

On diseases of the throat and windpipe, as reflected by the laryngoscope : a complete manual upon their diagnosis and treatment / by George Duncan Gibb.

Contributors

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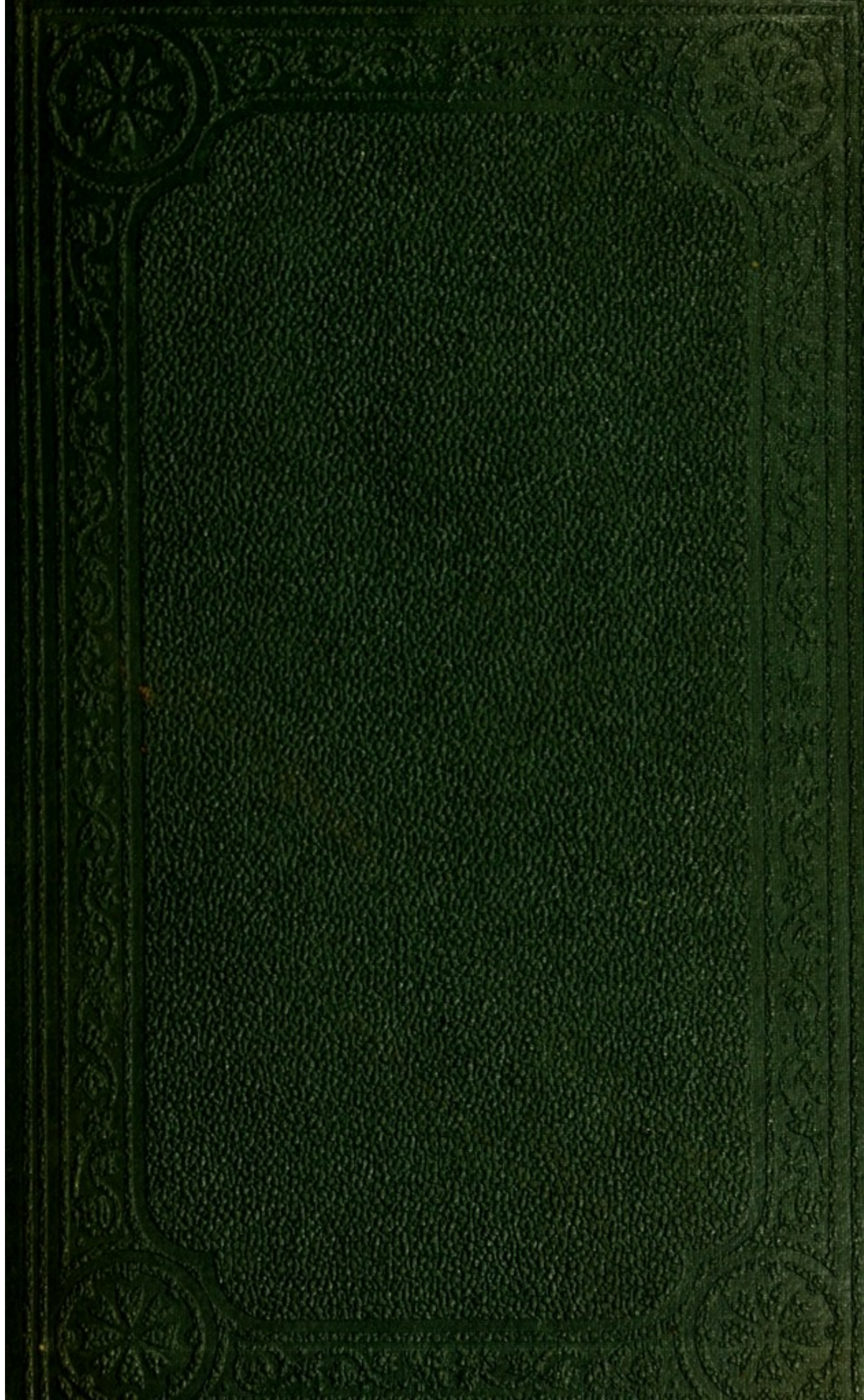
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BY

GEORGE DUNCAN GIBB, M.D., M.A.,

MEMBER ROYAL COLLEGE OF PHYSICIANS, LONDON; ASSISTANT-PHYSICIAN AND LECTURER
ON FORENSIC MEDICINE, WESTMINSTER HOSPITAL.

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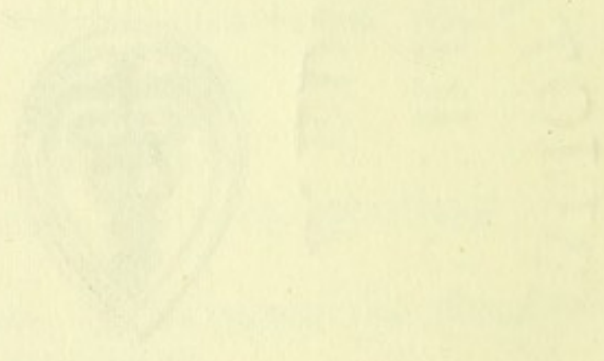
IN THE COUNTY OF SOMERSET

BY JOHN SMITH, ESQ.

IN TWO VOLUMES

LONDON

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TO

THOMAS WATSON, M.D., D.C.L., F.R.S.,

PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS;
PHYSICIAN EXTRAORDINARY TO HER MAJESTY THE QUEEN,

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P R E F A C E

TO THE

S E C O N D E D I T I O N .

THE present edition is in every sense a perfectly new work, for the introduction of the laryngoscope has added so much to our knowledge of the throat and larynx, as to render it necessary that the greater part of the subject should be rewritten. This has been a task of no ordinary kind, for the author has had to strike out for himself a new path hitherto untrodden, and several new diseases are described for the first time. Some of the views enunciated will be either confirmed or rejected by future experience; in the meantime, it is hoped they will be received with indulgence. A description of the diseases, with illustrative cases, would have been unintelligible without the aid of engravings; they have been therefore unsparingly introduced, regardless of expense, so as to render the work a complete manual and guide upon their diagnosis and treatment. With a few exceptions, all have been carefully executed by Hart, from drawings made by the author.

The satisfactory results obtained in many of the cases narrated could not have been accomplished unaided by the laryngoscope. In the hands of those accustomed to its manipulation, its use effects what has been heretofore looked upon as marvellous, for it renders "the dumb to speak and the deaf to hear."

The flattering reception given to the first edition, notwithstanding its omissions and imperfections, leads the author to hope that the present will meet with approval. He has spared no effort to make it a useful and practical work—one that could be consulted on emergencies, and at the same time helping to explain some of the appearances presented in the laryngeal mirror. The laryngoscopic drawings are represented with the objects reversed, in regard to the position of right and left, and from before backwards, and nearly all are explained in the various cases selected as examples of most of the diseases.

In the present edition the following subjects have been introduced:—Diseases of the mouth, the nose, and the trachea; the larynx in fevers; deformities of the larynx; worms and other bodies in the air-passages; tracheotomy; the beard; injuries to the throat and larynx; affections of the voice in speaking and singing; and some others, such as cancer and elephantiasis. The chapter on the laryngoscope is in itself complete, and affords all the necessary information for its manipulation. A short glossary is added, together with a complete index.

The length of the work has compelled the treatment of many subjects briefly ; nevertheless, nothing has been omitted having any relation with diseases of the throat and larynx—a class of maladies which may be now claimed as coming especially within the province of the physician, who can devote that patient attention and care to their investigation and treatment which surgery does not permit of.

A reference to the table of contents will show the classification which has been adopted in the arrangement of the various subjects under particular heads. Objections might be taken to some of these, but the object held in view was simplicity and general convenience.

The author returns his most grateful acknowledgments to the large number of his professional brethren throughout the kingdom, and in other parts of the world, who have honoured him with their confidence, in soliciting his opinion and advice. He humbly hopes he may always merit it.

19A, PORTMAN STREET,
AND 1, BRYANSTONE STREET.

March 1st, 1864.

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THE UNIVERSITY OF CHICAGO

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REPORT OF THE
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FOR THE YEAR 1900

CHICAGO, ILL.,
1901

THE UNIVERSITY OF CHICAGO
PHYSICS DEPARTMENT

CHICAGO, ILL.,
1901

ON
DISEASES OF THE THROAT
AND WINDPIPE.

CHAPTER I.

GENERAL DISEASES OF THE UPPER AIR PASSAGES.

SECTION I.—FOLLICULAR DISEASE OF THE THROAT AND AIR-PASSAGES.*

By far the most frequent and probably the most important affection of the throat is that known as the follicular disease of the mucous membrane, which in its extension from the fauces downwards proceeds along the same membrane lining the windpipe to that of the bronchial tubes. Although the nature of this disease has now been recognised for many years by the profession in this country, it was not until the labours of Dr. Horace Green, of New York, were first made known that special attention was paid to its consideration. It is the malady now known as the “dysphonia clericorum,” or clergyman’s sore throat; but it is by no means confined to the clerical profession. Medical men rank next in frequency, if I might judge from the large number who have sought my

* Granular pharyngitis, papillary sore throat, and clergyman’s sore throat, are other names for this form of disease.

advice. A moderate proportion exists amongst members of the bar, and a large proportion among the general public. I have seen it in a very exaggerated form in photographers, and in persons much exposed to the fumes of acrid chemicals in confined chambers, and its obstinacy in them is something quite remarkable.

The entire mucous membrane of the air-passages, as well as that leading to the stomach and alimentary canal, is supplied by a large number of small glands and follicles, which are situated for the most part either beneath this membrane or else imbedded in its submucous areolar tissue. Those in the pharynx are not only abundant, but at the same time naturally large in many persons, and can oftentimes be seen projecting along the lining membrane at the back of the throat. These delicate follicular glands are subject to various diseased conditions, which result from chronic inflammation of the mucous membrane, such as hypertrophy and induration, which may be associated with an altered or total arrest of secretion, producing a dryness of the throat; or they may become the seat of a deposit of tuberculous matter. The general enlargement of these follicles is what is first noticed; in Dr. Green's experience it is one of the earliest changes observed, and my own also fully testifies to the correctness of this view. This enlargement is found to take place not only in the throat, but in the air-passages as well, and, as has been pointed out, is observable, amongst other situations, at the back of the tongue. One of the most marked examples in this latter situation I exhibited before the Pathological Society of London,* in April, 1859, wherein many of the papillæ were fully the size of small peas, but not in a state of ulceration; they were, however, extremely indurated, although this is by no means a necessary accompaniment; indeed, it is rarely witnessed in the solitary glands, excepting in the mass of follicles entering into the

* See vol. x, 'Transactions' of the Society.

formation of the tonsils, which is considered in another part of this work.

As a result of disease of the follicles of the throat, their secretion may be increased in quantity, but completely vitiated in its character, becoming an acrid, viscid discharge, firmly adherent to the membrane, and a source of great irritation; or it may become arrested, and the membrane be very dry and uncomfortable. More rarely an exudation of blood is poured out, which will cause great alarm, both to the patient and his medical attendant, if not well looked into. Such cases are noticed by several writers, and several have occurred in my own experience. But by far one of the most important consequences is ulceration of these glands, the result of long-continued irritation following chronic inflammation. This state of throat-disease in the larynx is considered in the next section, and perhaps is the most important with which we have to deal.

As the seat of this malady is located in the fauces and upper part of the respiratory apparatus, the expressive appellation of *follicular disease of the pharyngo-laryngeal membrane*, as chosen by Dr. Green, is exceedingly appropriate and convenient, and it is adopted here because the essence of the disease consists, as has been pointed out, in a morbid action in the glandular follicles of the mucous membrane of these parts, and commences primarily in those situated in the fauces and pharynx, extending in many cases to the larynx and trachea, and even to the œsophagus itself. Although the disease is generally chronic, and seldom seen at the onset, from the insidious character of its invasion, yet it is not until many months or years afterwards that we notice some of the lesions which it produces. These shall presently be referred to.

The symptoms presented by this complaint are those of chronic irritation of the throat, as evidenced by frequent attempts at hemming and hawking, as it were to clear the throat of phlegm; this may or may not be associated with

efforts at deglutition. There is hoarseness, or roughness of the voice, which becomes increased by much talking, reading, preaching, or singing, and the irritation produced compels a cessation of the use of the vocal organs. Some slight soreness is occasionally observed about the larynx; there is an absence of cough, although there is an expectoration from the larynx and fauces of a tough, thick, opaque, and adherent mucus. On looking into the throat, the appearances at first noticed are, general enlargement of the mucous follicles at the posterior part of the pharynx, which stand out quite prominently on a red membrane in places deprived of its epithelial covering, giving to the whole a "raw or granulated" aspect. The rhinoscope shows the same appearances extending upwards in many instances to the limits of the pharynx; whilst in the laryngeal mirror the mucous membrane is seen generally congested throughout the larynx, upon the vocal cords, whose white colour is absent, in the trachea as far as the eye can reach, and on the laryngeal surface of the epiglottis, not unfrequently of a scarlet redness. Minute red points are commonly noticed in the situations just mentioned, which represent the follicles slightly enlarged, and in some places are observed to be pouring out fluid. With all this the membrane generally seems lax and loose, tumid, and thickened from mucous infiltration. This condition is that which may have existed for years, remaining in a stationary character, unless aggravated by some cause or another, of which changes in temperature and undue exercise of the voice are recognised as the most active. As the disease advances, these follicles become indurated or ulcerated, or they secrete a muco-purulent fluid, which may cover the greater part of the pharynx or soft palate; should they become involved about the root of the epiglottis or in front of the arytenoid cartilages, or in the interior of the larynx, the general symptoms already described become aggravated and increased in their intensity, shown particularly by the hoarseness, pain, and soreness, with extreme debility and lan-

guor, which accompany them. According to the condition and seat of the disease within the larynx, so will the voice become affected; sometimes it is almost gone.

There is a peculiarity worthy of notice in this form of disease of the throat, and with which every physician who has had such cases to treat must have noticed equally with Dr. Green, myself, and others, and that is the absence of "any decided or troublesome cough." Now, cough is occasionally present from the irritation existing at the top of the larynx, the pendent position of the epiglottis, or the congestion of certain parts of the larynx, which give rise to spasm, and vents itself in that way, as proved by the laryngeal mirror, but there is no disease of the lungs. Dr. Green goes so far as to say that he has met with cases "repeatedly, where the affection had advanced, until the symptoms present indicated extensive disease of the follicles of the larynx and of the membrane covering the vocal ligaments; until the ulceration of these glands, situated at the root of the epiglottis, could be felt upon the laryngeal surface, and yet the patient would remain free, or nearly free, from a cough, notwithstanding an abundant acrid secretion, poured out by the diseased follicles, would occasion an incessant hawking, to clear the upper part of the windpipe and the pharynx of this tenacious mucus."*

These observations are important, as showing us that regular cough need not be present unless there is actual lung-disease, and have been confirmed by myself with the laryngoscope over and over again; but a cough may steal on from gradual extension of the morbid process downwards. When follicular disease has advanced to the stage of extensive ulceration, the submucous tissues become involved, and add much to the general complexity. I have invariably noticed these ulcers confined to the back part of the pharynx, with a tendency to spread rather upwards than downwards.

* 'On Diseases of the Air-Passages.'

The superadded complications to this form of sore throat are such as might be anticipated from the contiguity of situation; thus the uvula will be elongated and swollen, causing great inconvenience, the tonsils are enlarged, often concealing the state of the pharynx behind, and the membrane of the soft palate is relaxed and tumid, and at times feeling as if scratching it would give ease. There may be phthisis, but then the follicular disease is truly tuberculous, as I have proved by histological analysis;* the reaction of the two, one upon the other, causes much aggravation and an early termination, unless warded off by timely treatment. Chronic bronchitis may be associated with it, and is accompanied by a free expectoration of mucus. Nevertheless, the throat-disease alone may go on for years without involving the lungs, if there is an absence of the predisposition to chest-affections. The epiglottis is subject to erosions and ulcerations in this complaint, which often require particular attention, especially when associated with follicular laryngitis. They are also noticed in a separate section.

The causes of the disease under consideration are various; the chief are, exposure to sudden vicissitudes of temperature, in almost any climate, but especially in such a one as ours, where the peculiarly moist atmosphere exerts a remarkable influence, particularly in those who, by constitutional predisposition, are prone to diseases of the throat. It is not uncommon to find several members of a family subject to this form of sore throat, which general experience shows to be more frequent in men than in women, between the ages of twenty and thirty-five years. Among the special exciting causes are those affections which in any way implicate the mucous membrane of the throat, such as the exanthematous diseases noticed further on; influenza; derangements of the gastric organs, which so manifestly react upon the throat; undue

* This is described in Section V.

exercise of the vocal organs, whether in speaking or singing; preaching in large and airy churches with perhaps a rather low temperature, the head being at the same time unavoidably uncovered: this in clergymen is the most frequent cause; reading the burial service out of doors in cold weather with the head uncovered, a most dangerous proceeding; and exercise of the voice when suffering from an attack of catarrh or of influenza.

In some persons the complaint is very liable to degenerate into one of the forms of disease described in other parts of this book.

General treatment.—This will be guided by the actual condition of the throat itself, and the particular stage of the follicular disease, which is manifested to the sight aided by the laryngoscope. If seen at an early period (which is seldom the case), the treatment, both general and local, soon cures the disease. Some of the cases briefly related at the end of this section fully show this in a remarkable degree, and the certainty with which this sometimes happens has enabled me not only to give a favorable prognosis, but at times an estimate of the period of cure, if my instructions are carefully carried out.

The treatment necessarily resolves itself into measures of a local character, and into those of a general or constitutional nature. These may be best considered separately.

Topical medication.—The medicinal substances which are applied to the diseased mucous membrane of the throat are used either in the form of powder, by means of insufflation, or in a liquid form, wherein the fluid is inhaled in a state of fine vapour or spray, or is directly applied through the aid of a brush or round piece of sponge, attached to a rod of whalebone, one end of which is bent or curved.

Of substances recommended for insufflation by Trousseau and Belloc, are the usual salts of mercury, zinc, copper, lead, alum, bismuth, or silver, mixed in various proportions with

very finely powdered sugar. The powder, to which the preference is given, is placed at one end of a hollow tube, and a forcible inspiration draws the particles into the larynx and trachea. Rauchfuss's instrument for propelling powdered substances to any given part of the larynx is sold by Krohne, 241, Whitechapel Road.

One part of powdered nitrate of silver and two of sugar of milk has been recommended to be placed in a pint glass jar and well shaken, and to be insufflated through a tin or glass tube, eight or nine inches long and an inch in diameter, inserted into the mouth of the jar. One to three inhalations at a time, two or three times a week, are deemed sufficient to thoroughly sprinkle the air-passages.* This is, perhaps, more useful in chronic chest than laryngeal affections, but is applicable to either.

Dr. Fournié, of Paris, conceives that liquids penetrate very imperfectly into the bronchial divisions, but that solid powders may, on the contrary, be conveyed with ease and precision into any part of the air-passages.

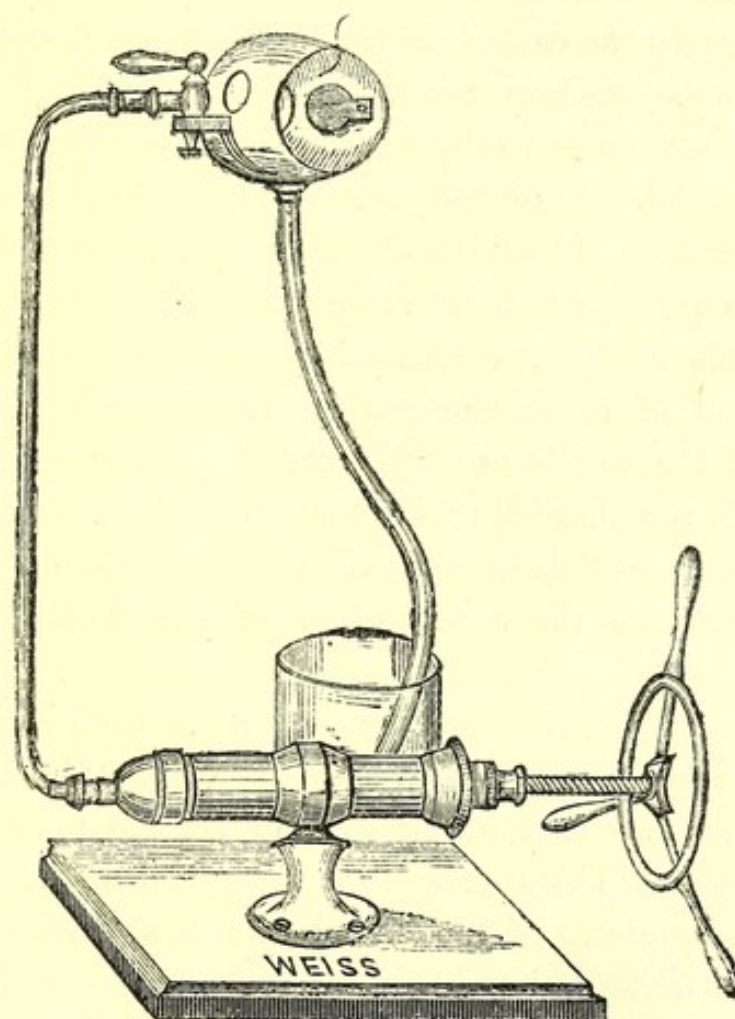
Hydrostatic treatment.—This has latterly come into vogue, as preferable to the method of inhaling various substances in the form of the vapour of hot water impregnated with them. The essential oils, iodine, chlorine, chloroform, ether, the sedative plants, and numerous other substances, were thus employed in many of the inhalers, and no doubt will continue to be commonly used, as heretofore, with great benefit.

The same practice has been revived, but with more certainty, in the dissemination of medicated fluids throughout the throat, larynx, and bronchial tubes, in the form of a fine vapour or spray, driven from an instrument which is said to produce "pulverization of the fluid." This is the respiratory hydrostatic plan of treatment, especially introduced by Dr. Sales-Girons, whose instrument was to be seen in the Great

* Dr. Studley, in 'Amer. Med. Times,' 2nd March, 1861.

Exhibition of 1862. It consists of a glass vessel containing the liquid, to the neck of which a syringe is attached. By pressing the piston the air in the interior is compressed, and on turning the stop-cock it drives the fluid with such force against a metal plate contained in a barrel-shaped tube, that it is instantly converted into a fine mist, which the patient can easily inhale. The large tube conveys away such portions as are at once condensed. The apparatus is figured in the 'Medical Times' of June 28th, 1862, and is extensively used in France, but especially at the thermal establishment at Pierrefonds. I have used it with great advantage; but for simplicity, and perhaps less cost, it is rivalled by the instrument made by Weiss and Son, of which the annexed wood-cut is a representation.

FIG. 1.



The pulverizer of fluids, for the lungs and windpipe.

“The apparatus consists of a syringe fixed to a stand, and furnished with a screw piston-rod, worked by a handle in the form of a wheel; to fill the syringe, the elastic tube is fitted at the end, and placed in a glass of water, and the piston drawn back by reversing the action of the screw; the elastic tube is then taken off, and the metal tube fitted on, and by screwing the piston forward a fine stream of water is sent out with great force through the mount at the end, striking upon the diaphragm in the barrel-shaped tube, from whence it issues in the form of spray; the condensed fluid is carried off by an elastic tube.”

I have used this instrument in a number of painful and severe cases, both of chest and laryngeal disease, and can honestly recommend it as most convenient for general use. In some cases of throat and chest disease combined this hydrostatic treatment cannot be too highly praised, and notwithstanding the opposition raised against it by Dr. Fournié, of Paris, will become generally adopted in cases requiring it.

In the treatment of the disease under consideration, the direct application of liquid medications by means of brushes or sponges, is perhaps of more value than any other plan we can adopt. This has been confirmed by experience and the common consent of those engaged in this branch of practice, because of the readiness and certainty of the application of remedies, of the decided effects they produce, and at the same time the absence of danger or even of risk to the delicate parts which enter into the construction of the whole breathing apparatus.

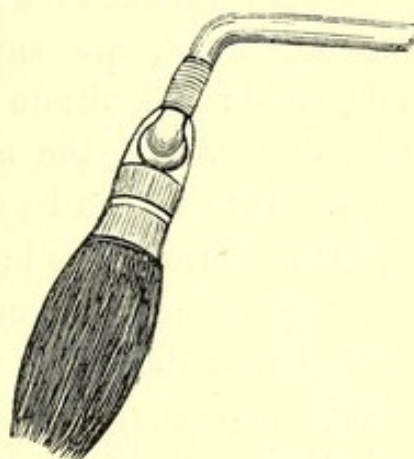
The most important of all the substances used is the nitrate of silver, a solution of which may be employed in strength varying from two to four scruples of the salt to an ounce of distilled water. This can be directly applied to the interior of the larynx, by means of the curved sponge and whalebone, or, what is still better, a brush and bent whalebone made like the annexed figure, and which I was the first to adopt. Indeed, I

have wholly abandoned the sponge, from the irritation it produces, and the manner in which it scrapes and injures the delicate membrane of the larynx.

A large, full-bellied camel or squirrel's hair brush is to be employed instead, and which will readily pass, with the aid of the laryngeal mirror, between the lips of the glottis, or around the base of the epiglottis, or any other part of the throat, as circumstances may demand. I wholly agree with many writers, that a solution of less strength than that named should not be applied; but, if it is necessary, according to the recommendation of Dr. Green, even a stronger may be made for use when the ulcerations are extensive upon the epiglottis or about the opening of the larynx, ulcerations which it is desirable to arrest at once.

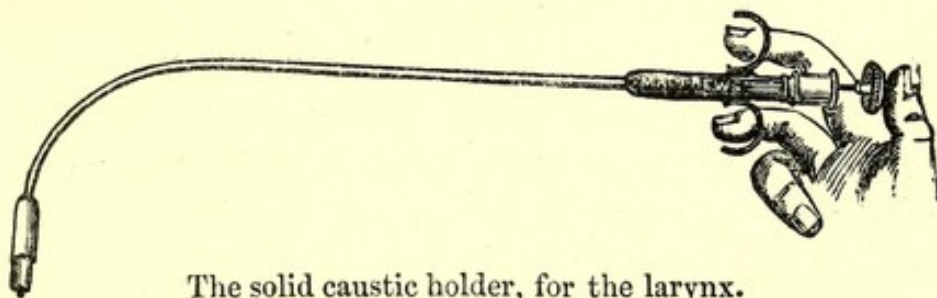
If it is desired to apply the solid caustic to any particular spot, it can be readily done by means of an ingenious instrument, manufactured by Mr. Mathews, of Portugal Street, Lincoln's Inn. It consists of a curved silver canula, containing the nitrate within the end of the curve, which can be pro-

FIG. 2.



The angular brush, for the larynx.

FIG. 3.



The solid caustic holder, for the larynx.

truded on pressing the end of the piston-rod, and after touching the diseased part, is allowed to be withdrawn again into its

sheath; it is depicted in the woodcut. I seldom use the solid nitrate, unless to heal up obstinate ulcers, or to destroy growths that cannot otherwise be removed.

Of other solutions I am in the habit of employing, according to circumstances, are sulphates of copper, zinc, and other metals, tannic acid, nitrate of uranium, iodide of silver, argentonitrate of mercury, the mineral acids, and many other substances. Brushes can be used for any corroding liquid, nitric acid, for instance; glass brushes are dangerous.

The mode of application of the solution of nitrate of silver to the interior of the larynx is now so familiar to the profession that it is unnecessary to detail the steps of that process. I was in the habit of following out the plan of Dr. Green, of not intruding the sponge or brush directly into the larynx on the first occasion, but now I commonly do so with the latter without the least inconvenience or even a spasm. The exquisite sensibility of the glottis does not seem to be excited by contact with the brush, unless in some rare instances. Yet it must be remembered that this operation is one not always of easy performance, on account of spasmodic constriction of the lips of the glottis. The frequency of its application, therefore, will depend upon the amount and duration of the disease, and the effects it produces. At first every other day for two or three weeks is recommended, and then two or three times a week, watching its effect on the mucous membrane of the fauces, and continuing it until its rough, tuberculated aspect has become quite smooth and healthy. I have sometimes employed the olive oil, as recommended by Dr. Scott Alison,* after all irritation is subdued, and with great comfort to the patient; it is used in a similar manner to the solution of the nitrate of silver. Various substances dissolved in glycerine, such as the iodide of ammonium and sodium, or the bromide of ammonium, sodium or potassium, I have found equally efficacious in suitable cases. Glycerine and borax in my hands have proved very beneficial

* 'The Medication of the Larynx and Trachea.'

in healing up the ulcers at the root of the epiglottis, but not at the commencement.

Constitutional treatment.—In the follicular disease of the throat which presents the granulated appearance from hypertrophy, the most useful preparations will be found those of iodine. They will cure when other substances have been tried in vain. My favorite remedy is the ioduretted iodide of potassium, or a weak Lugol's solution, combined with some carminative and tonic, of which the *hydrastin*, the active principle of the *Hydrastis Canadensis*, is one of the best. Although the action of iodine on the system is now pretty well known, in its causing the disappearance of glandular and other enlargements, yet it exerts a specific influence on the throat, for after it has been taken for some time it causes a heat and dryness of the mucous membrane of the fauces and pharynx. When iodine and iodide of potassium are combined, the dose to produce the desired effect need not be large, unless there is some other indication besides the throat-affection for its increased employment. The iodide of ammonium also is a reliable preparation in small doses, and may be substituted for the potassium salt in many cases; or either may be replaced by the bromide of ammonium, especially if there is much irritation of the fauces and larynx. These two salts are prepared in a very pure form by Messrs. Fincham, of Baker Street, and require to be given pure to produce their good effects. Occasionally the bromide of potassium has replaced the iodide in my hands with evident advantage, but I now give a preference to the ammonium base. In advanced cases lozenges of the *Eucalyptus Rostrata*, the red gum of Western Australia, are of extreme value from the permanently astringent powers they possess; these are prepared by Mr. Squire, of Oxford Street, who has also made lozenges of the bromide of ammonium.

In giving these remedies attention should be paid to the secretions by the use of mercurials in alterative doses, or the use of aloes, or regulated doses of the *podophyllin*, the active prin-

ciple of the *Podophyllum peltatum*, combined with Leptandrine and Hyoscyamus, or Iridin, with mucilage in pill, or some other laxatives. The functions of the skin must be strictly attended to; and, above all, by suitable diet and regimen, are all dyspeptic symptoms to be overcome. Many suggestions in the treatment will urge themselves upon the mind of the enlightened practitioner, which it is unnecessary for me longer to dwell upon.

A word may be added upon the subject of mineral waters in follicular disease of the throat. Without going fully into the efficacy of these, I may refer to those of Eaux Bonnes, in the Pyrenees, which are highly extolled by Dr. Guéneau de Mussy, of Paris, and by my friend Dr. Lucien Leudet, the latter in his philosophical essay on the mineral waters of that celebrated and fashionable watering-place. A residence of a few months there in the summer, or even the winter season, after cure in very chronic cases, will render it permanent.

The inhalation of the spray of mineral waters has been found useful in these cases also by Drs. Sales-Girons and Trousseau, but caution is necessary in employing it, for pneumonia has resulted when the spray was impregnated with tannin.*

Illustrations of follicular disease of the throat.—The following are a few out of some two hundred examples in my note-books, which are very briefly given, with some of the leading symptoms and laryngoscopic appearances, together with the stage and duration of the complaint, and the period of cure, so far as could be made out. Many gentlemen may recognise their own cases by their initials. Clergymen are for the most part selected, because in them the complaint is usually in a more aggravated form, necessarily as a result of their avocation. I have preferred also to select many that have especially come under my notice within the past four years, during which time I have worked with the laryngoscope; but it may be stated that in a great many the true state of the

* 'Medical Times,' July 5, 1863, p. 18.

throat and larynx could be pretty accurately diagnosed before the laryngeal mirror was even introduced into the mouth, from long familiarity with the complaint.

CASE 1. *Follicular disease of two years' duration; cure in three months.*—A well-known Canadian merchant consulted me in the year 1853 about his throat. The entire pharyngeal mucous membrane, as far as could be seen, was irregularly granulated by the elevation of the glandular follicles, which stood out in the form of circular, smooth, shining, little tumours, varying in colour, some being red, others pink, some again yellowish-pink, with the intermediate membrane here and there of a deep pink colour, for the most part deprived of its secretion. Dryness of the throat and huskiness of the voice had been long complained of, and the throat had been affected for nearly two years. At times he felt wretched and miserable, and quite incapable of attending to his business; he had been under the care of two gentlemen of eminence in their profession, and had not experienced any relief. The employment of topical measures, attention to the general health, and regulating the diet especially, conjoined with suitable constitutional treatment, already noticed, effected a perfect recovery in the course of three months.

CASE 2. *Follicular disease for eighteen months, after diphtheria; cure in seven weeks.*—Rev. Mr. W—, æt. 26, consulted me November 5th, 1862, with his father. Attack of diphtheria eighteen months ago, followed by follicular disease of the throat and larynx. Had attacks of spasmodic cough. The entire membrane of larynx, trachea, and fauces, was seen to be red, irritable, swollen, and follicular, with choking sensation. He had enlarged tonsils as well, and slight hoarseness. He was treated as already recommended, and by the 22nd of December he was quite well, and could read and preach better.

CASE 3. *Follicular disease, with epilepsy ; purple redness of the windpipe.*—Mr. M—, a surgeon in general practice, consulted me 20th May, 1861. Subject to epilepsy three years ; larynx very tender, and much mucus is expectorated. Has follicular disease of the throat and upper larynx ; in the latter the membrane was raw, and of a purplish-red colour, with mucus in the ventricles ; the same redness extended to the trachea, and simulated active inflammation, but it was in reality a stasis of the blood from the nature of his other malady, and he seemed to think that the fits arose from the state of the throat. I prescribed my usual treatment, but did not see him again.

CASE 4. *Follicular disease, with ulceration below the left tonsil ; speedy cure.*—Mr. G. A—, æt. 68, consulted me February 11th, 1862 ; recommended by Mr. Clowes, surgeon, of Windermere. Had suffered from irritation and congestion of the throat for some years ; worse after fits of indigestion. Follicular disease was seen, and some ulceration of the pharynx below the left tonsil. The larynx was pretty healthy. This gentleman's cure could not have been longer than three or four weeks.

CASE 5. *Follicular disease of the throat ; incomplete dislocation of the right thyro-hyoid articulation ; thinning, flattening, marginal ulceration, and depression of the epiglottis backwards ; cure in two months.*—Mrs. P—, æt. 32, married nine years, one child, was sent to me by Dr. Tilbury Fox on the 29th of August, 1862. Subject to sore throat ever since a child ; but her present illness commenced about eleven months ago with a feeling of choking, and since then she has had a constant hemming, as if there was something present at the back of the throat ; this is worse in damp weather. Gets hoarse and very nervous at times. Has tenderness and occasional pricking at the right thyro-hyoid articulation, often after

eating, and grating can be felt there with the finger. General health bad. Mucous membrane of the pharynx is relaxed, secreting mucus, with some redness and streaks the result of follicular enlargement. The laryngoscope showed the epiglottis very thin and dry, ulcerated at its left and upper margin, flattened out laterally, and much depressed backwards, so that the interior of the larynx could hardly be seen by forcible inspiration or sudden expiration; it was much congested. She was subject to spasmodic fits of dyspnœa, and often felt as though she should be suffocated. This patient had been seen by many practitioners and hospital men; some pooh-poohed her complaint, and told her it was imaginary; yet on examination I diagnosed follicular disease of the mucous membrane, with general congestion and irritation, incomplete dislocation of the right thyro-hyoid articulation; and, more important still, depression, thinning and flattening of the epiglottis. Under treatment she was perfectly cured in two months, to my own surprise, and it has remained permanent, for the natural position of the epiglottis was restored.

CASE 6. *Congestion of larynx and trachea, from follicular disease.*—The Rev. Mr. P— was sent to me by Mr. Critchett, 18th January, 1862. Had been ill for some years with his windpipe, and went to various places for his health; soreness at the root of the neck, and frequent expectoration. Had follicular congestion of larynx and trachea, and enlargement in the fauces. By the 14th February he was wonderfully improved, and was directed to persevere with his treatment a little longer.

CASE 7. *Follicular disease, and cardiac dyspnœa.*—Dr. R—, æt. 64, consulted me 25th May, 1863. Voice weak, and frequently gone; terrible attacks of dsypnœa at night, from probable cardiac mischief; has calculus in the kidney; thinks he has pulmonary emphysema. The pharynx, larynx, and

trachea affected with follicular disease, with a watery, gelatinous secretion. I advised, besides other measures, the inhalation of tannin with the pulverizing fluid apparatus of Weiss, which was procured by him, with what results I am not aware.

CASE 8. *Follicular disease for years, with pendency of epiglottis.*—Rev. G. H. W—, residing near Leeds, consulted me 28th April, 1863. All his life affected with sore throat, but never aphonic. In June, 1862, had acute laryngitis. Voice is husky and rough when ill; he cannot then do duty, and all his strength is gone. Besides follicular disease of the upper air-passages, in a most extreme degree, the epiglottis was pendent, and caused much discomfort, especially as a deep, hollow ulcer was present at the right side of its base. This was really a very bad case, and every winter necessitating a journey abroad. On July 14th he wrote that his health was much improved, the throat and voice stronger, soreness gone, and could do more work than for some time past. He felt assured that my treatment had been of benefit.

CASE 9. *Follicular disease of the entire pharynx following inflammation; extensive fissures of the tongue.*—Mr. F—, æt. 37, consulted me 12th October, 1861, for sore throat. Four months ago had a severe attack of pharyngitis, which was followed by acute follicular disease, dysphagia, and thick tenacious secretion; the membrane was of a deep crimson colour; the voice was thick, and the tongue deeply fissured in various places. As he was seen daily, the improvement was very great by the 19th, and on the 30th of November he was pronounced to be quite well in every respect.

CASE 10. *Follicular disease and impaired voice for two years; great congestion of the trachea and subglottis.*—The Rev. T. S. N—, Rector of —, at Lincoln, consulted me

May 27th, 1863. Two years ago his voice got weaker and weaker, until he could do no duty. Three weeks ago the voice was better, and all at once it became a hoarse whisper, and went away. For nine or ten years he has had to labour single handed, and has done overwork; general health bad; evening service was quite unbearable if gas was used, from the stifling atmosphere produced. The laryngoscope showed relaxation, pallor, and follicular disease of the larynx and fauces, with great congestion of the trachea and subglottis. The vocal cords were white, but had a relaxed and watery look. Streaked ulceration was visible at back of the pharynx. This was really a very bad case. He was treated upon the principles already laid down, generally and locally; the latter on some half dozen occasions. On 29th July he wrote, "You will be glad to hear that your treatment of my throat has been marvellously successful; my voice has fully returned, I have preached twice with great ease and with a stronger voice than I have had for years."

