely, papilloma.

Papilloma.—Papillomata, in order of frequency, assume the first rank, not only in adults, but especially in children. They vary greatly in size, viz., from a millet seed to a walnut. Their most common situation is on the anterior two-thirds of the vocal cords; on the ventricular bands they occur more rarely; and they are hardly ever seen in the posterior commissure or in the posterior portions of the larynx. On the epiglottis they are seldom observed.

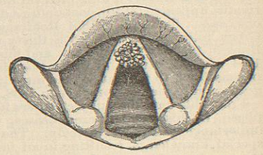

Fig. 3130.—Papilloma at the Angle of the Glottis.

Clinically, three varieties of these tumors are met with: The first class includes small light-red tumors of uneven surface and broad base, generally scattered and never of great size. After removal their recurrence is unusual. The second variety is a whitish-gray (the white growths are frequently mistaken for condylomata), papillary, warty tumor, seated upon a broad base and springing usually from the vocal cords. It recurs very slowly after removal, if at all. The third form, the most intractable as regards recurrence, is the large reddish tumor, single or multiple, variously designated by different authors as cauliflower, raspberry, strawberry, mulberry, etc. They grow rapidly and invade all parts of the laryngeal cavity. These papillary growths, when they have assumed considerable size, become dangerous, not because of any tendency to carcinomatous degeneration, but on account of their bulk, by which they obstruct normal respiration, causing dyspnœa or even apnœa. They are frequently ulcerated in consequence of necrosis of the superficial cells resulting from the insufficient blood supply. The latter fact is in all probability due to the constriction of the supplying blood-vessels in the usually slender stem of these growths, this constriction being caused by the

*Perhaps the best definition of what constitutes a cancer, in the mind of the pathologist, is the same as the definition given by Balzac in his "Country Doctor" of dirt—"the right thing in the wrong place."

pressure exerted by the growths themselves upon the surrounding tissue.

Fibromata.—These growths are second in order of frequency. They are usually red in color. They are as a rule sessile when located, as they usually are, on the vocal cords, but may be occasionally met with as pedunculated growths. They may be regarded as intrinsic neoplasms when they are attached to the cartilaginous structures of the larynx, namely, the perichondrium of the epiglottis, the arytenoid cartilages, or the cricoid; or as extrinsic when they spring from the lingual face of the epiglottis, the aryepiglottic folds, the hyoid bone, the larger cornua of the thyroid cartilage, or the articulation of the thyroid ligament. Their surface is smooth, they always occur singly in the larynx, and they are of slow growth. After removal they have no tendency to recur.

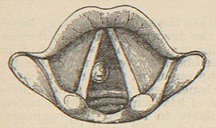

Fig. 3131.—Fibroma on the Left Vocal Cord.

Histologically, the hard fibroid tumor is made up of interlacing bundles of white fibrous tissue generally covered by several layers of epithelial cells. The softer forms of fibroma (sometimes called cellular fibroma) are largely made up of more or less developed fibro-cellular tissue, diffused through the meshes of which is a quantity of serum-like fluid.

The vascular supply of both varieties is but slight, and is always accomplished by anastomosis from the adjacent tissues on which these tumors are located, except in the rarer pedunculated variety, in which, as in the fibrous polypi of the nasal cavity, we not unfrequently find a large artery in the centre of the pedicle which carries the blood supply to the neoplasm.

Cystic Growths in the larynx rarely attain a large size. On the lingual face of the epiglottis, their favorite seat, they are usually seen of the size of a pea, although there are a few cases on record in which they have attained a larger size than that of an ordinary split pea. Their color is yellow or white. They have dense walls, and are filled with a thick gelatinous material. When situated on the vocal cords, they are always seen on the free edge, and their wall or enveloping membrane is much thinner than when they are situated elsewhere within the laryngeal cavity, because the epithelial covering of the vocal cords themselves is of a more delicate structure and of a different variety (squamous) from that of the epithelial covering of the rest of the surrounding mucous membrane. Rupture of these cysts is not unusual when they are seated in this locality. Cystic growths, when laid open and their contents emptied, show no tendency to recur.

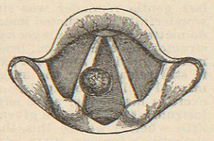

Fig. 3132.—Fibroma on the Left Vocal Cord; Growth of Larger Size.

Histologically, they belong to the class of retention cysts, and therefore it is natural that they should be most frequently located in those portions of the laryngeal cavity which abound in racemose glands, as the epiglottis, the aryepiglottic folds, the ventricular bands, and the ventricle of Morgagni.

A few cases of inversion of the ventricle have been reported (Cohen, Fauvel), and these—as the writer has personally verified in an unreported case—closely resemble a cystic laryngeal neoplasm.

Lipoma.—Among the rarer forms of laryngeal neoplasms—which indeed are rarely seen even by the specialist—are such tumors as the lipomata, which are to all intents and purposes nothing but encysted overgrown fat cells.

