

the sebaceous glands, which are, however, normal in shape and have normal excretory ducts. Each gland is inclosed in a thin capsule of fibrous tissue. The epithelial layer is increased and the papillæ of the corium are hypertrophied; and here the growth resembles the benign forms of epithelioma to a certain extent. The isolated hair papillæ found in a few of the sections are very small and atrophic. The sweat glands and the subcutaneous connective tissue and fat are apparently unchanged, save for the compression exercised by the hypertrophied sebaceous glands.

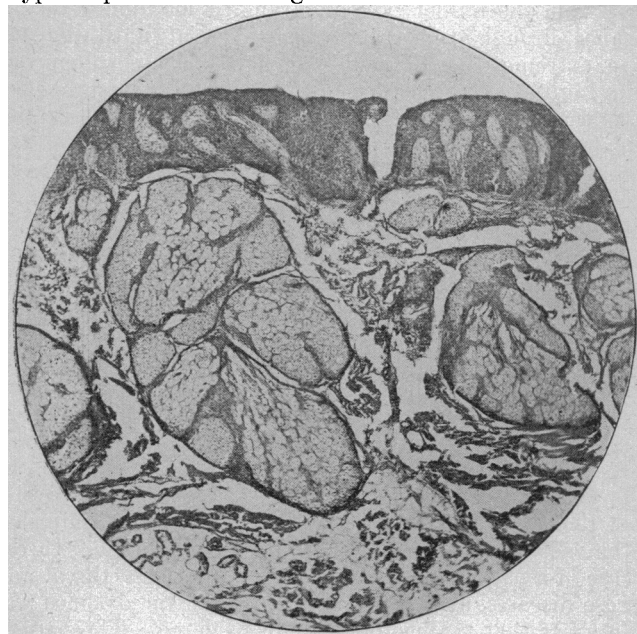


Figure 2.

The resemblance to rhinophyma is marked, but there is absence of any hypertrophy of the connective tissue of the cutis, and the increase of the epithelial layer is distinguishing. Benign epithelioma of the adeno-cystic type might be thought of but for the absence of epithelial prolongations and degenerated cell-nests.

### THE TREATMENT OF LARYNGITIS.\*

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It is the intention of this article to describe chiefly the local treatment of acute and chronic laryngitis, and to mention general measures only where they are necessary aids. The first form of acute laryngitis to be considered is the simple catarrhal type of moderate degree. This variety occurs chiefly in adults and, of all forms of laryngitis, is seen oftenest. It does not confine the patients to the house so that most of them are seen in the office or at clinics.

The chief symptoms are cough, at times incessant and distressing and varying degrees of hoarseness. The laryngoscopic appearance are the well-known ones of diffuse or localized congestion, especially of the cords, while secretion may be absent, or raised in the form of mucus or muco-pus. Most of these cases run but a short course and recover spontaneously, though the patient may continue to use and even abuse his voice. Where cough is a prominent feature it mechanically injures

the larynx and should be controlled by codein or other usual remedy. The influence of the inhalation of hot steam on the course of the disease has, in my hands, been so decided that I have come to rely on its beneficial influence. Voice rest is to be enjoined, but it is hard to enforce obedience. Of internal remedies, salicylate of sodium seems to have an abortive influence in some cases. With diaphoretics I have accomplished nothing, neither has menthol volatilized or sprayed in oily solution influenced the course of the affection as far as I could see. Seth Bishop praises menthol as an antiseptic anodyne. The anodyne effect is so feeble, in my experience, that it will not even suppress cough. The cooling sensation caused by the drug is deceptive. Menthol is, as Ingals says, chiefly an irritant stimulant and hence out of place in early acute laryngitis. As to its antiseptic influence it is doubtful whether the minute amount of this rather feeble antiseptic entering the larynx in volatilized form will influence the growth of microbes encased in protecting mucus. The oily menstruum of the spray will prevent efficient action of the antiseptic qualities of the remedy. This effect of oily solution on antiseptics is emphasized by John E. Weeks in his article on the relative germicidal value of the antiseptics. He thinks that the oily solvent prevents contact of the chemicals used, with the tissues.