CASE 11. *Follicular disease, with extreme irritability of the fauces.*—The Rev. J. B. P—, of Sheffield, consulted me June 10th, 1863, recommended by the Rev. Mr. C—, of Leeds, whose case is given in Section IV of Chapter II. He had been subject to wheezing, cough, and other symptoms, for which he had been successfully treated by Mr. Elam, his medical adviser; an obstinate sore throat remained, and when I examined him there was present extreme redness and follicular congestion of the mucous membrane of the fauces, pharynx, and larynx, including that of the vocal cords and trachea, associated with the most extreme irritability. The posterior wall of the pharynx presented a patchy, tessellated condition; all bathed in a shiny, gelatino-aqueous secretion, which every now and then had to be got rid of. I prescribed on that occasion, and subsequently by letter on the 22nd; and this was ably seconded by the efforts of Mr. Elam; and as I have not heard from

either since, I conclude that the recovery has been good and permanent.

CASE 12. *Follicular disease, necessitating a residence for two months at Madeira and Mentone; most extreme irritability of the throat; complete cure.*—Mr. G—, æt. 45, from Yorkshire, consulted me 20th June, 1863. Two years ago he took cold after rheumatic fever, and his throat became bad; he has had a constant desire to *hem* and clear the throat by expectoration, and then he is quiet. Suffers from influenza and colds from time to time, and the last two winters he spent from home, for fear the disease might extend to his lungs, namely, at Madeira and Mentone. Dr. C. J. B. Williams and Dr. Quain had both assured him his lungs were sound, and this was also the case when I saw him. He had slight cardiac derangement from three attacks of rheumatic fever. Always well at sea-board, as coast of Yorkshire or Isle of Man. Has uneasiness at junction of hyoid bone with thyroid cartilage.

The very greatest degree of irritability was present of the fauces, with much congestion, relaxation, and secretion of all the neighbouring parts; uvula elongated and gelatinous. The larynx was seen the next day, and found in a similar condition, without ulceration; in twenty-four hours the irritability was greatly lessened, and the throat was better. A course of treatment was enjoined, and he returned home.

On October 8th he called upon me; all the old hemming and general irritation had gone, and he was comparatively well, but anxious to become perfectly so to face the coming winter, and “wanted his flues cleaned out.” He was subjected to daily topical treatment for seven days, and left for home quite cured.

CASE 13. *Follicular disease following bronchitis.*—The Dean of — consulted me June 30th, 1863, for sore throat. Had good health till the autumn of 1862, when he had

bronchitis. The voice has been hoarse, rough, and feeble since. The slightest cold flies to the windpipe; and if he preaches, the voice becomes feebler and feebler; it was not a reliable voice. The throat was seen relaxed, congested, and streaky; the larynx much congested, and greatly so in the trachea as far as could be seen, the chief cause of the mischief, especially in the subglottis. Applied a shower of nitrate of silver to the trachea, and prescribed rest of voice and suitable medicine. On 20th July he was very much better, the voice stronger, now possessing more distinctness and its natural compass. He preached in the cathedral yesterday with a sonorous voice, and was heard all over the building. The laryngoscope showed the trachea normal and the larynx nearly so. His recovery was shortly after this quite perfect.

CASE 14. *Incipient follicular disease.*—The Rev G. J —, æt. 26, who accompanied the dean, had incipient follicular disease of the throat from excessive work; this had been present for three or four months, and was becoming inconvenient. In a month he was quite well from the treatment adopted.

CASE 15. *Follicular disease for five years, with husky voice and inability to read aloud; cure in three weeks.*—The Prince D'—, æt. about 45, consulted me November 11th, 1863. His highness had been suffering from husky voice for five years, with follicular disease of the throat, and inability to read aloud for any length of time. He had been treated by men of eminence at Paris and in Germany, and had been much at watering-places, without benefit. His general health otherwise was good, but he felt depressed and uncomfortable about his throat. The follicles of the pharynx were enlarged, and the entire membrane relaxed. The larynx was also much congested, relaxed, swollen, and pouring out mucus; a few dots of follicular redness were visible here and there. Below the cords the trachea was much congested; the epiglottis was

red and shiny. Topical treatment was applied every two or three days for a fortnight, when all these conditions disappeared, and in three weeks his highness was cured. This good result was chiefly brought about by frequent showers to the larynx and trachea.

CASE 16. *Follicular disease and great irritability of the throat ; good cure.*—Rev. T. F. R—, of Wilts, consulted me July 15th, 1863, recommended by Mr. Thomas Hunt, of Alfred Place. Has had a tendency to sore throat since a boy, but latterly it has become very troublesome, and last Sunday he broke down in the pulpit. Huskiness ensued, followed by paroxysms of coughing ; is hoarse for days, unless the throat can be cleared ; the tone of the voice sometimes changes ; he has to chant the service. Has great discomfort at the root of the neck ; very choky in the mornings. The laryngoscope showed extreme congestion and great irritation of the fauces, velum and uvula, the mirror being borne but a few seconds at a time, yet I saw the membrane of the larynx, vocal cords, and trachea, quite red and swollen, and the follicles prominent. Applied silver solution at ~~once~~, and prescribed medicine. On August 4th he was altogether much better, and a few hours after seeing me the last day his voice was as good as ever for a short time. Expectoration of little mucous pellets had ceased ; irritability and other symptoms very much diminished. On October 6th, after returning from a visit to Yorkshire, he was wonderfully improved ; had chanted prayers without inconvenience, and delivered a sermon on the 4th, of twenty minutes' length. The larynx, trachea, and fauces, were quite healthy.

CASE 17. *Follicular disease, chiefly confined to the larynx, with a partly pendent epiglottis, and ulceration around it ; good recovery.*—The Rev. Mr. L—, from the south-east of Kent, was brought to me by Dr. Murray, of Green Street, September 30th, 1863. This was a very severe case, wherein the mischief

lay chiefly in the larynx itself, associated with incomplete pendency of the epiglottis, and ulcers at the base of its glossal surface, as well as at the left side of it, where also was a small body like the remains of an abscess, punctured there by Mr. Cock with the escape of a teaspoonful of pus. Taste, smell, and hearing, were affected; an irritable cough had been very troublesome; and altogether there was much discomfort, interfering with active duty. By careful treatment he was quite cured, and permanently so by the 10th of November, even to the taste and smell.

CASE 18. *Follicular disease since Easter, 1863, stopping all duty; cure within a month.*—The Rev. Mr. H— consulted me September 15th, 1863, accompanied by Mr. Walter R. H. Barker, surgeon, of Wantage, Berks, recommended to me by Mr. Weedon Cooke. Had been affected with sore throat since Easter last, from a severe cold. Hoarseness ensued, and no power to continue speaking, and he has done no duty since then. This was a well-marked case of extreme follicular disease of the throat, larynx, and trachea; the cords were of a vivid red colour. I undertook to cure him in about four weeks (a thing I seldom do), if my directions were implicitly followed, as much depended upon an early cure. Every second day applications were made to the throat and larynx, and the morbid condition completely mastered, so that his cure was actually accomplished in three weeks. On October 11th he read one lesson in the morning and one in the afternoon, without inconvenience. On 17th, at the piano, he could get up to two notes higher than on a previous trial. On 18th read two lessons in morning, and long exhortation in communion service, and two lessons in the afternoon, now and then joining in chanting; no inconvenience at all from it. On 25th read two lessons and litany in the morning, and one lesson and baptized three children in the evening. His cure was permanent.

CASE 19. *Chronic follicular disease of the larynx, with extreme hyperæmia, great perspirations, and other symptoms.*—The Rev. J. A. B—, residing near Chelmsford, consulted me November 6th, 1863. Had aphonia in 1853-54-60-62, and in March, 1863. Took two full duties in June, but not since. He had extreme congestion, relaxation, and thickening of the membrane of the larynx, cords, and trachea, a most uncertain throat to depend upon, and also a patchy, follicular pharynx. Constant excessive perspirations were a prominent feature, induced by the merest exertion. On the 23rd he wrote that his progress was quite astonishing; for though he only began the medicine on the 9th, he was able on the 11th to go through his work both morning and evening without fatigue. The diminution in the perspirations, he said, was not the less astonishing, for he could now take a walk without having to change his clothes on his return. The pulse, heretofore from 90 to 120, was now reduced to a natural standard. When seen on the 28th, the vocal cords were of a gray colour, tinged with pink, and his cure was soon expected to be complete.

I regret not being able to give Cases 17, 18, and 19, more in detail, for they were extremely interesting, as showing the value of treatment in long-standing and severely complicated disease. Those that now follow are necessarily very brief.

CASE 20.—Follicular disease of the throat and larynx, with congestion of the epiglottis and base of the tongue, huskiness and vocal weakness, general debility and emaciation, of seven years' duration, in the Rev. G. P. C—, from Yorkshire, who consulted me September 3rd, 1862. Cure followed in a few weeks.

CASE 21.—A mild example of follicular disease occurred in a gentleman who had been under the water-cure at Malvern,

with complete success for his other malady, and who consulted me on October 14, 1862, at the recommendation of Dr. Gully, for his throat. He had been some years in India. A single prescription effected a cure.

CASE 22. Pulpy congestion of the larynx and trachea, with disposition to enlargement of the follicles, in Mr. H. I. H—, a merchant, aged 50, subject to sore throat for some time, and who consulted me on 4th July, 1863, at the recommendation of Mr. J. Johnston, of Great George Square, Liverpool. By the 7th the larynx was more healthy, and the congestion of the trachea had already greatly diminished. I have no doubt that the recovery in this case was very speedy.

CASE 23. Mr. P—, æt. 23, consulted me, July 14th, 1863, with Mr. J. E. Mathew, surgeon, of Elvaston Villas, South Kensington. Extreme follicular disease, with great irritation, was present in the fauces, larynx, and trachea. The vocal cords were quite red, and subglottis crimson; secretion abundant. Duration of disease three months, and the cure effected in three weeks, with the co-operation of Mr. Mathew.

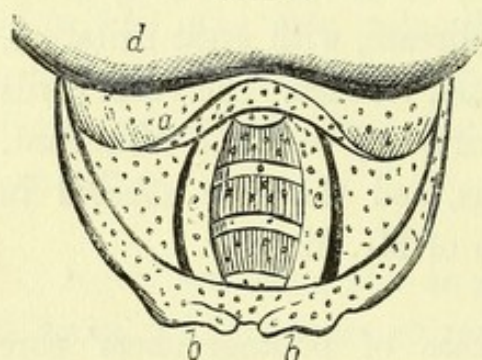
CASE 24. A terribly severe case of photographers' sore throat, with several relapses, in a gentleman brought to me by Mr. Rugg, surgeon, on 9th June, 1863. It originated in a severe cold some three months before. A prominent symptom was the feeling of rags in the back of the throat. He was well by August, but the tendency to relapse was strong from the fumes of the chemicals employed in photography.

CASE 25. Mr. Stephen L — was brought to me, 30th October, 1863, by Mr. J. F. Lovegrove, of Igktham, in Kent. Has had follicular disease of the throat, larynx, and trachea, of many years' standing, with extreme irritability and a bad cough. I saw him three times, the last on 7th December,

when I pronounced him nearly quite well, but this good result was chiefly due to the local treatment carried out by Mr. L—, at my suggestion.

CASE 26. A not less remarkable case is one brought to me by Mr. Firth, surgeon, on September 23rd, 1863, of a gentleman, æt. 55, who had been subject to hoarseness and most aggravated follicular disease of throat, and entire wind-pipe, for many years, that had wholly resisted treatment. Considerable swelling of the left false cord was the cause of the hoarseness. By the 13th October a terribly severe cough had disappeared, and a healthy condition of the throat and larynx was already brought about. I afterwards learnt from Mr. F — that he was comparatively well.

FIG. 4.



a. Epiglottis. *b, b.* Arytenoid cartilages. *c, c.* Vocal cords. *d.* Back of the tongue. The trachea is seen between the cords.

CASE 27. A barrister consulted me, October 19th, 1863, with incipient follicular disease of the throat and larynx, commencing in March. There was great irritability and redness—indeed *all* the parts were red, and the follicles dotted out in minute little points, as shown in the sketch. The cure was remarkably speedy.

In my case-books are the notes of some 200 cases coming under the denomination of follicular disease, and the foregoing are a few of the more interesting, but quite sufficient to show how curable the complaint is when judiciously managed.

SECTION II.—CHRONIC DISEASE OF THE WINDPIPE.

In its importance, chronic disease of the windpipe ranks next to the follicular inflammation of the throat considered in the preceding section, for we have now to deal with one of its consequences—namely, ulceration of the minute glands with which this membrane is furnished as the result of the long-continued irritation which has characterised the primary disease. Besides the ulceration, the structures beneath the lining membrane take on diseased action of a subacute character, and a very chronic or slow form of inflammation goes on; this is the chronic laryngitis of many writers. It ensues as the result of many other throat-affections besides follicular disease, and would seem in very many instances to follow in their wake, as is shown in other parts of the present work. The frequency with which it is encountered, both in its mild and aggravated forms; the tendency it has to involve the lungs by sympathetic irritation, as well as by spreading along a continuous membrane, and the obstructed or interrupted free admission of a sufficiency of air for the purposes of breathing—the result of impaired action in the vocal cords from thickening or submucous deposit—necessarily invests its consideration with an amount of importance which must at once suggest itself to the mind of the reader. In many instances, unfortunately, the mischief is allowed to proceed and spread to such an extent as to become utterly irremediable, whereas timely interference might have done much to save life.

The special tissues implicated in chronic disease of the windpipe are, as already mentioned, the proper mucous membrane and its follicles, together with the subjacent areolar structures, and in advanced cases the cartilages. The last, for many reasons, are considered separately.

Many of the symptoms enumerated as indicative of follicular disease of the throat are likewise present in chronic disease of

the windpipe; thus, there is hoarseness and dryness of the throat at first; this is succeeded by a dry hacking cough, and uneasiness or pain in the larynx itself. If the cartilages of the latter are pressed back against the spine, or pressed laterally, soreness is felt. As the ulcerative process extends, it causes irritation of the small muscles of the larynx, and their spasmodic contraction, producing constriction at its orifice, and an approximation of the lips of the glottis. This greatly affects the respiration, which becomes whistling or stridulous, causing much dyspnœa and cough, aggravated towards night. The voice has now become weak; it may be in a whisper or almost gone, because there is not a sufficiently free current of air to throw the vocal ligaments into vibration, and if not relieved suffocation is threatened. The symptoms in chronic laryngeal disease vary considerably, and according to their character the physician will generally be able to point out the special locality of the disease, and the parts engaged, almost before the laryngeal mirror is introduced. In a great many instances all the active signs of a rapid consumption are present, such as hectic fever, night-perspirations, a terrible hacking and irritating cough, much expectoration, general emaciation and extreme prostration, followed by gradual decay. A careful examination of the chest will show that such cases are *probably* unaccompanied by tuberculous disease of the lungs, and the patient has the malady known as phthisis laryngea, or consumption of the larynx. Such, however, is the effect produced upon the lungs by this distressing complaint, that it is but seldom, indeed, that they remain unaffected, and this greatly adds to the difficulty of treatment.

Yet, again, it must be remembered that in many very severe cases, wherein the exacerbation of the general symptoms is increased from causes that may arise during the progress of the disease, very much relief is derived from treatment, and a cure is not infrequently obtained. In some individuals there is a liability to attacks of chronic disease of the throat,

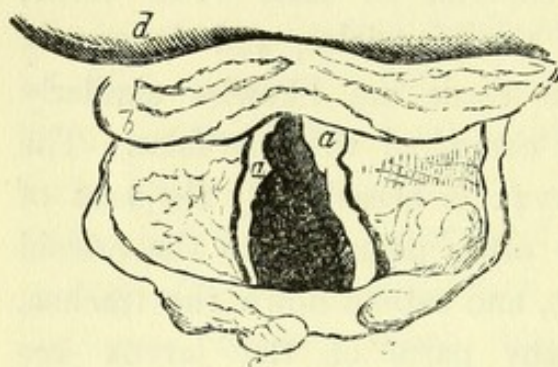
brought on by cold and exposure, and the voice becomes naturally harsh and hoarse.

The laryngoscopic appearances vary considerably, but the chief are ulceration of the superior or false vocal cords, especially on the borders of the ventricles, and frequently extending to them. The true cords are likewise similarly affected, but infrequently so as compared with the false. The sub-glottic portion of the larynx is occasionally the seat of one or more ulcers, and these often penetrate to the cricoid cartilages at the posterior part, and extend down the trachea. The tissues generally in many parts of the larynx are thickened and indurated from sub-mucous and interstitial deposits of lymph or albumen (of serum in acute laryngitis), the former more particularly below the *cordæ vocales*. Sometimes there is total loss of action of the vocal cords, which remain permanently separated with incurable organic aphonia; the membrane covering them is of a deep-red colour, and the arytenoid cartilages are immovable. The changes that occur in old cases of chronic laryngitis are sometimes most remarkable, and when extensive ulceration has been healed the general cavity of the larynx is contracted and irregular, and the natural appearance of the vocal cords is quite destroyed. Fortunate is it if the patient has had his voice left to him.

Pathological observations made throughout a series of years, from post-mortem inspection, have been over and over again confirmed in the living with the laryngoscope. Several cases introduced into other sections to illustrate special lesions, especially those on the epiglottis, aphonia, and growths, might with propriety have been introduced here, for they were truly examples of chronic disease of the larynx. The annexed drawings are from cases of old standing disease that came under my notice, in which the ulceration was chronic, and had existed for many years. In fig. 5 deep ragged ulcers had involved the false cords to the margins of the ventricles, and also the lingual surface of the epiglottis; the larynx is

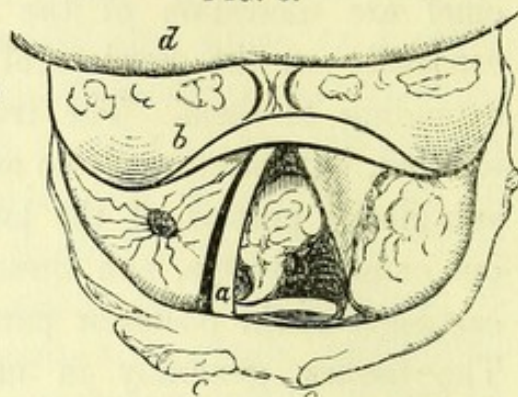
irregular and deformed; the true cords were narrow and irregular on their free margins, and approximated sufficiently

FIG. 5.



a, a. The vocal cords. *b.* The epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of the tongue.

FIG. 6.



a. The right vocal cord. *b.* The epiglottis. *c, c.* The arytenoid cartilages. A large ulcer is seen in the trachea, and cicatrices elsewhere. *d.* Back of the tongue.

to produce a very hoarse voice. In fig. 6 the cicatrix of an old ulcer is seen on the right side, destroying in great measure the false cord; and on the left a great, ragged, deep, ulcerated surface, extending to the boundary of the larynx behind. There were no remains of the true vocal cord on this side, but there was on the right, the membrane of which was red and thickened, with no action whatever; there was incurable aphonia. An ulcer is seen in the trachea.

Mr. Porter of Dublin (one of my old teachers) says that of all the causes of ulceration of the larynx, some specific or constitutional taint seems to be the most influential, such as syphilis, scrofula, mercury, or a combination of two or more of these.

Among the changes which are produced by the malady under consideration, besides those already described in the larynx and trachea, is a thickening and induration of the mucous membrane of the pharynx from deposit beneath, which constitutes a true hypertrophy, which may even pervade that covering the velum palati. More usually the soft palate has sustained loss of some part of its substance, generally the

centre with the uvula, or it has become adherent to the back part of the pharynx. On the other hand, when absorption has become increased from the long cessation of the natural functions of the part, an atrophic contraction of the pharynx has resulted with the formation of those "enlarged or cavernous throats" which occasionally are presented to our notice.

Usually there is no pain nor difficulty in swallowing in chronic ulcer of the larynx, but it is otherwise if the anterior or lingual surface of the epiglottis is ulcerated. Again, if the ulcer is situated at the junction of the vocal cords, namely, at their anterior part, readily seen in the laryngeal mirror, both speaking and coughing produce uneasiness and soreness. This latter condition, before the introduction of the laryngoscope, was a great help in the diagnosis. It is important to go into the patient's history to ascertain if the disease in the larynx owes its origin to syphilis—a rather frequent cause of ulceration,—or, to the excessive use of mercury. Then again, the lungs should invariably be examined; this is indeed a matter of vital importance in the prognosis and treatment. When the lungs are sound, the ulceration is generally confined (not invariably) to that part of the larynx *above* the vocal cords. On the other hand, when the stethoscope assists us to learn the presence of pulmonary disease, the vocal cords are *seen* to be the most affected, especially in the anterior sub-glottic region. Although the state of the lungs will thus assist us sometimes to form a tolerably correct opinion as to the probable seat of the ulceration before the laryngeal mirror is introduced, it must not be forgotten that all parts of the interior of the larynx, extending downwards to the trachea and bronchial tubes, are at one period or another affected by different degrees of ulceration.

The present section might be very considerably extended, but this would have been at the sacrifice of some of the other subdivisions of throat-disease, and in the present state of our knowledge it is advisable to illustrate the distinctive forms of lesion as much as possible.

I may refer here to *pneumatocoele*, as a consequence of chronic disease of the larynx. It is rare, but a case occurred at the London Hospital, under Mr. Hutchinson, in a circumscribed form, in the neck of a phthisical patient, from a communication through the crico-thyroid space. The air could be squeezed out of it by compression.*

The *treatment* which has been recommended by many writers of authority for chronic disease of the windpipe in this country, although it had the semblance of rationalism, is such as to cause it to become even still more chronic, and with less favorable prospects of a successful cure. It would answer no useful purpose to go over all the different measures recommended for relief and cure, but we shall at once proceed to state what will be found really serviceable, and the most likely to arrest the progress of the disease.

If the actual condition of the interior of the laryngeal cavity be taken into consideration, and the ulcerated state of its mucous lining is borne in mind, with its reactionary influence upon the system at large, associated necessarily with the local irritation and its consequences, it will not require much reflection to conclude that no treatment will prove of any value without its direct application to the seat of mischief. The small ulcers upon some part of the laryngeal mucous surface will never heal up unless perseveringly attended to locally, as we are in the habit of doing on the external part of the body. If an ulcer upon the tongue presented itself to our notice, surely very few individuals indeed would attempt to heal it up without some local treatment. This topical medication applied to the ulcers of the laryngeal mucous membrane will in very many instances, wherein the general severity of the symptoms has been extreme, be followed by the happiest results. This has occurred frequently not only in my own experience, but in that of many other physicians at the present day.

A solution of the nitrate of silver (two to four scruples to the ounce of water) must be applied at once to any abnormal

* 'Medical Times,' March 30, 1861.

appearance in the fauces and pharynx, and the curved brush is to be introduced daily or every two days into the larynx, and all its parts are to be thus freely cauterized wherever the ulceration is visible. This practice will be followed by the very best effects; and if the voice has been gone, or was only in a whisper for some time, it may be speedily restored, providing the integrity of the vocal cords and the structures which cause their action are unimpaired. By persevering in this course, allowing intervals for its application, as the general health is improving, a cure is quite possible after the lapse of a reasonable period. Dr. Green, whose experience has been exceeded by no man living, considers the local employment of this remedy specific in chronic ulceration of the windpipe, and my own experience both before and since the introduction of the laryngoscope has proved it to be so.

After the ulcerations have healed under this treatment, and if any thickening remains of the vocal cords, with impaired power, readily seen in the laryngeal mirror, and associated with an occasional difficulty of breathing during exercise, or undue exertion, the internal use of small doses of the bichloride of mercury and iodide of potassium, or either with any suitable combination, will be found effectual in causing absorption of the interstitial deposit, and affording complete relief.

Whilst the ulceration is undergoing treatment, quiet and rest are necessary, and the use of the voice is strictly to be prohibited. Indeed, Mr. Hilton has well shown the influence of rest in chronic laryngitis, in his 'Lectures on Rest,' published in the 'Lancet' (8th September, 1860, p. 232). Should there be a tendency to spasm of the muscles of the glottis towards night, some mild anodyne may be administered. According, however, to the indications present, general remedies of a tonic nature should be ordered, combined with an unstimulating and yet most nourishing diet.

Notwithstanding all that has just been recommended, if it can be clearly foreseen that the improvement is likely to prove

only transitory, and some of the more serious complications are likely to arise as mentioned in the succeeding section, and if, moreover, we should feel satisfied, from the frequency of attacks of spasm, of the likelihood of the occurrence of some sudden suffocative seizure, then it is here most strongly recommended to make a fistulous opening into the trachea (not the larynx), and constantly to keep it patulous. This proceeding will give the vocal organs such an amount of rest and quietude as shall permit of considerable comfort to the patient, and will not prevent the employment of such topical medication as is likely to heal up the ulcerated surfaces. This would not cause partial obliteration of the larynx, as has been supposed, unless under certain circumstances, nor would there necessarily be destruction of the voice, for the patient would merely require to place his finger over the fistulous opening in the windpipe, and the voice or a loud whisper is heard. This I saw verified in January, 1848, when a pupil at the Meath Hospital, in Dublin: a man, aged twenty-five years, with a permanent fistula of the larynx, was shown to the pupils by Dr. Stokes; and was the subject of some interesting clinical remarks. When in battle, this man, who had been a soldier, was wounded in the throat by a splinter, which perforated the larynx; it healed up afterwards, leaving this permanent opening. When it was exposed the voice could not be heard; but the finger placed over it at once restored speech. The same phenomenon is generally noticed where a silver tube is worn in the trachea.

If life is prolonged by this expedient, and the patient is comparatively free from suffering and breathes easily, then indeed is a great boon conferred. It is doubly necessary, however, when consumption of the larynx has proceeded to destroy the cartilages, and is again recommended in the next section. Hitherto, Mr. Porter and some others have considered ulceration of the mucous membrane of the larynx or disorganization of the cartilages as wholly incurable. Fortunately the laryngoscope has already proved that this is not always so.

The hypertrophied condition of the pharynx, and its opposite state, atrophy, which causes the cavernous throat already spoken of, are also amenable to treatment, and the muscles will assume their natural condition, usually beginning on the right side, as noticed by Dr. Green. The constitutional treatment to bring about this has been considered in the first section, including the inhalation of pulverized medicated liquids.

All the larger museums of the metropolis contain examples in abundance of chronic disease of the windpipe terminating in extensive ulceration, no part appearing to have been spared, and sometimes proceeding to a wholesale destruction or denudation of the cartilages. St. Thomas's, Guy's, and the Army Museum, are especially rich in such specimens, and will well repay careful inspection.

SECTION III.—DISEASES OF THE CARTILAGES OF THE WIND-PIPE.—ULCERATION, DESTRUCTION, AND ULTIMATE EXFOLIATION.—PERICHONDritis, VEL PHTHISIS LARYNGEA.

When the general symptoms of chronic disease of the windpipe, described in the previous section, continue to progress, and the ulceration of the mucous membrane and its subjacent areolar tissues spreads and extends more deeply, the cartilaginous framework of the larynx becomes involved, and serious mischief generally ensues. The parts which are exposed to the ravages of ulceration are the thyroid, cricoid and arytenoid cartilages, the epiglottis, and the rings of the trachea. Besides these, the delicate muscles and ligaments, the latter including the vocal cords, participate in the morbid action, and add to the general complexity of the disease. The ulcerative process gradually eats into the attachments of the cartilages, which produces at first a partial displacement, especially of the arytenoid, which seriously embarrasses the

breathing and produces fearful attacks of spasmodic dyspnœa ; in the mean time their destruction goes on, ending in a state of necrosis or death, and finally they are thrown off and expelled, and the poor sufferer obtains some temporary relief. When a portion only of the cricoid or of the thyroid cartilage is discharged and thrown off, it then constitutes a distinct exfoliation.

The period of displacement before complete separation has taken place is one, necessarily, of great anxiety, for the symptoms of suffocation are imminent, and too often death ensues before measures can be adopted to afford relief. In consumption of the windpipe (*phthisis laryngea*), as this affection has been designated, the sufferer has been most probably long the subject of chronic throat-disease, and besides the pain and soreness of his throat, difficulty of swallowing, the oppressed breathing and the whispering voice, there is a hacking and distressing cough, as if the last stage of pulmonary consumption were reached. The noise of the cough is of a barking or crashing sound, and is eminently a throat-cough, associated with very fetid, purulent expectoration, may be tinged with blood from the ulceration into some of the capillary vessels, and according to its violence so will there be disengaged a partially ulcerated piece of cartilage, which is expelled during expectoration. It may be mentioned at once, that when a patient is thus situated, and suffocative breathing *suddenly* comes on, it is the result of a displaced portion of cartilage, not wholly detached, and *immediate resort must be had to the operation of tracheotomy*, unless it can be as quickly removed with a pair of fine curved forceps aided by the laryngeal mirror.

The following case, full of clinical detail of the highest value, may be appropriately given in this place. It is at present unique, for I have not met with any similar case wherein the necrosis had been similarly made out with the laryngeal mirror.

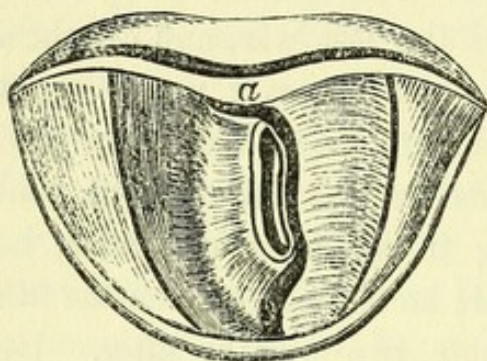
CASE. *Portions of necrosed cricoid cartilage expelled in coughing from a peculiarly shaped tumour of the right false vocal cord; aphonia and dyspnœa.*—S. P—, æt. 47, was sent to me on the 10th of January, 1863, by Mr. Corner of Poplar, for admission, under my care, at the West London Hospital.

He went to India and China in the last war, and caught a severe cold in the latter country, which he never perfectly got rid of. When he got back to Calcutta, he suffered from cold sweats and fever, and afterwards general rheumatism, and became a hospital patient. Being in government service, he was invalided and sent to England; he left Calcutta on the 9th of August, 1862, and arrived here two months after. He complained of sore throat before leaving India, and it was very sore when he arrived. Always healthy as a young man; twenty years ago, he had aphonia for a short time from cold. Has been hoarse for four months, and three weeks ago he lost his voice.

He now feels choked up, and “cannot get clear of the phlegm.” Has no pain, but cannot swallow fluids without choking; some passes through the nose, and some is swallowed, about one half returns. No dysphagia with solids, but they seem to stop in his throat. He feels as though he could eat and drink well, but cannot do it, and is very thirsty at times. He whispers, but cannot talk; his breathing is noisy and stridulous, very much like Stoneham’s case in the next section. Cough of a brassy, laryngeal sound, as if there is obstruction. Expectorates about two pints of a yellowish catarrhal sputum in the twenty-four hours. Has no night-sweats, but little sleep, being “choked up with the phlegm.” Is thin, pale, and wan, pulse feeble and small. The lungs are sound, but the dyspnœa is considerable, and respiration laboured. In forty-eight hours tracheotomy would have been necessary. Laryngoscopy was difficult at first, from the irritation and general secretion. The fauces and pharynx were much relaxed and quite white; the uvula elongated. Epiglottis was

sound, but much inflamed, and not covering the glottis completely in deglutition. The glottis was difficult to make out at first, but after awhile it was seen to be nearly closed by a

FIG. 7.



- a. The epiglottis, below which is seen the tumour of the right false vocal cord, shaped like a volcano with a crater.

tumour in form like a miniature volcano, arising from a broad base on the right false vocal cord, projecting inwards towards the left side, its apex or summit being hollowed out by ulceration, and resembling a miniature volcanic crater. (See fig. 7.) The left false vocal cord was swollen and extended across to the right side to meet this, thus leaving a very narrow fissure to con-

stitute the temporary glottis. The true vocal cords were completely concealed.

The treatment varied according to the special indication, and consisted of different topical applications of nitrate and iodide of silver, nitrate of silver and mercury, tannic acid, &c. Preparations of iodine and bromine internally, gargles and good diet. In nine days the wheezing was gone, the expectoration was less, and the health improved; he was able, too, to eat more. The swelling of the larynx was diminished, and the glottis wider. On the 9th of February the voice was a little stronger, his general health wonderfully better, ate hearty, was stouter, and took walks in the grounds of the hospital. On the 11th, he coughed up without pain or effort a portion of the cricoid cartilage in a necrosed state. He left the hospital for Poplar on the 12th, altogether quite a different individual, but with a weak voice.

He came to see me several times at my residence, and was examined with the laryngeal mirror; the crater was gone, but on one occasion the right false cord was œdematous, and

seriously obstructed breathing; I therefore scarified it with an instrument I had constructed, and let out some serous fluid, but as the relief was not sufficiently decided, I introduced a large bougie into the glottis three times, and freely dilated it, with marvellous relief to the breathing. On the 16th of March, he expectorated another portion of the cricoid cartilage, the size of a sixpence, in coughing. He eats, drinks, and sleeps well, and has some colour. A third piece of cartilage was coughed up subsequently, and, I believe, still another piece has to come. His voice is now loud but hoarse, not painful; the larynx is clearer, but still with some swelling in the old situation, the natural appearance of the true vocal cords has not been quite restored, but will be in a few more weeks.

This case was an illustration of the efforts of nature to expel a dead cartilage, and the means she took to accomplish this were exposed by the aid of the laryngoscope; in all probability, it might have had an untoward result had not the treatment been greatly aided by one's vision, which permitted of the daily use of topical means, admirably seconded by Mr. C. A. Atkins, house surgeon to the hospital. It is the first instance on record where the condition of necrosis of the cartilages was seen with a mirror, and also the first where the scarification of œdema was practised aided by vision, as well as the introduction of tracheal sounds, which were *seen* to enter the proper channel. I have used the scarificator with success in some cases of acute supra-glottic œdema since the occurrence of the foregoing; they are given in another part of this work.

To understand the diseases and displacements of the laryngeal cartilages, we must inquire into the condition which they have presented in fatal cases.

The *thyroid cartilage* is often perforated by small ulcers, or even a tolerably large one, as noticed by Andral. It has lain completely mortified, entirely denuded and surrounded by pus. The left wing alone has been discovered loose and dead.

Exfoliations have been given off from its two wings. In St. Thomas's Hospital is a larynx in which a large ulcer has laid bare the whole of the right wing; its diameter is two inches and very deep. (W. 38.) Ryland believes it to be less commonly diseased than the others, because it is less in contact with the mucous membrane, an opinion in which I fully concur.

The *cricoid cartilage* has had its entire posterior part destroyed by an abscess, or completely denuded and laid bare, as in a preparation in the Guy's Museum; its front part removed by mortification with the upper rings of the trachea; sometimes it is completely dead; but this cartilage has been considered by some writers to be oftener the subject of disease than any of the others. Mr. Lawrence has found one half of this cartilage bare and loose, displaced into a cavity on the outside of the glottis. In the case already detailed, the necrosis was confined to almost the whole of the right side.

The *arytenoid cartilages* are often laid bare in their anterior parts, and oftentimes no trace of them can be discovered, as they have been expelled. Illustrations of both conditions are related further on.

The *epiglottis* has been wholly or partially destroyed by ulceration, and the various diseases to which it is subject are considered in a separate section.

The cartilages are commonly found partially carious, and laid bare at different parts. Most of the ligaments are exposed and often wholly destroyed. The thyro-hyoid membrane has been perforated by an ulcer communicating with an abscess in front, as mentioned by Ryland. The upper rings of the trachea have mortified and been expelled. Usually, collections of matter are associated with death of the cartilages, and as they are removed by expectoration, so are we made aware of what is going on by the fearful odour which is imparted to it. St. Thomas's Hospital contains some remarkable instances of exposure of the laryngeal cartilages, not excelled by those of

any other London museum. Not unfrequently the inflammation actually commences in the structure of the cartilages, and forms a true *perichondritis*, and as there is no layer of areolar tissue upon which to vent its force as it were, abscess is induced, and necessarily necrosis with separation of the mucous membrane. Laryngeal abscess thus forms, and is the forerunner of genuine laryngeal phthisis, quite independent of constitutional tubercle as pointed out by Hasse and others, such cases having occurred to Albers, Sir Charles Bell, and myself. Under these circumstances pathological experience abundantly proves the fact that but one cartilage only is generally affected, and that usually the cricoid; indeed the majority of specimens in the London museums thus affected were of that cartilage, the other cartilages suffering in a secondary manner.

With regard to the direction the pus may take, it may burst into the larynx; or it may perforate the cartilage and extend to the neck; or deeply between the larynx and pharynx; but the trachea, œsophagus, mediastina and other parts, have been invaded by the matter from a suppurating perichondritis.

Besides chronic disease giving rise to the displacement of the cartilages, the use of large quantities of mercury in broken-down constitutions has been noticed by Drs. Graves and Stokes to terminate in ulceration of the cartilages. They frequently slough in typhus fever, and the tertiary forms of syphilis are a fertile source of mischief.

It is extremely rare to meet with this stage of throat-disease in children, unless as the result of the sloughing sore throat in some of the exanthemata, when the progress of the disease has been extremely rapid from first to last. In adults, however, between the ages of twenty-five and thirty-five, it is most commonly seen. Mr. Durham has recorded an interesting instance of extensive necrosis in a boy of eight years in 'Path. Trans.,' vol. xii, secondary to an attack of scarlet fever; the larynx was found full of pus.

If unrelieved, the displacement and diseases of the cartilages

terminate fatally by slow wasting away and final exhaustion, if suffocation has not already ensued from the irritation set up by the mortified cartilage—generally the arytenoid—and the closure of the glottis by œdema or spasm. Some of the following cases are good illustrations of necrosis of the arytenoid cartilages especially.

CASE. *Necrosis of the arytenoid and other cartilages, with loss of the free portion of the epiglottis by ulceration.*—Mr. J. S. P—, æt. 55, a surgeon in general practice, had been subject to laryngeal symptoms and hoarseness two years, when he consulted me, in February, 1862. He had been subject to pain, dysphagia, and secretion of viscid mucus, which kept him almost incessantly hawking and raking to clear the glottis. Liquids often regurgitated through the nostrils; pain and smarting were increased tenfold at night from arrest of secretion, when swallowing became very difficult. Nearly twelve months before I saw him, he wrote to a friend that he then took but one meal a day, swallowed with extreme pain, lasting during deglutition only. He was easy when not swallowing. He had then also attacks of spasm of the glottis twice a day, commencing with intense stinging pain, followed by violent coughing of a most distressing character; this was followed by dyspnœa, only relieved by an outpouring of plastic secretion hanging in ropes a foot long, and most difficult to dislodge from the mouth. He then fell back exhausted; and what he dreaded was suffocation during these attacks.