Myxomata, which, strange as it may seem, are so frequently found within the nasal cavity in the shape of soft polypi, are rarely seen in the larynx. They constitute the so-called polypi of the older writers. They are composed of a bag covered with a thin layer of epithelium and filled internally with delicate interlacing fibrous strands, the large meshes of which contain a gelatinous mucoid substance. In the larynx they rarely attain any great size. Their most frequent seat is the lower or laryngeal face of the epiglottis, when by their mechanical interference with the complete closure of the glottis they have, in the few cases reported, caused partial or complete aphonia.

Adenomata and *Angiomata*, owing to the physiological function of the upper air passages, as well as to the anatomical structure of the larynx, are extremely rare, as are also *fibromyxomata*, of which there is but one positive case on record, the writer's, and but one case of intercanicular fibroma, of doubtful diagnosis, reported by E. O. Shakespeare, and supposed at first to have been a case of angioma.

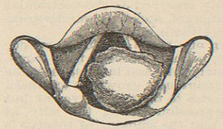

Fig. 3133.—Lipomatous Growth.

Malignant Tumors.—Among the so-called malignant neoplasms which we encounter clinically in the laryngeal cavity, first in point of frequency should be mentioned *epithelioma*.

But I wish most emphatically to express my opinion—which is that of many others—that epithelioma is not a true malignant neoplasm, any more than is a miliary tubercle, a condyloma, a gumma, or a rodent ulcer. The only difference between a benign and a malignant growth consists in the histological elements. In the one case (the benign) these are of the mature, perfect type, and therefore metastasis, histologically as well as clinically, is impossible. On the other hand, the cell elements of the second (the malignant) are embryonic in their type and may under favorable circumstances develop into farther advanced stages of embryonic cell structure, but under no circumstances can they attain to the mature type (Rindfleisch, Rokitansky, Virchow, S. Gross, Jr., Green, etc.). It is to my mind preposterous, from a purely histological and pathological point of view, to assume that a benign tumor, made up of mature histological elements, can be made to degenerate by local irritation into a malignant growth, composed of embryonic cell structure. It would be as sensible to assert the possibility of reducing, by local irritation, a hen into her original embryonic ovum.

Of course it is hardly necessary to recall to the mind of the reader that malignant neoplasms are subdivided into carcinomata and sarcomata, the first of which are made up of embryonic epithelial cells, the second of embryonic connective-tissue cells; nor is it necessary to dilate upon the fact that retrograde metamorphoses into various forms more readily obtain in such embryonic adventitious tissue. A translation from a focus in one organ to another distant one, by metastasis, is a fact of common clinical observation, and, as the lymphatics are the carriers and disseminators of these embryonic seed cells, we find that the lymphatic glands in the neighborhood of the original focus of the malignant growths are usually the temporary arresters of the progress of metastasis, and from overwork and constant irritation they become inflamed and enlarged, this enlargement forming one of

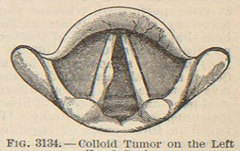

Fig. 3134.—Colloid Tumor on the Left Vocal Cord.

the most certain clinical features in the diagnosis of cancer.

Epithelioma is the most frequently observed of these malignant growths in the larynx and is usually seen on the mucous membrane of those portions of the upper half of the laryngeal cavity which are most prone to local irritation, namely, the upper surface of the vocal cords, the upper edge of the epiglottis, the laryngeal surface of the epiglottis, the ventricular bands, and the anterior commissure; in fact, the very same localities in which, as has been mentioned, papillomata most frequently occur.

Sarcoma, the form of cancer made up of embryonic connective-tissue cells, is extremely rare as a primary growth in the larynx, as also is the medullary form; but in the few cases of the latter, which undoubtedly can be looked upon as primary, the growths have sprung from the vocal cords, the laryngeal face of the epiglottis, the aryepiglottic folds, the ventricular bands, and the anterior commissure, while the few primary cases of medullary carcinoma have been mostly observed on the ventricular bands, the ventricle of Morgagni, and the posterior commissure of the larynx. (See Plate XL.)

In my opinion, however, one based on an experience of considerable magnitude, primary cancer (either sarcoma or carcinoma) is extremely rare, and in most cases the original focus of the malignant new growth is extrinsic. This very fact has given rise to the still prevalent but nevertheless erroneous impression among the laity, as well as in the profession, that the smoking of tobacco is one of the most frequent etiological factors in the production of malignant laryngeal neoplasms. Close observation of many cases has convinced me that such growths are not excited by the local irritation of the acrid tobacco smoke acting directly on the mucous membrane of the larynx, because, aside from the boyish habit of inhaling cigarette smoke, the smoker of a pipe or cigar seldom allows the smoke to come in contact with the larynx.

Symptomatology.—From what I have already said, in the above description of intralaryngeal neoplasms, it is plain that a very few words will suffice to convey to the reader the needed additional information in regard to the clinical picture presented by a given case of either a benign or a malignant laryngeal growth.