Though most cases of the variety of laryngitis under consideration recover speedily, quite a number show little tendency to get well and pass into a tedious sub-acute stage with slow recovery or become chronic. Persistence in singing or speaking contrary to orders is one of the chief causes for this. In fact, it seems almost impossible to induce patients with acute laryngitis to rest the voice. Where the acute laryngitis assumes this protracted form local treatment is needed. Most cases will recover promptly under its influence, but some will prove refractory, especially where the general health is bid, as in the pretuberculous state or when lactation reduces nutrition.

The clinical picture and histologic appearances of acute laryngitis are those presented by an infected mucous membrane, whatever theories may be held in regard to the etiologic importance of exposure to cold, which probably acts merely as a predisposing cause. If we find the histologic changes of acute laryngitis, the epithelial and subepithelial round-celled infiltration, the desquamation of devitalized epithelium, the wandering of masses of leucocytes to the surface in any mucosa other than that of the respiratory tract, as that of the urethra or conjunctiva for example, we are not in doubt in the least that we have to do with a mucous surface inflamed by bacterial invasion. Why should exposure to cold, without other agent, be supposed to be able to produce changes in the mucous membrane of the larynx that elsewhere in the body we regard as typical of an infected mucous surface? The beneficial action of the usual remedies also impresses one with the infectious character of acute catarrhal laryngitis. These remedies are the so-called astringents, all of which are bactericides, and it has been my experience that the most bactericidal of all, nitrate of silver, is the most effective, and that the least in value are two but feebly antiseptic, tannic acid and alum. The most effective astringents are metallic antiseptics, and differ from organic antiseptics in their power of combining with the surface of the living tissues and imposing a barrier of metal-laden protoplasm to bacterial invasion. They therefore do not merely lie on the epithelium, but enter into it so that

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prolonged contact is insured. If used in too great strength they will devitalize the surface, that is cauterize it, a result irritating and undesirable in acute inflammations.

This clinging power of the metallic salts to the tissues undoubtedly explains the permanence of their beneficial and also undesirable effects, such as lead poisoning and argyria. One of the unpleasant features of the silver salts is this latter quality, and Moritz Schmidt tells of three cases of argyria due to persistent swabbing of the throat for months with silver nitrate. As to the so-called astringent effect of the astringents, as Harnack says, it does not exist. They do not cause a mysterious contraction of the tissue elements or their vessels; they merely form a protecting coat which hinders the egress of secretion—hence the drying effect of astringents.

At present silver nitrate is largely being displaced by protargol and similar modern compounds of silver, which are undoubtedly superior to the nitrate. Protargol is antiseptic, does not cauterize and penetrates the tissues deeply. A good strength of solution for use in acute laryngitis is from 20 to 50 grains to the ounce. Protargol and the astringents seem to me most effective where there is a decided amount of purulent secretion, while in the cases where hyperemia predominates the result is much less marked. Some of these latter cases are, in fact, in some instances not so much laryngitis as congestion due to voice abuse, especially in singers. This has been well emphasized by Holbrook Curtis of New York. Results are best obtained here by voice rest and proper methods of singing.

I have not found that the remedies of the eucalyptol, thymol, menthol and terbene group compare in efficiency with the metallic astringents. They are often used in oily solution and, as mentioned, oily menstrua inhibit the action of antiseptics. In addition oils do not form intimate contact with the moist tissues treated, but spread and float away as they would on water. The conditions are different on the skin, designed naturally for oily media, and where prolonged contact is assured. The above-mentioned drugs belong to the class of feebler antiseptics and therefore require prolonged contact in decided strength to be effective.