He was submitted to inspection with the laryngoscope on the 21st of February last, in the presence of Dr. Henry Davies, of Putney. He bore the examination pretty well. The mucous membrane of the entire fauces and larynx was extremely relaxed, congested, and pouring out mucus. On the right side of the pharynx, low down, spreading to the tongue, the membrane possessed a purple redness, and was the seat of the constant pain in swallowing. The epiglottis was red on its

laryngeal surface; it was distinctly and readily visible, and was seen by Dr. Davies as well as myself. The uvula was long and pointed. The action of all the parts was free, perhaps too much so. The interior of the larynx was not diseased; the action of the vocal cords was perfect. The thyroid cartilage and os hyoides were much separated from relaxation of the intervening membrane, but no displacement of the ligaments was made out. At the base of the tongue, in the hollow in front of the epiglottis, the follicles were greatly hypertrophied, and seen pouring out white frothy mucus. The mucous membrane here, as well as in the middle of the pharynx, was red and raw. The voice was rough and cavernous; the throat large and capacious. Emaciation was most extreme; in fact, he was a living skeleton. He had been subject to bronchitic attacks; the breathing was slow, regular, and deep; about ten or twelve per minute, and vocal fremitus was felt all over the chest. There was no dulness anywhere. A little faint mucous râle was heard for a moment, but then disappeared in the anterior and upper part of the chest. The pulse was slow and regular, 68 per minute. A white annulus was present in each eye, but observed when he was a boy. The only thing that pointed to the cause of the mischief was the dark-red membrane on the right side, in connection with the aryteno-epiglottidean fold of that side; but with all his misery, the action of the parts was good.

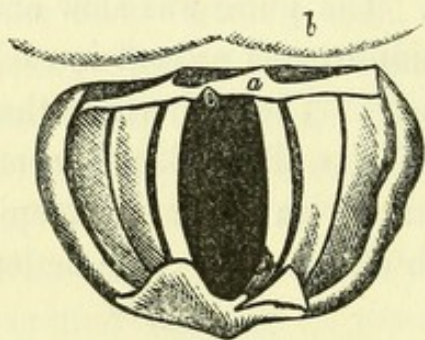
Treatment afforded no relief, for he was indisposed to take anything beyond morphine at night; and after great suffering and misery, and when nearly worn out from exhaustion and starvation, he passed away quietly and calmly, on 17th May, 1862, and was not suffocated.

Post-mortem examination, four days after death, by Dr. Davies, who subsequently transmitted to me, on the 27th of May, the various parts for examination. The body was extremely emaciated. The lungs were found collapsed, and throughout the greater part crepitant to the touch, but here

and there emphysematous; they were said to contain yellowish hard nodules, supposed to be tuberculous, but I failed to recognise this character. They were adherent superiorly and below. I observed several small cavities, which were the terminations of bronchial tubes, and were no doubt dilatations of the latter, and not vomicæ. There were here and there a few small calcareous nodules. The right bronchus at its division formed very large tubes, the rings were separated and projecting.

The free portion of the epiglottis was found wholly destroyed; a small ulcer was seen below its base. The apex of the left arytenoid cartilage had perforated the mucous membrane, and was quite bare. An ulcer was present at the apex of the left, but without perforation. The joint of the left was cut open in the preparation. The cricoid cartilage was undergoing calcification and necrosis. Both vocal cords were intact; the left was on the point of undergoing breach of surface. The terminal ends of the larger cornua of the hyoid bone

FIG. 8.



a. The base of the epiglottis. *b.*

The back of the tongue. The black space in the centre is bounded on either side by the vocal cords, at the base of which are seen the arytenoid cartilages. The position of right and left, anterior and posterior, is reversed in the laryngeal mirror.

looked as if possessing capsules, but this has to be determined by future dissection. Besides these, the base of the tongue was raw and excoriated, and little ulcers were noticed on either side of the larynx. The woodcut gives a laryngoscopic view which I made of the larynx, as it would have appeared before death, and may prove instructive in diagnosing lesions of the epiglottis and arytenoid cartilages.*

What gave rise to the fearful attacks of spasm and difficulty of breathing? These were due, no doubt, to a carious condition of

* For further details of this case, see 'Path. Tran.,' vol. xiv.

the right arytenoid cartilage, during motion in swallowing food or saliva, and not to loss of the epiglottis, because the latter was present and readily seen by the laryngoscope three months before death. From the appearance presented by the root of the epiglottis, it would seem as if the cartilage had become detached by three different lacerations, from commencing ulceration at the base, and this may have happened only a short time before death.

Magendie, Trousseau, and Belloc refer to the cases of individuals who were totally devoid of an epiglottis, and who yet swallowed without difficulty; and Magendie remarks, that if, in laryngeal phthisis with destruction of the epiglottis, deglutition be laboriously and imperfectly accomplished, it is owing to the carious condition of the arytenoid cartilages, and to the lips of the glottis being so much ulcerated as not to be able to close the glottis accurately. The correctness of these observations is shown by additional cases, detailed further on.

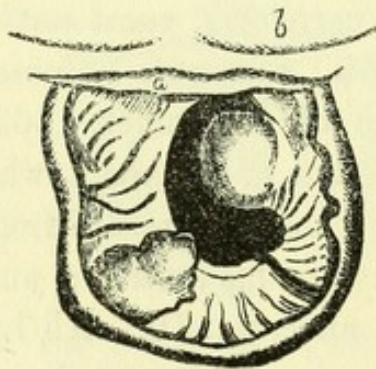
CASE. *Destruction of the arytenoid cartilages, vocal cords, epiglottis, and aryteno-epiglottidean folds; incurable aphonia.*
A. S—, æt. 24, called on me the 7th of November, 1862, with a letter from Dr. Maxwell T. Masters of Peckham, who kindly sent him to me. Always healthy until his return from Australia, three years ago; consumptive on his mother's, and asthmatic on his father's side; father alive, æt. 70. All his brothers and sisters, six in number, are alive. Present illness commenced with a cold on board ship, when he had on one occasion to bale out water, and got very wet. The throat became sore, two years ago, when he could scarcely swallow even milk, and he was a patient in the Consumptive Hospital, Brompton, for six months; he was told he was not consumptive. The throat gradually got worse; eight months ago a fit of coughing came on, which was followed by hoarseness and gradual aphonia, which has continued to the present time.

He has no pain, but in swallowing it tickles him at the back and roof of his mouth, which, if not carefully managed, suddenly regurgitates through the nose, unless his food is pul-taceous. Large lumps of bread sometimes actually pass through the nose; fluids he cannot swallow, not even his saliva. Five months ago he was nearly gone, and has passed through attacks of terrible misery and suffering with his throat. Is not so much emaciated the last two months.

He now breathes with a loud noise, somewhat of a snoring character, as if he was asleep; has occasional croupy cough, no dyspnœa, dysphagia, nor pain; speaks in a loud whisper; pulse 116, weak; respiration 20 per minute.

Laryngoscopy showed the most fearful ravages. The uvula was almost gone, the velum was adherent posteriorly to the pharyngeal wall, and left a shallow passage towards the right side passing upwards to the nostrils behind. The epiglottis was wholly gone, and the aryteno-epiglottidean folds were mostly destroyed, their remains

FIG. 9.



- a.* The root of the epiglottis.
b. The tongue. The black, crescent-shaped glottis is surrounded by the remains of the aryteno-epiglottic folds.

being transformed into fleshy tubercles surrounding the crescentic glottis, as represented in the woodcut. The arytenoid cartilages were gone. There were no vocal cords, but a sort of glottis remained, formed by folds or edges of the cicatrices of the destroyed mucous membrane, and expanding to a small degree with some slight movement during forcible inspiration. Everywhere great ravages were visible, and for fearful destruction of the parts it

was one of the most terrible cases that had come under my notice.

This patient had syphilis when a younger man, and although he denied it, I suspected a second attack from the occurrence of an eruption and other symptoms when on board ship.

Treatment was of course palliative, and he so improved that a more healthy state of the membrane of the larynx was brought about; heretofore it had been of a drab colour, it now changed to a pink. The breathing continued very noisy, and he had to expectorate frequently. In December, 1862, I exhibited him, with others, before the Medical Society of London, and then lost sight of him. In February last, Dr. Masters wrote me to say that A. S— was carried off by an attack of bronchitis, such as he had, to his knowledge, frequently been subject to. No post-mortem examination was made. Thus ended the unfortunate case, which might have been attended with much more comfort to the patient had his constitution been better, and the laryngeal consumption less extensive than it was.

Both cases are examples of laryngeal phthisis, for the patients underwent all the suffering and symptoms as if in the third stage of the pulmonary disease; this was especially so in the second case, the subject of which I showed to the Fellows of the Medical Society of London, and pointed it out as an example of laryngeal consumption, in which the lungs remain comparatively sound, and yet the structures at the upper larynx were wholly chaotic, or to use a geological expression, had undergone a cataclysm, wherein they had been swept away without leaving scarcely a trace behind.

But it will be remarked, that disease of an ulcerative character involving the arytenoid cartilages produces a painful set of symptoms, which are unmistakable, even although the laryngeal mirror may give no actual evidence of mischief beyond extreme congestion, or inflammation of the membrane covering them as in the surgeon's case. So long as these cartilages are undisturbed the patient is quiet, but the mere act of deglutition brings them into contact with the epiglottis and

gives rise to fearful attacks of spasm, amounting sometimes to almost complete closure of the glottis.

In the following case the disease was specific, and all the cartilages were either carious or necrosed.

CASE.—*Necrosis of the thyroid and cricoid cartilages, and also of the arytenoid; expulsion of portions of the first.* A female, forty years of age, was under the care of Mr. Ernest Hart, for iritis, which proved to be syphilitic. Under the use of quinine and iodide of potassium she got better, but remained much debilitated. Some time after, she was seized with symptoms of laryngitis, preceded by progressively increasing hoarseness. Dyspnœa and acute laryngeal pain came on suddenly, the voice became almost extinct, and as local and general remedies failed, no other resource was left but tracheotomy. Before doing this I examined the patient with the laryngoscope, at Mr. Hart's request, and found that the glottis was much constricted from inflammatory thickening, being almost closed; the movements of the arytenoid cartilages were wholly impeded, and the superior or false vocal cords were irregular and jagged from ulceration. The throat was morbidly sensitive, and as the fauces generally were much inflamed, some dexterity was requisite in making the laryngoscopic examination expeditiously. The uvula was destroyed from ulceration, the soft palate was ulcerated in the centre and at its left side, and was adherent to the posterior wall of the pharynx. The odour of the breath was that of an offensively-ulcerated throat, secreting pus.

From the severity of the general symptoms and the condition of the throat, the necessity of immediately laying open the windpipe below the seat of the disease was at once apparent, and I assisted Mr. Hart to perform tracheotomy at 2 o'clock the same day, the 18th November, 1860. The relief was decided, although at one time asphyxia was imminent; but from this she rallied, and expectorated two small

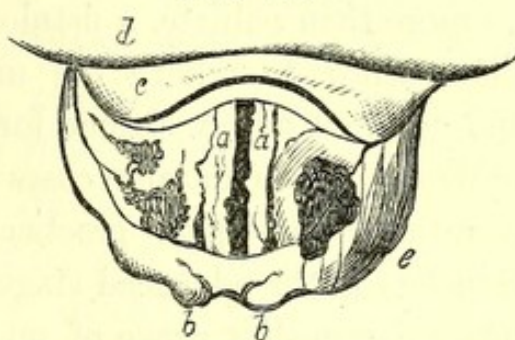
pieces of detached and denuded cartilage, which I afterwards exhibited at the Pathological Society, on the 18th of December. The patient survived ten days and died from pneumonia. The aryteno-epiglottidean ligaments on the left side were found much thickened, with some ecchymosis; the glottis was eroded, as well as the superior or false cords extensively so; the thyroid and cricoid cartilages were in a state of caries and necrosis, and the arytenoid cartilages were wholly detached. There were marks of ulceration about the fauces and pharynx.

This was one of the first cases brought forward at the time, in this country, to show the value of the laryngoscope in diagnosing a condition which determined the necessity of active measures for relief, although the patient's general condition was bad.

Cartilages of Santorini and of Wrisberg.—It is seldom, indeed, that the arytenoid cartilages are involved without implicating those of Santorini, necessarily from the situation which they occupy on the apex of each arytenoid; at present, therefore, I do not desire to say much about them. Those of Wrisberg are usually absent in man, and if not they are quite rudimentary. When present they are liable to grow, and give rise to hoarseness if the voice is loudly overstrained; a case of the kind came under my notice in the summer of 1863, wherein they simulated little moveable growths. I wished to remove them, but the patient was told by another person that there was nothing wrong with his throat.

Treatment.—When the ulcerative process is known to be spreading, by laryngoscopic examination, and extending to the

FIG. 10.



a, a. The vocal cords. *b, b.* The arytenoid cartilages. *c.* The epiglottis. *d.* Back of the tongue. *e.* Left aryteno-epiglottidean fold.

cartilages, with the presence of hectic fever, night sweats, and emaciation; and when all constitutional and local means do no more than palliate, a fistulous opening should be made into the trachea to relieve the more or less constant dyspnœa, and to hold out a chance for the laryngeal mischief to improve, and in favourable cases to heal up and get well. This is rational and good practice, because local applications are valueless in the advanced stage of cartilaginous disease, and all internal remedies prove of no avail whatever. Yet, to obtain the benefit of the operation, *it should not be left to the last moment*, more especially when the larger cartilages are affected, for they have been known to act as a foreign body, and thus prove a constant source of irritation, which has ended badly in a short time. When this is the case, and the seat of the necrosis can be clearly made out, after immediate danger is overcome by cutting a hole in the trachea, the thyroid cartilage must be laid open through one of its wings, so that the pent-up dead portion can be removed. This might prove to be the entire cricoid lying bare and loose. If the disease is then checked by the internal application of various topical measures through the wound made to remove the necrosed cartilages, it can be closed by a plastic operation at a future period, the fistula lower down being permitted to remain open for the purposes of breathing. The larger cartilages, when partially necrosed, and the pieces detached cannot be always expelled through the small opening in the glottis, we must therefore lend nature a helping hand, and endeavour to get rid of, by artificial means, what cannot be discarded through the natural efforts. I believe that I was the first person to recommend the removal of necrosed laryngeal cartilage, in these threatening cases; and after giving the subject much thought and patient consideration, and studying it in all its bearings, it affords a more positive chance of actual recovery than any other, after the fistula has been made into the windpipe. In these days of advancement in science why should we not direct our

efforts towards getting rid of dead cartilage, as well as dead bone? Since the first edition of this work appeared, Mr. Henry Gray showed me in the Museum of St. George's Hospital, on the 19th July, 1860, some exfoliations from the laryngeal cartilages, which were successfully removed during life from a patient by Mr. Cæsar Hawkins.

As auxiliary measures to the foregoing is the topical use of various substances, such as the nitrate of silver, and the argento-nitrate of mercury; the latter is a preparation first employed by myself in 1845, and one of considerable value. Anæsthetic and soothing gargles must be used. The diet must be plentiful and nourishing; if much difficulty or soreness is produced in swallowing, it should be given through an œsophagus tube.* Mild and soothing pectoral remedies will be found of service, rest and quietude are essential, and the vocal apparatus must not be employed.

SECTION IV. DISEASES OF THE EPIGLOTTIS.

THE epiglottis constitutes a valve to the air passages, similar to the lid of an organ pipe, it is an open door revolving upon elastic hinges, which permit of its rapid and momentary closure when necessity requires it, that necessity being the act of feeding when the food passes backwards into the pharynx on its way to the œsophagus or gullet. The integrity of the hinges, speaking metaphorically, and of this air valve, *porte de vent*, is the key-stone in the respiratory arch, upon which in great measure the perfection of the general health depends. To say that the epiglottis is the key-stone to health would not perhaps be conceded, its importance however in the economy will be shown by what now follows, for it assuredly ranks next to the glottis, of which it is the natural guardian.

* The œsophagus, if unfortunately ulcerated, is considered in the eighth chapter upon affections of that part.

It is an oval or somewhat triangular shaped cartilage, of the colour of crust of bread, situated at the base of the tongue, usually nearly erect, immediately above the entrance into the windpipe; it is composed of a very elastic tissue, which permits it to bend backwards quite horizontally during the passage of food, and thus guard as it were the aperture of the larynx from the entrance of any foreign body. In some throats, by depressing the tongue, it can readily be seen in an erect position, by the unaided eye; and before the laryngoscope was re-introduced into this country, I was commonly in the habit of using a steel mirror to examine the condition of this fibro-cartilage, and have no doubt seen the vocal cords and arytenoid cartilages several times, although then there was not so much importance attached to such a mode of investigation as is the case now, from the difficulties connected with illumination. The steel mirror used by myself and others, is figured in the *first* edition of this work.

In this place I am precluded from entering into the minute structure of this remarkable cartilage, upon which a monograph could well be written; it possesses peculiarities that the reader, it is hoped, is not unfamiliar with, and is retained in its singular situation by means of various attachments. To the tongue it is fixed by means of a ligament composed of elastic tissue, called the *glosso-epiglottic*, beneath the mucous frænum, readily seen with the laryngeal mirror; to the hyoid bone it is connected through a thin ligament, the *hyo-epiglottic*; inferiorly its terminal end is fastened by a stalk-like ligamentous pedicle to the inside of the pomum of the thyroid cartilage, immediately above that of the true vocal cords, the *thyro-epiglottic*. On every side, anteriorly, laterally, and posteriorly, it is connected with the tongue, pharynx, hyoid bone, and arytenoid cartilages by means of folds of the mucous membrane, which, as every anatomist is well aware, are individually named from their particular attachments. The most important of all these are the aryteno-epiglottic folds, within which are muscular fibres, which help

to draw down the cartilage with or without the cognisance of the will. The importance of these ligaments and folds will be recognised from the details given in almost every chapter of this work, but more especially in the present section.

The hitherto received opinion that the epiglottis is naturally in the erect or vertical position, has been disproved in papers which were brought by myself before the British Association for the Advancement of Science, at Cambridge, in 1862, and at Newcastle, in 1863,* wherein it was demonstrated that in *eleven per cent.* of mankind it was found to be oblique, very much or semi-pendent, or nearly quite horizontal, in persons apparently healthy. My arguments were founded upon an examination with the laryngoscope of 680 healthy persons, up to September, 1863. This was during passive examination, independently of the act of swallowing, of phonation, or of any motion in the structures of the throat, and carefully observed when the tongue was protruded forwards and held outside of the mouth. This was in both sexes and at various ages, from the young child to the very old man. It is sometimes congenital, for I have noticed it in the mother and her child, and in the young is a matter of the greatest inconvenience, and of danger to life during their passage through the diseases of childhood, especially those likely to involve the throat. Now, as vaccination in the young is a preventive or modifier of smallpox, so would the knowledge of the position of the epiglottis act as a safeguard in the treatment, whether prophylactic or curative, of diseases of the throat, more particularly in such terrible affections as croup, diphtheria, the different forms of œdema of the larynx, angina from scarlet fever, or other disease. The process of examination is further on spoken of under the term *Epiglottisation*.

By the last census, the population of Great Britain was determined to be 28,887,519; eleven per cent. gives the number

* See 'Archives of Medicine' for 1863 and 1864, and various journals and papers.

of 3,177,627 persons who have not a vertical or erect epiglottis. Can it be wondered at, that diseases of the throat are very prevalent among mankind, when the key-stone to the respiratory arch is shifted in its position? It is probable that in some countries, those within the tropics for example, the per centage might be even more than has been found to prevail in this country.

The *position* of the epiglottis, therefore, is one of the most important matters connected with its clinical history, for its pendency is one of the inconveniences, not to say positive obstacles in some cases, to the inspection of the interior of the larynx and trachea. Many persons probably go through their lives without any inconvenience from a pendent epiglottis, which is a natural condition in them. In others, again, it is a source of constant trouble, giving rise to many symptoms which cause great discomfort, until it is recognised. Serious mischief has frequently occurred, by the application of probangs to the lingual surface of a pendent epiglottis, not known because the throat never had been inspected with the laryngeal mirror. Some such persons have been rendered miserable sufferers for life, a few have been nearly choked, and some have died from the injuries thus received. It may become a medico-legal question hereafter, whether any one is justified in introducing a probang into the larynx without first ascertaining the position of the epiglottis.

This condition of the epiglottis arises from various causes, the chief of which are frequent attacks of cold and cynanche, in a lax habit; follicular disease is a common cause. The glosso-epiglottic ligament loses all power of contraction to draw up the cartilage, and the surrounding mucous membrane is deficient in firmness and elasticity, and its follicles pour out a quantity of fluid. On the other hand, the aryteno-epiglottic folds, with their muscular fibres, may so spasmodically act as to keep the cartilage permanently backwards, but this cannot be commonly so. The elasticity of the cartilage is destroyed

in many cases, and utterly impossible to be regained. The voice is often thickened and guttural, and in some persons it is easy to predicate the position beforehand, *i. e.*, before the laryngeal mirror has been introduced; this I have done many times, even in the healthy. The epiglottis is frequently congested under these circumstances, and if there is disease of the larynx or trachea, of the bronchial tubes or proper tissue of the lungs, it forms an obstacle to treatment, independently of the impediment it offers to breathing, until the adoption of such means as shall wholly or partially draw up and restore the cartilage to a more suitable position.

Cases of throat disease are remarkably frequent associated with a pendent epiglottis, and the general symptoms are greatly aggravated, giving rise to constant efforts to clear the glottis and to swallow, to get rid of the sensation of a body lying constantly at the back of the tongue. Sometimes the dyspnoea is extreme, and the patients are impressed with the idea that they must ultimately become suffocated.

The symptoms and treatment of this condition may be best illustrated by the following cases, a few of which are given a little in detail.

CASE. *Congestion and depression of the epiglottis backwards, giving rise to fits of dyspnoea and threatened suffocation at night, with great suffering.*—Mrs. B—, a lady without family, had been seriously ill two years when she consulted me, in June, 1862, for her throat. She had had a mild form of follicular disease six years before. She had been under the care of almost everybody of note, and the throat, she told me, had been burnt with all sorts of things, swabbed innumerable times—in fact each one, she said, did something. Besides various other symptoms, she felt, in swallowing, as if a lump was present at the back of the throat, and she was in the habit of introducing her finger, and feeling it. This proved to be the epiglottis, which the laryngoscope showed to be

much depressed, and presenting what I shall denominate a careworn appearance, for it had undergone much suffering. The left side of the cartilage was in complete contact with its proper fold, and a small aperture existed on the right, through which respiration was carried on; it was much congested. At night she had various distressing sensations of dyspnœa and threatened suffocation, and her life was most miserable and wretched. Under treatment her health improved, the condition of the throat was better, but the epiglottis could be only partially raised. She finally left London to pass the winter in a distant climate, although the lungs were quite sound. She was at all times very desponding, and this chiefly arose from the sense of suffocation she experienced for many hours, after swabbing had been done by others, and she would put the question to me, "Could such practice be really useful in the cure of throat diseases, when it caused her such agony?" Her sufferings were so extreme, that her friends always saluted her with the inquiry, "How is your poor throat?" which appeared to be peculiarly applicable to others at the time, for garotting was then rather prevalent.

The cause of the extreme amount of suffering in this lady is readily explained by the *position of the epiglottis*, for if this cartilage is depressed backwards, and not known to be so, any instrument employed for introduction into the larynx will naturally come in contact with the lingual surface of the epiglottis, and force it farther downwards, and for the moment close up the glottis. This is very rough treatment, for it has ended fatally shortly after in some instances, and therefore deserving of the severest reprehension, now that we have the laryngeal mirror to diagnose the condition of things in the beginning.

CASE. *Aphonia, severe irritation and burning in the throat, constant raking of mucus, associated with a pendent epiglottis.*—

John D—, æt. 53, came to me 15th of June, 1863, recommended by Dr. Greaves. For twelve months cold after cold settled in his throat, and he could neither rest day nor night; for the last three months his voice has been reduced to a whisper. Is constantly hemming and hawking to get up phlegm; the upper part of the throat is sore and tender, irritable beyond measure, and burning; and dyspnœa is at times fearfully urgent. The sufferings of this patient were almost unbearable, but on examination they were found to depend chiefly upon the position of the epiglottis, which was almost quite flat upon the glottis, so that scarcely room was left for the air to be inspired. By sudden forcible expiratory efforts the valve was raised for an instant, and the interior of the larynx seen. On the right side several deep and large ulcers were visible, extending to the attached margin of the vocal cord. At the left side of the root of the epiglottis was a circular deep ulcer, and several were noticed on each side of the base of the tongue. Under treatment the more urgent symptoms speedily subsided; but there was evidence of serious lung disease, which rendered nugatory any efforts to effect a complete cure.

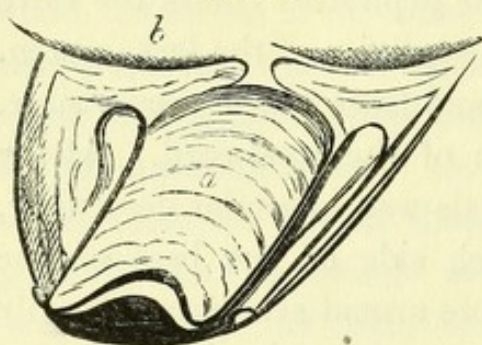
CASE. *Congenital pendency of the epiglottis affecting clearance of phonation.*—I examined a girl, æt. 15, from Hayes, in Sussex, on 6th December, 1862, and suspected beforehand the condition of the epiglottis, from her thick manner of speaking. It was seen to be careworn, projecting much backwards, yet permitting of a view of the larynx. She told me she was not able to speak plain until she was five years of age, and although she had never suffered from any throat ailment I have no doubt it was congenital in her.

CASE. *Peculiar symptoms with cough, depending upon pendency of the epiglottis for five years.*—George J—, æt. 25, was admitted under my care at the West London Hospital, 29th December, 1862, for a throat cough. For five years he

felt something in the throat, and was constantly hemming and hawking to clear it, which it did for the moment only; it made him cough also, sometimes most incessantly. Lungs were sound. The laryngeal mirror showed depression of the epiglottis, especially towards the right side, where it was in contact with the arytenoid cartilage; it was careworn. The interior of the larynx could be seen, but not readily.

CASE. *Sore throat following slight diphtheria: complete pendency of the epiglottis.*—Dr. S—, from Suffolk, consulted

FIG. 11.



a. The pendent epiglottis. b. The back of the tongue.

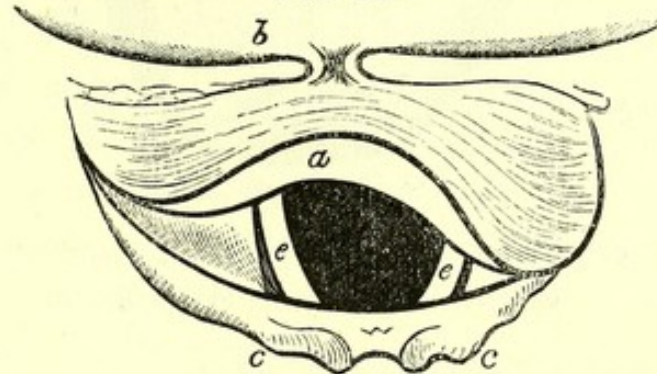
me, 17th June, 1863; was some years in India. Last year, in attending some cases of diphtheria, he had a mild attack of it himself. He recovered, but has had sore throat more or less since; has cough in the mornings, with secretion, dysphagia, and follicular faucial irritation.

Laryngoscopy showed the epiglottis pendent and curved towards the right side; doubled up laterally, as per sketch. The interior of the larynx could not be seen.

CASE. *Peculiar sensations in the throat and larynx, mainly depending upon irregular pendency of the epiglottis.*—Colonel W—, æt. about 55, in command of a regiment in Canada, consulted me 9th September, 1863, recommended by Dr. Killery. Had bronchitis three years ago, followed by a peculiar sensation in the throat, as if a lump was there, and getting worse since that time. In bad weather this feeling ran down to the middle of the chest. In breathing through the nose (but not the mouth) a sensation is experienced of cold, like that when eau de Cologne is placed on the hand. This troubles him also in

sleeping at night, especially if the decubitus is dorsal. He frequently hems to get up something from the throat. Has been in Canada last twelve years. Voice sometimes lost if used on three or four parades, but it has not been strong lately on giving the word of command. In the laryngeal mirror the epiglottis was seen slightly pendent, and irregular, as shown in the sketch,

FIG. 12.



but it could be elevated by forcible utterance, exposing much congestion, slight tumefaction, relaxation, and general redness, of the membrane of the larynx, vocal cords, and trachea, but no ulceration was visi-

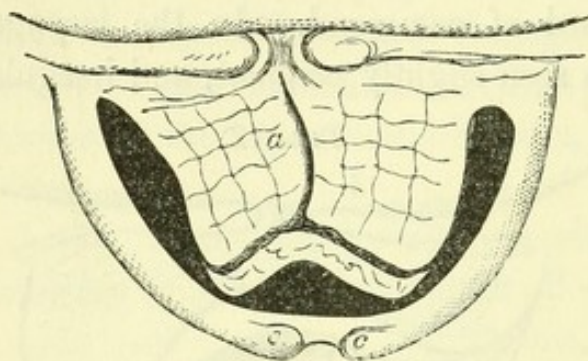
a. The epiglottis. b. Back of the tongue.
c, c. Arytenoid cartilages. e, e. Vocal cords.

ble. The fauces were slightly relaxed. In three days he was better; in another week was much improved, and could sleep without the sense of suffocation he used to have. The vocal cords were already becoming white. By the 23rd the epiglottis was straighter, and assuming its natural colour, and on the 28th the cold feeling was much less. Improvement gradually and surely went on, until everything abnormal had disappeared; and on the 31st of October he was pronounced cured, with nothing to be observed in the mirror. The epiglottis had wholly resumed its natural position and healthy condition; and this was only accomplished by the persistent regularity with which the treatment adopted was carried out, in which mineral solutions in the form of showers had much to do.

CASE. *Constant tickling sensation in the throat, with a desire to cough, from a pendent epiglottis.*—Mr. L. F—, æt. 18, the son of a well-known dentist, came to me, 23rd July, 1863. Has had a cough since when young; his mother

has had the same since she was nineteen. For some time he has had a constant slimy, tickling sensation in the throat; he wishes

FIG. 13.



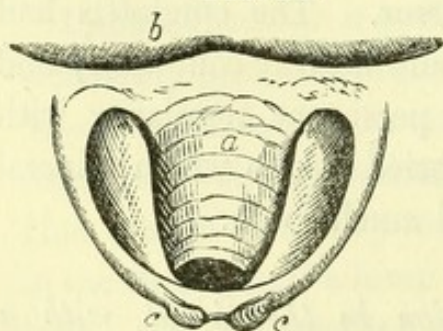
a. The pendent epiglottis. b. Back of tongue. c, c. Arytenoid cartilages.

to cough to remove it, but restrains himself, from its violence. Lungs are healthy, but has a weak chest and sluggish temperament. The laryngoscope showed a follicular throat, with depression of the epiglottis backwards, as per sketch; it had a

thickened, stiff, and worn appearance. The larynx could not be seen, and he could attempt bass singing only.

CASE. *Variable phonation in regard to tone and quality, for twelve months, depending upon a pendent epiglottis; cured by a single prescription.*—Master D—, æt. 6, was brought to me by his mother, August 13th, 1863, recommended by Dr. Greenhalgh. Has been speaking defectively for twelve months, although it commenced a long time before. The voice at one moment is a sharp and low laryngeal whisper,

FIG. 14.



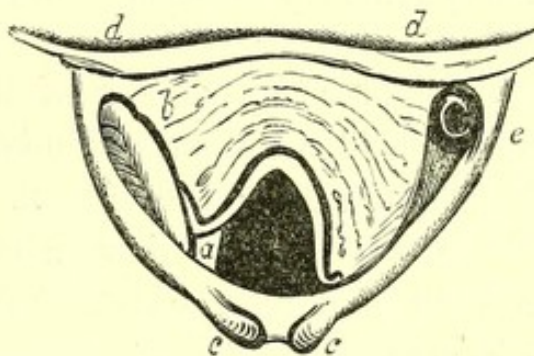
a. The pendent epiglottis. b. Back of tongue. c. Arytenoid cartilages.

and the next a louder and more natural sound; this I heard myself. He can holloa quite loud in playing with other children. Is the only one thus affected out of family of six. Is very thin and delicate, feels tired, and becomes very cross and peevish; has taken much physic. Laryngoscopy was very easy, and I held out the tongue myself; the epiglottis was

seen pendent, flat, and immovable upon the glottis. The vocal cords were seen once only, and seemed normal. Throat otherwise was healthy. I recommended the omission of all medicine, and to use a soothing and astringent gargle, which of itself alone produced a complete and effectual cure, as I was afterwards informed.

CASE. *A feeling as if something was in the throat, with an irritating cough, associated with some irregular pendency of the epiglottis.*—Colonel H. R. —, æt. 51, consulted me, 22nd September, 1863, recommended by Dr. Astley, of Dover. Has a fine powerful voice, but troubled with a cough for some time, and a feeling as if something was in the throat; this was at first as if a toothbrush bristle was there, and made him cough until matter and blood were expectorated, and he got better. The cervical glands have been swollen, and he had the sensation as if a finger was in the throat. On the 20th he coughed up a small fragment of one of his teeth, which had been lodged for two years in a sulcus of the aryteno-epiglottic fold, on the left side of the base of the epiglottis, seen on using the laryngoscope, and indicated in the sketch, for there was there a red and prominent tubercle, with a depression in the centre, which was clearly the opening of exit of the piece of tooth. The epiglottis was seen pendent, irregular, and inclining to the right side; on hemming or slight coughing it was elevated, and permitted of a good view of the larynx with a perfect pair of vocal cords. The state of the epiglottis and the little swelling, explained many of the symptoms

FIG. 15.



- a. Portion of right vocal cord.
- b. Epiglottis.
- c, c. Arytenoid cartilages.
- d. Back of tongue.
- e. Tubercle in left aryteno-epiglottic fold.

present and had much to do with the cough ; indeed, this latter was better since the foreign body had been got rid of. There was some general periosteal pain of the hyoid bone, which felt enlarged, and was tender. Topical and constitutional treatment produced a great improvement in three days, and a good recovery quickly followed, with the disappearance of old thoracic and abdominal pains.

CASE. *Flattening and pendency of the epiglottis from old laryngeal disease of five years' duration.*—The sufferings of the patient were not great when he came under my care in June last, at the Westminster Hospital ; the uvula and other parts of the throat were destroyed, there was ulceration leading up to the pharyngo-nasal arch, as shown by the rhinoscope ; and the epiglottis completely covered up the larynx, so that it was utterly impossible, with all the devices at my command, to see the interior of the latter. This patient had been subject to fearful tertiary ravages, under the care of my colleagues Mr. Holt and Dr. Fincham, and was comparatively well, but liable at any moment to attacks of serious laryngeal disease, and pulmonary mischief from the position of his epiglottis.

I might add a number of other really curious cases, with various odd symptoms produced by pendency of the epiglottis, but the foregoing will suffice. Many examples may be seen where it is associated with other disease, in most of our medical museums, which those interested may study with advantage.

The epiglottis is subject to inflammation and ulceration as in other parts of the throat, which may give rise to thickening, alteration in form, wasting away, and even tumours. When serum is poured out in its submucous tissues it is rendered œdematous and permanently erect, thus offering a most serious obstacle to the passage of food, because, from loss of its elasticity, it fails to cover and protect the opening into the

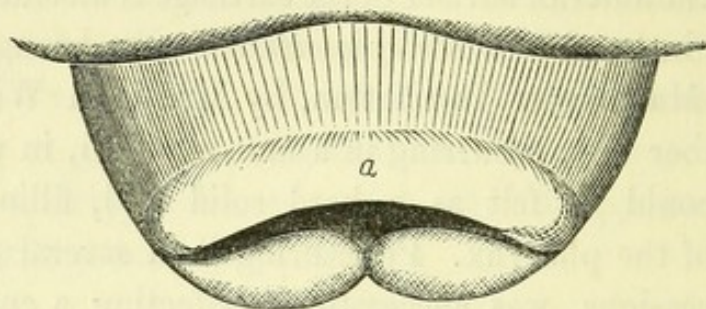
windpipe. If it does do so, deglutition is painful, more especially when the anterior surface of the cartilage is ulcerated as well.

A severe instance of *acute epiglottiditis* was brought before the Royal Manchester Institution, by Mr. John Windsor, on 4th November last, occurring in a man aged 35, in whom the epiglottis could be felt as a hard solid ball, filling up the lower end of the pharynx. Puncturing it in several places, on different occasions, was successful in effecting a cure.* Sir Henry Marsh has described some instances in the 'Dublin Journal of Medicine,' vol. xiii, 1838, and where the symptoms were associated with a prominent, red, and swollen epiglottis, resembling a Kentish cherry, seen on forcibly depressing the tongue. Some fine specimens are preserved in the College of Surgeons and other museums.

Whilst these sheets were passing through the press a gentleman was sent to me from Croydon, by Mr. Henley, whose voice had been gradually going for ten days, and now reduced to a whisper, January 2, 1864. For the last two days he could not swallow fluids: these symptoms supervened upon advanced phthisis. The laryngoscope showed the epiglottis to be enormously swollen, projecting upwards and backwards in the form of a bright crimson tumour, the size of a very large plum, the result of acute inflammation; it was almost immovably erect, its position being changed only by the action of the tongue. The swelling did not extend to other parts of the larynx. Its bulk was diminished by scarifications and tannin, but the result I am compelled to defer for another edition. It was, however, a remarkably good example of this rare disease of acute epiglottiditis, and could be seen even with the naked eye at the back of the mouth. The drawing shows its form and spreading outline as seen in the laryngeal mirror.

* See 'Brit. Med. Journal,' Dec. 5th, 1863, for an account of the case, with numerous references of Mr. Windsor to other cases.

FIG. 16.



a. The upper edge of the greatly swollen epiglottis, below which are seen the aperture of the larynx, and arytenoid cartilages.