The only appreciated, subjective symptoms are those of aphonia, dysphagia, and apnœa, all three of which may vary in degree. Thus, for example, the aphonia may vary from a slight hoarseness to complete voicelessness. As regards the dysphagia there may, in one case, be merely a slight impediment in the act of deglutition (particularly of liquids), while in another there may be absolute inability to swallow either liquids or solids (aphagia). And, finally, there may be present symptoms of difficulty of breathing, such as shortness of breath in ascending stairs or slight elevations, usually aggravated by increase in atmospheric pressure, and then frequently mistaken (without a laryngoscopic examination) for asthma; or, in a more serious case, the difficulty may amount to absolute apnœa. In such a case, as a matter of course, tracheotomy is not only indicated but should be at once performed, whether the necessary or so-called necessary instruments are at hand or not. I may add here that the operation of tracheotomy in the adult is by no means so serious and difficult a surgical procedure as it is usually supposed to be, and Fauvel, Cohen, and Seiler have all mentioned in their works the fact that it is desirable for a person suffering from any intralaryngeal neoplasm to carry with him constantly the necessary instruments for tracheotomy. This is particularly to be urged in those cases of papilloma, sarcoma, cysts, and fibroma in which, either by direct obstruction of the rima glottidis or by reflex irritation of the abductors of the cords, sudden and very serious dyspnœa may momentarily be expected to develop.

Pain as a subjective symptom is sometimes present in the benign form of neoplasms, but is always present, to a greater or less degree, in cases of malignant tumors. It is of a neuralgic, lancinating, more or less intermittent character, and is usually felt in the region of the distribution of the different branches of Meckel's ganglion. In the case of extrinsic foci of sarcomata, carcinomata, or epitheliomata, the pain is referred by the patient to the middle portion of the external auditory meatus or else to the middle or inner ear, or to the mastoid process. Tuberculous and syphilitic ulcerations, as well as foreign bodies embedded in either the tonsils or the faucial pillars, also give rise to similar sensations of pain in the same regions, but in none of these affections is the pain a severe or persistent one.

All other important points in the symptomatology have already been mentioned in the description of the different types of neoplasms of the larynx, and the local picture is so manifest to the eye of the observer, when the patient's larynx is exposed to view by means of the laryngoscope, that no further explanation is necessary. The general history of the patient and that of his family should be taken into consideration, particularly in regard to prognosis, and in doubtful cases, in which a differential diagnosis, by means of the general history, laryngoscopic inspection, or other evidence presented is apparently difficult to make, the laryngeal forceps, in the hands of the expert, can readily obtain sufficient tissue from the neoplastic formation for microscopic identification. It must be a "tyro" in the art and science of histology and microscopical technology who cannot differentiate a pathological neoplasm from sound tissue, or a benign tumor from a cancerous growth.

Prognosis.—In the case of the benign variety of laryngeal neoplasms, the prognosis, if the treatment is properly conducted, is invariably good, while on the other hand, in the case of growths of the malignant cancerous variety, no matter how the treatment may be conducted, the prognosis is always bad; but life may be prolonged by early tracheotomy or thyrotomy or even by partial or total laryngectomy.

Treatment.—"A tumor is a tumor, according to Hippocrates, the father of medical lore, and as such is a superabundance of tissue; a neoplasm is a new growth and as such is too much and thereby forms a tumor" (Samuel Gross).

I do not know that I can better express my opinion or indicate my treatment regarding laryngeal neoplasms or tumors, whether benign or malignant, than to follow the precepts of my venerable teacher, Prof. S. D. Gross, who emphatically impressed upon his students that no matter in what portion of the body they might find a tumor they should "take it out," adding in a more gentle voice "with the best means at command." What he meant by the last gentle reminder was simply that no matter what wonderfully constructed instruments may be available, no matter how advantageous, in the mind of the constructor, a certain form, bend, or shape, of the instrument devised by him for a particular purpose might be, it still remains for the surgeon to have acquired the manual skill to manipulate a given instrument, and to exercise his faculty as an engineer to select the proper instrument or tool for a given case. It therefore matters little whether we use this, that, or the other celebrated authority's forceps, snare, guillotine, or what not, provided that we know, not only how to handle dextrously a given instrument, but also how to adapt ingeniously and adroitly any instrument to a given case.

Carl Seiler.

LARYNX, DISEASES OF: PERICHONDRITIS.—Perichondritis laryngea is an inflammation of the perichondrium which is prone to proceed to suppuration and to necrosis with exfoliation of the underlying cartilages. Suppuration, however, is not an invariable consequence, for resolution may occur or hyperplasia continue indefinitely.

Etiology.—*Primary acute idiopathic perichondritis*, which is rare, may be ascribed to "cold" and vocal abuse, but only in the sense that these conditions act as factors which predispose to infection by pyogenic microorganisms. It may arise by continuity of tissue in

EXPLANATION OF
PLATE XL.