The mode of application of remedies is not a matter of indifference. The spray seems to me the best. Powders are removed by coughing and scraping before the active drug they contain has time to dissolve and penetrate the layer of mucus that protects the epithelium. Swabs mechanically injure the tissue by causing violent spasm of the laryngeal muscles and scraping off the epithelium, leaving raw surfaces. The laryngeal syringe, to reach all parts, must inject a large amount of fluid which can therefore not be used in proper strength to be effective without causing the patient great discomfort. With the spray a single drop can be made to evenly cover a large surface. The spray should of course always be introduced under the guidance of the laryngeal mirror, but even then its fault is that enough does not get into the narrow space found in many patients between the epiglottis and posterior pharyngeal wall, in sufficient amount to be effective. To open the upper larynx widely for the spray in these cases it is a good practice to hook the epiglottis forward with the tip of the atomizer. In many cases this is not possible, however, with the ordinary laryngeal tip, so that I use one of my deep tracheal spray tubes, recently described in *THE JOURNAL*, for this purpose. The long tube readily hooks up the epiglottis. Another advantage of

the instrument is the fact that it is possible with it to spray directly against the interior of the larynx and so blow away mucus from the surface while driving the remedy against the tissues at short range. The perspective does not permit us to appreciate how very far down in the neck the larynx is often situated, and a spray coming from high above it in the ordinary way spreads like a fan, so that but a portion of the medicament enters the larynx, and the rest is lost on the pharyngeal wall and in the fossa pyriformis.

From the milder type of laryngitis mentioned we advance through grades of increasing severity until we reach an extreme type of acute laryngitis, acute submucous laryngitis. In this form the infectious agents pass beyond the mucous membrane into the lymph spaces and channels of the submucous connective tissue, which becomes swollen and hyperemic, while at times enlarged cervical lymphatic glands can be felt. In the upper larynx the swelling may be so great as to cause serious dyspnea due to enlargement of the epiglottic and aryepiglottic folds. In this type of laryngitis it is obvious that the affection has penetrated too deeply to be influenced by applications to the laryngeal mucosa, as the disease is more in the lymphatic channels than on the surface; in fact the irritant effect of astringents may add to the swelling in a dangerous degree. In these cases the external application of cold to the neck is efficacious. As Schech states, cold limits the blood supply to the larynx by constricting both the great and small arteries of the neck, as proven by Winternitz. This diminishes the vascular swelling of the mucous membrane. In the case of a patient shown at the clinic for chest, throat and nose diseases, at Rush Medical College, the dyspnea was so great that tracheotomy was considered. The patient was admitted to the Presbyterian Hospital and treated with a spray of adrenalin chlorid applied systematically, together with repeated hypodermic doses of pilocarpin,  $\frac{1}{4}$  grain each, to keep up a profuse sweat. These means seemed to keep the swelling in check, so that operation was avoided.

The hypodermic use of pilocarpin for edematous conditions of the larynx has been advocated by Suarez de Mendoza, and he thought that it avoided tracheotomy in threatening cases. Felix Semon obtained good results from scarification of the swollen mucosa in these severe examples of submucous laryngitis. Intubation proved ineffective in a case of my own, as the edematous aryepiglottic folds closed over the top of the tube; scarification also proved unavailing so that tracheotomy had to be performed. When the epiglottis is much swollen it is apt to be immovable, so that fluids enter the trachea. In this state it is advisable to feed with the esophageal tube. In some instances submucous laryngitis is confined to the hypoglottic region, the loose areolar tissue underneath the cords swelling and dangerously obstructing respiration, the so-called laryngitis hypoglottica acuta gravis of Naether, or chorditis vocalis acuta inferior as it is also called. This grave form occurs chiefly in adults, while a less serious variety is found in children, causing the condition called pseudocroup, laryngismus stridulus, or spasmodic croup. Though often this affection is caused by spasm of the glottis merely, the opinion of to-day seems to be that at least most of the cases are due to temporary hypoglottic swellings that increase during the venous congestion due to sleep, and subside as soon as the waking child takes deep inspirations. The swelling has been seen by a number of observers. In some cases intubation is needed, but as

a rule cold applications to the neck, keeping the air moist with steam and the use of narcotics to avoid any complicating spasm of the glottis will avert this. Local applications to the hypoglottic region in children are impossible.