Of all these particular lesions the chief is *ulceration*, which is known to be remarkably frequent in diseases of the larynx, and may have supervened upon general inflammation of the throat. The part affected seems to be the margin or borders of this cartilage, but almost every part of it is liable to be affected: thus, at the very base or root of the tongue, close to the origin of the free portion of the cartilage itself, deep or ragged ulcers may be noticed, burrowing as it were very extensively. In this situation, unless careful examination be made by thoroughly pulling the tongue in a forward direction, to give the laryngeal mirror full play, they may not be noticed.* The general symptoms guide us as well in our diagnosis of the seat of the mischief, for besides hoarseness, there is soreness and actual pain, particularly in swallowing, together with pain under the cornua of the hyoid bone; there is an irritative cough with expectoration, which seems to come from the very top of the windpipe, and this is often noticed tinged or mixed with blood. The symptoms often indicate mischief in the larynx, and in the topical treatment these deep ulcers are very liable to be neglected, unless a certain amount of watchfulness be observed on the part of the physician. Expectoration tinged with blood, increased after eating, before

* There are numerous specimens illustrating this in the different museums, one in Guy's of a large sloughing ulcer on the inner side and base of the cartilage, of two months' duration, not specific. 1685²⁰.

the laryngoscope was introduced, were to a certain extent, pathognomonic, taken with true hyoid pain and soreness. When rightly understood, these deep and ragged ulcers on both sides of the root of the tongue will at length heal up under proper cauterization, and then all the various symptoms which were previously present will have disappeared.

When the laryngeal face of this cartilage is ulcerated, it has been noticed by Dr. Green, myself, and others, that it assumes a somewhat flattened form, instead of the crescentic, and at the same time it is not only enlarged, but thickened, from some submucous infiltration. These numerous ulcers will spread to its border, which assumes a distinctly serrated appearance, noticeable by careful examination. See notes of Case 17 in Section I.

Another form of ulceration, which has not come as yet under my notice, is that affecting the cluster of follicles constituting the epiglottic gland, which Dr. Green (*op. cit.*) describes as causing the epiglottis to assume nearly an erect form, and to become incurvated, the curvature will actually assume a tubular shape, with its convexity towards the dorsum of the tongue, if the above lesion has extended to the numerous glandulæ of the ventricles and vocal cords. He refers to a case of this kind, associated with pulmonary consumption; a sponge introduced into the larynx for the purpose of cauterizing its cavity was found, on being withdrawn, to be loaded with purulent matter; but the epiglottis, besides being red, erect, and hypertrophied, was seen rolled up like a scroll.

In a gentleman, aged thirty-five, in good health, I came across an epiglottis rolled up like a scroll, of which the annexed woodcut is a representation. There had been no history of former throat-disease.

Whether the condition of the epiglottis in the following case arose from

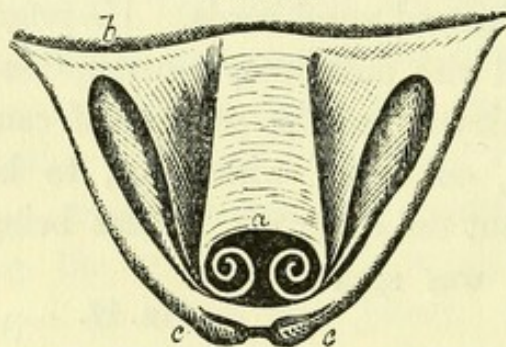
FIG. 17.



any ulceration about the follicles described above I am not prepared to say, but as the shape of the cartilage answered to Dr. Green's description, I give place to it here. But it will be observed that the valve was horizontal, and not erect in position.

CASE. Complete pendency and curling of the epiglottis backwards like a scroll, giving rise to certain symptoms.—Dr. C— consulted me on the 18th July, 1863, through the recommendation of Dr. Peacock. He had been in India some thirty years, and with some throat-affection about the whole of that time. In 1839 he had slight hæmoptysis, followed by severe pain under and behind the right clavicle; there was still some consolidation there, he stated, although he looked very well. Had a loud powerful voice at one time, which could be heard by a thousand men on parade. It cracked after thirty-nine, and pain came on in the chest after talking. Has never had pain in the larynx, but has a feeling as if a valve rose up in the throat, and a little expectoration of mucus gives relief. It returns if the voice is raised a little. Has

FIG. 18.



- a.* The epiglottis, pendent and curved like a scroll. *b.* Back of tongue. *c, c.* Arytenoid cartilages.

suffered from relaxed throat and dyspepsia abroad, but is now quite well. Reading aloud produces huskiness, and he has a little irritation low down in the neck. The laryngoscope showed a remarkable condition of the epiglottis; it was quite pendent horizontally, and both sides were curled back-

wards like a scroll, which however prevented it lying quite flat on the glottis. Deep, sudden inspiration elevated the valve a little, and much congestion of the sub-glottis and upper trachea at the posterior part was seen, the membrane being

pulpy and slightly tumefied; the membrane covering the vocal cords was a little congested. All the symptoms were thus explained. I prescribed a soothing and astringent gargle to elevate the epiglottis if possible, and remove the irritation, and applied some zinc spray to the larynx and trachea with my laryngeal fluid pulverizer. My prognosis was good.

In acute inflammation of the larynx, the epiglottis is observed to be more erect than natural, red in colour, and variously thickened by submucous infiltration of serum and sero-pus; such conditions are also present in supra-glottic œdema, but the former can be readily distinguished from the latter. When its anterior surface is ulcerated, there is always painful deglutition from the food rubbing over the ulcerated surfaces, and if any portion of the cartilage is destroyed, fluids cannot be swallowed. Consumption and syphilis exert a most baneful effect in many instances upon this fibro-cartilage, as stated in the sections upon those complications. A considerable portion, nay the whole of the epiglottis may actually be destroyed by ulceration; yet, with none to cover the opening of the larynx, there may be an absence of difficulty of swallowing. It is frequently cut across in wounds of the throat, and has been known to be shot away.

The literature of the diseases of the epiglottis has been enriched by a special paper on the subject by Dr. Green, entitled 'Lesions of the Epiglottic Cartilage,' published at New York in 1857, for a copy of which I am indebted to my respected friend, Dr. Robert Nelson, formerly of Montreal, and now of New York. The principal lesions of this part of the throat-apparatus are considered by the author under three heads, namely, 1. *Erosions* and *Abrasions* of its mucous membrane. 2. *Ulcerations* of the membrane and of its glands. 3. *Edema*, or infiltration of its areolar tissue. These alterations in structure are placed in the order of their frequency. With regard to the first, it would appear, on the testimony of

Professor Hasse, that they are alterations peculiar to phthisis, and affect the outer and epithelial layer of the mucous membrane, and are looked upon as the result of superficial irritation, produced by contact with tuberculous matter, expectorated from the lung. They have been noticed to occur under other and different circumstances by Dr. Green, associated with follicular inflammation, or catarrhal irritation of the mucous membrane of the respiratory passages, but in a large majority of cases entirely independent of tubercular disease. The left superior edge of the epiglottis is their favorite seat, but next in frequency is the centre, and more rarely the right border. The erosions are treated by the application of the solid nitrate of silver at first, which affords immediate relief, and, when that has been done a few times, a strong solution may be employed, not only to the border, but to the whole cartilage. A harassing dry cough is usually present in this form of lesion.

The *ulcerations* are quite distinct, and do not originate in erosion. The treatment is, however, similar in the topical use of the crystallized nitrate, and afterwards the strong solution, taking care to do it effectually, when they are deep seated in the fossæ at the back, and on each side of the tongue. The solution of the argento-nitrate of mercury is one that I have much confidence in, as it produces a more decided effect than the nitrate of silver alone. Œdema of the epiglottis, of somewhat frequent occurrence, is the result usually of catarrhal inflammation, and is generally attended with aphonia, dysphagia, and occasional ulcerations, and, in rare instances, complete destruction of the cartilages. The reduction of the œdema is effected by the strong solution of the nitrate applied topically, continued at intervals until it has completely subsided, combining tonic and absorbent remedies, such as iodine, and, perhaps, steel. If it is obstinate, small scarifications with a proper instrument, practised with the aid of the laryngeal mirror, will afford speedy and decided relief.

Loss of the free portion of the epiglottis.—It has fallen to

my lot to meet with six instances of destruction of the free portion of the epiglottis; three of them occurred in 1862, and were brought before the Pathological Society;* a fourth was lately sent to me by Mr. Brace, of Bath, and Dr. Guthrie, of Brechin. A fifth I lately examined for Mr. Nunn, and Mr. J. W. Mason; and a sixth was recently under the care of my colleague, Mr. Holt, at the Westminster Hospital, wherein I diagnosed this condition. The symptoms in all were very distressing and painful to witness; in the first there was ulceration of the left arytenoid cartilage, and the poor patient's sufferings were described as actually horrible. It is given in Section III (p. 42). The root of the cartilage seemed as if it had been cut off by three incisions; my belief is that it was detached by three separate lacerations. A second case follows the first in the same section; the arytenoid cartilages, aryteno-epiglottic folds, and vocal cords, were all destroyed, and I felt the deepest commiseration for the poor sufferer. It was a question in my mind whether tracheotomy would not have benefited this patient, as relieving and affording rest to the larynx, in this melancholy case. Fortunately, such terrible cases are extremely rare, although I have seen others nearly as bad. A third case now follows, and differing from the preceding cases, it has ended in a good recovery, with the possession of speech. I suspect that the too free use of the solid nitrate of silver was the cause of the mischief in this instance; there is no structure so sensitive to the use of this agent as the epiglottis, and cases of ulceration commonly come before my notice, the result of this proceeding. Too much care cannot be taken in its application, and *it is very seldom required*. I admit, however, that loss of the epiglottis does occur independently of any local application.

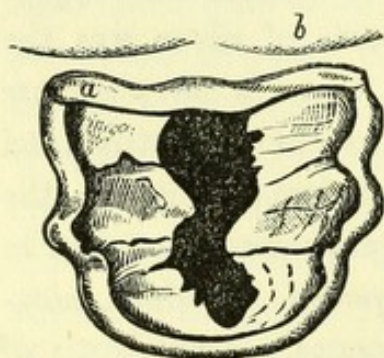
Total loss of the epiglottis, with aphonia from ulceration of

* See 'Pathological Transactions,' vol. xiv.

the larynx and pharynx, good recovery, with restoration of voice.—In October, 1862, a lady consulted me from one of the western counties, accompanied by her son and daughter. She was æt. 56, the mother of ten children, and of delicate health. She was very well from June to November, 1861, when she had a relaxed sore-throat. A solution of caustic was applied in April, 1862, and afterwards the solid substance. Her illness when I saw her had been of twelve months' duration, with loss of voice since April, over six months. She has had ulceration of the fauces, for which the solid caustic has been rubbed round and round in the form of a complete circle, *i. e.*, the diameter of the faucial space. Was never without ulcers, she said, until she commenced to take bismuth and henbane, a month ago. Stomach is often out of order; she is very nervous and easily agitated, and has spat up latterly sometimes a quart of mucus in the twenty-four hours.

She is very pale, and speaks in a low but distinct whisper, and gave me the particulars of her case herself. Has no cough nor chest symptoms; can swallow fluid but not solid food; throat at times painful, with pricking of the fauces in the right side. Tongue is constantly covered with a thick, white, creamy fur along the back and sides, the tip is clean and pink.

FIG. 19.



a. The remains of the epiglottis. *b.* The back of the tongue. The dark space represents the glottis.

Laryngoscopy and inspection.—

So irritable was the throat that my examination the first day was unsatisfactory, but both on it and the second day (17th and 18th) I contrived thoroughly to see all the parts. The mucous membrane of the fauces was bathed in a profuse secretion, especially the first day; the membrane was sensitive and extremely congested. A large, deep, and irregular ulcer occupied the

middle of the back of the pharynx, and could be seen only by depressing the tongue with a depressor. Another was present in the right side of the pharynx, laterally, seen with the laryngeal mirror—this one gave rise to the pricking pain. Several other smaller ulcers were scattered here and there.

The epiglottis was wholly destroyed down to its root, leaving the merest trace of its presence. The first day there was a granulation on its left border, which disappeared by the second on the use of a proper gargle. The membrane of the interior of the larynx was red, œdematous, swollen, and irregularly prominent, as seen in the drawing. The white colour and shape of the cords were gone. The trachea could be seen with streaks of white lymph-like secretion. The parts moved freely, the aryteno-epiglottidean folds were partly ulcerated, but otherwise sound, as also were the two little cartilages, permitting of complete closure of the larynx during deglutition. There was no feeling of suffocation at any time—a noteworthy fact.

The effect of an astringent and soothing gargle the first day was a diminution of the secretion, and subsidence of the irritability, producing a more healthy pink colour of the membrane generally; but this was partly due to a solution of the iodide of silver, freely applied the first day. On the second day I carefully applied a solution of nitrate of silver to the interior of the larynx, and to all the ulcers, especially that in the middle of the pharynx, by means of a soft brush. Suitable constitutional and local measures were prescribed, the diet regulated, and a hopeful prognosis was given. In two months she had greatly improved, her throat was comfortable, and it seemed cured. One month after she saw me she wrote (on the 16th of December), "The expectoration was much lessened, the general health greatly improved, appetite doubled, meat acceptable, which she had not touched for months. Voice returning; she does not whisper, yet the sound is croaky.

Ulcers all healed up." The vocal cords were subsequently seen by her son ; and her recovery has been complete, with full power of swallowing, although the epiglottis is irrecoverably gone, and I heard her speak in a good, clear voice, at her own residence, on 8th August last.

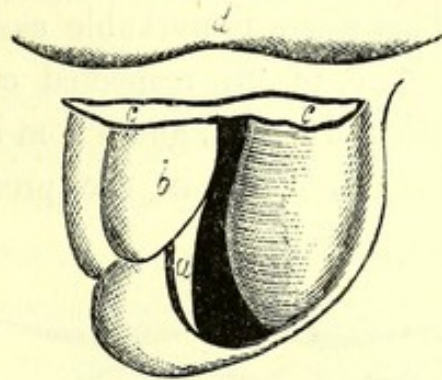
CASE. *Destruction of the free portion of the epiglottis from ulceration and disease of the throat for four years ; together with portions of the aryteno-epiglottic folds.*—Mr. J. H. L—, æt. 27, consulted me 29th May, 1863, by the advice of Mr. Brace of Bath, and Dr. Guthrie of Brechin. For four years and upwards has been subject to severe phagedenic ulceration of the throat, and great pain in swallowing. At one time he could not swallow fluids at all, and afterwards could only get down pultaceous food. He can swallow now pretty well, but is very nervous and anxious about himself. Voice good and strong, but sometimes it goes away entirely, and if fatigued it does do so in the evenings. He constantly expectorates a large quantity of mucus ; has no cough, but a feeling as if he wanted to get rid of something. Has to make a double effort in swallowing, to get the food down ; sleep irregular, throat "dried up immensely at night ;" pulse 130, and weak, but always quick since rheumatic fever in 1851 ; sometimes has cardiac pain.

Laryngoscopy.—Uvula partly gone, and velum much adherent to pharynx ; right side of nose tender, and ulcerated in the nostril ; tongue thick ; the epiglottis quite gone, and evidence of great destruction of tissue, and active ulceration visible ; vocal cords could not be seen ; but there was a wide artificial glottis, which permitted of easy breathing and a view of the trachea. The left side of the glottis consisted of a thick oval swelling formed by the left aryteno-epiglottic fold and false cord. Treatment was commenced.

June 6.—Expectoration and secretion almost wholly stopped, and is very much better. The ulceration of the larynx and

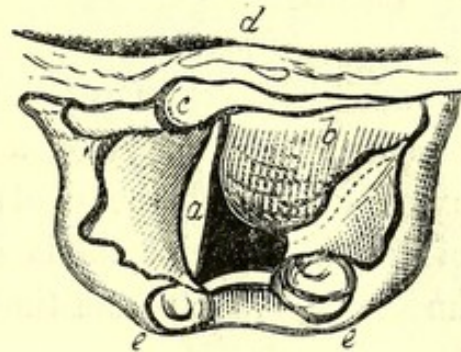
other parts has diminished one half, and the parts are more distinct, as per sketch. Movement is freer, and the right vocal cord is seen, with the other, if a sudden inspiration is taken. The remains of the left epiglottic fold move inwardly from side to side by the aid of the arytenoid cartilage; that on the right side I fear is gone. Back of tongue, right wing of thyroid, and septum of nose, feel sore. It is unnecessary to give the treatment from day to day, it will suffice to mention that by July 14th he was quite well, and wonderfully improved by carrying it out at Hastings. The larynx was now more compact, and in uttering sounds the cords were seen to come well together. He returned to his residence in the north of Scotland quite a new man. In September he had an attack of bronchitis, which threw him back a little, and I examined him at the latter end of October, and found the improvement permanent, but advised him to pass the winter at Bournemouth, which he consented to do. Fig. 21 shows the larynx as it appeared in December. The recovery in this case was something extraordinary, but it shows the value of the laryngoscope in effectually applying local remedies.

FIG. 20.



- a.* The right vocal cord. *b.* Remains of the right epiglottic fold. Edema of the left aryteno-epiglottidean fold, and of the false cord are seen on the opposite side. *c.* The root of the epiglottis. *d.* Back of the tongue.

FIG. 21.

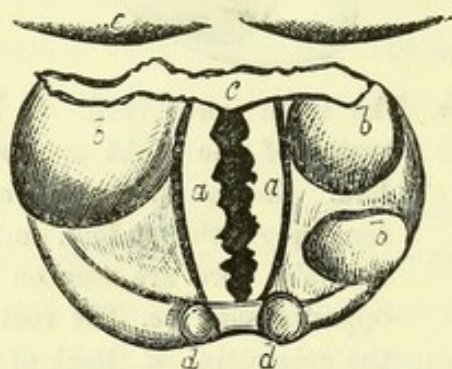


- a.* The right vocal cord. *b.* The remains of left false cord projecting across the glottis. *c.* The root of the epiglottis. *d.* Base of the tongue. *e, e.* Arytenoid cartilages.

CASE. *Destruction of the epiglottis, and its proper folds, with disease of the vocal cords and trachea; adhesion of the veil of the palate to the pharynx; and serious disease of the nose.*

—This was a remarkable case of old syphilitic disease, under the care of my respected colleague Mr. Holt, at the Westminster Hospital, and whom I examined with the laryngoscope, July 1st, 1863, in the presence of Mr. Christopher Heath,

FIG. 22.



a, a. The vocal cords. *b, b, b.* Positions of aryteno-epiglottidean folds and false cords. *c.* The root of the epiglottis. *d, d.* Arytenoid cartilages. *e.* Back of the tongue.

and many of the pupils. The epiglottis was gone, and the greater part of the aryteno-epiglottic folds, the latter forming irregular tubercles, as seen in the sketch. The vocal cords were degenerated, thickened, irregular at their free margins, but not destroyed; they formed a narrow glottis. The membrane of the trachea was ulcerated, thickened, red, and swollen, giving rise to an occasional croupy cough; the arytenoid cartilages were

sound. The velum palati and uvula were almost wholly adherent to the pharynx, a small passage only existing at the extreme point of the uvula. There was much hyperæsthesia of the fauces, rhinophonia and dyspnœa. He has continued under observation from time to time.

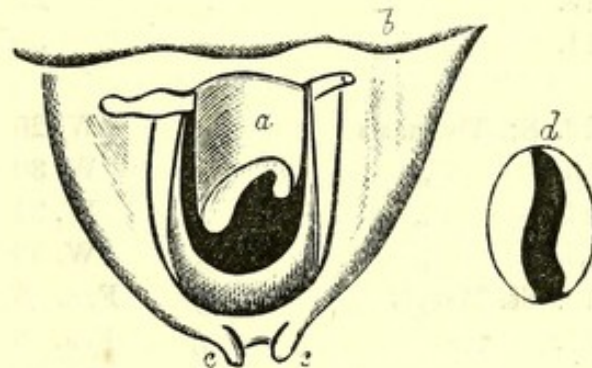
CASE. *Reduction of the epiglottis to a mere stump by ulceration; tracheotomy, inspection of the glottis from below.*—

J. C—, æt. 30, had sore throat in January, 1863, which rapidly got worse, with much dysphagia; he ate little and drank about two quarts of port wine daily. There was a specific history dating back to Christmas, 1861. Severe and extensive sloughing ulceration of the tongue and fauces ensued,

which was ultimately subdued. Sudden dyspnœa occurred at the end of June, and laryngotomy was performed on the 28th, by Mr. T. W. Nunn, with immediate relief, at the request of Mr. J. Wallis Mason, who attended the patient, and who kindly favoured me with his history. I made an examination with the laryngoscope on the 10th of July, in the presence of both gentlemen; the right false cord was swollen from œdema, and a short stump of the remains of the epiglottis was visible. The left true vocal cord was seen, and the aperture of the glottis expanded pretty widely on inspiration, I therefore advised the removal of the silver canula, which was at once done; with a small tracheal mirror, introduced into the fistulous opening in the neck, the sub-glottis was seen, as shown in *b*, in the sketch, permitting of a view of both vocal cords, and the passage quite unobstructed. The right half of the velum was adherent to the pharynx.

On the 17th of September he was brought to me by Mr. Mason, when I found the stump of the epiglottis somewhat fleshy, and hanging into the cavity of the larynx, as per sketch *a*, so that the true vocal cords were partly concealed. The arytenoid cartilages were not seen, but a good view was obtained of the inner wall of the posterior part of the larynx. The voice was thick, and somewhat rhonchophonic.

FIG. 23.



- a.* The remains of the epiglottis hanging over the cavity of the larynx. *b.* The base of the tongue. *c, c.* Arytenoid cartilages. *d.* View of the subglottis, from the tracheal opening. In the larger view, the true vocal cords are not shown.

As a guide to estimate the condition of ulceration which the

epiglottis undergoes, I have prepared the following table, from personal examination, of all the examples to be met with in the metropolis to the present time.

Table of Examples of Loss of the Epiglottis, preserved in the Museums of London.

1. Guy's Hospital . . .	1690	all the free portion in a young person.
2. St. George's . . .	103	almost the whole of the free portion. Young woman. Phthisis.
3. Army Museum . . .	466	all the free portion.
4. " " . . .	467	" "
5. " " . . .	468	nearly one half of.
6. Middlesex Hospital . .	vii, 40	nearly all the cartilage.
7 " " . . .	vii,	all the free portion from cancer.
8. University College Hospital	0.29	entire free portion of.
9. St. Bartholomew's " "	24	" "
10. " " "	27	upper two thirds of.
11. " " "	39	entire free portion. Man of 50. Syphilitic.
12. St. Thomas's " "	W. 29	entire free portion.
13. " " "	W. 30	nearly all ditto.
14. " " "	W. 31	entire free portion.
15. " " "	W. 33	greater part of ditto.
16. St. Mary's " "	F. a. 5	a portion of it.
17. " " "	F. a. 6	entire free portion.
18. " " "	F. a. 24	greater part of free portion.
19. King's College " "	379	entire free portion.
20. Westminster " "	—	" "
21. Grosvenor School . . .	—	greater part of free portion.

Mucous cyst of the epiglottis.—This is a rare affection of the cartilage, an instance of which occurred to Mr. Durham at Guy's Hospital, in a boy of 11 years, admitted under Dr. Wilks, in June, 1863. For three years he had affected voice, dysphagia, and dyspnœa, very severe on admission, with pain about the larynx, and then aphonia. The laryngoscope showed a large, round, tense tumour, projecting backwards and down-

wards, and covering the glottis. On either side the swollen and œdematous aryteno-epiglottic folds were seen. Mr. Durham made an incision into it with a long, curved, sharp-pointed bistoury, and out gushed a thick glairy mucus mixed with a little pus and blood, and this subsequently proved to be similar to the contents of a ranula, beginning to suppurate. The recovery may be said to have been instantaneous, for he was singing in his bed the same evening. Four months after he was still quite well. Dr. Wilks informed me the swelling could be seen by the unaided eye at the back of the mouth.

On one occasion a lady presented herself to me with a bleb of fluid on the laryngeal surface of the epiglottis, as large as a big pea, the result of inflammation; it burst on the simple application of a curved brush. It looked like a serous vesicle.

In terminating this chapter I should mention that cases have come before me where the epiglottis has had a circular hole through it; or has been fissured in the median line generally associated with cleft palate or a double uvula; or doubled upon itself laterally, and quite immovably pendent; or has been twisted upon its upper edge backwards, as seen in a noble lady; or lastly has resembled a tripartite leaf, the upper part bending backwards and having that peculiar form. Sir Henry Marsh refers to the case of a child, aged fifteen months, who suddenly died from an elongated epiglottis plugging up the aperture of the glottis, and so producing suffocation.

Epiglottisation, signifies the act of epiglottising a person, by means of the laryngeal mirror, to determine the position of the epiglottis. As already stated, this is an important proceeding in the young, from the age of four to ten years, for reasons that have been mentioned. The process consists of the usual operation of laryngoscopy, employing small mirrors in the child, and holding the tongue well forward in a handkerchief outside of the mouth, when the position of the fibro-cartilage is readily determined, whether wholly or partially pendent or erect; if it is erect the parents need not be anxious

whilst the child is going through the usual diseases ; but if it be oblique and very much pendent, which it is in eleven per cent. of mankind, then it should be specially noted as a precautionary measure.

SECTION V.—CONSUMPTION AND BRONCHITIS IN CONNEXION
WITH DISEASE OF THE WINDPIPE AND THROAT.

WHEN *active* disease is present in the throat and upper part of the windpipe, its importance becomes of such a nature as to call for our solicitude and utmost attention. If, however, besides the throat affection, we have the complication of disease of the bronchial tubes and proper structure of the lungs themselves to deal with, then is the mischief of still greater importance ; the general symptoms become aggravated, giving rise to much inconvenience, and oftentimes will wholly baffle our efforts at affording relief. The throat disease may either extend to the lungs, as occurs in the follicular inflammation of the mucous membrane, and chronic lesions of the windpipe ; or else the disease may begin primarily in the lungs, and pass upwards to the windpipe, constituting, perhaps, a consumption of the lungs and windpipe together. According to the researches and experience of Louis, as given in his able work on Phthisis, he found the epiglottis and larynx to be ulcerated in *one-third* of the cases of consumption which came under his observation. When these ulcerations are present in the larynx in pulmonary consumption—a complication which it is in the experience of every physician to have witnessed—the general symptoms of the chest malady become so much aggravated by the constant irritation at the seat of entrance to the air-passages, thus giving rise to an incessant hacking cough, that the stages of the complaint rapidly run their course to a fatal termination, unless by timely and well-directed efforts, this distressing irritation is subdued. This, it may be observed at once, is effected by topical applications, either of the nitrate

of silver, or of the argento-nitrate of mercury, and the ulcerations are quickly checked in their tendency to spread along the surface of the mucous membrane, and to the deeper structures. The latter is prevented if seen sufficiently early, and much, indeed very much, depends upon early treatment of this kind, for reasons which now shall be explained.

Pathology of ulcerations in the larynx in Consumption.—From some peculiar cause, as yet unexplained, but most probably from the sympathetic irritation of consumptioa, the follicles of the mucous membrane of the upper air-passages take on the same kind of diseased action as in the lungs themselves; that is, coincidently with the progression of the deposition and ulceration of tubercle in the pulmonary structure, the same substance is being deposited in the submucous tissues of the larynx, which, in a little time, is followed by enlargement of the follicles themselves, in the form of numbers of minute or small scrofulous tumours. These ulcerate on the surface, the tuberculous masses break down, suppurate away, and, if not arrested in time, the ulceration extends superficially, and destroys much of the mucous membrane, and penetrates still more deeply until it reaches the cartilaginous investments themselves, or some of the essentially vital parts of the larynx. Preparations illustrating this are quite abundant in the various London museums. Most usually, however, the patient perishes before the latter stage is reached, being worn out and exhausted by the complication of his maladies. It may be observed that the symptoms of laryngeal disease may sometimes commence in the first stage of the pulmonary disease, and escape attention until the difficulty in swallowing, hoarseness, tickling cough, and perhaps absolute pain in the larynx are increased. The throat-disease may, however, remain dormant for a time, and suddenly spring into dangerous activity. Dr. Cotton remarks, in his philosophical work on consumption, "When the laryngeal affection advances rapidly, the lungs, in many cases, enjoy a respite, the morbid action

appearing to be transferred from one part to the other ; but very often it is otherwise ; additional tubercle, with destruction of tissue, going on simultaneously in both organs." p. 170.

Although, perhaps, the symptoms of ulcerated larynx, when thus associated with consumption, differ in no material respect from the other forms of ulceration previously described, beyond the increase in their severity, yet there is an essential peculiarity in the constitution of these ulcers which no person that I am aware of has demonstrated histologically, and that is, the presence of real tubercle in their structure (I leave out, of course, their naked eye appearances). This I have determined by the aid of the microscope on many occasions, and its seat seems to be especially the submucous tissues. Perfectly analogous is the condition of the ulceration of the smaller intestines in phthisis, which, if examined in a similar manner, will be found loaded with true tuberculous deposits, as I have noticed as far back as 1845. Thus, then, the character of the ulcers in the larynx, associated with pulmonary consumption, is perfectly distinct and altogether different from that which is present in idiopathic ulcerations of the same part. This fact I most particularly insist upon, the correctness of which has been tested over and over again in my own hands. It has been surmised by others, but never actually proved.*

It is, nevertheless, a curious fact in connexion with the phthisical laryngeal ulcer that, if the disease commences primarily in the larynx, in a constitution wherein the hereditary predisposition is remarkably strong, the irritation set up by the constant cough, together with the excitement in the breathing apparatus generally, will light up the pulmonary consumption, and, when the case has terminated, the laryngeal ulcers are found to be tuberculous in character. Nay, I will even go so far as to state my belief that, in such a class

* Perhaps I should except the researches of Hasse, given in the translation of his work on 'Pathological Anatomy,' published by the Old Sydenham Society.

of persons, these ulcers are tuberculous almost from the beginning.

The parts affected by their invasion are the trachea, the larynx, and the epiglottis. Louis found the first ulcerated 76 times in 190 subjects, or upwards of *one third* presented ulcerations in the *trachea*, 21 in females and 55 in males; the *larynx* was in a state of ulceration 63 times in the 190 cases, or less than one third, 19 in women and 44 in men; whilst the *epiglottis* was ulcerated only in 35 out of 135 cases, or almost *one fourth* of the whole, 8 in women and 27 in men. Louis goes so far as to state, that "ulcerations of the larynx, more especially those of the trachea and epiglottis, must be regarded as lesions proper to phthisis."* Such a serious complication, and one so frequent, therefore merits more attention than is bestowed upon it, on the part of the patient himself, in early seeking for medical aid.

The vocal cords rarely escape; either one or both may be ulcerated—and this explains the whispering or almost absent voice of patients who are thus affected in this complaint. But every part of the larynx may be invaded, as shown by experience, and now fully confirmed by the use of the laryngoscope; this complication affords to the pathologist abundant opportunities of studying the disease. When the epiglottis is affected, it is at the inferior part of its laryngeal surface almost invariably; the ulcers may extend to the margins, giving to the cartilage a serrated or notched appearance, and once in a while the whole of its free portion is destroyed; it is commonly pendent backwards. The uvula is elongated and relaxed, proving an additional source of irritation, and a cause of frequent sickness and coughing. The fauces are in a relaxed condition, in some states of phthisis, with atrophy of the anterior arch of the palate, giving an undue prominence to the posterior arch, which seems excavated as it were from the

* 'Researches on Phthisis.' Translated by Dr. Walshe, for the Old Sydenham Society, London, 1844, p. 46.

absorption of fat in the areolar tissue, and not unfrequently by a diminution in the size of the tonsils themselves, their surface often being covered by projecting follicles. This form of throat is well described and figured by Dr. Edward Smith, in his work on 'Chronic Phthisis.'

It is unnecessary to enter into a consideration of the physical signs present in consumption and bronchitis, co-existent with throat disease: these will be determined when examining the patient; but the presence of cough, dyspnœa, emaciation, hectic fever, night sweats, purulent expectoration, and the symptoms of consumption generally, will naturally draw attention to their source. Distressing, however, and aggravated as the symptoms may be, topical treatment will not only do much towards their alleviation, but will frequently heal up the laryngeal ulcers, and thus permit of the application of such remedies for the chest disease as are likely to afford relief and occasionally to cure. Besides those already well known, such as cod-liver oil, glycerine, preparations of phosphorus, iodine, iron, and others, I have found the decoction of Senega, combined with the tincture of sanguinaria, especially useful in promoting warmth and easy expectoration. And inhalations of the vapour and spray of certain soothing and astringent medicated substances in addition, by means of some of the instruments described in the first section of this chapter, and used in the recumbent position if necessary, will afford a greater amount of ease and comfort than could at first sight be expected. In confirmed and apparently hopeless cases, the topical treatment already mentioned will have the effect, if applied within a reasonable time, of quieting or arresting the laryngeal disease, and even to produce cicatrization and healing up of the small ulcers. This good result removes an exciting source of irritation, and will as certainly prolong the patient's life and give him an amount of ease and comfort to which he was hitherto a stranger. Suitable counter-irritation at a distance from the throat, by means of small blisters to the sternum, and allowed

to discharge for some time, or some other suitable application, should not be overlooked. What has already been said upon the treatment of the follicular disease of the pharynx and fauces will be applicable here. In advanced tuberculous disease of the larynx, where our efforts are at best but palliative, much ease and comfort will be experienced by the topical use of olive oil to the interior of the larynx, as recommended by Dr. Scott Alison, in his *brochure* on the Larynx and Trachea. I have found it serviceable in many other forms of throat disease besides that under consideration; as also cod-liver oil, and a mixture of glycerine and borax. But I now give the preference to a solution of the bromide of ammonium in glycerine, from two to four drachms of the former to an ounce of the latter, and applied every day, or every second day, with a curved brush, and the patient expresses himself as most sensibly relieved by it. The uvula, if elongated, must be truncated; and, whilst undergoing treatment, the use of the voice must be almost wholly laid aside.

Frequent as is the association of tubercle in the lungs and larynx, it would seem to be exceeded by the complication of follicular disease of the upper air-passages with *chronic bronchitis*, and it is fortunate that this should prove to be the case, for it is a much more remediable complication. The disease most generally extends from the larynx downwards, and thus accounts for the almost invariable accompaniment of the bronchitis. Besides a loud ringing cough, which is the distinguishing feature, there is a free expectoration of transparent and adhesive mucus, which varies much in its character and appearance throughout the progress of the inflammation, being very commonly muco-purulent. The laryngeal mirror shows the pendency of the epiglottis to be very frequent in such cases, with congestion of the larynx usually below the true vocal cords, in the anterior sub-glottic space; and the laryngeal surface of the epiglottis is often of a scarlet redness. The tonsils most probably will be enlarged and ulcerated, and

the uvula elongated. Besides topical treatment to the throat with silver, copper, or zinc spray, or by means of the curved brush, iodine in some of its forms, will here be found of much service internally, and blood-root with tincture of opium, or of lobelia, associated either with syrup of marsh-mallows, Indian sarsaparilla, senega, or of matico, will give great relief to the bronchial irritation. Lozenges of eucalyptus are most comforting, as also are pills of sanguinarin.

The mineral waters of Eaux Bonnes, Pyrenees, previously referred to, are most particularly valuable in cases of chest and throat disease like those just described.

In taking leave of the important chest complications with throat-disease, which the limits of this work compel me to treat thus briefly, I must not omit to draw attention to the fact, that throat disease often—indeed I might say commonly—gives rise to symptoms which simulate chest maladies, and I have known a most unfavorable prognosis to be given in certain cases which passed under my own care, and a careful examination has shown me that the lungs were sound, and on curing the throat disease the supposed lung mischief has disappeared. This only the more convinces us of the necessity for a guarded opinion in doubtful and obscure cases.

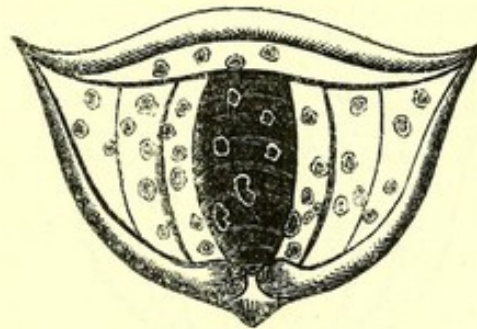
As illustrating the peculiarities of the laryngeal ulceration in these complicated affections, the following cases are given. They are selected from a large number of which I possess notes, and the lesions in nearly all were seen by the gentlemen who brought the patients under my notice.

CASE. *Aphonia and dysphonia from tuberculous ulceration of the follicles of the epiglottis, larynx, and trachea, in the first stage of phthisis pulmonalis.*—A. M—, a young gentleman, æt. 17, was sent to me by Dr. John Hall Davis in the middle of December, 1862. He had been ill sixteen months, commencing with pain in the chest. Twelve months back he could not talk without coughing. The cough originated in a

sort of itching of the throat, with a squeaking attending it. His breath was short, and he could scarcely ascend a flight of stairs. He coughed and expectorated a large quantity of phlegm, especially at night. Was a delicate, strumous, fair and tall lad, with pale complexion; was always healthy before his present illness. Had grown much last twelve months, and his appetite had failed, so that he had become like a shadow. All his brothers and sisters were healthy, his father and mother were living. Deglutition was very painful, the first mouthful was quite agonising. Voice reduced to a laryngeal whisper, getting better and worse; had not had his proper voice for sixteen months. He was in the first stage of phthisis.

Laryngoscopy. — Redness and congestion of the mucous membrane, with very fine tuberculous ulcers on the true and false vocal cords, and also in the trachea and on the epiglottis. (Fig. 24.) There was much secretion of mucus in the upper trachea. Applied a solution of nitrate of silver on two occasions to the trachea with my laryngeal fluid pulverizer, and to the other parts with a brush, and these were sufficient to heal up all the ulcers, and improve the voice.

FIG. 24.



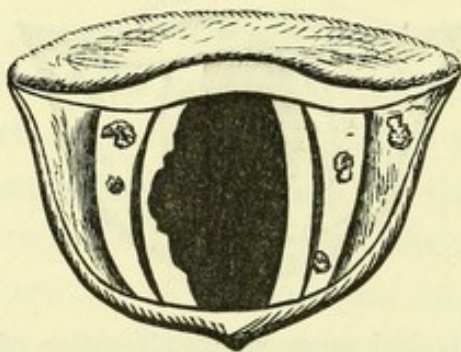
The dark space shows ulceration of the trachea, with the true and false cords on either side, all capped by the epiglottis.

CASE. Tuberculous ulceration of the larynx, especially involving the right vocal cord in a phthisical patient; inflammation of the right thyro-hyoid ligament.—In the following case the ulceration of the affected vocal cord was completely arrested, and the other little ulcers healed up by topical applications. Constitutional measures alone cannot be relied upon in such cases; something must be done locally as well.

C. L—, æt. 38, married, and the mother of four children, came under my care, July, 1862. She had been subject to chest-disease for eighteen months, but had had cough for four years. She was now in the third stage of phthisis, with cavities in the upper and anterior part of the left lung, and extensive tuberculosis of the right, running into the second stage. General health bad, is much emaciated, has night sweats and hectic fever. Has had hoarseness and partial aphonia for the last seven months, with occasional attacks of pain; the throat feels raucous and sore after much coughing and expectoration.

Laryngoscopy, 28th July.—Throat raw and very irritable, but she bore the laryngeal mirror three times. General

FIG. 25.



The right vocal cord is seen much ulcerated, with small ulcers in other parts of the larynx.

redness of the entire laryngeal mucous membrane was noticed, with extensive ulceration of the inner or free margin of the right vocal cord, which had penetrated somewhat extensively, as shown in the sketch. The left vocal cord was quite healthy. In several other places small points of ulceration were visible. The large ulcer was

touched with the aid of the laryngoscope, with a solution of nitrate of silver, by means of a suitably curved, large-bellied camel's-hair brush, causing comparatively slight spasm.

In a few days the voice improved, the irritation subsided, and the ulcers were found to have healed.

In October, deglutition produced pain on the right side of the neck, mainly due to inflammation and probable dislocation of the right thyro-hyoid articulation; this part was painful, and caused a rough aphonic voice at times, from impeded motion of the parts. The laryngoscope showed the ulcer on

the right vocal cord cicatrised, and with capability of action. The left vocal cord vibrated like a relaxed string.

Pain and soreness were prominent symptoms for some weeks, necessitating a second swallow to get down food. The thyro-hyoid ligament had become shortened, so that the cartilage and bone were nearly in contact. Under the use of glycerine twice a day, and expectorant mixture with half-drachm doses of tincture of sanguinaria, she experienced great relief, and got better, and remained so for some weeks, but the pain was so severe in the right side of the neck, that my strongest fears were excited lest rupture of the ligament should ensue. The phthisical affection was so far advanced, that her existence terminated in a few months.

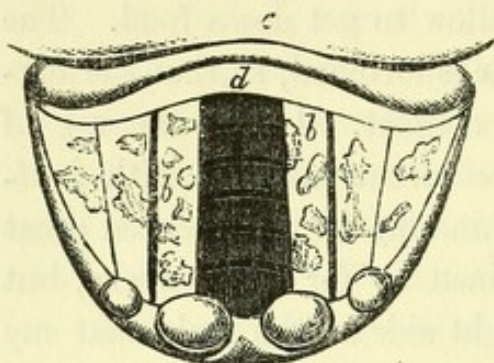
CASE. *Aphonia following phthisis and pneumonia, tuberculous ulceration of larynx and disease of the vocal cords.*—Mrs. C—, a handsome, but pale, young married lady, accompanied by her husband and Mr. F. B. Pearse, of the Maldon Road, her medical attendant, consulted me in the latter part of January, 1863.

She was pregnant four months with her first child. Two years ago she had an attack of pneumonia at Bristol, and remained delicate after it. In December, 1861, her voice began to fail and went gradually away, so that for the last twelve months she had spoken only in a whisper. Has a severe cough and expectoration of purulent mucus, with pain in the larynx, throat, and ears. She was in the second stage of phthisis.

Laryngoscopy was difficult, from her nervousness and irritability of the fauces; I held out the tongue myself. The epiglottis was intensely red, the mucous membrane of the fauces much relaxed, the velum was drab, the uvula long, and the tongue of a drab colour. The interior of the larynx down to the cords was congested, and the membrane ulcerated, even upon the cords themselves, to their very edge, but there was no

loss of their substance. These ulcers were tuberculous (*see* fig. 26). Beyond the glottis I could not see, but so delicate was

FIG. 26.



b, b. Vocal cords ulcerated. *c.* The back of the tongue. *d.* The epiglottis.

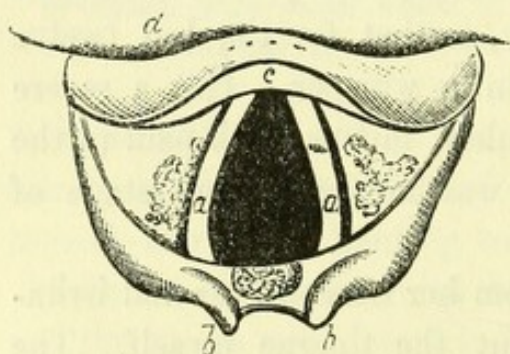
time not overlooking the general health.

the patient that she fainted away during the examination. The aphonia was due to the ulceration of the larynx, and thickening of the vocal cords.

I prescribed a course of treatment which Mr. Pearse approved of, including topical measures, with the view of healing the ulcers and restoring the voice, at the same

CASE. *Consumption, with a very irritable and harassing cough, depending upon ulcers in the larynx. Great relief by cure of the latter.*—Capt. G. W. V. came to me direct from Paris to be treated for his throat, on Oct. 14th, 1863. His lungs were affected with phthisis, for which he had been treated by Dr. Churchill, of Paris, the previous three months, with the hypo-

FIG. 27.



a, a. The true vocal cords. *b, b.* The arytenoid cartilages, between which is seen an ulcer. *c.* The epiglottis. *d.* The back of the tongue. Ulcers are seen on the false cords.

phosphites, and certainly with benefit. But his cough did not lessen; it was constantly present almost without cessation, and was irritating and harassing. The laryngoscope showed the presence of ulcers on the false cords and fold of membrane at the back of the larynx, between the arytenoid cartilages, as shown in the sketch, the surrounding membrane being pale and anæmic, and inflamed.

The true cords were unaffected, and the voice good, but the ulcer on the right side extended into the ventricle. He was at one time a powerfully built, stout person, but was now very thin; and he vomited all his meals from the coughing. I prescribed medicine, and rained a slight shower of zinc into the larynx without a spasm. He had had the sponge frequently introduced, and remarked upon the comparative inconvenience of my plan of topical treatment.

Next day, there was a decided improvement in his throat; he felt more comfortable, *the cough was very much less*, and he expectorated easier. Had slept some hours in the night, which he had not done for some time. The ulceration in the *right* side of the larynx was diminished one-half.

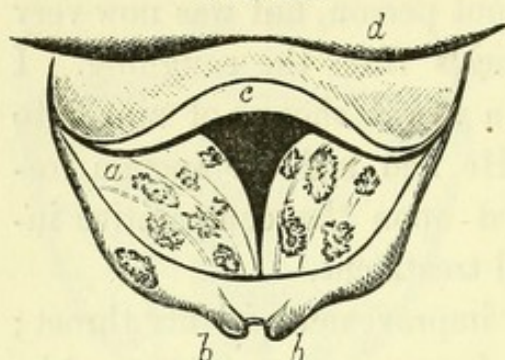
I saw him daily up to the 20th, carefully applying topical treatment each time, and the *ulcers were perfectly healed by the 19th*. There was still some cough, but nothing comparatively to what it was, nor so distressing, and he felt more himself. My first topical application at once put a stop to the vomiting, which had been caused by the reflex irritation produced through the intra-arytenoid ulceration, as was first pointed out by Lewin, of Berlin. I deny, however, that it always does so, for I have seen examples without vomiting.

He now left for Paris, on his way to Seville, in Spain, to pass the winter. During the week he was in London the weather was exceedingly unfavorable, with easterly winds, yet it did not throw him back.

CASE. *Aphonia from tuberculous ulceration and chronic œdema of the false cords, with phthisis in the third stage.*—Miss C., æt. about 34, I saw in consultation with Dr. Cahill, on 29th October, 1863. Had a cavity in the left lung, but quiescent; expectorates much, chiefly from the throat; dysphagia with fluids, and throat very sore. Aphonia and sore throat had

been present for some months.

FIG. 28.

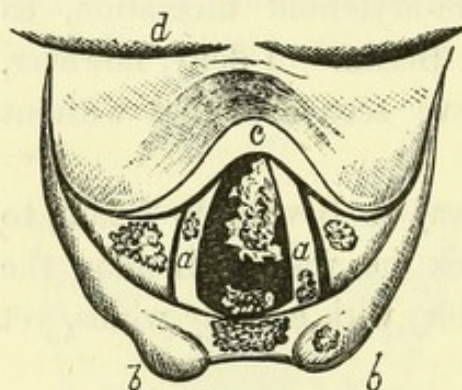


- a, a.* The œdematous false cord covered with ulcers; there is also one on the right epiglottic fold.
b, b. The arytenoid cartilages.
c. The epiglottis. *d.* Back of the tongue.

A deep red ulcer was present in the right wall of the pharynx. The laryngoscope showed swelling of the false cords which met posteriorly, and covered with small ulcers as seen in the sketch. The true cords were not visible. The ulcers and œdema of the false cords explained the symptoms, conjoined with great mucous secretion. Topical application was made to the larynx and pharynx without inconvenience.

CASE. Extensive ulceration of the larynx and aphonia from advanced consumption, with a pendent epiglottis. Healing up of all the ulcers.—Henry D.,

FIG. 29.



- a, a.* True vocal cords, both with ulcers, also seen on the false cords. A large ulcer is seen between the two arytenoid cartilages, *b, b*, and one on the apex of the left. *c.* The epiglottis. *d.* Back of the tongue.

æet. 30, came to me Nov. 14th, 1863, from Dr. Wright, of Somerset Street. Ill with advanced tuberculosis three years, and loss of voice eight months; whispering very painful. Laryngoscopy was at first not easy, from the great soreness of the throat. The epiglottis was pendent, but was raised during certain efforts, and permitted of a view of the larynx and trachea. The true and false cords were, in-

deed, extensively ulcerated, as shown in the sketch, the ulcers

extending into the trachea as well, and also at the base of the epiglottis. This was an exceedingly painful case, and required great dexterity to treat satisfactorily, from the position of the epiglottis. By the 4th of December, much of the superficial ulceration had healed, and it was some weeks later before it was wholly arrested, and the voice restored. Vomiting was a common occurrence in this patient.

On 20th August last, a young lady was brought to me from Manchester, who was in the first stage of consumption (Miss W., aged 26); the cough being kept up mainly by a congested larynx, the membrane of the false cords and surface of the epiglottis resembling thick pile velvet. On the cure of this, the cough almost wholly disappeared.

An instance of attacks of dyspnœa and bronchitis, in Mr. B., aged 42, was brought to me by Professor Georgii, of Wimpole Street, on 24th February, 1863, which were due to a hollow excavation seen in the mirror of the right side of the epiglottis, and congestion of the trachea, and probably also of the bronchi. A cure followed treatment.

Urgent dyspnœa at night, dysphonia, associated with chronic bronchitis and tracheitis, with subglottic congestion, were phenomena observed in Mrs. H., aged about 35, brought to me on the 16th June, 1863, by Mr. C. H. Buncombe, of the Bow Road.

Mr. G., aged 56, a surgeon, consulted me 21st September, 1863, at the recommendation of Mr. Henry Smith, of Caroline Street, for sore throat of five years' duration, and a constant irritating bronchitic cough, which had produced general redness and tumefaction of the entire larynx.

Entire marginal ulceration of the epiglottis in a lady who first consulted me on September 14th, 1862, most severely aggravated attacks of humoral bronchitis, to which she was almost constantly subject. This ulceration was healed, and the last time I saw her (October 17th, 1863) she told me

she had not enjoyed such health for years as she then experienced.

SECTION VI.—WEAKNESS OF THE VOICE AND CHEST.

As a corollary to the two previous sections, a few observations upon weakness of the voice and chest will not be amiss. It has already been shown that the voice undergoes various modifications and alterations as the result of certain functional and organic causes, directly related to the throat and its connexions. These are distinct in themselves, and do not enter into the present question. Observation and clinical experience have taught me, however, that a general weakness of the vocal apparatus and its intrathoracic ramifications is not uncommonly met with as depending upon a state of debility in two classes of persons, namely, in the young of both sexes before the age of puberty is reached, and in the elderly after the age of from thirty to forty years, or beyond the critical period of life. This abnormal weakness is unnoticed by almost any author with whose writings I am acquainted, and deserves consideration, because it is liable to assume the characters of actual disease when the constitutional predisposition is strong. The causes which give rise to weakness of the chest and the voice are chiefly systemic, and may be set down to a sluggishness or general torpor of the liver, with habitual constipation; or again, to frequent and exhausting attacks of diarrhœa. The influence of great extremes of heat and of cold also produce it, and it will remain persistent for years after a return to a more genial and temperate climate. The person affected complains of weakness and aching of the chest, with a dull pain under the lower part of the sternum, or behind its upper third. The breathing is slow and languid, and it is an effort in many instances to breathe at all; now and then it is followed by a long inspiration. Coincident is actual weakness of the voice,

which can scarcely find its way out of the mouth, so to speak ; it is in a low tone, although not lost, and speaking produces great langour. A person thus affected is most disinclined to converse, and can scarcely describe the symptoms of his complaint. Perhaps the majority of these cases is observable in the young, who have, among other causes, indulged in pleasures of an essentially weakening and debilitating character. Such patients have told me over and over again, that they felt such a weakness in their chest and in their voice. It will even continue beyond the age of puberty in such persons. Diseases of the lungs and heart, and the various tumours pressing upon the windpipe, necessarily produce their characteristic depression and weakness, but the condition I am describing is totally different, for no actual disorganisation is manifest in any of the tissues of the body. It seems to be a constitutional weakness of some portion of the spinal nervous system, especially implicating the throat and chest, for the intellect is perfect, although the listlessness occasionally present would leave the impression that it was not clear. Young ladies thus affected, complain that their voices in singing are getting weaker than they used to be ; they cannot get out the notes, the chest feels tired and aches, and after exerting themselves for a little while, their throats feel strained from the effort. This is especially so during menstruation.

On making a physical examination of the chest, percussion elicits a clearness of sound throughout, but with the stethoscope the respiratory sounds are heard of diminished intensity and duration ; in other words, the *respiration is weak*, although in other respects it is natural. The vocal resonance is also diminished in intensity, it is less distinctly marked than natural, and sometimes is exceedingly slight. Feeble or weak respiration and diminished vocal resonance, then, are the chief signs observable on examining the chest. There is nothing unusual about the heart's action, unless an occasional

feebleness of pulsation, and diminution of the beats to sixty.

The most careful exploration will fail to detect the evidence of any physical cause, such as obstruction to the entrance of air, or of diminished conducting power of the lung substance, to account for the two chief signs mentioned. They are the result of the depressed nervous influence on the lungs and vocal apparatus, more especially the agency of the pneumogastric and laryngeal nerves. The formation of the chest is usually regular, although I have seen this form of weakness in females with lateral curvature of the spine. The chest does not seem to expand to its full extent, possibly from diminished nervous power in its muscular apparatus, depending upon the causes mentioned. The laryngeal mirror reveals nothing abnormal in the larynx or trachea, beyond pallor of the mucous membrane in the former. The urine is often loaded with lithates, sometimes mixed with crystals of the oxalate of lime under the microscope, and it is not scanty in quantity. In many persons with this form of weakness, the skin is dull, but there is sometimes considerable pallor in young females; this does not wholly depend upon irregular menstruation, for there is oftentimes *emansio mensium* up to a late period. It seems to me that there is little difficulty in making out this affection when once it is studied.

In the treatment to be pursued, two objects are to be held in view; the first, and most important, is, careful regulation of the digestive organs; and the next is the administration of some of the milder tonics, associated with diffusible stimuli. I have found it occasionally necessary to give small and repeated doses of mercurials, or of podophyllin or iridin, to conquer the obstinacy of the liver, and have followed them up by the internal use of the citrate of iron with quinine, with decided advantage; or a very beneficial result may be obtained, by the use of the *hydrastin* combined with iron, or with strychnine and iron, the latter especially if there exist excessive

discharges. If there is still a tendency to constipation, a mild aloetic pill may be taken every second night. The chest and voice have been remarkably strengthened by cold shower baths in the young during the summer season only, and in the elderly by cold sponging at the same period. The nervous power is greatly restored by the application of electro-galvanism to the nape of the neck, and each side of the dorsal spine. The local application of galvanism to the vocal cords is not of the slightest use in this form of weakness of the voice, for the malady is constitutional, and not the result of impaired nervous power in the larynx. When the weakness has arisen from the enervating influences of climate, reliance is to be placed upon tonics conjoined with the mineral acids, and the use of wine daily. Combinations of ammonia with iron and quinine present elegant and useful preparations, and agree well with the stomach. If no organic disease has set in, there is reasonable ground for assuming the gradual disappearance and cure of this peculiar form of weakness; and the gradual restoration of the tone and strength of the voice have often indicated the disappearance of the chest weakness, and shortly afterwards is followed by complete cure.

In this malady we have an illustration of functional disease, in which, as I have mentioned before, the chest, windpipe, and throat, may be actual models of perfection in regard to their formation.

Of instances that have come before me, was one in a lad of 19, whom I examined for Dr. Copland, in July, 1862; he had weakness of the voice and chest, and general relaxation of faucial mucous membrane, notwithstanding the presence of a large thyroid cartilage, and yet the epiglottis was small. The circulation, breathing, phonation and other functions were sluggish. The larynx was quite healthy.

Another instance occurred in a young lady aged 18, from Harrow, who was under my care in July, 1863, with rather

extreme weakness of voice and chest, with no evidence of disease at all, although there was a strong phthisical diathesis and family history.

In the majority of these cases there is anæmia of the larynx, for the membrane is extremely pale, a condition that was well marked in an elderly lady brought to me by Dr. Cahill, in October, 1863 ; she was pale and weak, from attacks of dysmenorrhœa, and had an occasional *hem*, but the larynx was normal, although the voice and chest were both weak, yet with no evidence of disease.

CHAPTER II.

DISEASES OF THE VOCAL CORDS, OF A FUNCTIONAL AND ORGANIC NATURE, GIVING RISE TO HOARSENESS AND MODIFICATIONS OF THE VOICE, WITH LOSS OF IT.

IN the chapter on aphonia, in the first edition of this book, there is a reference to the observation made, now many years ago, by Dr. Stokes, in his truly philosophical work on 'Diseases of the Chest,' that morbid anatomy and pathology have not been sufficiently applied to the subject of phonation : "The field is open, and promises a rich harvest." However much was revealed to explain chronic hoarseness, aphonia of an organic nature, and certain changes in the voice, by the occurrence of abnormal conditions seen after life ceased to exist, little or nothing was discovered to account for alterations in the voice in speaking or in singing, or even of loss of it altogether, when depending upon causes wholly functional in their nature. Singularly enough, since the introduction of the laryngoscope as a means of investigating diseases of the larynx in the living, the field has been entered by a number of observers, who are already reaping an abundant harvest ;

and for the future, diseases of the larynx will become as well understood and as clearly recognised as any other class of maladies which flesh is heir to. The various workings of the beautiful living instrument which gives rise to phonation are becoming thoroughly understood in the healthy, and already much is being done to explain the pathology of vocalism under different circumstances and relations.

In the present chapter, therefore, those conditions of the vocal apparatus will be described which modify or alter the voice, or that suppress the utterance of sound altogether, and producing what is so well known under the name of aphonia. The modifications and alterations of the voice (phonopathy) will include declamation, oratory, singing and simple speaking. Many of these, however, can be but very briefly considered, from the necessarily limited space at my command.

In considering aphonia, it will be convenient also to divide it into the functional and organic, which take in conditions of an almost totally opposite nature, yet helping to simplify what would otherwise prove a complicated subject.

SECTION I.—FUNCTIONAL APHONIA,

May arise from—

- A. Emotional causes, as anger, joy, or fright.
- B. Impaired innervation, from constitutional defects.
- C. Hysteria.
- D. Certain local influences, as congestions, strains, &c.
- E. Pressure on nervous trunks.
- F. Poisons, as the narcotics, lead, antimony, and arsenic.
- G. Exhausting diseases.

In all the subdivisions which come under the general term of functional aphonia, there is impaired nervous power, or

disordered innervation, either general or local, and as a rule there is usually nothing to be seen in the laryngeal mirror of any special importance, structurally wrong.

A. *Emotional causes*.—Violent and sudden strong mental emotion, such as joy, grief, anger or fright, will produce an attack of aphonia, and it has not unfrequently happened that the same causes have cured the aphonia; this has been known to occur with both anger and fright. There is no doubt that the influence of the mind upon the laryngeal nerves is the cause of the aphonia under these circumstances. Dr. Forbes Winslow on one occasion, before the Medical Society of London, referred to cerebral congestion as a cause of aphonia, which he had seen cured by the abstraction of a small quantity of blood from the head by leeches. In history, cases are commonly related of dumbness produced by some strong shock to the nervous system, and further on are the details of a case that came under my own observation. In many cases among females, the voice has become suppressed in a few minutes, or during the day, and has either suddenly returned during periods of excitement, or has been lost for months or years, and suddenly, to the astonishment of every one, it has reappeared in its natural condition, without any assignable cause.

In a case of total dumbness recorded by Inspector-General Longmore (in a report of Invalids admitted into Fort Pitt in 1860-61, reviewed in 'Brit. Med. Journ.', Dec. 19th, 1863) following a gun-shot wound of the front of the lower jaw, the aphonia was most clearly the result of emotional causes, the sudden shock upon the nerves of the larynx instantaneously depriving the person of any power of utterance, as occurs in sudden joy, fright, anger, &c., already mentioned. That is, of course, assuming that the vocal cords were in every other respect normal, of which there is no reason to doubt, as speech was as suddenly restored after an absence of twenty-two months.

B. *Impaired innervation, from constitutional defects.*—Influences of a constitutional nature, chiefly the result of debilitating diseases, are causes of aphonia, and sometimes extremely difficult to overcome. Great loss of blood, as occurs in menorrhagia, or from the gastric ulcer, producing anæmia, gives rise to impaired power over the nerves of the larynx; so does leucocythemia and chlorosis, and climacteric diseases in females; loss of voice is the result. Dysmenorrhœa, and especially leucorrhœa in some persons, induces obstinate aphonia that will yield to no mode of treatment, until the uterine system is restored to a normal condition. An instance of this kind is at present under my care, where the aphonia had existed two years, in a healthy-looking girl of twenty-seven, supervening upon dysmenorrhœa. There was a suspicion of chest symptoms, but a careful examination made by Dr. Sieveking, in December, failed to detect anything wrong with the lungs; the larynx was normal, and the vocal cords possessed good action, but no vibration. I have met with cases of aphonia, originating in some slight cold, but remaining permanent for years, in consequence of there being disease of the substance of the lungs. The impaired nervous power in the larynx would seem to depend upon reflex action, for the vocal cords have been perfectly normal in every respect, and approximated very well. In the form of aphonia resulting from defective nervous power, it is not uncommon to see the structure of the vocal cords undergoing atrophy from the absence of the nerve stimulus to throw them into vibration, and keep up their proper supply of blood. Dr. Bryant relates in his Fothergillian Prize essay the case of a lady who had repeatedly, *on the instant*, lost her voice after taking soup or any article of diet which disturbed the quiet of her stomach, and it was only by paying strict attention to diet for a few days, that her voice was restored. There can be no doubt that a strong sympathy exists between the stomach and larynx through the medium of the pneumogastrics, and hence derangement of the

digestive organs is by no means an uncommon cause of aphonia.

Rheumatism is said by Lewin, of Berlin, to be a cause of aphonia.

C. *Hysteria*.—The laryngoscope has dispelled the notion that hysteria was a common cause of loss of voice; indeed, many of the cases given under the head of organic aphonia had been pronounced hysterical before they came under my care. Yet hysteria gives rise to aphonia among other maladies, in young females subject to it, and the voice suddenly vanishes, to sometimes as quickly return without any treatment. In diagnosing the hysterical aphonia, the mere fact of the patient being a young female is not to be taken as conclusive evidence in favour of it. If there are no clearly marked hysterical symptoms, then the loss of voice, if determined to be functional, must be placed under some one of the other causes. This form of aphonia is referred to in Chapter VII. Dr. Althaus reports a case of hysterical aphonia in a woman of thirty, in whom the vocal cords were quite flaccid and could not be stretched, there being a corresponding change in the form of the glottis. Faridisation was successful after some trials in effecting a cure. The following is an instance in the male sex.

CASE. *Hysterical aphonia for seven years in a male*.—Samuel W—, æt. 47, came to me November 28th, 1863, from Mr. George L. Cooper, of Woburn Place. He has had aphonia more or less continuously for seven years, since an attack of bronchitis in December, 1856. Is a very nervous hysterical person, with the atheromatous expression. The slightest shock has a powerful influence upon him. On two occasions he spoke for half an hour, this was followed by great prostration and weakness. The laryngoscope showed nothing wrong, beyond some congestion of the larynx. I succeeded in restoring the voice, without galvanism; in the mornings

he still speaks in a whisper, and in the afternoon in a stronger tone. He reminds one of a delicate, frightened, hysterical girl. His sister was speechless for seven years, but now speaks quite well.

D. *Certain local influences.*—Overstraining of the laryngeal muscles in violent declamation or loud exertion of the voice, especially in the open air, produce paralysis resulting in aphonia. The nervous force appears to be completely destroyed for the time being, and may be sometimes only partially regained, when hoarseness is the sequel. There may be loss of voice from a local palsy similar to that in other parts of the head, face, and neck, probably associated with neuralgia (see Neuralgia of the Throat, in Chapter VII), arising from cold, or from irritation in any of the nervous centres, or along the course of the pneumogastric nerves and any of their ganglia. Simple congestion of the vessels of the mucous membrane of the larynx, and that covering the vocal cords, impeding their free action, and necessarily impairing their nervous force, sometimes, but not commonly, engenders aphonia; when this occurs, the vascularity on the surface of the cords is seen to be punctiform; or streaked, red lines running along parallel to their length, sometimes with cross bars, giving them a fenestrated look; or there may be partial or general hyperæmia and redness. The effects of certain throat diseases locally upon the nerves produce aphonia, for example diphtheria and hooping-cough, an account of which is given in the chapters relating to those affections. These two diseases, but especially the former, act as a local poison, unless the general system is so contaminated as to affect the entire nervous tract of the body.

E. *Pressure on nervous trunks.*—Compression of the pneumogastrics or their branches, by tumours in the neck, or in the chest, give rise to incurable aphonia, unless by some fortunate circumstance their removal was accomplished by the aid of the surgeon. Aneurisms, bronchoceles, and enlarged

glands, are the usual forms of tumour thus producing pressure, and when situated external to the chest, can be readily made out; this is otherwise when the tumour is within the chest, for great care is necessary in the physical diagnosis, which is most obscure in many instances.

Mr. D. W. Parsons, of Liverpool, removed an osseous tumour, the size of a bantam's egg, from the right lobe of the thyroid gland of a girl aged twenty-one, in whom it had caused aphonia and dysphagia. The voice was instantaneously restored as soon as she recovered from the effects of the chloroform, and the dysphagia disappeared.* The operation reflects the highest credit upon Mr. Parsons, for it was undertaken not without some hesitation, and persevered with notwithstanding the many obstacles which presented themselves in the course of its performance.

Besides compression of main nervous trunks, irritation of their branches by disease or injury will not unfrequently impair the production of sound, and sometimes extinguish it. Pneumonia, and other diseases of the lungs, are causes of aphonia. According to the side on which the particular nerve is involved by a tumour—an aneurism for instance—will there be paralysis of the vocal cord on that side only, as in a patient in Professor Traube's wards, Berlin. At King's College Hospital, some months back, there was a case of aphonia co-existent with thoracic aneurism, which, however, was found to depend upon growths attached to the vocal cords.

F. *Poisons*.—The influence of certain substances taken in poisonous doses is exerted upon the nerves and muscles of the larynx as well as other parts, and loss of voice is a circumstance to be witnessed. Some of the powerful narcotics, antimony, mercury, arsenic,† and other poisons of an exhausting

* 'Medical Times,' Dec. 27th, 1862.

† Three cases are related by Christison, in which hoarseness and aphonia resulted from arsenic.

nature, are mentioned in various works on toxicology and materia medica as inducing this result. The class of cases, however, that more commonly present themselves to our notice are those wherein certain agents have *slowly* found their way into the economy, and finally given rise to a set of phenomena characterised by their influence on the nerves. Lead may be taken as an example of these, which received but a passing notice in the first edition of this work. Palsy of the larynx ensues, therefore, under the same conditions as wrist-drop, and the cause giving rise to it is readily apparent, for in my experience, and I believe in that of others, lead aphonia is rarely or never seen as an isolated malady, but is generally associated with indications of its effects in other parts of the system, in which the diagnosis is ably assisted by the characteristic blue line on the edges of the gums. In lead aphonia the laryngeal muscles are no doubt affected as well as the nerves, by the poison, and constitutional agents are requisite to eliminate it, as well as certain local agents, such as galvanism, to restore the nervous power temporarily in abeyance.

G. *Exhausting diseases*.—In certain affections of an exhausting character the voice not only becomes altered, as in the husky voice of cholera, the well-known *Vox cholERICA*, but it is frequently gone, and the intellectual faculties remain quite unimpaired. In cholera, I have seen persons speechless, although able to make signs, and my lamented father (an officer in H.M. Ordnance for many years), who succumbed from this disease, was thus affected some hours before his death, although sensible to the last.

Tumefaction of the follicles at the base of the tongue, and in the tonsils, have been observed in fatal cholera; so, also, has œdema of the aryteno-epiglottic folds and ventricles of the larynx; the follicles in the larynx and trachea have been noticed enlarged and numerous, frequently accompanied by injection of the membrane.*

* 'London Journ. of Med.,' vol. i, 1849, p. 929.

Laryngoscopic appearances in examples of functional aphonia.—The vocal cords are seen to be pale, and yet possessing their greyish-white colour, sometimes preternaturally white. Occasionally they possess a pinkish redness, or they may have minute little red dots upon their surfaces; or, again, red lines running in streaks from before backwards, varying in number from two or three to several. This congestion may increase or diminish, according to the movements of the cords. In the greater number they are seen of their normal colour.

They may possess some amount of movement, or none at all, until efforts are made to produce sounds, when they slightly approximate but do not meet, leaving a space between, invariably much wider posteriorly, through which the air rushes up and down. Sometimes, as in diphtheria, the paralysis is so complete that the cords form thin arcs of a circle, yet under excitement they may be stimulated to approximate, but not completely. The intermediate space, therefore, may be slight or great, according to the amount of paralysis of the muscles. Again, approximation in some cases may be good, and attempts at sound are fruitless, the glottis opening slightly behind to let the air pass outwards; the most minute examination with powerful light will fail to detect anything wrong with their tensile power. Yet again, approximation will be seen, but with a failure in the power of tension in one or both cords, thus giving them a bulging and flaccid appearance; or one cord may approximate towards the centre and the other may be sluggish, and will only partially meet it, the posterior third being retracted spasmodically outwards. This last condition I have found very persistent in some cases, examined on several occasions. The causes of the variation in the power of tension of the cords will be referred to in some of the cases to be given as examples, but I believe the fault to lie chiefly with the lateral crico-arytenoid muscles, the arytenoid, and the thyro-arytenoid muscles, in fact, the three groups that close the glottis. The crico-thyroid was looked

upon by Meckel as an opener of the glottis in common with the posterior crico-arytenoid, but I agree with Mr. Bishop in the opinion that the latter alone is the opener of the glottis. Yet in my paper brought before the British Association for the Advancement of Science, at Newcastle, in August, 1863, "On Voluntary Closure of the Glottis independently of the act of Breathing," I hazarded the opinion that the voluntary muscular power began in the crico-thyroid muscles in approximating the two cartilages and rotating the cricoid on the thyroid, thus forming a *point d'appui* for the continuance of muscular action in the other laryngeal muscles, although the crico-thyroid exert at the same time their own influence on the tension of the vocal cords when they depress and draw forward the thyroid and raise and tilt backwards the cricoid cartilage, at the same time rotating the one cartilage upon the other.

Prognosis.—This was always doubtful and uncertain before the use of the laryngoscope; but providing that the general conditions associated with the aphonia are not positively bad, the prognosis may now be said to be good, especially on account of the direct application of certain agents which experience is already proving are worthy of reliance; these are local stimulants, whether medicinal or galvanic. Those that are likely to prove obnoxious to treatment are constitutional defects in impaired innervation in some instances; laceration of muscular fibres, or of some minute or molecular change of which we are not at present cognisant, but resulting from overstraining of the voice, or some equally injurious action; long standing emotional aphonia with resulting atrophy; and mechanical pressure on the nerves. It will be seen, therefore, that even in functional loss of voice cases will occur that baffle treatment altogether, and permanent aphonia is truly a deformity for life.

Treatment.—In the great majority of these varieties of aphonia direct stimulation of the nervous force is necessary to bring about a cure, and the agents to accomplish this are

various. In simple cases of short duration solutions of nuxvomica or of strychnine applied to the vocal cords will restore muscular contraction and closure of the glottis to produce vocalism. A solution of nitrate of silver or other metallic tonic will, in the form of showers of spray, frequently accomplish the same end. Next to all these, galvanism directly applied to the vocal cords and arytenoid cartilages, will cure many obstinate and long standing cases, as first announced by Lewin, of Berlin, in 1860. In common with others, I have used galvanism direct to the cords on many occasions, by means of the continuous or uninterrupted current, given in a stream that could be borne without inconvenience, and applied with a copper rod suitably bent, covered with gutta percha. Mackenzie's improvement, however, of interrupting the current by means of an ivory handle, spring, and metallic ring upon a glass rod, thus permitting the regulation of the duration of the electric current, is a decided advantage, and I add my testimony most unreservedly in its favour, having adopted it in preference to my own.

The following is the mode of applying this agent:—The patient holds her tongue well forward in her handkerchief, the laryngeal mirror is introduced with the left hand,* and the galvaniser with the right, and a stream of electricity is allowed to play upon the anterior part of the cords, or the arytenoid cartilages. An assistant turns the handle of a battery with one hand, whilst with the other he applies a rod with a sponge on one end, to the thyroid cartilage in the middle of the neck, or along the course of the pneumogastrics. Sometimes the patient applies the latter herself. This operation is one of great ease and ready application in some patients, whilst in others it is not so; usually, however, it is not a difficult proceeding. Some patients bear it well, and experience no inconvenience, whilst others feel a slight pricking sensation—as if needles

* This is not always necessary, for I sometimes apply it with unerring certainty without, and a cure has followed.

were running into the larynx. In a few it excites a flow of mucus, which is readily wiped off of the galvanizer by means of a small hollow sponge.

The effect of this is to bring the vocal cords into contact, and to impart contractile power to the delicate little muscles of the larynx. But it must not be relied upon to cure all cases of functional aphonia, else disappointment will be the result. I treated a couple of cases of aphonia by the mere contact of the instrument on a few occasions, without galvanism, and the irritation it caused induced muscular action, which became permanent, and the voice returned. This is mentioned to show that any foreign substance, applied directly, will induce action sometimes, as in those two instances, and likely to remain persistent. Irritating gases bring about the same thing, but there is always some risk attending them; they are the vapour of ammonia, sulphurous acid, and chlorine, and are not recommended, unless for the most momentary inhalation, great care being taken that the irritation produced shall not degenerate into inflammation. Yet I must acknowledge that the results produced by gaseous stimulation are sometimes most surprising, especially in cases where all other agents have failed, including local galvanism among others. The smoke of tobacco, the vapour of turpentine, and some other substances, have been likewise employed.

In treating functional aphonia, whatever constitutional vices may be present must not be overlooked whilst local treatment is going on. It will be convenient sometimes to order the shower-bath, and to give tonics, chalybeates, good food, and to enjoin reasonable exercise. In saturnine aphonia, whilst galvanism is being applied to the vocal cords, iodide of ammonium or sodium should be given internally, and sulphur plaisters applied to the front of the neck.

So frequent are cases of functional aphonia, and considerable as the number has been of examples sent to me by various practitioners, that I am actually embarrassed in making a selection from my note-books for these pages,

with every desire, at the same time, to thank those by name who kindly sought my opinion for their patients. The following are practically illustrative, and fair examples of the functional variety. The first is an instance in which emotional causes gave rise to the lesion of innervation, and as is often the case, relapsed into the second variety previously mentioned, and ultimately was a local malady. I have ventured, also, to call it hereditary, for the predisposition to its occurrence was certainly acquired.

CASE. *Hereditary aphonia from impaired local innervation for the period of ten years; cured in a few days.*—Mrs. S. C. H—, æt. 52, the wife of a surgeon in Essex, consulted me November 7th, 1863. Before hearing the history of her case, I was requested, to examine the larynx, and give my opinion as to the appearances, which I did, and it agreed with that of Dr. Johnson I was told.

She has had aphonia for ten years, from the shock of the loss of her eldest son, but gradually occurring two or three days after his demise.* For eight years *everything* was tried in vain; then galvanism under a professed hand, which produced no change, unless increased uneasiness. She wore galvanic belts round the neck, which produced ulceration of the integuments of the left side of it, where the scars are visible. She was under Dr. Yearsley for three months, who freely sponged the larynx with a solution of nitrate of silver. At this time she had sore throat as well, and expectoration of blood; one day she hemmed for the first time, in Regent Street, and a sound returned, which she called “croaking or unearthly.” By perseverance for two weeks, a sort of hoarse masculine voice came back, and was retained a month, when it went away again; this was in October, 1862. She was taken by Dr. Yearsley to Dr. Johnson, who found the vocal cords in a state of paralysis, without any action. As her malady was looked upon as nervous constitutionally (so she said) she was ordered to the sea-side for change of air.

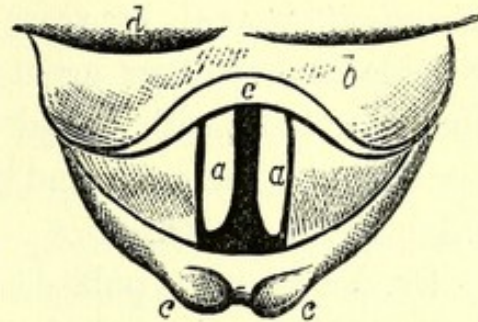
* She lost her voice for seven months at seventeen.

Laryngoscopy was very easy ; the larynx and trachea were seen quite normal structurally ; the vocal cords appeared as represented in fig. 30, and were motionless, at every attempt to utter a sound ; indeed this latter was impossible, for she could only susurrate in a very low tone. The glottis was about two lines wide, and the cords ran parallel for the greater part of their length. Pain in the left wing of the thyroid was a marked symptom.

Her mother, many years ago, was subject to occasional loss of voice, and so was her grandmother. Galvanism had already been used direct to the cords ineffectually, and I was not disposed to continue it. On the 16th, I applied showers of strychnine to the cords, believing the disease entirely local, although I prescribed a tonic mixture. On the 18th, a solution of nitrate of silver and mercury was applied, and a counter-irritant to the front of the pomum, but in reality intended to irritate the larynx. On the 19th, a solution of nitrate of silver in showers, repeated on the 20th and 21st. At the last date, she told me that sounds had occurred several times the day before, heard during the whisper, and frequently also in my presence. There was a decided *hum*, and she could clear the throat, which she could not do heretofore. The cords approximated a little, and the larynx was more sensitive.