The acute hypoglottic laryngitis of adults is apt to require tracheotomy or intubation, and neither of these operations should be put off if dyspnea is at all marked, as the hypoglottic swellings are apt to suddenly increase enough to suffocate the patient. Cold applications to the neck will prove useful. Hajek warns against the use of potassium iodid in this affection, as it may make immediate tracheotomy needed by adding to the swelling. Laryngitis with scabbing and crusting in the larynx, the so-called laryngitis sicca, exists not merely in a chronic but also in an acute and subacute form. It is hard to explain this tendency of the secretions to dry in the larynx. The crusts may become massive enough to cause serious dyspnea, but usually are merely sufficient to create cough and hoarseness and at times bleeding.

Cases of this kind are not excessively rare, and usually the crusts can be seen to extend down into the trachea. As a rule the scabs rest on the cords and inter-arytenoid region, where there is pavement epithelium. These cases are generally tedious without treatment both to the larynx and trachea. As long as the latter is lined with crusts treatment confined to the larynx is ineffective. Inhalation of normal salt solution from a steam atomizer is an excellent palliative, but will have little effect on the tracheal scabs. Nitrate of silver or protargol sprays, as soon as the disease has passed its acutest stage, are very effective if they can be made to reach all of the diseased mucosa. The ordinary laryngeal tip will answer well enough for most cases confined to the larynx, but for the tracheal scabbing I have found it necessary to use the long tracheal spray tube devised by me. The tip of this must be either held within the opening between the cords or passed through them into the trachea after cocaineization. The ordinary spray tip has to be placed so far above the chink of the glottis that most of the jet is lost in the larynx and but little passes into the trachea, especially as the cords are held spasmodically in a position of partial adduction by most patients. Until I used this method I found laryngotracheitis sicca a discouraging disease to treat. The tracheal syringe is far more unpleasant for the patient than the spray, and as it necessitates larger amounts of fluid the concentration of the chemical in solution must be weaker unless we wish to run the risk of causing excessive irritation. The spray also applies itself more evenly to the tracheal walls. Oily substances can be sprayed into the trachea with the view of dissolving the crusts, and the patient should be kept in a room with a steamy atmosphere.

Laryngitis characterized by hemorrhage from the mucous surface without ulceration or wound, and at times by submucous hematoma, is called laryngitis hemorrhagica. It is very rare and in some cases has proved dangerous on account of large tough clots forming in the trachea and larynx. In a large proportion of cases it accompanies laryngitis sicca. The bleeding may be profuse. In laryngitis sicca the recurrence of the bleeding can be avoided by moist inhalations to prevent the formation of crusts. Astringent applications in laryngitis hemorrhagica should not be irritating, and the best of these for mild hemostatic effect is probably tannic acid. The iron salts will certainly create much reaction and form tough leathery clots hard to remove

by coughing. When the larynx is full of clots and blood it is doubtful whether any local applications will reach the bleeding surface, so that cold to the neck, rest and narcotics are probably the best remedies under these conditions. Adrenalin would have a good but temporary effect when it can be applied.

Uchermann has recently described a form of laryngitis which he calls laryngitis acuta circumscripta nodosa rheumatica. It occurs in the form of sensitive, rather firm, blue-red infiltrations analogous to those of the cutaneous erythema nodosum. When seated over the crico-arytenoid articulation the nodes cause pseudo-anchylosis with immobility of the cord. The therapy is salicylate of sodium.