23rd. After she left me on the 21st, the voice gradually increased, and she spoke quite well. To-day the voice is good and strong, freely uttered, and fortunately quite harmonious and pleasant, in fact her own long-lost voice. The vocal cords were quite active, and approximated perfectly, and sounds were easily ejaculated, even musical when desired.

FIG. 30.



a, a. The paralysed vocal cords, seen to run parallel for a certain distance. *e, b.* The epiglottis. *c, c.* The arytenoid cartilages. *d.* The back of the tongue.

She returned home on the 25th, perfectly cured, for the voice has remained permanent, which I prognosticated would be the case.

From the good effects of nitrate of silver as a *direct local stimulant*, proved by years of its use, I believe it to be as reliable as any other agent when properly applied, and this I took care to do with the aid of the mirror, and several showers sprinkled on the cords and trachea, without a spasm or even a catch of the breath.

Dr. Yearsley has published an account of the foregoing case in the 'Medical Circular' of January 6th, and it will be seen that in the main facts we both agree. He treated the lady with his well-known skill, cured the throat affection, and brought back the voice; its subsequent disappearance in six weeks was a circumstance beyond the control of any one. He mentions that a fetid discharge never recurred after the voice returned; of this nothing was related to me by the lady. I have given the particulars as narrated to me, and I am sure that Dr. Yearsley will acquit me of any desire to cast the slightest reflection or discredit upon his well-known skill and treatment. Indeed, nothing could be kinder than the expressions of the patient herself for what he had already done for her. In fact, I may say that our treatment was the same, only varying in the minutiae of detail, but it was not carried out at the suggestion of the patient, as Dr. Yearsley has inadvertently stated, and I am sure he will gladly withdraw the observations made at the conclusion of his own narrative of the case.

CASE. *Overstraining of the voice from passion, causing attacks of aphonia; cured in two sittings.*—Mrs. D—, æt. 39, called upon me with her sister, July 20th, 1863. Although quite young looking, she has had fourteen children. Has had aphonia several times, the present her sixth attack, induced by sudden passion with an old servant who gives her much trouble. The vocal cords were in a state of inaction and hyperæmia, the last seen as well in the trachea. The case was clearly one of impaired nervous power from over-

straining of the muscles of the larynx, with temporary hyperæmia. With ordinary constitutional treatment, and topical showers of a solution of sulphate of copper, she was cured in two sittings only. She was told that possibly her life depended upon the avoidance of passionate excitement.

CASE. *Aphonia for six months, wholly functional, cured by metallic showers and one application of external galvanism.*—Mrs. W—, æt. 47, consulted me July 16th, 1863, recommended by Mr. Jabez Hogg. She resides in Devon, and lost her voice in January previous. Subject to sore-throat many years ago. Is very delicate, and constitutionally weak. Speaks in a low, almost inaudible whisper. The larynx was not diseased, but the vocal cords were seen motionless. For a few days she had metallic showers to the larynx, of silver, copper, and zinc, which strengthened the whisper. On the 21st, Faridisation was applied for eight minutes to the external parts of the neck, and through the body. On leaving my house and crossing the street, she spoke quite loudly and naturally, to the astonishment of her brother and a lady with her. It was applied twice more to still further strengthen the voice.

Amongst other examples of functional aphonia, one was brought to me by Dr. Broughton, of Preston, in a single lady of forty-nine, who had lost her voice on and off for two years. On examining her in August, 1863, the larynx was normal, and the left vocal cord was partly paralysed, the right being normal; the trachea was, however, much congested. She had had galvanism applied directly to the cords, for two weeks before I saw her, by an expert hand at it, but without the least effect. She was subsequently cured by silver and zinc showers, combined with constitutional measures.

On 21st October, 1863, Mr. Carter, of Upper Fitzroy Street, sought my opinion for a gentleman aged twenty-seven, who had been subject to aphonia for twelve months. The laryngoscope revealed impaired nervous power of both vocal

cords, which lay quite flat, although they, as well as the larynx, were congested. Galvanism had been previously used in this case, also, without effect.

Whilst I have found galvanism directly applied to the vocal cords to cure in a few sittings in some cases, in others it will be found to fail. I have a young lady under my care, whilst preparing these pages, who has had functional aphonia for two years, from defective innervation. I applied galvanism to the vocal cords on eighteen different sittings, with restoration of motion, but the aphonia, to my own and her extreme mortification, remained persistent, and I have been compelled to resort to other measures to accomplish a cure.

I was the first in this country to apply galvanism direct to the vocal cords, aided by the laryngoscope; it has been recommended as a universal panacea by others for hoarseness and aphonia, at least the public are led to believe it is such; but I must again repeat, that it will not effect all that has been stated of it, even in the hands of the most expert.

SECTION II.—ORGANIC APHONIA,

Differing from the functional form, may arise from—

- A. Inflammation, whether acute or chronic.
- B. Induration and thickening.
- C. Œdema, above or below the glottis.
- D. Ulceration.
- E. Growths and tumours.
- F. Disease of the brain.

With the exception of the last, all these conditions exert either a mechanical obstruction to the harmonious action of the vocal cords, or by the irritation they produce so impair the contractile power of the laryngeal muscles as to render their action almost inert. It is assumed with correctness by our best physiologists, that all the muscles of the larynx are in a state of action during phonation, and in consequence of

the general harmony and sympathy which exist everywhere amongst groups of muscles associated for one common purpose, their states of tension and relaxation must be adjusted in such nicely balanced proportions as to produce the effect required, and this effect is speech. Any disturbance of this want of harmony by actual disease will necessarily impair or extinguish the voice until it is removed.

A. *Inflammation of the vocal cords (chorditis vocalis).*—Of all the causes that give rise to an attack of aphonia, inflammation of the membrane covering the vocal cords is the most common, almost invariably supervening upon an attack of cold, may be associated with some chest affection, such as catarrh or bronchitis. The inflammation may partake of a severely acute character, or be sub-acute and comparatively mild, and if not early subdued subsides into a chronic condition, which gives rise to some of the conditions to be presently considered. It is in the experience of almost every practitioner to meet with cases of the sub-acute or mild form of inflammation, which after a few days' persistence will either spontaneously subside, or will do so by any treatment adopted for the probable catarrhal complaint co-existent with it. Of many such cases that have come under my notice, the membrane of the cords is seen in the laryngeal mirror to be vividly red, especially upon their free borders, and most usually it extends to other parts of the larynx, especially to that covering the arytenoid cartilages, but not producing symptoms of acute laryngitis. According to the nature and suddenness of the attack of cold, of which exposure to draughts of air is the commonest cause, so will the voice gradually or quickly disappear. If the inflammation comes on slowly, hoarseness precedes the loss of voice, and only a mere whisper can be uttered. According to the acuteness of the attack of inflammation will there be pain in the larynx, indicated by the pointing of the finger of the patient to the *pomum Adami*, a peculiarity witnessed in acute laryngitis. Sometimes a strongly distended

vein is seen to run parallel with the attached edges of the cords, as in two cases noticed by Lewin, of Berlin, associated with croupy cough and dyspnœa; the cords appeared quite bloody. In many of these cases of chorditis the pathological changes can be inferred before the mirror is introduced into the mouth. It was so in the following instance, which I select from a number of others, as a fair example of the acute form of the disease.

CASE. *Acute inflammation of the vocal cords, producing aphonia, and seen by aid of the laryngoscope, cure in ninety minutes.*—Mary H—, æt. 34, married, and mother of one child born sixteen years ago, was admitted as an out-patient at the West London Hospital, under my care, in August, 1862, for aphonia. Last winter she had suffered from an attack of bronchitis, from which she recovered, but occasionally she has coughed up to the present time. A week ago she complained of rheumatic pains, for which she took medicine, and almost immediately after her voice completely “went away,” for she could not speak at all. This she thought was the result of taking cold after the medicine, for she sits in draughts. She is subject to burning heats.

On examination the aphonia was found to be complete; she could utter a whisper, but so low and faint that it was with considerable difficulty she could make herself understood. She had pain externally, in the upper part of the thyroid cartilage, to which she pointed with her finger, corresponding to the hollow behind the pomum Adami. On inspection with the laryngoscope, which was performed without any difficulty or resistance, the mucous membrane covering the vocal cords was seen slightly tumefied, and of a bright crimson-red colour. The bright redness seemed to be confined to this part of the larynx, for other parts were of a light pink. The action of the cords was limited, for they divaricated but slightly on forcible breathing; she could utter no audible sound, such as

“ah” or the letter “a.” A solution of nitrate of silver (two scruples to an ounce of water) was applied directly to the bottom of the larynx, by means of a curved camel’s-hair brush. This was followed by comparatively little spasm, and a very slight amount of dyspnœa—indeed less than was anticipated. She was ordered a mixture containing small doses of tartar emetic, nitrate of potass, and acetate of ammonia in water.

This patient did not return to the hospital for some days, and fears were entertained that the laryngeal symptoms had increased, and prevented her stirring out. On the 25th, however, she presented herself, and appeared to be in good health, with a clean tongue, clear complexion, and in the possession of her natural voice. It was then ascertained that she returned home on the 14th (eleven days previously), immediately after the application of the nitrate of silver to the larynx, and remained quiet. In an hour and a half afterwards her voice returned in full power and compass, without any pain or effort, and continued good. A laryngoscopic inspection showed disappearance of the redness of the vocal cords, the subsidence of the swelling, and restoration of the mucous membrane to its normal condition.

As she was now free from any inconvenience beyond a slight cough and a little soreness in swallowing, she was discharged cured, with a caution so to regulate the economy of her dwelling as to avoid being placed in a direct draught between windows and door.

The foregoing case is given without unnecessary detail; it sufficiently tells its own story, and shows the rapidity with which the aphonia and inflammation yielded to the means employed.

From among many other cases of chorditis not less striking and interesting than the foregoing, and where cures were accomplished as speedily by the same treatment, so much so as to give the inflammation quite an ephemeral character, I

select the following. The autolaryngoscopic demonstrations of Czermak, myself, and others, will no doubt be called to mind by its perusal. A person who is enabled to examine and to show his own larynx to others, can, if necessary, touch the interior of it with any suitably curved instrument, armed with some medicament, by adopting proper firmness and self-reliance. Providing that the necessary instruments are to be relied upon, he can employ them with as much safety and certainty upon himself as others, using reasonable dexterity. The following case is in illustration; the dates are given, as the circumstances will be remembered by some of my medical friends:—

CASE. *Chorditis vocalis, from cold, producing sudden loss of voice; autolaryngoscopy; a circle of redness seen round the vocal cords; cure after self-application of topical treatment.*—On Sunday evening, May 5th, 1861, at half-past six, I entered into one of the tramway omnibuses at the Marble Arch, and as it proved to be full, I stood in front with the driver. During the ride to Notting Hill, I was exposed to the full force of a strong wind blowing at the time. On reaching a friend's house at Bayswater, and making an effort to speak, to my surprise I found my voice almost wholly gone, and had to converse in a very low tone, a little louder than a whisper, accompanied with hoarseness. Next day there was no improvement, and aphonia was complete. On practising autolaryngoscopy, which I did with facility, a circular zone of redness of the mucous membrane was observed around the vocal cords, without any apparent tumefaction. Here was the cause of the aphonia explained. Although alone and unassisted, I applied, with the aid of the laryngoscope, a sponge dipped in a solution of the argento-nitrate of mercury to the interior of my larynx. This was probably the first occasion that such a proceeding had been attempted upon oneself, and was accomplished with precision and facility, being followed

by spasm and dyspnœa of about twenty seconds' duration. I kept quiet during the day, and did not essay to speak. Next day there was a marked improvement in the voice and in the redness. In a couple of days later the voice was quite restored, and the larynx had assumed its normal condition.

It is probable that had I treated another in the same condition, instead of myself, the cure would have been even more speedy; but fearing spasm, especially as I was alone, the application of the sponge was more gentle, and therefore less efficacious, perhaps, than it might have been. I may observe, *en passant*, that at that time the centre of my neck and chin were unprotected; since then the natural appendage and covering has been allowed to grow, and although sometimes exposed to even more violent winds than on that occasion, no inconvenience has resulted. This is a plea for the beard.

On laryngoscopic examination, the gravity of many of these cases become apparent; for the inflammation is seen to be very acute, and confined to a part of the larynx which, if not checked, might lead to disastrous results. I have habitually practised what has hitherto been looked upon as fraught with danger, but which my own experience and that of Dr. Horace Green convinced me might be attempted without any risk, and that is the direct application of a solution of nitrate of silver sufficiently strong to arrest the inflammation. It may seem startling at first sight that a solution of this substance should be applied to the larynx in a state of acute inflammation. Indeed it was not without much misgiving that I employed it myself in the early part of 1860, fearing that the spasm resulting from it might produce a suddenly fatal result. I remembered, nevertheless, an instance of success in Dr. Green's hands (which is noticed in Chapter III), when all other means had failed; and in some cases of acute laryngitis that came under my care this plan of

treatment proved curative, without any dangerous spasm, beyond some dyspnœa and cough, which lasted for perhaps a few minutes; and even these might have been obviated if the solution had been applied by means of a soft brush, as I am now in the habit of using, instead of a sponge. The laryngoscope is a great auxiliary both for diagnosing the amount and extent of the inflammation, and for applying the solution with the aid of one's vision. I am now, I may say constantly, in the habit of *seeing* my brush enter the larynx, and do its allotted duty, with a precision that is really astonishing. And I should not attempt the local treatment of *any* case of laryngeal disease without a primary laryngoscopic inspection, for the chief reason (previously referred to in section IV of Chapter I) that the epiglottis is occasionally found to be lying almost flat upon the glottis, and further pressure upon its anterior surface downwards would be mischievous. Some distressing cases of this kind sent to me for diagnosis, have been already narrated.

The *sub-acute* or mild form of chorditis vocalis producing aphonia is the commonest of the inflammations, readily curable in the beginning, if some treatment is adopted, and sometimes passing away *sua sponte*, without any treatment. It is very common in those who live in damp kitchens. A single application of the solution of nitrate of silver, either immediately or within a few hours, removes the inflammatory condition, and the voice is restored. The redness is not so vivid as in the severely acute form, but the larynx generally is more congested, and the membrane slightly swollen and relaxed. In the beginning of last November a surgeon residing in the Euston Road called upon me with aphonia, resulting from a condition that appeared intermediate between acute and subacute inflammation of the vocal cords. The local treatment adopted restored the voice the same night, as he told me a few days afterwards, a matter to him of consequence, for he was actively engaged in practice himself.

I am constantly in the habit of treating such cases at the Westminster Hospital, and the voice commonly returns the same night or following day.

If neglected or direct local treatment has not been carried out, the inflammation becomes *chronic*, and in some instances gives rise to conditions which either render the aphonia extremely difficult to cure, or wholly incurable. Its consideration, therefore, may be best entered upon in the next division.

B. *Induration and thickening* are usually the results of the chronic inflammation just described, and are placed separately, because the treatment consists of constitutional measures as well as local. They are more commonly noticed in females, and ulceration in males. The vocal cords are seen of a dark crimson or deep-pink redness, not the vivid colour of acute inflammation; they have a sort of elevated and in some instances a rounded form, due to thickening of the mucous membrane or submucous deposit, imparting to them an indurated and rigid character. The effect of this is to narrow the aperture of the glottis. The thickening sometimes is of the character of hypertrophy of the true structure of the cords, or at others of a deposit of an interstitial character. When such is the case, the immediately subjacent structures in the sub-glottis are involved, and it is in such cases as these that there is the tendency to the formation of out-growths from some portion of the affected cords. This variety of aphonia, as well as many of the others, I became familiar with, long before the introduction of the laryngoscope, by the examination of persons who had died mostly from other causes, having watched some with great perseverance for years. This has enabled me sometimes to make out the causes of the aphonia beforehand when the history is pretty clear, and the laryngoscope has confirmed them.

C. *Edema, supra-glottic or sub-glottic*, is another consequence of chronic inflammation of the vocal cords keeping up

the aphonia. Associated with the morbid condition of the true cords is an œdematous swelling of the false cords, more or less chronic, which in some cases prevents the true cords being seen in the laryngeal mirror, and giving rise to pain and soreness even in attempts to whisper. This condition is often present in persons with some specific constitutional vice, such as gout, rheumatism, syphilis, or even chronic chest disease, and also in albuminuria.

The sub-glottic œdema, on the other hand, consists of effusion of layers of lymph beneath the membrane, and directly involving the cords, so as wholly to impede their action. The calibre of the larynx is thus sensibly diminished, and the cricoid cavity becomes nearly filled up by sub-mucous indurated tissue, which I affirm to consist of organized lymph, reducing the voice to a hissing or feeble whisper. A case of this kind related by Cruveilhier, and some others, are noticed in Chapter III.

Edema of the aryteno-epiglottic folds, or of the epiglottis itself, results in aphonia, so does ulceration of the fossæ at the roots of the tongue, and on the sides of the aryteno-epiglottic folds.*

The treatment of these chronic states of disease is wholly different from those described in section A, for whilst the acute forms require antimonials and diaphoretics, with other measures, the chronic must be treated by the preparations of iodine and bromine internally, conjoined, as may be considered necessary, with mercurials in very small doses, and likewise the persevering and frequent use of various topical agents, either dissolved in glycerine, or in distilled water; these are, the nitrate of silver, and argento-nitrate of mercury, amongst others. The strength of the first of these is noticed further on, but it is quite possible that a voice that shall have been

* Dr. Green's paper on 'Aphonia,' before the Medical Society of London, at the reading of which I was present. The 'Lancet,' vol. i, 1854 (p. 516).

impaired or lost for three or four years, may be recovered in as many weeks.

D. *Ulceration of the vocal cords*.—The reader will have been prepared for the modifications and utter extinction of the voice, as the result of ulcerative mischief around the glottis and neighbouring parts, from what has been already stated in the preceding chapter. Our knowledge of the physiology of the larynx tells us that all the minute ligaments and muscles in their healthy combination are necessary towards the perfect development of the voice. The injury of any of these necessarily impairs the production of sound.

Of the morbid lesions which pathology has shown to influence the voice, ulceration is the agent which tells with the greatest severity in extinguishing it.

The presence of ulcers is made known to us by a considerable alteration in the voice; and if they become extensive, or exist in certain parts, eating away the attachment of the vocal cords, the voice is extinguished. It may be laid down as a rule, that, under any circumstances, ulcers in the larynx alter the tone of the voice. If they form on the vocal cords, the voice is materially affected; it is rendered raucous and hoarse, according to Ryland, if the mucous membrane covering one of the vocal cords only is affected. It is reduced to a mere whisper if both cords are ulcerated. On the other hand, if the ulceration spreads and destroys, or even injures the vocal cords, "the state of aphonia is complete, no proper vocal sound is distinguishable, and a whisper, which is simply an articulation of the ordinary respiration, remains."* This has been beautifully confirmed by the laryngoscope.

It has been observed by some writers, that ulcers in other parts of the larynx cause little, if any change, either in the power or tone of the voice, but in this I cannot agree. They have been found in every part of the larynx, and the voice is almost invariably modified by their presence; hoarseness is

* Ryland 'On the Larynx and Trachea.'

chiefly observed, with a decided alteration in the character of the voice, noticed particularly by the patient's family ; speaking causes pain, and leaves a sensation of fatigue or uneasiness. When present between the arytenoid cartilages or on the posterior wall of the larynx, vomiting not unfrequently occurs. Sometimes the vocal cords may be laid bare by the ulceration, and the voice, although rough and hoarse, is not extinguished.

For some particular reason, most of these ulcerations and other lesions, with their accompanying aphonia, are found to occur in men ; many of them may commence primarily in follicular inflammation within the windpipe, and the voice will become gradually hoarser and hoarser until it ceases altogether. With what has been related, together with the patient's previous history, the diagnosis can be made out in the majority of instances, even before the introduction of the laryngeal mirror ; and if too much mischief has not occurred, and the parts which are so essentially important to correct phonation, such as the vocal cords, are not destroyed, there is a prospect of the recovery of the voice by the topical use of the strong argental solution. Ulceration of the vocal cords, if confined to the mucous membrane, is susceptible of complete cure.

As to the various solutions I am in the habit of employing, a few words are necessary on the strength of those of the nitrate of silver. Solutions varying from two to four scruples of the crystals of nitrate of silver to the ounce of distilled water will be found sufficient for most purposes, as already pointed out in a previous page. The two-scruple solution is the most serviceable for ordinary occasions, such as introduction into the larynx, trachea, behind the nose, or the fauces. Indeed, one of less strength than this is really trifling with the patient, as the experience of others teaches, as well as my own. One of the ablest of modern surgeons, whose opinion is entitled to very great weight—Professor Pirrie of Aber-

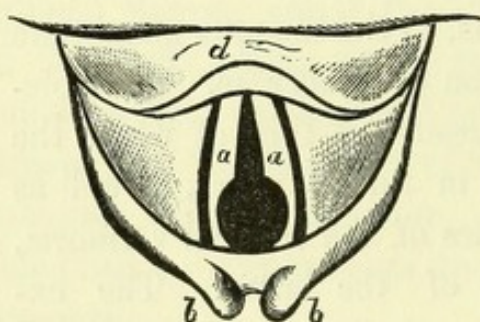
deen,—in the last edition of his standard work upon Surgery, says, “ My own experience leads me fully to agree with Dr. Green and Dr. Gibb, that a solution of less strength than from two to four scruples of the salt to an ounce of distilled water should rarely be used ; and that if the object be to arrest ulcerations upon the epiglottis or about the opening of the larynx, a stronger solution may be employed with advantage ” (p. 793). I am the more anxious that there should be no misunderstanding upon this point, because the impression prevails amongst many practitioners that a solution containing ten grains or a scruple is sufficiently strong for topical use, and fears are entertained of employing anything stronger. Need I say that these fears are groundless? On the other hand, while advocating solutions of a certain strength, I cannot too strongly deprecate the practice, which prevails with some, of applying the solid nitrate, or the strongest concentrated solutions, to the mucous membrane of the throat in a state of ulceration or otherwise. A wholesale destruction of tissue is the result of this, of which the epiglottis not unfrequently comes in for its share, as well as the structures in front of the bodies of the cervical vertebræ, and which has led to exposure of the latter. The extreme delicacy and great importance of the structures entering into the formation of the larynx especially, should never be forgotten.

Many cases of aphonia from ulceration of the vocal cords are given throughout the first chapter, and are scattered also throughout this volume. I shall, therefore, introduce two examples only in this place, the first of rare interest, from the peculiarities associated with it.

CASE 1. *Aphonia for two years, with atheromatous disease of both vocal cords, and loss of substance in each posteriorly ; suffocating attacks of dyspnœa necessitating laryngotomy, and subsequently tracheotomy.*—Mrs. Mary Ann M—, æt. 47, was

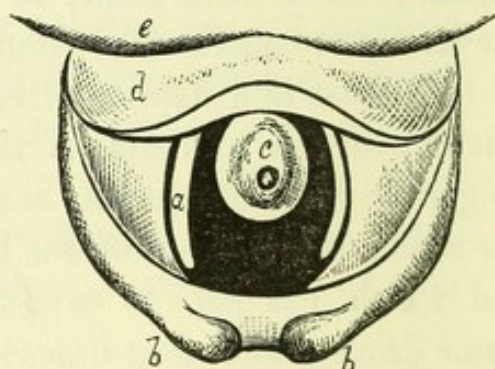
admitted into the Westminster Hospital, on June 16th, 1863, under the care of my colleague Dr. Fincham. She had had aphonia for two years, in Devonshire, on and off, and her whisper was almost inaudible; a laryngoscopic examination, which I made at Dr. Fincham's request on the 20th June, showed short and narrow vocal cords of a bread colour streaked with brown, their posterior free margins being ulcerated away, as shown in fig. 31, so that complete approximation was impossible, and the air passed out without resistance on endeavouring to utter sounds. The cords were undergoing atheromatous conversion as occurs in the blood-vessels. A solution of nitrate of silver was occasionally applied, at my suggestion. In July she was seized nightly with terribly severe attacks of spasmodic dyspnoea, which

FIG. 31.



a, a. The true vocal cords, uniformly ulcerated at their posterior free margins. *b, b.* Arytenoid cartilages. *d.* Epiglottis. The letter *d* is below the back of the tongue.

FIG. 32.



a. The right vocal cord; the left is seen narrowed. *b, b.* Arytenoid cartilages. *c.* The silver canula, with a small hole in it. *d.* The epiglottis. *e.* Back of the tongue.

threatened suffocation several times, and was wholly unrelieved by any plan of treatment. Laryngotomy was performed by Mr. Christopher Heath in the early part of August, with good results, for the dyspnoea at once ceased. She subsequently spoke quite well and loud several times with the tube in the larynx; on the 10th October I examined her again with the laryngoscope,

in the presence of several of the pupils and visitors, when the glottis was seen widely expanded, the right vocal cord well seen, the left but slightly, and the shining surface of the silver canula distinctly and easily perceptible, as in fig. 32. Before the operation, the atheromatous condition of the vocal cords was demonstrated many times to the pupils and others, among the latter to Dr. G. Fedeli of Rome; and, afterwards, the silver tube was seen below the glottis in the laryngeal mirror by Dr. Davison of Paris, Dr. Fedeli, my colleagues Dr. Fincham, Mr. Holthouse, Mr. Heath, and many others, and even a small opening on the upper surface of the tube was recognisable. Sunlight was used occasionally when present.

The tube worn was a flattish, short, angular one, and had to be taken out daily for cleansing; this caused great suffering to her, but she could not wear a double canula, from the shape of the larynx and the irritation its introduction caused. I therefore advised the removal of the tube altogether, and to allow of closure of the wound; and if there was any return of the spasms of dyspnœa, to perform tracheotomy, which would obviate any difficulty in the wearing of double tubes. This was kindly acceded to by Dr. Fincham, and it was removed the end of October.

A subsequent examination showed the glottis to have assumed its first appearance; the vocal cords were of a whiter colour, and there was a tendency to the recurrence of spasm, as the wound in the neck gradually closed up. By the end of November the attacks of dyspnœa were again so distressing that tracheotomy was inevitable. On the 1st of December, the operation was done by Mr. Holthouse in the operating theatre without chloroform by means of a double hook, with a rapidity and dexterity I have rarely seen equalled and certainly never surpassed; the incision through the skin, the insertion of the double hook into the trachea, the entrance of the blade of the knife between the double hook dividing

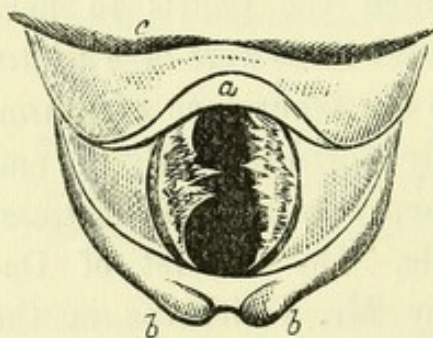
the tracheal rings, then their divarication with the hook, and finally the introduction of the double tube, did not occupy more than a *single minute* from first to last. There was no hæmorrhage, and a few minutes afterwards the patient rose from the table, and walked to her ward as if nothing had happened. Mr. Holthouse may be justly complimented for his skill and dexterity in these operations, which I have had proofs of several times, both in public and private. My last examination was on the 15th January, 1864, when I again saw the canula, now lower down: and on putting her finger over the opening, she uttered some audible sounds. She left a few days after for Devonshire, quite well, for the spasms had entirely ceased.

This remarkable case may be called a *vocal paradox*, for the aphonia was mainly due to the loss of substance of the vocal cords, yet when a tube was worn in the larynx it permitted of phonation.

CASE 2. *Aphonia from considerable loss of substance of both vocal cords.*—Thomas L—, æt. 32, a coachman, consulted me March 7th, 1863, recommended by Mr. P. B. Giles of Staunton-on-Wye, near Hereford. In November, 1861,

he caught cold, followed by hoarseness, and in October, 1862, his voice went away altogether, and was reduced to a whisper. General health perfect. The laryngoscope showed loss of substance of both vocal cords, anteriorly and posteriorly, as shown in the sketch, giving to their middle a prominence, possessing a light, fawnish-drab colour. In attempts at sound they approximated, but formed an incomplete

FIG. 33.



- a. The epiglottis, below which are seen the irregular and jagged vocal cords. b, b. Arytenoid cartilages. c. Back of the tongue.

and imperfect glottis. My efforts were directed to produce a hoarseness, through loosening of the subglottic folds of mucous membrane; in accomplishing the latter, I was successful, so that the glottis closed better, with more substance about it, yet it only increased the intensity of the whisper. I showed this patient to Professor Czermak and Mr. Lund of Manchester, on the 27th of May last, and I still hope to give him an audible hoarse voice.

E. *Growths and tumours of the vocal cords*.—Since the first edition of this work appeared, now four years ago, wherein the subject of polypus and other tumours of the windpipe was discussed in five and forty lines, the most astonishing advances have been made in their pathology in the living, and, perhaps, nothing has so strikingly demonstrated the value of the laryngoscope, as the diagnosis of such growths and their successful removal after years of suffering. Their supposed rarity in the larynx as compared with the throat was due to the impossibility of making them out during life, and hoarseness even of many years' standing, with occasional attacks of aphonia, was not suspected to depend upon the presence of polypi. A glance at the hospital museums of London and elsewhere will show the existence of a fair number of preparations, indeed much larger than would be supposed even at the present moment of these tumours. I have inspected all in the metropolis, and in many of the provincial museums; the following table shows at a glance those preserved in the London museums; they number thirty-one; and it will be seen that eleven occur in children, three in youths, and seventeen in adults. Their situation and size are also given.

Table of Vegetations and Growths in the

No.	Hospital.	Label.	Situation.
1	Guy's Hospital	1690 ⁹⁵	Whole upper surface of right vocal cord
2	ditto	1702	Entire surface of both vocal cords and ventricles
3	ditto	1703	Entire sacculus and both vocal cords of left side
4	ditto	1703 ²⁰	Entire right ventricle
5	ditto	1704	Posterior part of larynx, in a line with sacculi
6	St. George's Hospital	110	Upper surface and ventricles of both vocal cords
7	ditto	—	Whole length of left vocal cord
8	College of Surgeons	1859	Both ventricles and upper surfaces of vocal cords
9	ditto	1859A	Posterior part rima glottidis, and extends as high up as upper border of epiglottis
10	ditto	1864	Inner surface of left wing of thyroid, involving cricoid and arytenoid cartilages and vocal cord
11	Army Museum	506	Whole of left vocal cord
12	Middlesex Hospital	VII. 26	Above and below both vocal cords, and sides of epiglottis
13	University College Museum	O.49	Large one from left ventricle, smaller from pomum, and another below the second
14	ditto	O.50	Entire surface, above and below both vocal cords, and all posterior surface of epiglottis
15	ditto	O.51	Entire outer surface of right vocal cord

Larynx, preserved in the Museums of London.

Form.	Sex.	Size.	Remarks.
Papillary	Child	Small.	
Cauliflower vegetations	ditto	Minute.	
Cauliflower	Adult	Small marble.	
Polypus, pedunculated	Adult female	Size and shape of a tamarind	
Warty or cauliflower	Woman	A bean.	
Papillary and warty	Boy, aged four	Small clusters.	
Warty	Woman	Four fifths by half an inch.	
Cauliflower or warty	Adult male	Two large and separate marbles	United anteriorly. Hunterian.
Pyriform and pedunculated	Adult male	One and a half inch long and three quarters of an inch in diameter	Its anterior surface projects forwards.
Probably medullary	Adult male	Irregular walnut.	
Warty	Adult	Round and large.	
Numerous and warty	Youth	Small clusters.	
Cauliflower or warty	Adult	First, a large marble	A very remarkable specimen.
Warty vegetations	Child	All small.	
Foliaceous	Child	Small Barcelona nut.	

No.	Hospital.	Label.	Situation.
16	St. Bartholomew's	22	Surface of epiglottis and superior orifice of the larynx
17	ditto	25	From both sides of the whole larynx, filling it.
18	ditto	17	Whole of larynx, ventricles, and base of epiglottis
19	ditto	33	Attached to right epiglottic fold, narrow end hanging into glottis
20	ditto	38	Above and below vocal cords and base of epiglottis
21	St. Thomas's	52	Upon and below vocal cords, chiefly below whole
22	ditto	53	Whole of true and false cords and the ventricles
23	ditto	54	Springing from left arytenoid cartilage
24	St. Mary's	F. a. 16	Median line between origin of vocal cords
25	King's College	376.4	Whole of right ventricle
26	ditto	None	Vocal cords posteriorly
27	ditto	388.	Middle of left vocal cord by a narrow pedicle
28	ditto	388.1	Both sides of larynx, above and below vocal cords
29	ditto	389	Origin of left vocal cord by a small pedicle
30	Royal Free	128	Projecting from posterior part of the larynx
31	Westminster	—	Base of epiglottis and above the whole right ventricle

No. 17. Had dyspnœa a week after birth, and lived three years ; died of phthisis, with croupy symptoms.

„ 18. Had dyspnœa from birth, and died suffocated two years old. It is the most beautiful preparation in any of the London museums.

Form.	Sex.	Size.	Remarks.
Flat, spongy	Adult	Small marble	Medullary, a part ulcerated.
Warty, tuberculous mass	Child	Small and numerous	Congenital.
Warty and pedunculated	Child	Numerous, small	Congenital and extensive.
Epithelial	Adult	One inch by one and a half, triangular.	
Warty, fibro-cellular	Boy	Clusters, closed glottis.	
Filamentous and warty	Child	Fringe, quarter of an inch wide	Fissure of ventricles well seen.
Pedunculated and warty	Child	Spanish nut	In three or four groups
Fibroid, with a peduncle	Man	Small walnut.	
Epithelial, warty	Boy	A large pea.	
Tuberculous	Woman	A bean	Phthisis pulmonalis.
Warty	Child	Very minute	Mr. Wood.
Cystic	Woman	Small damson stone.	
Warty	Child	Small and numerous.	
Fat and areolar tissue in mucous membrane	Woman	Large marble.	
Warty	Adult	Size of a bean	No history.
Fibrinous	Adult	Small peas.	

No. 24. Hoarse for some years; died of scarlatina, aged eight years.

„ 27. Looks like an hydatid. This and No. 28 are figured and noticed in Ryland's work on the larynx, pp. 228-9, and plates 5 and 6.

In the London Hospital and Charing Cross Museums there are no examples.

The *situation* of laryngeal tumours in the great mass of preparations is above and below the *origin* of the true vocal cords ; larger and more disseminated above, smaller and more compact below. The root of the epiglottis above the vocal cords, and the subglottic space anteriorly below the cords, have the preference over any other part of the larynx for their development, and this can be readily understood when it is remembered that all the explosive effects of coughing, hemming, and similar acts, vent themselves upon that part of the larynx more than any other, during the succussion which the air undergoes. Persons who have palsy of the cords without approximation can cough, and the point of resistance in the production of the tussal sound is the anterior sub-glottis. Next to the spots mentioned the anterior free borders of the vocal cords give rise to the tumours, and progressively backwards upon their surface and border, but rarely from the edges of the cords far back. The inner surface of the cricoid cartilage, below and between the arytenoid cartilages and vocal cords posteriorly, come next in point of frequency, and sometimes in size. The ventricles of the larynx come last, but are probably the most important seat, for suffocation is most imminent when the tumours thence ensuing begin to grow apace. Occasionally, but more rarely, they spring from the false cords, and the aryteno-epiglottic folds, generally as the result of syphilitic, catarrhal, or cancerous disease.

In *number* they vary much according to the character of the growth, being generally broad and flat and sometimes numerous in syphilitic cases, and single or isolated, perhaps double or treble in others. In one instance, shortly to be detailed, there were four from the surfaces of the true and false cords, in another as many as five ; but I have counted eight, twelve, and upwards on museum specimens.

Their *size* is generally small, fortunately, from a pin's head to a pea, or a bean, or perhaps a tamarind stone ; but larger, the size of a hazel nut, are seen in the true epithelial or warty

variety of the disease. In the Museum of King's College is a circular polypus of the larynx the size of a marble, attached by a pedicle to the inner surface of the *pomum Adami*. No. 389. A small pea is perhaps the size most commonly met with. When free they are circular or oval in *shape* and pedunculated, but if attached by a flat base they are conical, or irregularly flattened, cauliflower-like, and foliated. Their obstruction to breathing is in proportion to their size and situation. They are more often witnessed in the male than the female *sex*, and occur at all ages, from the newly-born child to the adult, but are comparatively infrequent in old age. A child of four years of age, under the care of Dr. Wilks, died of diphtheria, and a papillary polypus was found growing from one of the vocal cords, which no doubt gave rise to the inflammation.*

In St. George's Hospital is a preparation from a male child aged four of papillary vegetations on the entire surfaces of both vocal cords, many projecting from the ventricles. For two years he suffered from dyspnœa; croupy during sleep. In the early part of 1862, a female child, aged two years, was brought to me with stridulous breathing, existing since her birth and strongly simulating laryngismus. I passed my index finger into the larynx, and felt several soft growths attached to the left side of the larynx, and intended to scrape them away with my nail, but lost sight of the child, who must have died unrelieved. A somewhat similar case is noticed in the section on laryngismus.

Their *nature* has been found to be simply epithelial, that is, composed of scales of the squamous variety, or fibro-cellular, when the former has been interlaced with fibrous tissue. The latter condition predominates in the chronic or long-standing cases, and the former in the more recent. The epitheliomal or carcinomatous variety of disease is excluded from this place, and meets with attention in chapter four. In rarer instances the tumours are cystic, fibro-plastic, fatty, and follicular;

* 'Medical Times,' 1859.

sometimes a prolongation of the mucous membrane only from a mucous follicle.

Their character and *mode of origin*, however, is often modified by disease. Thus, in syphilitic dyscrasia, they will partake of warts of the same nature elsewhere; in follicular disease, the follicles on the surface of the cords or elsewhere, will enlarge and form warty growths, with coalescence sometimes of several together into one large mass. They may be offshoots from an hypertrophied vocal cord whose structure has undergone some interstitial or molecular change. At first they resemble little acuminate, tooth-shaped processes on the free edge of the cords, which may grow or not; at other times they simulate bead-like projections on the upper free edge of the cords, which may subsequently disappear under progressive pathological changes. When arising from below the cords anteriorly, it may be from a puckering or plication of the mucous membrane, the result of relaxation from cough or other cause; and posteriorly between and below the arytenoid cartilages I believe an ulcerated surface, probably secreting pus, is the cause of their origin, for there, more than in any other place, they seem to partake of the character of a foliaceous wart.

Does nature ever remove them? is a question that may be asked, and the answer is in the affirmative, and probably more frequently than we have at present any idea of. An illustration is related further on. Under such circumstances there is every probability that the growths are renewed from time to time in cases of degeneration of the true structure of the vocal cords. Further information upon their *repetition* or renewal would prove of much value.

Diagnosis.—If a clear view of the larynx is obtained with the laryngeal mirror, there is nothing easier than a good view of a polypoid or other growth, especially when originating from any part of the vocal cords, or situated between them in front or behind; and not uncommonly in such cases, especially

in males, the larynx is very capacious and readily inspected. The interest felt in these cases has made me always anxious to show them to others not less experienced in the use of the laryngoscope than myself, and of those recorded in these pages, particularly where their removal was accomplished by means of my *laryngeal ecraseur*, in every one my diagnosis was confirmed, not merely by one or two, but by several experienced laryngoscopists, and, with two exceptions, the tumours were obtained after removal, and have been preserved, so that their structure could be made out. Of the two exceptional cases, in one there were two tumours; one was expectorated after detachment, the other was swallowed; whereas in the second case the growth came away in shreds and fragments, and could not well be preserved; yet there was plenty to examine under the microscope.

The marvellous results in my first case were such that I remarked to the kind friends who freely and ably assisted me, that no one could realise them unless with the assistance of strong corroborative testimony, for they were like miracles. In my second case the immediate consequences were even more remarkable still than in the first, for the patient, who was partly under the influence of chloroform, the very instant the *ecraseur* was removed from the mouth, after detaching the tumour in a very difficult situation, immediately exclaimed, in a *loud voice*, before even consciousness had returned, that he felt that the tumour was cut off, previously to which the voice was a low, rough whisper. The four gentlemen present were as agreeably surprised as myself, and the emotions of the patient were difficult to control, for he had got back his natural voice after a ten years' absence. Of my remaining other cases the results were equally gratifying, showing, therefore, the utter impossibility of any error in the diagnosis so far as the growths were concerned. If they were not there how could the cure have so speedily followed the simple introduction of the *ecraseur*; the patients could not have expectorated

polypi from their bronchial tubes. Knowing, therefore, the ungenerous nature of mankind, I would strongly advise every one practising laryngoscopy to get his diagnosis carefully confirmed, as has been the custom with myself, and then, if the removal of the tumour is to be accomplished by instrumental interference, let him do it with the assistance of one or two reliable and trustworthy friends, else some *malignant rascal* will try and rob him of his justly earned fame. Yet, kind reader, there are such people in this world.

“ O, heaven, that such companions thou'dst unfold ;
And put in every honest hand a whip,
To lash the rascals naked through the world.”

According to the position occupied by the tumour so will it influence the voice ; this will be better explained by a reference to some of the annexed cases, wherein will be noticed in the woodcuts the form and seat of the growth ; indeed, without illustrations, lesions of form could not very well be understood.

In the *treatment* of laryngeal tumours, the question must be discussed whether their nature, form, and situation will permit of their complete and effectual removal by any instrument, or require their discussion by means of agents directly applied to them. Now, if the tumour possesses a base of attachment, peduncular or broad, so situated that it can be encircled by a loop of wire, or laid hold of by forceps or minute vulsellum scissors, the preference should be given to this mode of removal, more especially as the result is sharp, quick, and decisive, On the other hand, if the swelling is upon the upper surface of the vocal cords, and with a firm base, no matter how small it may be, its removal can only be attempted by applying every few days the solid nitrate of silver by means of Mathew's instrument described and figured in the first section of the first chapter of this work. In some of my cases this result was obtained by means of various

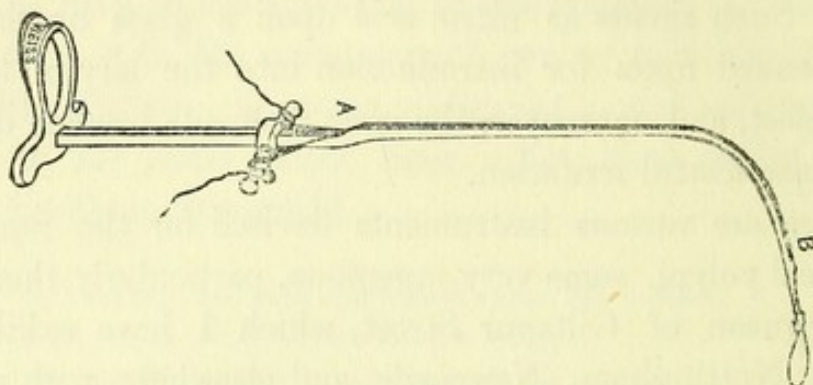
solutions, astringent or otherwise, according to circumstances, and with satisfactory although somewhat tedious results. As a rule, however, the solid nitrate will be the most useful for these tumours, and I now extensively use it for such a purpose. Such agents as nitric acid upon a glass brush cannot be depended upon for introduction into the larynx to effect this object, and, moreover, the glass filaments become detached and cause fearful irritation.

There are various instruments devised for the removal of laryngeal polypi, some very ingenious, particularly those made by Ferguson of Giltspur Street, which I have exhibited at Bristol, Nottingham, Newcastle, and elsewhere, with my own *ecraseur*. But as every one has a preferential liking for his own invention, I have invariably employed my own. Dr. Walker of Peterborough used a Gooch's double silver canula bent at a suitable angle with a loop of wire at the end. The *principle* of the instrument was in my mind long before his paper was published, of using a loop of wire if ever I were required to remove a growth from the larynx, as preferable to the great bulky instruments used on the continent for this purpose, which possessed an enormous curve like a lithotomy sound. Indeed, how they could have been introduced with this great curve was to me an enigma. The following is the history of my own *laryngeal ecraseur*.

In 1862, after making the diagnosis of a polypoid tumour attached to the vocal cords of a gentleman who had been hoarse and aphonic for twelve years, and who had undergone all manner of treatment during that time, the observation was made to me that it was satisfactory at least to be told the nature of one's complaint; but that now that it was known, he should like to get rid of it. Reflecting upon the matter very carefully for a few days, I arranged the principle of an instrument in my mind for some time which would remove small tumours by means of a loop of wire to be drawn home on catching the pedicle. Messrs. Weiss and Son most ably

seconded my efforts, and at once comprehended the nature of what I so much desired.

FIG. 34.



The laryngeal ecraseur which I first used.

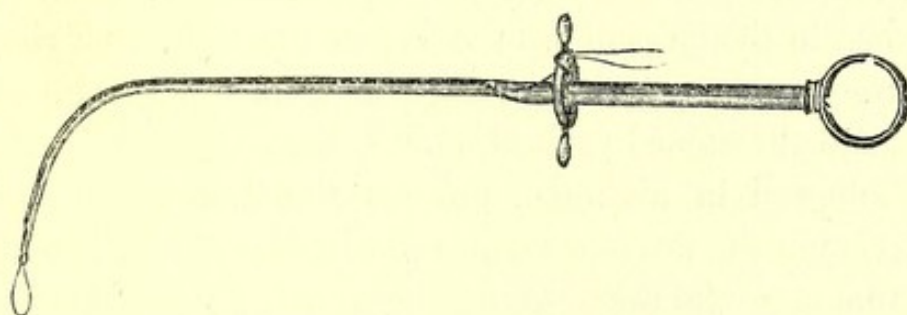
I had carefully experimented on the dead larynx and tongue to get the requisite amount of curvature, so that the moment the instrument should be introduced into the living larynx, the end of the curve in connection with the loop of wire should reach the hollow in the thyroid cartilage corresponding to the *pomum Adami* at the root of the epiglottis and origin of the true vocal cords. This I took most particular pains to ascertain with great accuracy, and then tried it on the dead body with complete success. The instrument was made, and is represented in the accompanying woodcut. It consists of a small square bar, with a ring attached to one end (for the thumb), and terminating at the other in a curved stem, which is grooved on its upper or convex surface to within half an inch of the point. The latter has two small holes drilled in a line with the groove. A cross-piece slides on the bar, against which the fore and middle fingers rest. A fine steel wire is passed through the holes of the point (so as to make a loop), carried along the groove, passed through the little holes of the cross-piece, and then wound round it two or three times. On introduction, the loop of wire catches the laryngeal tumour like a noose; it is drawn home, the pedicle is cut

across, and the tumour detached. The instrument in its action is not unlike that of Wilde's snare, but it is considerably modified to suit the requirements of the larynx.

Its slender form, very little bulk, and easy manipulation with a single steel wire, renders it superior to any other instrument with which I am at present acquainted. In all my cases it was applied without any difficulty, as the many gentlemen can testify who were present at my operations.

The laryngeal ecraseur, as shown in figure 34, I used three or four times, but have since modified it with advantage in turning the cross-piece of movable steel at right angles to the curve of the instrument. The white metal ring has been removed, and one of steel substituted, placed in the same plane as the curve of the limb. This has permitted of very ready application, more so than in the first contrivance, and its simplicity is even increased. Fig. 35 shows it in its improved form.

FIG. 35.



My improved laryngeal ecraseur.

Wilde's snare, with its loop of wire for aural tumours, I was acquainted with before I had the pleasure of reading Dr. Walker's most interesting and highly important communication in the '*Lancet*' of November, 1861; and I am sure he will acquit me of the least desire of appropriating to myself any credit on the score of similarity of the principle of his instrument and mine so far as the loop of wire is concerned. His instrument and mine are widely different, as

will be manifest to the most casual observer; his double canula would be employed with difficulty in such cases as I have treated, wherein an instrument was required that would take up the *smallest possible room in the larynx*, without the necessity of having two tubes as in Dr. Walker's.

If the growth can be got rid of wholly by one operation, no matter how accomplished, whether by the loop of wire or any other instrument, it should be done; *unless the growth is large and disseminated*, it should not be taken away in small fragments and pieces at a series of sittings, because the irritation thus likely to be set up is very liable to degenerate into epithelioma and the ultimate death of the patient. This fact cannot be too well borne in mind.

Chronology of the operation in England.—Dr. Walker of Peterborough has the merit of being the first person who has removed a growth from within the larynx in England, by means of the laryngoscope, and this was on the 18th of August, 1861, when he extracted a tumour in three portions each the size of a pea from above the right vocal cord, and attached to the epiglottis, in a lad of fourteen, with complete success in a very bad case, for the growth formed a sort of valve and threatened suffocation.*

I followed in his wake, and was the first to do such an operation in the metropolis, on the 6th November, 1862, when two tumours were removed, one from between the vocal cords anteriorly, the other from the anterior part of the free border of the left vocal cord, with satisfactory results. My second operation was on the 2nd December, 1862. Since then I have practised it in six other cases, all of which are detailed further on. Without any disparagement to the claims of Dr. Walker, I may say that I was the first in England to remove a growth directly attached to the vocal cords. On the 17th May, 1863, Mr. Bracey removed a considerable portion of a polypus from the larynx of a patient of Dr. James Russell

* The 'Lancet,' 9th Nov., 1861, p. 444.

in the General Hospital, Birmingham. This operation was repeated two or three times on the same patient by Mr. Bolton. When at Nottingham during the past summer (25th August, 1863), Dr. Ransom showed me a small bottle containing a number of small growths removed a short time before by Mr. Thomas Wright, with my *laryngeal ecraseur*, on various occasions, and he mentioned that it was applied with great facility. The result in that case and in my own conclusively shows that the little tumours do not necessarily drop into the trachea, and even if they did, they are readily expectorated and collected. No other person that I am aware of has done this operation, although it has been attempted several times in this metropolis.

The operator has his choice of diminishing sensibility either by the use of bromide of ammonium in large doses, or by chloroform. I now give the preference, when necessary, to a few whiffs of the latter.

In children, with the physical signs of obstruction, assistance is required in holding the child to use the laryngoscope, from the dyspnoea and stridor present; and if this is impracticable, the index finger must be introduced to feel for any growth, and if readily reached it should, if possible, be scraped away with the finger nail. This is, however, a proceeding that requires some dexterity.

Polypi of the larynx may likewise be removed by the electric cautery as recommended by Czermak. Althaus says that Professor Middeldorpf's galvanic burner, porte-ligature, and seton, are the most convenient instruments for cauterization by means of galvanism.*

Illustrative cases.—I shall now relate the chief cases of growths of the larynx, which I have successfully treated.

CASE. *Organic aphonia for twenty-two months from foliated epithelial growths on the true and false vocal cords; recovery*

* 'Medical Times,' Sept. 13th, 1862.

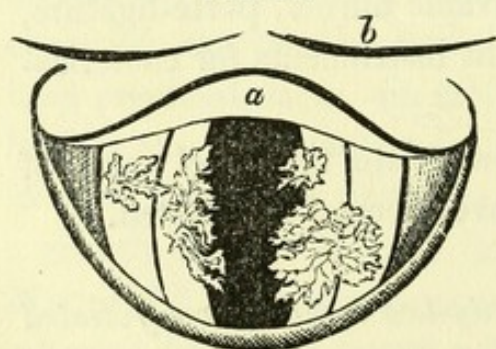
of the voice in five months.—A young man, æt. 24, a worker in precious stones, came under my care in July, 1860. He had gradually lost his voice twenty-two months before, and could utter only a very low laryngeal whisper. Sometimes for days together there was complete dumbness. Whispering was usually associated with great pain, straining and tightness of the chest, referable particularly to the thyroid cartilage; general health bad. He had contracted syphilis three years ago, with secondary eruption and sore throat. A little mirror was used to look at the deeper parts of the throat, and I was enabled to see the laryngeal surface of the epiglottis. It is figured in the first edition of this work at page 34, in the chapter on lesions of that cartilage.

It was not, however, until October, 1860, that I examined him in the regular way with the laryngoscope, and made out the nature of his complaint. Warty growths of a foliaceous form were discovered above the true and false vocal cords. One, large and broad, nearly covered the posterior third of the left true and false vocal cords, overlapping the free border of the true, whilst a smaller was situated more anteriorly on the free border of the true cord. The free border and part of the surface of the right true vocal cord was in connection with a long growth, and a smaller one occupied the anterior part of the right false vocal cord. These are shown in the figure. (Fig. 36.)

The glottis could not close, and therefore voice was extin-

guished. The treatment consisted in the topical application of solutions of nitrate of silver and argento-nitrate of mercury on many occasions. Small doses of bichloride of mercury and iodide of ammonium were given internally. The growths gradually shrivelled up and were wholly ab-

FIG. 36.



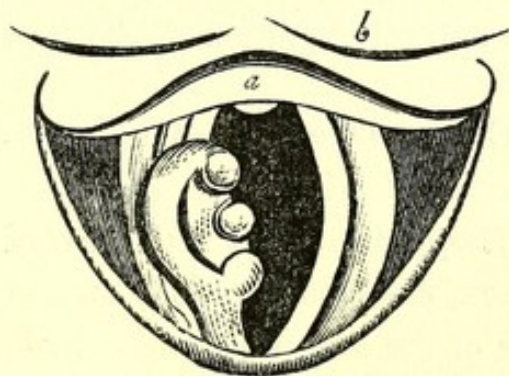
a. Epiglottis. b. Back of the tongue.

sorbed, and the mucous membrane assumed its natural condition, as well as both true vocal cords. The whisper in the meantime became gradually louder and louder, until the voice returned in about five months, and in two months later he was perfectly cured.

The growths, I believe, were solely confined to, or originated upon, the mucous membrane, and were specific in their nature, although not necessarily so in the majority of cases.

CASE. *Organic aphonia for five years, from a tumour on the right vocal cord, cure in seven months.*—A young lady, æt. 29, came to me, accompanied by her aunt, in August, 1860. Her general health was good in every respect, excepting that she had a violent attack of cold with sore throat, followed by hoarseness six years ago, and after the lapse of a few months the voice became gradually extinguished, so that a whisper was reduced to absolute dumbness. Yet on two or three occasions the whisper returned, but again to disappear. She had consulted many men of eminence, who looked upon her complaint as hysterical, and she was treated accordingly, without any or the slightest benefit. At times dyspnœa was distressing and her health suffered, but the aphonia had existed for five whole years. Local and general treatment produced some slight benefit only. On the 24th October, 1860, she was submitted

FIG. 37.



a. The epiglottis. *b.* The tongue.
The tumour is seen on the right vocal cord.

to laryngoscopy, when the cause of the aphonia was at once revealed: for a large, nodulated, and somewhat oval tumour occupied nearly the whole of the right vocal cord, excepting its anterior eighth, encroaching upon the false cord, and protruding across the glottis (*see wood-*

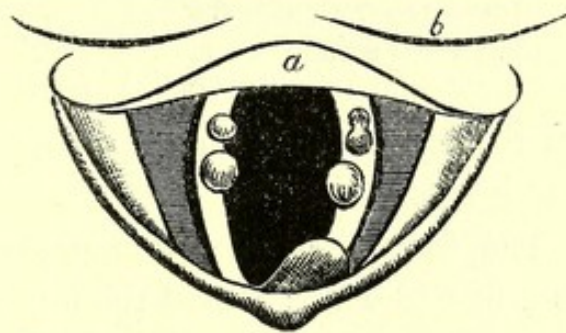
cut). It was red and fleshy, and quite immovable, whilst the left vocal cord was white and slightly movable, and bent outwards. Nothing else was noticed beyond general congestion of the throat and trachea. Of the nature of the tumour it was then impossible to say, but as it had existed for some years in a comparatively young person, it was not malignant.

The treatment varied, being chiefly iodide of ammonium and tincture of iodine, occasionally associated with sanguinaria and nux vomica. Topical applications were persevered in with regularity and frequency, by the aid of the laryngeal mirror, of nitrate of silver, nitrate of mercury and silver, sulphate of copper, tannin, &c. The second appeared to do the most good, for in a little time the growth began to get smaller, and by degrees absorption went on, until there was little or none of it remaining. Coincidentally with its decrease the whisper became stronger, the voice increased in tone and intensity, until it became natural at the end of seven months. The cord now acted well and met its fellow, and the remains of disease quickly disappeared as the voice strengthened. The mucous membrane of the cord remained red for some time and then disappeared, and, beyond some slight irregularity of the surface, it was of proper width and colour. My impression now is, that the growth was originally follicular and confined to the mucous membrane, possibly an agglomeration of several enlarged follicles, for the reason that the natural condition of the cord was preserved.

CASE. *Organic aphonia for three years, from tumours on both vocal cords, one near the left arytenoid cartilage, protracting the cure to nine months.*—H. B—, æt. 22, resided in Essex, came to London, and was treated for consumption at one of the hospitals. She had lost her voice for three years, and was given cod-liver oil, steel, and the neck and chest were blistered numberless times. She had a slight cough, but she said her throat caused it. She spoke in a low whisper, and

its laryngeal softness and tone at times gave the belief that she was suffering from ulceration of the follicles of the larynx, especially as there was some follicular disease of the pharynx. The catamenia were regular. General health middling, but she did not look phthisical. The most careful examination failed to detect any pulmonary disease. The laryngoscope was used on the 27th October, 1860, and several tumours were found on the surfaces of both vocal cords, two on the anterior half of the right, both slightly overlapping the edge of the cord; and four on the left, the largest situated at its posterior part close to the arytenoid cartilage; another smaller was on the middle of the cord; these two, especially the former, overlapped the edge of the cord; whilst two very much smaller lay on the surface, on the anterior third of the cord. All these are seen in the drawing (fig. 38).

FIG. 38.



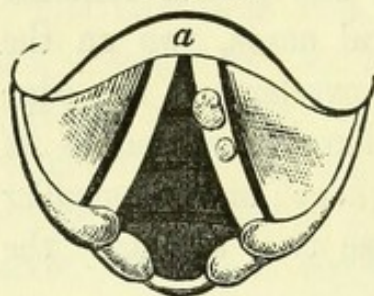
a. The epiglottis. *b.* The tongue. The tumours are seen on both vocal cords.

These growths were regularly touched with various applications, and one by one gradually disappeared; in the interim the voice was slowly returning, but it was not until nine months after laryngoscopy was first practised that the remains of the last and largest growth had completely disappeared, when the voice assumed its full and natural compass and power.

CASE. Varying aphonia for eighteen months, from two small congested growths on the surface of the left vocal cord.—The subject of this was a young lady, æt. 20, supposed to be phthisical, who came to me on the 2nd of November, 1860. Her voice was weak, at times reduced to a whisper, for the period of eighteen months. General health good.

Laryngoscopy showed two swellings or tumours of a deep crimson colour upon the surface of the left vocal cord; one was situated near its anterior third and projected over the free edge of the cord. Although these did not interfere with its action, they nevertheless impaired phonation. The drawing (fig. 39) gives an accurate view of them.

FIG. 39.



a. The epiglottis. The two tumours are seen on the left vocal cord.

She was treated for three months by the local application of various solutions and the internal use of the iodide of ammonium, when the growths disappeared, the voice being restored to its usual power and strength without any further attacks of weakness or aphonia.

I have no doubt that these took their origin in two of the follicles of the mucous membrane.

The four cases of aphonia just detailed were some of the very first in which I used the laryngeal mirror, and they well illustrate its value both for diagnosis and treatment.

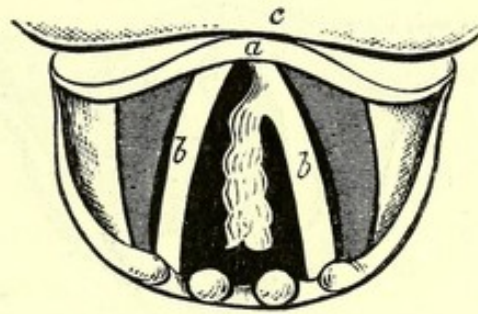
CASE. Dysphonia and acantophonia for ten years, rapid growth of an elongated polypus from the left vocal cord, subsequently undergoing spontaneous expulsion.—The subject of this was a young lady, whose voice had been affected for ten years, but not lost, after singing the higher notes. In March, 1861, the glottis was pear-shaped from imperfect action of the anterior part of the vocal cords. This condition, due probably to paralysis, disappeared, and the glottis became oval. In May, 1862, she was seen with me by Professor Czermak, when a number of little tubercular bodies were observed on the edge of both cords like a row of small beads; these disappeared under treatment, and in June the glottis opened widely, and the voice was stronger. In August three

small spiculæ were noticed, two on the right and one on the left vocal cord, producing no inconvenience. In the beginning of February, 1863, the appearance was presented, as seen in the drawing, of an elongated growth, originating from the anterior part of the left vocal cord, and about two thirds of its length running parallel to both cords from before backwards. It did not hang downwards into the trachea, and when the glottis was closed it lay over the fissure. This was seen by the young lady's brother (a surgeon), her father, sisters, and other persons. It had formed in five months. In the first week of March the pedicle of attachment, which was small, became strangulated one evening, and permitted of spontaneous expulsion, thus obviating the necessity of its removal by operation.

In the 'Brit. Med. Journ.' for June 28th, 1862, is recorded an interesting case by Dr. Sieveking, where an elongated growth not unlike that in the foregoing instance was present, but springing from between the origin of the vocal cords.

CASE. Hoarseness and aphonia for twelve years, from two polypoid growths which were removed from within the larynx, by means of the laryngeal écraseur. Instantaneous cure.—The patient was a gentleman, æt. 37, who had been the subject of hoarseness and varying aphonia for twelve years, which supervened upon an attack of yellow fever in the West Indies. In recovering from this, he was profusely salivated, and permanent hoarseness commenced. In the open air, he

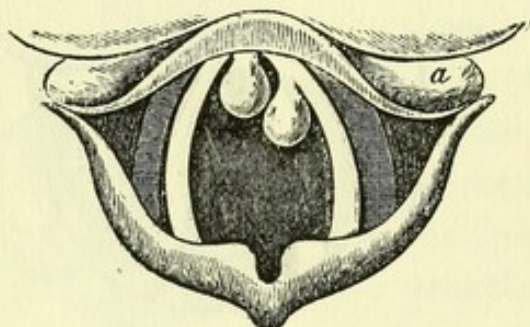
FIG. 40.



- a.* The epiglottis. *b, b.* The vocal cords; the left gives origin to an elongated polypus.
c. The tongue.

spoke only in a whisper; in-doors the voice was stronger, and possessed a rough and hoarse laryngeal sound. He had been under every variety of treatment for many years without any benefit, as the true nature of his malady was never made out,

FIG. 41.



a. The epiglottis. One tumour is seen to arise between the two vocal cords anteriorly, the other from the left vocal cord.

until examined by myself with the laryngoscope for the first time in November, 1862. Two distinct, fleshy, pedunculated, polypi were seen attached to the vocal cords nearly as large as peas. One was situated between the two cords anteriorly, whilst the other was attached to the anterior free border of the

left vocal cord, as shown in the woodcut (fig. 41). This patient was shown to some twenty-five gentlemen, amongst others, to Mr. Henry Smith, of Caroline Street, on the 5th. On the 6th, I succeeded in removing, with the laryngeal *écraseur* of my own contrivance (manufactured for me by Weiss and Son), by the aid of the laryngeal mirror, the left tumour; and on the 8th, the other, situated in the median line, with the able assistance of Mr. George Lawson and Mr. T. Carr Jackson.

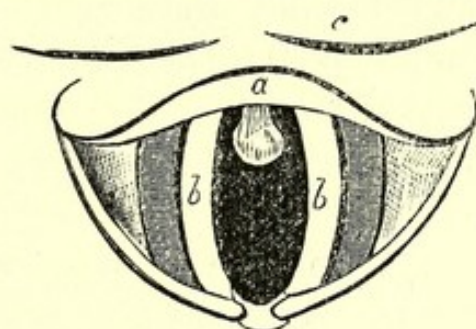
The voice and hoarseness instantaneously improved, he could readily fill his chest with air, and felt much more ease in breathing. There was no bleeding. Anæsthesia of the fauces had been produced by the internal use of the bromide of ammonium.

Under the microscope, the growths were found to consist of delicate fibres without nuclei, in a transparent basement membrane, with multitudes of epithelial cells, many of which were free.

A little congestion of the larynx followed, but the recovery was most satisfactory, and the voice became strong.

CASE. *Hoarseness and dysphonia for ten years, from a fibrocellular polypus of the larynx, the size of a pea, successfully removed, with immediate cure.*—The patient was a gentleman, æt. 42, the subject of hoarseness and dysphonia for ten years. He had rubeola at twenty-four years of age, pertussis at thirty, and variola at forty. The voice possessed a sort of hoarse whisper, and was constrained as if the trachea was tied. He had undergone every variety of treatment, but the nature of his complaint had never been suspected. The laryngoscope showed the long existing symptoms to depend upon the presence of a polypus the size of a pea, situated immediately below the origin of the true vocal cords, and no doubt originating in the anterior part of the subglottic space. In speaking, the tumour would glide upwards between the cords, and so prevent their approximation. The left aryteno-epiglottidean mucous fold was swollen from œdema, and impaired in its action. The drawing accurately represents the condition of the larynx as sketched at the time (Fig. 42).

FIG. 42.



a. The epiglottis. *b, b.* The vocal cords, between which is seen the polypus. *c.* Back of the tongue.

The polypoid growth was alternately prominent or retiring, according to the state of relaxation of the throat.

Anæsthesia of the fauces was produced by the internal use of the bromide of ammonium; yet on attempting to introduce the laryngeal *écraseur*, the reflex action, through contact with the epiglottis, frustrated attempts at removal, notwithstanding the celerity of my movements. On the 10th December, 1862,

aided by Mr. Alex. Ure, Dr. Richardson (who admirably gave chloroform), Dr. Logan, and Dr. Fisher, I very readily succeeded in catching the pedicle in the wire noose of the *écraseur*, and the tumour was detached. The merest trace of blood was visible.

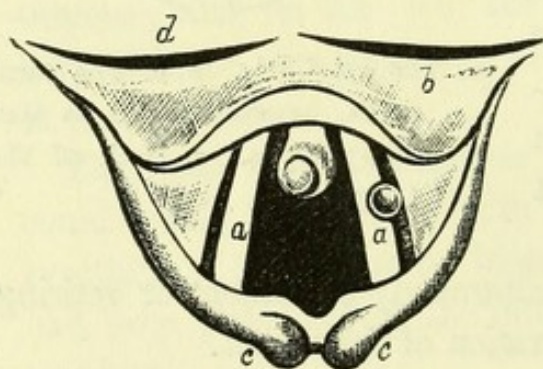
The result of the operation was marvellous. The voice *instantaneously* became altered and sonorous, the chest filled with air, and the patient felt as if suddenly possessed of increased bodily power and energy. Nothing untoward followed, and a good recovery ensued.

In composition the growth was similar to that removed in the previous instance, consisting almost wholly of epithelial cells, with a very few interlaced fibres.

CASE. *Hoarseness and aphonia for nineteen years, from a polypus of the larynx, successfully removed.*—Captain H—, æt. 47, for many years in China, California, and coasts of the Pacific Ocean, consulted me on the 23rd Dec., 1862, accompanied by Dr. Theobald Smyth, who had been his companion most of the time. For nineteen years he had constant hoarseness, always ending in loss of voice in particular states of the

weather, especially damp. General health good, but face very red. Voice a rough, tremulous hoarseness, which made me suspect a growth beforehand. Laryngoscopy showed a small oval polypus between the vocal cords anteriorly, with a distinct sulcus running across it, as per sketch (Fig. 43). He was prepared by very large doses of the bromide of ammonium

FIG. 43.



a, a. Vocal cords, between which is seen the polypus; a small one is noticed on the left. *b.* The epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of the tongue.

and on the 6th of January, 1863, with the assistance of Dr. Logan, Dr. Smyth, and in the presence of three other gentlemen, the pedicle was readily caught in the wire noose of the *écraseur*, and was divided, the growth coming away with the instrument. I did not allow him to utter a sound for twelve minutes, until I applied an astringent solution to the subglottis, for fear of bleeding, although there was none, and to our astonishment, he spoke in a slow, distinct, and pretty loud tone, without any hoarseness. Indeed, it had disappeared as if by magic; and up to the period of his departure from England his voice was stronger and better still.

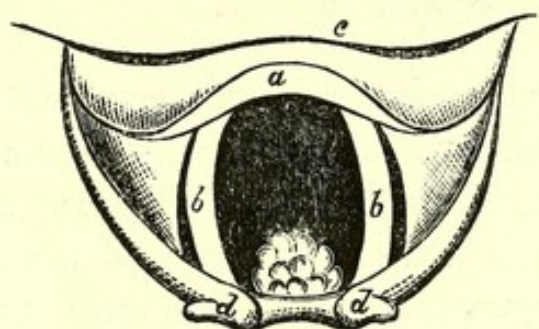
CASE. *Constrained hoarseness for eighteen months, depending upon a warty growth of the larynx, removed with the laryngeal écraseur; cure.*—Mr. Henry D., æt. 51, had had hoarseness for eighteen months, of a peculiar laryngeal character, indicating obstruction, which I suspected beforehand to be due to a warty growth. This was verified by the laryngoscope, which revealed a

tumour as large as a pea springing from the posterior part of the larynx, between the vocal cords and arytenoid cartilages, as shown in the woodcut (Fig. 44.) He had been

under various persons, without any relief, and was still a great sufferer. By local treatment the growth

shrank a little, but it was mostly removed with the laryngeal *écraseur*, on the 22nd of February, 1863, at which operation I was ably assisted by Mr. W. F. Teevan. His voice and general health greatly improved, but the tendency towards a laryngeal tone in the former for some time remained.

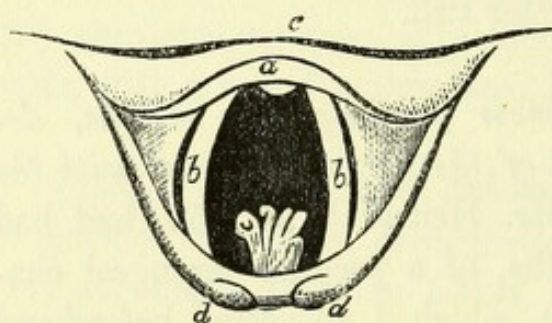
FIG. 44.



a. The epiglottis. *b, b.* The vocal cords, between which is seen the growth. *c.* Back of the tongue. *d, d.* The arytenoid cartilages.

CASE. *Loss of voice, with an occasional hoarse whisper for fifteen months, from a warty growth at the back of the larynx, which was successfully removed.*—This patient was a young lady, æt. 25, placed under my care by Dr. Routh. She had lost her voice from a cold in December, 1861, and never regularly recovered it, and the whisper was at times rough and hoarse. Health very good. The laryngoscope revealed a fissured wart (Fig. 45) at the posterior part of the larynx, in the same situ-

FIG. 45.



- a. The epiglottis. b, b. The vocal cords, between which is seen the growth. c. Back of the tongue. d, d. The arytenoid cartilages.

ation as in the foregoing instance. This patient, in common with the others, was examined by several gentlemen, who confirmed my diagnosis of the growth. On Sunday, 29th March, 1863, she was given a few whiffs of chloroform, by Dr. Routh, with an inhaler of his own contrivance, and sensation was removed from the larynx. I then

proceeded to remove the growth with the laryngeal *écraseur*, which was accomplished with the greatest ease on the second introduction of the *écraseur*, and with no bleeding. The voice immediately improved and became strong, but she subsequently lost it two or three times, from attacks of cold, to which she was exceedingly liable. She had a strong tendency to pulmonary tuberculosis, and her vital capacity was weak.

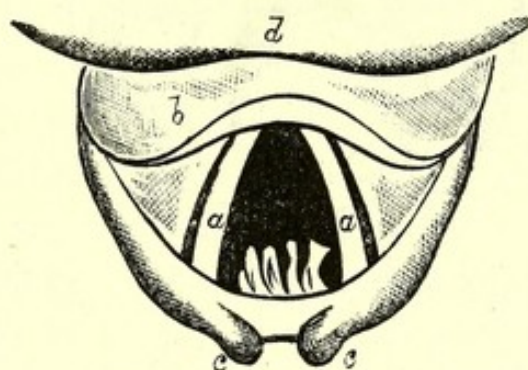
I saw her quite lately, and her voice was in a good melodious tone, and there was no appearance of recurrence of the growth, nor, in fact, in any of the others, where opportunities were afforded me of examination.

CASE. *Occasional aphonia, with a constant unconscious*

catch of the breath, from a cluster of small papilliform growths in the posterior subglottis; removed with the laryngeal écraseur.

—Lydia C—, æt. 16, pale and anxious-looking, with a very thin neck, was admitted under my care at the West London Hospital, early in March, 1863, in very delicate health, for she had never menstruated. She had occasional aphonia, and spoke as if she had a cold, with a sort of unconscious catch in the breath, with some dysphonia, which induced me to examine her with the laryngoscope. To my surprise, I found a cluster of papilliform bodies situated below the vocal cords at the posterior part of the larynx, and wholly concealed in the approximation of the cords during phonation. She was examined several times, and shown to my colleagues, and the resident medical officers, who very readily saw the growths from the position they occupied, as shown in the sketch. On the 31st of March, with the aid of Dr. Logan and Mr. Sturges, they were readily separated with the *écraseur*, a portion coming in the loop of the wire, and the remainder expectorated immediately after. The peculiar catch disappeared, as well as the attacks of aphonia, and under the use of bromide of iron, she became a stout, healthy-looking girl.

FIG. 46.

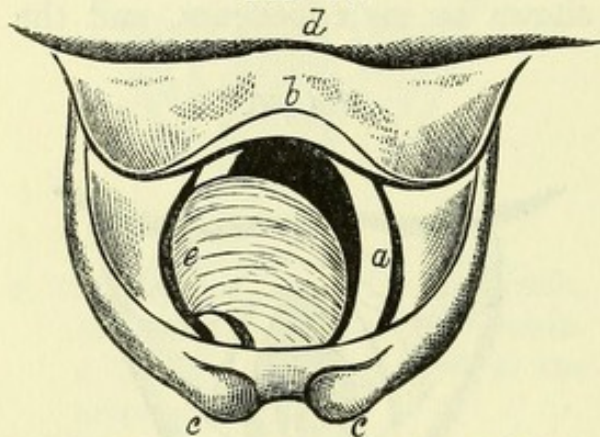


a, a. The vocal cords, between which are seen posteriorly the papilliform growths. *b.* The epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of tongue.

CASE. *Large, flat, cystic polypus springing from the right ventricle of the larynx, causing aphonia for years, and, latterly, imminent suffocation; successful removal.*—The subject of this was a woman, æt. 38, who was sent to me

from the country for dyspnœa and stridor, with aphonia, on 2nd May last. She fainted in my passage and appeared to be dying, and with great difficulty came to. She whispered that she had been without a voice for years, but latterly she was nearly suffocated several times. Fortunately, she had a capacious mouth and larynx; in the latter was seen a swelling completely occupying the glottis, and by degrees it was made out that the left cord was intact, and in some views the anterior edge of the right cord could be seen; it was evident, therefore, that the growth, whatever it was, sprang either from the right cord or the ventricle of Morgagni. The figure

FIG. 47.



- a.* The left vocal cord. *b.* The epiglottis.
c. The tumour hanging down the glottis. *d.* The back of the tongue.
e, e. The arytenoid cartilages.

shows the position occupied by the growth. The dyspnœa and weakness were such that tracheotomy would have been necessary in a few hours, and time, therefore, was of moment. I sent for Mr. Ure and Mr. Teevan, both were out, but, fortunately seconded by the aid of Dr. Logan, I introduced the *écraseur* with a large loop of wire

placed laterally, and thrice essayed to slip it down the glottis beside the growth. The parts, however, were so benumbed that this caused but little irritation. The fourth time I was more fortunate, and caught the growth about its middle; the wire was pulled home but would not cut through it, yet it was forcibly withdrawn with the growth, torn from its bed of attachment in the ventricle. A few drops of blood exuded slowly, and the woman spoke in a hoarse but low toned voice immediately afterwards; chloroform was not given. She recovered her voice well and returned to her home at a village near Brighton.

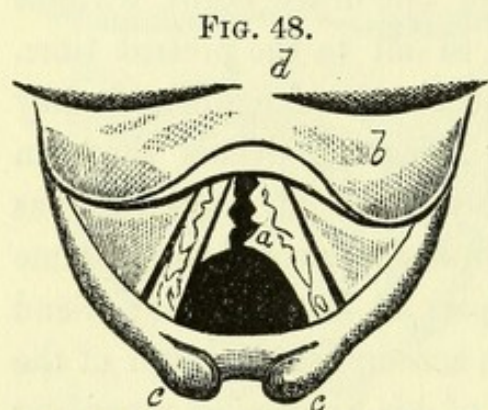
The tumour proved to be a cystic growth, developed within a protrusion of the mucous membrane from the ventricle, and the only instance like it that I know of is in the Guy's Museum, where a flattened square tumour projects from one of the ventricles, but whether it is cystic or otherwise I know not. Meckel says cystic tumours of the larynx are not uncommon, but they are rare in the London museums.