In chronic laryngitis we have to deal with lasting changes which have gradually more or less profoundly altered the epithelium, the submucous connective tissue and the blood-vessels of the larynx. These elements will be effected in varying proportion. The epithelial changes are usually in the direction of the creation of a dermoid condition of the laryngeal mucosa. In extreme cases the whole laryngeal interior becomes thus lined with pavement epithelium, but usually there is thickening merely of the inter-arytenoid epithelium and of that on the cords. At times the change is confined to the region of the processus vocales, causing two epithelial protuberances, the typical pachydermia laryngis of Virchow. When occurring in the inter-arytenoid region the epithelial thickening causes stiff folds or a general warty prominence of this locality. The connective tissue hyperplasia may cause smooth or nodular hypertrophy of the cords, greatly increase the size of the ventricular bands, which then cover the cords, create hypoglottic swellings that at times dangerously interfere with breathing, fill the inter-arytenoid space with clumsy folds and nodosities of thick mucosa. Hyperplastic mucous membrane protruding from the ventricle of Morgagni has given rise to the term "eversion of the ventricle," a false conception of the condition. The vascular changes are in the direction of venous dilatations which form, at times, varices on the cords. There may be venous congestion of the entire laryngeal membrane.

In other cases of chronic laryngitis there is atrophy instead of hypertrophy. In my experience a not very rare condition is absorption of the tendon-like connective tissue of the cords, leaving in their place mere folds of flabby mucous membrane, an incurable state well described by Störk. In some rare cases erosions on the cords and fissures of the interarytenoid region are found. They are always suspicious of tuberculosis. In some old cases of laryngitis atrophy of the muscles occurs simulating paresis.

Most cases of chronic laryngitis do not show these profound alterations. In many cases the condition is slight and localized, especially in the chronic laryngitis of singers.

In another type of cases the most prominent changes are found in the mucous glands, with chronic alteration of secretion, in mild examples limited to scraping up of small amounts of mucus. In the severer grades the whole larynx and trachea may be lined with pasty pus or thick crusts, at times fetid, the so-called ozena laryngis, usually but not always associated with the same state in the nose and nasopharynx. When the secretions are removed the shape of the laryngeal interior may be found but little altered. In some extreme cases the vocal cords will be found distorted and

joined to each other by cicatrices, leaving but small room for breathing, as described by Freudenthal.

This brief sketch of the pathologic conditions of chronic laryngitis shows their enormous diversity and the great variety of means needed to combat them, ranging from a mild astringent to a surgical operation, and that one must be able to recognize states in which irremediable changes make all treatment useless. The need of treating simultaneously nasal and pharyngeal pathologic conditions is too well known to need more than mention here. The great and inveterate effects of chronic laryngitis can not be conquered by a few spray formulæ, as the favorite prescription corner of some medical journals would lead one to think. Great patience is needed by the patient and physician and we can not promise too surely a recovery. Often we will get only moderate or no improvement.

The first thing needed in the treatment of chronic laryngitis is to remove the source of chronic laryngeal irritation if there is one, whether it be mouth-breathing, nasopharyngeal catarrh, alcoholism, voice-abuse, or other cause. It is very important to bring the body weight and nutrition up to the normal standard for the individual. This is unfortunately not always possible when we consider how often chronic nontubercular laryngitis depends on pulmonary tuberculosis.

In the milder cases of chronic laryngitis, where the changes are confined to slight epithelial thickening and hypersecretion with moderate congestion, we can sometimes effect rapid improvement by the stimulus of mild astringent applications, such as silver nitrate, 10 grains to the ounce, or copper sulphate, 20 grains to the ounce. From the much praised alumnol I have had only disappointment, but zinc sozo-jodole, recommended by Moritz Schmidt, is mild in action and gives positive results. I use it in 5 per cent solution. This treatment is gratifying in the slight chronic catarrhal irritations of singers. Singers are subject to these even when they use their voices properly, and seem to have a special tendency to laryngitis.

In instances where the epithelial thickening and connective tissue hyperplasia is pronounced we need more powerful chemical agents to accomplish our ends. Those authors who have had the widest experience and have acquired an unusual degree of intralaryngeal skill in consequence advise here the application of mildly caustic solutions applied accurately to the parts showing pathologic changes, as for instance thickened hyperplastic vocal cords or the pachydermatous folds in the interarytenoid region. Solutions of silver nitrate in the strength of 25 to even 240 grains to the ounce of water are advised by Störk, Krieg, Schroetter, Semon. Tincture of iodine—pure—and chlorid of zinc in 3 to 5 per cent. solution are examples. Sajous even employs fused chromic acid to destroy completely the thickened epithelium and ectatic veins on the vocal cords, with good results. Störk says that silver nitrate should be used in strength sufficient to whiten the surface treated. Where the pathologic changes are marked and where we must cause destruction of epithelium which is unnatural to its location such severe means are needed and will be better borne than by the healthy larynx, but it is well to follow Semon's advice and begin with the milder solution, and only if nothing is being accomplished to work up to the stronger ones. It is better not to cover too much ground at one sitting, as severe reactions are to be expected; in fact, Störk says that the patient will be voiceless for a few days, and suggests that this enforced silence will be beneficial. He and others

advise a sojourn in a resort, for some cases, simply because the patient will not have the usual opportunities for conversation. For these strong applications local anesthesia is needed as a preliminary, and the application of the astringent must be made with a small swab under the guidance of the mirror, with perfect accuracy. As Ingals says, the strong solutions are in most cases objectionable, because of the spasm of the larynx and the great discomfort they cause the patient. In some cases of marked chronic laryngitis, however, we can not avoid their use if we wish to accomplish anything.

Where hyperplastic mucosa protrudes from the ventricle it must be cut away. The best instrument for this purpose is the double curette of Landgraf and H. Krause, which cuts vertically. Tuberous masses in the interarytenoid region, elephantastic ventricular bands can also be removed by some one of the double curettes, or can be reduced by electrolysis or the galvanocautery. The cutting operations are to be preferred, however. In some cases the snare can be used.

The treatment of the typical pachydermia laryngis of Virchow, the cushion-like epithelial masses growing from the processus vocales, likened properly to corns in the larynx, is regarded as very unsatisfactory. The accompanying chronic laryngeal catarrh may yield to remedies, but the pachydermatous outgrowth will remain. Some advise against interference with these growths where they do not injure the voice perceptibly. Chiari thinks they should be removed as they are occasional sources of perichondritis. If partly cut off with the double curette they will return; if deeply removed we may do injury to the processus vocalis. The cautery, electrolysis, tincture of iodine, chromic acid, have all been used with poor success. Scheinmann employs a spray of 2 to 3 per cent. acetic acid inhaled from a steam-atomizer for ten minutes three times a day. He also injected the same solution from a laryngeal syringe. The proceeding does not seem very logical, and his claims that the pachydermatous nodes softened and grew smaller were not confirmed by Ilberg, who also had no success with applications of 0.5 to 5 per cent. solutions of caustic potash.

Fein's method is the most promising. He caused disappearance of the pachydermia by using a solution of salicylic acid, 15 grains, water and alcohol each 75 minims, applied with a swab. There was no reaction. The remedy was used every other day for three months. For the treatment of chronically swollen vocal cords softened by venous dilatations Krause's incisions or scarifications offer a decided advance over previous methods. Krause uses a lance-shaped knife and makes small incisions 3 to 4 millimeters apart, longitudinally, along the cords from the anterior commissure to the processus vocalis. The incisions pass through the entire thickness of the vocal cords. In Krause's reported cases the result was recovery from chronic conditions that had resisted astringents for months.

The condition known as ozena laryngis or laryngo-tracheitis sicca chronica is notoriously intractable. A case of mine of this nature, of long standing, with extensive thick crust formation in the larynx and trachea, responded to treatment with protargol applied with my long tracheal spray, with but moderate improvement. Nitrate of silver was equally ineffective, and I was agreeably surprised, therefore, to find that a spray of potassium permanganate of 12 grains to the ounce was followed in a few days by absolute disappearance of the crusts, which have not returned after weeks, though the

treatment is kept up every three days to avoid a relapse. A rhinitis atrophica and pharyngitis sicca of severe degree still continue, though improved so much by irrigations with the same remedy, in the strength of  $\frac{1}{2}$  grain to the ounce, that the patient suffers no discomfort from these conditions. Permanganate of potassium is an ancient disinfectant of great power, and in my hands has proved itself far superior to peroxid of hydrogen, which has so largely supplanted it. It seems to deserve a more prominent place in laryngo-rhinologic therapy than it has at present.

In the treatment of the condition called singer's nodes, removal of these little outgrowths with cutting forceps seems most in favor at present, the galvanocautery and chromic acid being regarded as too uncontrollable. In one instance, in which I was greatly elated at the neatness with which I had removed some singer's nodes with Fraenkel's forceps, the patient disagreeably surprised me by returning the next day voiceless. Terror of the operation has caused an hysterical aphonia that lasted three weeks. Removal of singer's nodes may not improve the voice as much as hoped for, so that patients must not be led to expect too much.

Among the modern methods of treatment to be considered is Laker's vibration massage directed toward the removal of hyperplastic states. It also affects pareses of muscles and hypoglottic swellings favorably, according to the author. Laker, by means of tetanic contractions of the muscles of the forearm, can make the end of a cotton-wrapped probe vibrate 600 to 2,000 times in a minute against the tissues of the laryngeal interior. Coarse motions do harm.

In chronic hypoglottic laryngitis we have a condition that is a constant menace to the life of the patient. The characteristic hypertrophic swelling of the subglottic mucosa is liable at any time to an acute increase that may suffocate the patient. Attempts at operative removal of the swelling below the cords is apt to cause this so that tracheotomy should precede all efforts to remove the swollen hypoglottic mucous membrane by electrolysis, the galvanocautery or by means of the cutting curettes. Usually, however, the hypoglottic folds are unreachable from above, so that the operation of Sokolowsky, laryngofissure and excision of the hypoglottic mucosa is needed. Schoetz reports two cases in which iodid of potassium caused the subglottic swellings to disappear. There was no history of syphilis obtainable. In other cases the drug proved of no avail.

In conclusion two newer remedies are to be mentioned that have earnest endorsers, ichthyol, which is a non-irritating antiseptic with true astringent properties, causing contraction of vessels and paling of inflamed tissues. It is recommended by Hubbard in chronic laryngitis sicca. Methyl violet, pyoctanin, has great penetrating power, is a powerful germicide and non-irritating. I have had no experience with it in the larynx, but can confirm Breagen's statement that applied along the eschar after the use of the galvanocautery in the nose it will prevent inflammatory reaction and suppuration. The subject under consideration is large, and I am aware of lack of detail in this article. I hope that it has brought into notice some methods of treatment that should have extensive trial.

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## DISCUSSION.

DR. E. FLETCHER INGALS, Chicago.—In spraying the larynx it often happens that the ventricular bands close and the spray does not reach the cords. I have overcome this obstruction by directing the patient beforehand to take a deep inspiration immediately after the spray has been applied and thus the liquid thrown into the vestibule of the larynx is drawn down on the cords. A remedy that has recently come into favor, which I have found of much value in tubercular cases, is the tetrachlorid of iodine; it may be used in a solution containing from one to two and one-half grains to the ounce of distilled water. It must be kept in a well-stoppered dark bottle and only the amount needed for one treatment should be turned into the atomizer at once. What remains in the atomizer after the treatment has been given must not be turned back into the bottle containing the original solution.

DR. ROBERT LEVY, Denver, Col.—The spray that Dr. Freer has shown us is very similar to one that I have used for some time. His instrument is an improvement over mine, however, in that mine is made on the atomizer and is of hard rubber, whereas his is made detachable and is applicable to any ordinary Davidson spray, which I think is an advantage. In some cases of acute laryngitis, in the form the Doctor mentioned at first, I have been accustomed to use adrenalin chlorid and I have had it used by the patient at home. Repeated applications during the day will keep up the ischemic action, which I have found of great advantage, especially in teachers and singers who must use their voice during the time of the treatment. I must offer a protest against intubation in cases of edema or in cases which are liable to become edematous in the course of the affection. It is a mistake to encourage increased edema by the introduction of the intubation tube. In those cases in which I have seen it used, the edema has continued above and below the tube; I have known it to occur below the intubation tube, but usually it is above. When surgical intervention is necessary, tracheotomy is the only resource.

DR. FREER, in closing.—In regard to Dr. Ingals' remarks as to deep inspiration during the spraying of the cords, I think this a good procedure when the larynx is not especially sensitive. When this is the case I use first a spray of cocaine. In the majority of instances it is necessary to use the cocaine spray before introducing my intra-tracheal spray tube into the larynx.

## EDEMATOUS LARYNGITIS; WITH REPORT OF CASES.\*

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PHILADELPHIA.

The term edematous laryngitis is intended to describe a disease the underlying process of which is inflammation of a mucous surface, attended by serous transudation into the submucous tissues. To this disease many names have been applied, among which may be mentioned: Phlegmonous laryngitis, abscessus laryngis, edema of the larynx, erysipelas of the larynx, etc. Semon, in a paper on the subject, has called attention

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to the confusion which has resulted from the multiplicity of terms, and made a very commendable effort to simplify the matter by classifying certain types.

Much of the confusion which certainly does exist in the literature could be obviated if a distinction was sharply drawn between cases in which the symptom edema is present without inflammation, or, as Rice denominates these, the passive cases, and those in which inflammation of the mucous surfaces is an active and conspicuous feature. It is obvious from a study of the literature that much of the confusion has arisen from an attempt to classify under one head all diseases in which the symptom of edema is present.

My attention and interest was drawn to the subject by a case which has but recently been under my close observation. The history is as follows:

## ACUTE EDEMATOUS INFLAMMATION OF THE LARYNX; CATARRHAL PNEUMONIA; PHLEBITIS OF THE LEFT LEG.

CASE 1.—On Dec. 29, 1900, H. P., 55 years old, a driver by occupation, presented himself at the Polyclinic. His family and previous personal history was good. He had never been sick. About one week previously, he contracted a severe cold. There was nothing peculiar about this catarrhal attack, and he did not regard himself sick until his voice left him; and it was because of this symptom he came to the hospital.

On admission the voice was completely extinguished and there was considerable stridor in respiration.

*Examination:* The pharynx was intensely red—the nasal chambers filled with tenacious mucus. The laryngeal mucous membrane was extremely red and the lumen of the larynx much encroached upon by very marked edematous swelling—no view of the cords was obtained. There was much stridor in respiration, especially after a little excitement, e. g., in an attempt to make a laryngoscopic examination.

The condition of the patient in consequence of the laryngeal obstruction was so precarious that he was urged to remain in the hospital so that prompt measures could be taken to relieve him if it became necessary. Instructions were left the resident physician that preparation for immediate tracheotomy be made and that careful examination also be made of the urinary secretion.

He remained in about the same condition until Jan. 1, 1901, when there was marked increase in the stridor, he seemed to the resident physician to be in imminent danger, and I was called. It was evident, on a casual inspection, that the edema had increased. The face was bathed in perspiration and had that unmistakable distressed appearance so common in those in whom the respiratory functions are endangered. An attempt at scarification of the edematous tissue was determined on before resorting to the more serious operation—tracheotomy.

After a number of futile attempts, the tissues were finally thoroughly scarified. There was slight immediate relief, but much more a few hours later. The scarification was sufficient, however, to entirely remove all apprehension of danger from this source, nor was it necessary to resort to any further local measures throughout his illness, though, as will be seen, this continued for a long time.

The result of the urinary analysis was negative on Dec. 29, 30 and 31, 1900, and Jan. 1, 1901. On January 2 the specific gravity of the urine was 1028; a large quantity of albumin was present and there were numerous granular, hyaline and epithelial casts. The daily quantity of urine voided from the time of admission was from ten to fifteen ounces. This condition of the urinary secretion continued, with the exception of two or three days when the albumin disappeared, until January 21, when the quantity voided rose to fifty ounces, and there was a complete disappearance of all abnormal ingredients—these favorable changes occurring co-incidentally with a retrocession of grave pulmonary symptoms, to be adverted to later on.

Following the scarification, as above noted, there was relief to the extreme difficulty of breathing. There was still much stridor and the voice did not improve. The cough became