Among the foregoing are the seven cases submitted to instrumental interference up to the period of my description of the *laryngeal écraseur* (which now goes by my name), in the 'Lancet' of May 20th last. I have had another case since in the month of August, wherein a very small polypus was removed from the free border of one of the cords, without much difficulty, that makes eight in all to the present time. Without laying myself open to the charge of egotism, it may be permitted me to say, that the foregoing details show an amount of success that I feel justly proud of, and that has not as yet been equalled by any physician devoted to the same branch of medicine, in any other part of Europe. My friend Dr. Logan of Somerset Street—an accomplished master of the laryngoscope, and yet so modest of his knowledge regarding it—I cannot sufficiently thank for his able assistance in some of these difficult cases, his firmness and skill in trying moments have greatly aided me. Nor am I insensible to the kindness of many other friends, who assisted me with their counsel and co-operation in these cases of laryngeal tumour.

Before concluding this important section of organic aphonia, I shall notice the following case selected from many others, but occurring in the practice of Mr. Maunder of Old Broad Street.

CASE. *Warty growths on the free border of the left, and under the right vocal cord, thickening of both with alteration of structure and patchy discoloration.*—Mrs. Caroline A—, æt. 32, has had sore throat three years, commencing with

hoarseness, voice nearly lost for twelve months, but completely so for three, and has a leprous eruption on the limbs. Laryngoscopy at Mr. Maunder's residence, 29th December, 1862, showed warty vegetations springing from the *edge* of the left vocal cord near its origin, extending across and meeting the opposite cord when they approximated. Occasionally, there protruded from *beneath* the right cord a small vegetation attached no doubt to the membrane beneath and movable, for it was not always to be seen. Both cords were much thickened from submucous deposit, which had evidently invaded their proper structure, for they presented a white and gray patchy discoloration, with at the same time a few *very minute*



a, a. The growths between the vocal cords. *b.* The epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of the tongue.

nodules here and there. There was no mistaking the nature of the case, it was very clear. The woodcut shows them. She was examined at the same time by Dr. Mackenzie, and we agreed as to the appearance of the growths. I had the opportunity of again examining this patient on the 15th of January, 1863, when both tumours were larger, that under the right being

now more projecting, and almost in contact with that on the opposite cord.

F. Disease of the brain.—A few words upon this subject as a cause of aphonia remains to be said in concluding this important section. Actual disease in the brain is a most fertile cause, whether in the form of effusion or otherwise; the larynx then becomes wholly or partially palsied; this is referred to in Dr. Todd's lectures on the diseases of the nervous system. The various forms of apoplexy, ramollissement of the brain, and other diseases of the encephalon when they

give rise to aphonia, are not attended by any obscurity, and as the question of recovery depends mainly upon the progress that the cerebral affection may make, any remarks upon the treatment are quite unnecessary. The appearances presented by the larynx and other parts occurring under such circumstances, are briefly noticed in the section on palsy of the throat, further on. At first the aphonia may be said to be functional, but after a time it becomes organic, for the vocal cords undergo alteration in structure, become atrophied, and their innervation is impaired. They are then seen to be narrow and wasted, are irregular in outline, and their colour becomes altered.

SECTION III.—HOARSENESS. RAUCITAS.

From what has been stated in Section II, it will be readily understood that hoarseness will arise from most of the same causes producing aphonia; indeed, in a great many instances it precedes the aphonia, or else they alternate with one another, according to the particular condition that may be present acting as a cause, and sometimes they run on almost concurrently together. In hoarseness there is a voice, in aphonia none; therefore, the two cannot actually be present, yet a whisper sometimes may possess a hoarse but low sound.

Hoarseness has long been recognised as a prominent and common symptom of disease, whether located in the larynx or in the trachea. According to the amount of roughness it possessed, or to its smooth, yet low tone, was the inference erroneously drawn of the amount of congestion or inflammation of the part giving rise to it. Its period of duration, if protracted for months or years, was still believed to depend upon a very chronic state of inflammation, requiring the persevering use of counter-irritation and the adoption of alte-

rative constitutional treatment, until the various causes of hoarseness were made out by the aid of the laryngeal mirror. A commencing hoarseness, changing in its tone and character according to its period of continuance, would not unfrequently end in more or less complete aphonia, perhaps a raucous, or may be a soft and smooth whisper.

A hoarseness may persist for ten or even twenty years, without being necessarily associated with permanent loss of voice; yet experience is daily proving that freedom from occasional attacks of the latter is rare in long continued hoarseness.

The numerous causes of hoarseness shall be now briefly noticed, but the reader is referred for some additional information on this subject to a paper which I brought before the meeting of the British Medical Association, held at Bristol in August last, and published in their journal of the 28th of November, 1863.

A. *Inflammatory conditions.* Congestion or hyperæmia of the larynx, *per se*, will not produce hoarseness, unless it so involve the mucous membrane in immediate connection with or covering the vocal cords, as to interfere with their action.

Temporary congestion of the membrane covering the thyro-arytenoid muscles, and of the aryteno-epiglottidean folds, is produced when particles of dust, food, or other substances, come into contact with them in deglutition. This is commonly known as "something going the wrong way." The roughness felt in the larynx and the hoarseness are here the result of the impaired action of the laryngeal muscles through the want of harmony and simultaneous action, which arise in common with the irritation and congestion produced by the presence of the foreign substance. The membrane of the false cords is at the same time not unfrequently tumefied as well as congested, as the laryngeal mirror has shown me, under such circumstances.

Acute inflammation of the larynx or trachea is known to

cause hoarseness and dysphonia, and this has now been seen many times in the laryngeal mirror. The ulceration of a single mucous follicle will produce as obstinate an amount of hoarseness as a large extent of inflammatory disease, and if the ulcers be extensive and numerous, especially on the vocal cords, the voice is extinguished.

An artificial voice after the partial loss of substance in one or both true vocal cords, gives rise to what may be called a loud and rough hoarseness.

In cases where the destruction of the cords has been so great as to produce complete aphonia, my efforts are directed to the production, if possible, of a loud and audible hoarseness, through the intervention of the subglottic mucous membrane; and I am happy to say they have been sometimes successful, so that a person heretofore aphonic, and able to make himself understood only by an almost inaudible whisper, has been heard across a room in a loud hoarseness. This is a desirable result, when the generation of perfect vocalism is rendered impossible from the lesions existing in the yellow elastic tissue of the true vocal cords.

B. *Structural changes*.—Induration and thickening of the vocal cords are sometimes to be seen in the laryngeal mirror as causes of a painful hoarseness, as if from obstruction. The action of the vocal cords is limited, and the dimensions of the glottis much contracted; the hoarseness partakes of a laryngeal tone, and it is an effort to squeeze or force out sound.

Atheromatous conversion of the proper structure of the cords, seen as the result of advanced life, or of premature changes in the middle-aged, or even younger, and not unfrequently supervening upon other diseased actions, gives rise not only to some amount of hoarseness, but to modifications of the voice, which in its character may become harsh, cracked, tremulous, or otherwise, as noticed in Section IV. Nobody had observed this before I drew attention to the fact.

A rare cause of hoarseness is *hypertrophy of the cartilages of Wrisberg*, small bodies which are known to be either very minute and rudimentary, or sometimes wholly wanting in man. I have often dissected them in monkeys, and exhibited the larynx of one of these animals before the Pathological Society, in March, 1861, with the object of showing the size of these bodies, even in such a small animal. They are the *cuneiform* cartilages, with their bases turned upwards and their summits downward, and are situated in the centre of the membranous expansion extended between the arytenoid cartilages and the epiglottis. The name of Wrisberg serves to distinguish them from the small, round, or horny cartilages termed the *tubercles of Santorini*, or *cornicula laryngis* placed on the summit of the arytenoid cartilages, and are altogether quite distinct and different, although commonly confounded, as happened to Cuvier and Wolff. Cruveilhier denies their existence in man.

An instance of this form of hoarseness came under my observation in June, 1863, in a clergyman who had been thus affected continuously for six months.

C. *Œdematous conditions*.—Œdema of the structures of the larynx, whether above or below the glottis, depending upon various causes, often supervening upon acute inflammatory or specific affections, are generally preceded by hoarseness, or it may be a persistent symptom throughout. A painful kind of hoarseness, the hoarseness from obstruction, is produced by subglottic œdema; that is, an œdematous state of the mucous membrane of the larynx occurring *below* the vocal cords, as described in Chapter III. It is a totally distinct affection from the supraglottic œdema—the form of œdema with which we have heretofore been familiar—but which likewise gives rise to hoarseness until the voice is extinguished.

A lax condition of the mucous membrane of the *false cords* and epiglottidean folds, with sometimes tumefaction or swelling, or submucous infiltration are causes of hoarseness as verified by the laryngoscope.

In recent cases of hoarseness—cases in which this symptom has been present perhaps but a few months or weeks only—the cause is found not unfrequently to depend upon a swelling and loose condition of one or both false cords, indeed several cases have come under my care where it was confined to but one, and no other cause was apparent beyond some amount of congestion of the membrane covering the true cords. The swollen false cord will project towards the median line and conceal the true cord of the same side; or sometimes muscular action is induced and the false cord is temporarily drawn to one side, and for the moment the true cord can be seen quite normal in form. There can be no doubt that, in such cases the proper muscular structure of the thyro-arytenoid muscle is affected, either by some amount of œdema, or possibly congestion, thus impairing its contractile power. It is important to diagnose this condition accurately, because the success of the treatment will depend upon it.

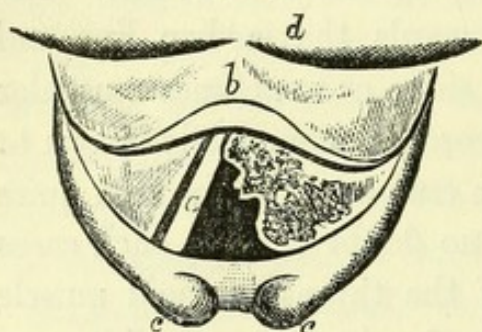
The only really good example of this that I have seen is preserved in the Museum of St. Bartholomew's Hospital; the swelling affects the left false vocal cord in a man of fifty, who died of chronic specific laryngeal disease, accompanied by loss of his epiglottis. It is really a typical instance of this form of swelling, and is well displayed in the spirit (Series 25, No. 13).

From many examples in my case-books, I select the following as illustrations, accompanied by woodcuts, so that the reader may become familiar with the appearances which the swelling presents. They are given briefly.

CASE. *Hoarseness for nine months, and some dysphonia, from swelling of the left false vocal cord, and chronic congestion of the larynx.*—The Rev. Dr. W—, æt. about 60, came to me on the 7th of October last to be examined with the laryngoscope, at the recommendation of Mr. Paget. He had hoarseness since Christmas, 1862, originating in a cold; he preached for two Sundays immediately after, but was not able to do so

since. General health pretty good in other respects, excepting some dyspnoea the last two months. The voice is decidedly harsh, hoarse and weak, and speaking is sometimes painful. The laryngoscope showed a fleshy swelling projecting inwards from the left side, as shown in the sketch, and wholly concealing the true vocal cord.

FIG. 49.



- a.* The right true vocal cord. The swelling on the opposite side is the false cord, concealing the true. *b.* Epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of tongue.

cealing the true vocal cord. This swelling was the enlarged false vocal cord, and was somewhat movable. The right vocal cord was seen natural in shape, but congested; this latter condition pervaded the greater part of the larynx and trachea. These appearances were shown to Dr. Burrows later in the same day, and readily recognised, from their remarkable distinctness, and I was permitted with his sanction to apply

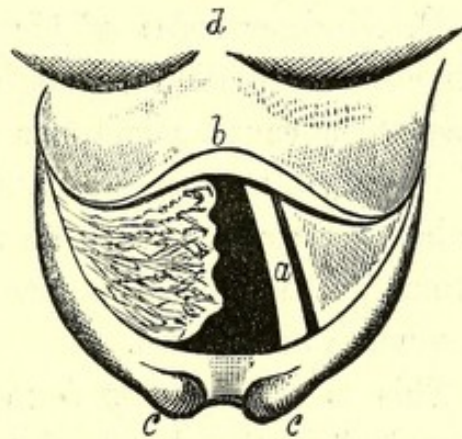
topical treatment. By the 12th the swelling had wholly subsided, both true vocal cords were seen with their free borders becoming white, and the larynx and trachea were assuming a healthy appearance. The difficulty of breathing and speaking was now nearly gone, and the voice had a laryngeal tone which seemed to depend upon some narrowing of the calibre of the trachea. He now returned to the country for a week, and on his return (21st) he was again examined in the presence of Dr. Burrows, who recognised the improvement of the voice. Both vocal cords were gaining more power of approximation, and looked more natural. On the 3rd of November the voice had a soft modulated tone, the laryngeal character having become altered; this was quite manifest to his friends. On this my last examination, again in the presence of Dr. Burrows, the vocal cords were seen much more

active and of a grayish colour, the redness having wholly gone; the larynx looked healthy. He left next day for the south of Europe to thoroughly renovate his health, and to give the vocal organs complete rest.

The local medication varied, but consisted chiefly of showers of salts of silver and zinc, and occasionally of tannin.

CASE. Hoarseness for three months, from swelling of the right false vocal cord.—Mr. W. C. H—, æt. about 45, was brought to me November 17th, 1863, by Dr. Coates, of Bath. He had been hoarse for three months, the voice was not lost, but it was a great effort to make himself heard. He was better after dining. The laryngoscope showed the right false vocal cord swollen and prominent, and *occasionally* projecting across towards the median line as shown in the sketch, concealing the view of the true cord of the same side. Both true vocal cords were healthy. A solution of nitrate of silver was applied, and medicine prescribed.

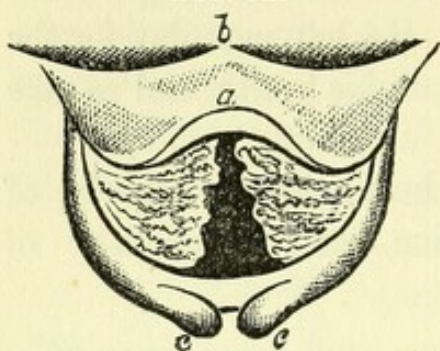
FIG. 50.



- a.* The left true vocal cord, opposite to which is the swollen false cord concealing the true. *b.* The epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of tongue.

CASE. Hoarseness for five months, from relaxation and swelling of both superior or false vocal cords.—Mr. J. T. P—, æt. 42, a medical practitioner, consulted me November 9th, 1863, recommended by Dr. Routh. Has been hoarse five months, with a cough, and occasional dyspnoea. Health broken from excessive work. The laryngoscope showed re-

FIG. 51.



- a.* Epiglottis, beneath which are seen the two false cords swollen and concealing the true vocal cords. *c, c.* Arytenoid cartilages. *b.* Back of tongue.

laxation and swelling of both superior or false vocal cords as per sketch, which concealed the view of the true cords, unless drawn to one side by a powerful inspiratory effort. The entire larynx was in a state of chronic inflammatory redness. A shower of nitrate of silver was applied, and a proper treatment prescribed, to be followed out at his own home.

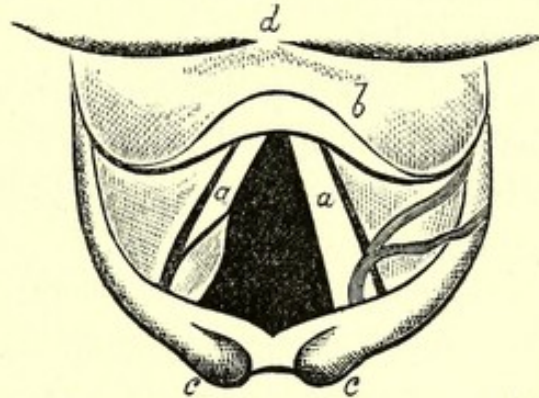
D. Varicose veins of the larynx. Phlebectasis laryngea. Impeded circulation through the laryngeal vessels, whatever may be the cause, sometimes proceeding to a varicose condition of the veins, and generally, so far as my experience leads me to believe, associated with a moderate amount of œdema, particularly involving the aryteno-epiglottic folds, produces a dysphonic hoarseness.

This is a very rare form of disease, and yet it has been described in the detail of a single case by one writer as of common occurrence. Experience has yet to prove whether this is the fact. I have, however, met with slight prominence of the veins about the throat and larynx in cases of obstruction; but, in rather an extensive experience up to the present time, the following is the only instance wherein the disease was well marked. It was cured, but the condition of the larynx giving rise to the aphonia, appeared to be irremediable for the present.

CASE. Hoarseness for two years and a half, followed by aphonia six months ago, associated with phlebectasis laryngea, in a case of chronic chorditis vocalis.—John H—, æt. 33, from Cornwall, was sent to me by Dr. Symes Thompson, March

28th, 1863, under whom he had been in the hospital for consumption. Had an attack of bronchitis six years ago, three years ago hoarseness commenced, and six months ago his voice was extinguished, being reduced to the most feeble whisper. Twelve months ago had dysphagia. The laryngoscope showed a red and inflamed larynx, with some swelling of both superior or false vocal cords, particularly of the left, and thickening of the true vocal cords, which were extensively eroded by ulceration at their anterior part. The right cord had a deep ulcer on its upper surface anteriorly, and was intersected by an oblique line about its middle, as if the cicatrix of old ulceration; it was there also swollen from old submucous deposit. There was little or no motion in the parts. The subglottis and the trachea partook of the same chronic inflammatory thickness and extreme redness. An enlarged vein of a dark bluish black colour was seen crossing the posterior part of the true cord in a single trunk; and as it reached the false cord, it divided into two branches, one and the larger crossed it towards the vestibule of the larynx, where it was lost; the second and smaller branch took a direction outwards, and was lost on the aryteno - epiglottic fold of membrane. I believe that the division in the vein occurred in the posterior angle of the left ventricle. The sketch shows the appearances noticed. The case was so unusual and peculiar, that it afforded clinical instruction

FIG. 52.



a, a. The true vocal cords; the right is swollen posteriorly from old submucous deposit. A large vein is seen passing from the posterior part of the left true cord on to the false, where it divides into two branches. *b.* Epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of tongue.

to a large number of medical gentlemen. The treatment was at first directed to reducing the inflammatory condition of the larynx and obliterating the vein, and this latter was most satisfactorily accomplished by various powerful astringents, and there was a prospect of improvement in the voice, but it proved fallacious, for the condition of the true cords was such, that although they were excited to action, and even closed and met together to form an irregular glottis, sound was not produced. Every kind of treatment was tried to bring about even a hoarseness, but ineffectually, and in September he was submitted to direct Faridisation of the vocal cords many times, but with no good result, as was anticipated. Before returning to the country he was kindly examined by Dr. Sieveking, who found the cords much thickened, very red, and at their anterior portions much eroded by ulceration, an opinion which was most strictly accurate with what I myself then saw. There was no return of the varicose condition of the vein, and he returned to the country without a voice on the 29th of September, 1863.

E. *Pressure of tumours externally.*—What has been said in Section I, Chapter II, upon pressure on nervous trunks giving rise to aphonia, is partly applicable here, for sometimes hoarseness precedes the aphonia.

Hoarseness not unfrequently arises from the pressure of intrathoracic or cervical tumours upon the bronchi and trachea, with a decided alteration in the voice as well. It varies from hoarseness to a shrill whisper, and the breathing is frequently stridulous. If circumstances be favorable, the trachea can be seen throughout its length to the bifurcation, and collateral signs must be weighed in estimating a diagnosis. Aneurisms are the most common of all tumours pressing on the trachea, and not necessarily involving the pneumogastric or recurrent laryngeal nerves, although they frequently do. When they do, the true vocal cord is found motionless upon the side on which the recurrent nerve is involved.

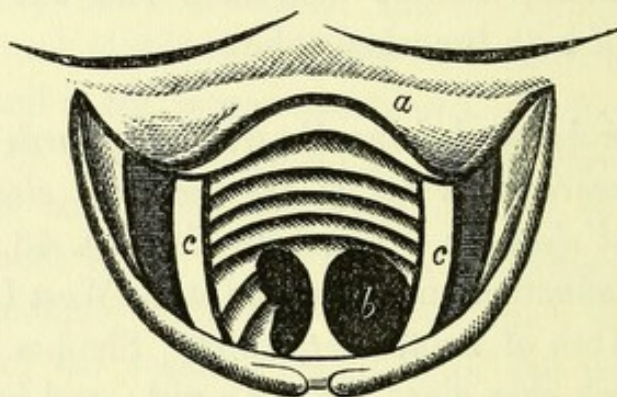
Tumours growing within the trachea, generally from its posterior wall, give rise to hoarseness which simulates that from the pressure of an aneurism, as in the details of a case given in Chapter IX.

Many patients apply for medical relief under the impression that the larynx is chiefly involved in disease, when their maladies exist in other parts of the body, although, perhaps, secondarily influencing the former. A careful examination with the laryngoscope generally clears up any doubt, as in the instance which now follows wherein a view was obtained of the entrance of both bronchial tubes.

CASE. *Bronchocele bulging the trachea inwards near to the bifurcation, neuralgic pains of the neck and elsewhere, with hoarseness and dyspnœa.*—Elizabeth T—, æt. 43, married, no children, was admitted under my care at the West London Hospital, on the 15th of September, 1862. She has had a swelling of the neck ever since she was a girl; and bronchitis for the last three months, with some slight hoarseness; is subject to pains about the knees, arms and shoulders. Two years ago had an attack of sciatica. During the last winter she suffered much from pains in each side of the neck and upper part of both sides of the chest, which she attributed to the bronchocele. At times she has pains between the shoulders, also over the heart, and she feels this latter more if she uses her arms much, when her fingers become numb. She is a very tall, stout, plethoric person, with the atheromatous expression well marked. A tumour of the size of a turkey's-egg is present on the right side of the base of the neck, resting upon the upper part of the chest, but not entering it; it is divided into two parts, movable above but not below, where it is apparently in connection with the trachea. She has no dysphagia; but when she swallows, the tumour is wholly drawn up, and she feels as if something was sticking in her neck. She has slight dyspnœa when she takes cold, and pain on either side of, but not

in, the tumour. She has follicular disease of the fauces with injection of the membrane, but no ulceration. The laryngoscope showed the epiglottis a little red, the larynx capacious, vocal cords healthy, the passage downwards unobstructed until near the bifurcation of the trachea on the right side, where there was a bulging inwards produced by the adhesion and pressure of the bronchocele since youth. In other respects the bifurcation was well seen, as shown in the woodcut, for

FIG. 53.



a. The epiglottis. *c, c.* The vocal cords widely dilated, between which are seen the rings of the trachea and the bronchial tubes, *b*, being on the left. The parts are reversed, as seen in the mirror.

the trachea was large and wide—indeed it seemed larger than usual. The bulging inwards partially obstructed the view of the right bronchus. The heart was moderately large and flabby, with feeble but regular sounds, and no distinct bruit. Its action was, however, heard all over the chest. She was nervous and low-spirited, and very uneasy about the “weakness in the throat,” and pains in the neck and chest, which made her very miserable from their steady persistence.

Under the use of general tonics, such as quinine and other remedies, and the use of an embrocation, she improved in health, and the pains diminished. The tumour appeared to become smaller, and she thought she breathed better. In November the cough was rather troublesome; this subsequently got better, as well as the hoarseness. When lately

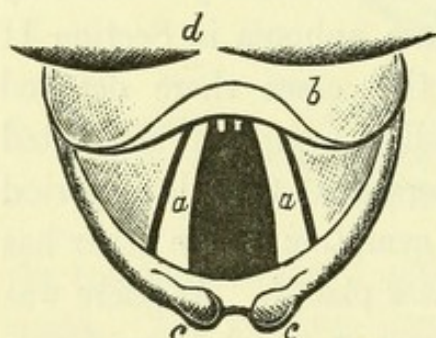
seen she was thinner, and could use her arms and hands in needlework, which she could not do when first admitted. The old pains in the limbs had wholly disappeared.

F. Polypi and epithelial growths.—The supra and infraglottic submucous areolar tissue is in some persons so lax, that there is a tendency, on the subsidence of congested or inflamed states, to the formation of little folds or plications of the mucous membrane, which grow into little polypoid tumours, or form true warts, according to their seat and the amount of resistance which they offer to the explosive succussions of the air during the formation of sound, or in coughing. These are the causes of the most obstinate and long-continued hoarseness. Submucous effusion of lymph in the subglottic region anteriorly or laterally, I have no doubt is a frequent cause of these formations, and the consequent hoarseness. These observations, however, are in reality a corollary to what has been stated upon organic aphonia in Section II of this chapter. For in many of the cases there detailed hoarseness was a prominent or leading symptom, associated occasionally with loss of voice, but persistent for a long period of years, and according as the one symptom or the other has been more prominent so are the cases placed. As there was aphonia in all or nearly all of the cases in which I was fortunate in curing the disease by removal of the exciting cause, they are given in succession in the preceding section, and thus the series is rendered the more interesting and convenient for reference.

CASE. A hoarse sound for three years, depending upon two little folds or plications of mucous membrane in the anterior subglottic space; cure.—Miss T—, æt. 22, but not looking more than seventeen, consulted me with her parents, September 26th, 1862, recommended by Dr. Arthur Fisher of Montreal. She had been under the care of my valued friend Dr. G. W. Campbell of Montreal, but came to England expressly to be treated for

her complaint. Has had sore throat for three years with hoarseness, and inability to read or speak for any long time. Her general health was good in other respects. The hoarseness was usually manifested by a kind of rough cough which was peculiarly harsh and unpleasant, but the lungs were perfectly sound. In the laryngeal mirror was seen congestion of the membrane of the larynx, but not that covering the vocal cords. The latter were widely separated anteriorly, and did not approximate perfectly there in uttering sounds, although the general voice was not bad. She was better from the treatment adopted, but the hoarse sound was still present; and on very careful examination, with most powerful light, the cause of this was made out to depend upon two little plications or folds of the mucous membrane in the anterior

FIG. 54.



a, a. The true vocal cords, between the origin of which are seen two folds of mucous membrane. *b.* The epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of tongue.

subglottic region below the origin of the true vocal cords; these are shown in the sketch, and represented of the natural size. The course to be pursued was now clear, and applications were made every two or three days, directly to the spot affected, until the mucous membrane there was restored to its natural flat position, and as this was accomplished, so did the hoarse sound disappear, and on the 26th of December, 1862, I pronounced her cured.

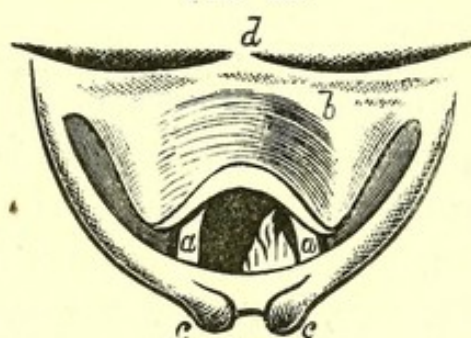
CASE. Hoarseness for five weeks, and a feeling as if a bone was in the throat, depending upon a growth at the posterior part of the larynx; pendency of the epiglottis.—Mr. P—, æt. 44, a Russian, consulted me 16th March, 1863, at the recommendation of Mr. Gay, for some affection of the larynx.

He had had a cold for some time, but sore throat for five weeks associated with constant hoarseness, dysphagia, a desire to expectorate but no phlegm coming, and with a feeling as if a herring bone was in his throat. Has much to do with shipping, and exposed to all sorts of weather. Although the voice was tremulous, husky, rough, and hoarse, it was not lost at any time. Laryngoscopy showed general congestion of the larynx, the true vocal cords were natural, yet did not close perfectly posteriorly because of the presence of a triangular warty growth, situated at the back part of the larynx near the base of the left vocal cord, as shown in the sketch. This growth was quite recent, and of a reddish colour, and permitted of some motion of the left vocal cord beneath it. The epiglottis was partly pendent, but did not permit a good view of the larynx. This patient was shown to Dr. Logan, Dr. Fisher, Mr. Ure, and other gentlemen, who readily recognised the tumour. I attempted to remove this on three occasions, and completely failed from the position of the epiglottis and extreme irritability of the larynx, although he was prepared by the bromide of ammonium for it. I therefore shrivelled it up by astringent applications, and the hoarseness improved, but there was the liability to recurrence at any time.

Many other cases which are scattered throughout the volume might have been introduced in this place, but as they are examples of peculiar conditions of disease, associated with hoarseness, it has seemed to me desirable not to give them here.

I might have added some other causes of hoarseness

FIG. 55.



a, a. The true vocal cords, between which is seen a warty growth. *b.* Epiglottis somewhat pendent. *c, c.* Arytenoid cartilages. *d.* Back of tongue.

besides those considered in this section, but sufficient is stated to show that mere congestion or chronic inflammation is not the invariable cause of hoarseness, especially in chronic cases, and that the extent and amount of counter-irritation sometimes practised to get rid of it is generally uncalled for, and decidedly debilitating, if not positively injurious, in its results. In some cases, on the other hand, the hoarseness present is not at all proportionate to the extent of the disease, and the resistance which it offers to the passage of air through the glottis.

SECTION IV.—PATHOLOGICAL MODIFICATIONS OF THE VOICE.

THE reason is by no means a valid one, that because certain forms and varieties of throat and windpipe disease occur in persons whose voices are seldom used, either in loud or long-continued speaking and singing, there should not be a peculiar and special form of throat mischief common to orators, public speakers, lecturers, clergymen, singers, and others, whose use of their voices may be carried beyond what is their average employment among mankind. Habit and custom do much in such persons to render the majority free from any disease or inconvenience. In others, again, although such an immunity may be acquired, yet, from various causes, there is a tendency towards congestion and irritation of the vocal organs, which, when fairly initiated and allowed to proceed, often gives rise to great inconvenience and mischief.

In the present section, therefore, a brief consideration of the pathological modifications which the voice undergoes, explained as far as our present knowledge and experience will permit with the aid of the laryngoscope, will be a convenient conclusion to the second chapter. The following division of the subject will, perhaps, prove the most useful, especially for reference, as illustrative cases are given under each head.

- A. In declamation and oratory—contendophonia.
- B. In singing—acantophonia.
- C. Double voice—diplophonia or vox convulsiva.
- D. Stuttering and stammering—ischophonia and psellismus.
- E. General disease.

A. *Contendophonia, a straining of the voice occurring in declamation and oratory.*

The signification of the term which I have proposed for the condition of voice resulting from an overstraining or continued exertion in public speakers and orators, whether clergymen, barristers, or otherwise, is sufficiently expressive to denote its meaning.

Among the *causes* which may be mentioned as giving rise to contendophonia are a sudden change of temperature immediately after, or whilst using the vocal organs; for instance, the sudden opening of a window, and with a very slight draught blowing upon the speaker, whose digestive organs, perhaps, may not be in a normal condition, or who may already have general relaxation of his mucous membrane. The membrane around the upper part of the windpipe, from the long-continued tension of the vocal cords in speaking, perhaps, in a state of congestion or relaxation. This takes on a semi-inflammatory state on emergence into the open air, which may produce huskiness and dryness of the throat only for the time being, but its natural condition is not resumed for it may be a long time, the congestion or hyperæmia probably ending in a chronic thickening of the parts. Besides these causes, long-protracted speaking sometimes overstrains the muscles of the windpipe, and debility is produced, which is followed by some amount of actual loss of the voice; or the voice becomes weak and changed in its tone and character. Thus, although it may be feeble from the cause mentioned, its note will be in a higher key. Or, a

man's voice will become feminine or puerile, and a female or child's voice will assume the hoarse and rough voice of a man.

As the natural voice, then, may be taken as a test of the integrity of the windpipe, so will its alteration in quality or tone be understood as depending upon some unhealthy condition of the lining membrane of the vocal apparatus which is always to be seen in the laryngeal mirror. In the class of persons referred to, the vocal organs are naturally in a state of capillary injection or hyperæmia, and are extremely sensitive, being very liable to take on changes from often the slightest cold or draught of air. A simple congestion of the vocal cords will thus produce *contendophonia*, and many of our public speakers are not unfrequently obliged to give up their vocation until this condition has been removed as happened in the case of Mr. Gladstone in 1862. Loud talking out of doors is another cause of the same thing, only that besides congestion, a thickened state of the vocal cords is present from slight submucous effusion but which is very liable to end in dangerous spasm.

Co-existing with the other symptoms of the throat-affection in speakers, there is occasionally present a catarrhal attack, accompanied with hoarseness, the result of some tumefaction of the mucous membrane and dryness seen in the laryngoscope. There is not at first any submucous infiltration, and when secretion is fully established, much relief is experienced. The occurrence of a single attack is not, perhaps, of any very great importance, but it is the frequency of their repetition which is to be feared, for then the fauces and back part of the throat become relaxed, and the uvula is elongated; besides hoarseness, there is pain in articulation, and this is likely to become increased. Vocal efforts produce fatigue and exhaustion, as if the chest were too weak to utter another syllable. The follicles of the mucous membrane become enlarged and at last ulcerate, and the character of the mischief is then changed, and follicular disease of the throat

is present. I will not deny that *contendophonia* often precedes or is the forerunner of follicular disease, but it is often again seen as a distinct affection.

In some cases where declamation has been carried to such a degree, that hoarseness and exhaustion have followed, I have seen the vocal cords vibrating like a relaxed string, from the extraordinary amount of tension they had undergone, and with this was associated spent energy of the laryngeal muscles, for their tonicity was in abeyance. For days afterwards the voice would assume a low husky tone and a roughness was experienced within the larynx.

In declamatory out-door speaking and preaching, the superior thyro-arytenoid ligaments or false vocal cords often become swollen, and assume the condition that has been already pointed out in the section on hoarseness. A husky or hoarse voice is the result, and likely to remain persistent, unless means be adopted to get rid of it.

In the treatment of *contendophonia* the particular causes giving rise to it must be studiously avoided, and rest must be enjoined for a time, that is, the use of the voice should be nearly dispensed with until a cure is performed. The judicious selection and careful application of topical agents, will be the chief means necessary to restore the vocal cords and neighbouring parts to their normal condition. Fine showers of nitrate of silver or other agents will be useful.

With this may be associated mild general measures, especial attention being paid to the organs of digestion, by carefully regulating the diet, and correcting the tendency to acidity and acrid eructations, which produce a remarkable reaction upon the throat and upper part of the windpipe.

For the condition of the fauces, such measures should be employed as have been elsewhere recommended; these consist of gargles or topical applications, as the indications suggest. The relaxed condition of the mucous membrane should be braced up by suitable tonic and other remedies, and the

altered or deepened tone of voice will resume reasonably early its natural and healthy sound.

From among many examples of contendophonia, I select the following as a good illustration of what has been described.

CASE. *Contendophonia in an orator, giving rise to occasional attacks of loss of voice and painful hoarseness for twelve years: perfect recovery in six weeks.*—The Rev. Mr. C —, of Leeds, æt. 41, a well known and popular dissenting clergyman, an orator in every sense of the word, consulted me on January 21st, 1863, at the recommendation of Dr. Lankester, the coroner for Middlesex. His history is briefly as follows:—The first seven years of his life he had croup every winter, and ever since a cough every winter (two or three attacks lasting a month). When the cough goes it generally leaves hoarseness; occasionally there is bleeding from the throat after coughing in the morning, and also has soreness at the back of the nostrils. Professor Syme and others examined him some years ago, and believed he had a congenital affection of the laryngeal nerves. His general health is very good, he is stout, can eat anything, speaks for hours sometimes continuously, and always takes part in singing, after the first ten minutes he gets on better. He lectured last night at Exeter Hall for an hour and three quarters. He cannot speak so well out of doors. Cough is sometimes so distressing as to induce cerebral congestion. Has had aphonia occasionally with the hoarseness for twelve years, sometimes for two weeks, and then the voice comes back.

So extreme was the irritability of the fauces, that it was some days before the retching caused by the application of the laryngeal mirror would permit me to obtain a view of the larynx. The entire mucous membrane of the larynx, vocal cords, trachea, epiglottis, and neighbouring parts, was in a state of irritation and redness, pouring out fluid from the

follicles; it was also tumefied and resembled red velvet, the false cords were greatly swollen; fortunately there was no breach of surface. He was treated in the manner recommended for follicular disease in the first chapter, locally and constitutionally. On the 1st February he preached, but the voice became weak. On the 3rd, a good view was obtained of the larynx, when the mischief was found to be chiefly located in the anterior subglottic region, where there was much congestion and tumefaction; the upper larynx was more healthy. He left next day for Leeds. On the 25th March he presented himself perfectly well, all the old symptoms were gone; he could preach without strain or effort for a long time, and could sing tenor. He never looked better. The throat and windpipe were perfectly natural.

The above details hardly do justice to the case, for it was one of the severest and apparently most dangerous that had ever come before me; I feared sudden suffocation, and the presence of some serious obstruction, especially as the cough used to cause the under lip to swell, and the lips to become blue; yet by steady and judicious treatment a complete and satisfactory cure was accomplished after years of inconvenience and suffering.

CASE. Contendophonia in a member of the drama giving rise to huskiness and hoarseness; cure in four weeks.—Mr. B —, an actor at the — Theatre, came to me on 15th July, 1863, recommended by Mr. A. Francis. He has usually a good, very powerful, and clear voice, and can imitate a female opera singer. Was subject to attacks of huskiness and hoarseness from the draughts in the theatre, and latterly these were so bad that he could not perform. Great irritability of the throat existed, with congestion and chronic pulpy tumefaction of the lining of the larynx, the right vocal cord possessing a yellowish white colour. This gentleman was quite cured by the 10th August.

CASE. *Contendophonia in a member of the drama producing hoarseness and inability to perform ; cure within a month.*—Mr. L—, a popular and well known performer at the — Theatre, consulted me 16th July, 1863, at the recommendation of the same gentleman above mentioned. About a month before, he was ill with his throat, and went to Dr. Hastings ; he was well a week ago, but the disease has returned and he has to cease performing altogether. The voice is rough and harsh, readily getting out of tune and becoming quite flat ; in health it is a loud, powerful, declamatory voice. The condition of the throat and larynx was much the same as in the preceding instance, involving in addition the vocal cords and subglottic region. By the 14th August he was quite well and has remained permanently so.

CASE. *Impaired nervous power affecting perfect articulation.*—The Rev. John R —, æt. 46, from a town in the south of Hampshire, consulted me February 25th, 1863. He could speak and read certain words at certain times well enough and strong enough, but occasionally he had a sort of spasmodic seizure which interfered with his articulation, which compelled him to give up some of his duty. This commenced eighteen years before ; his voice is naturally strong and clear, and in private is unexceptionable ; but when about to read, especially in a church, he begins to hesitate and stammer. On examination, this was found to depend upon impaired nervous power of the muscles of the larynx, in a highly nervous temperament, and after a short period he was cured. I may remark that the fauces were studded with minute red crimson points here and there. I give this case, under the head of contendophonia, although not occurring from the causes which give rise to it.

B. *Acantophonia, or an impairment of the voice in singing, as shown in the failure of the higher, lower, or middle notes.*—There are certain defects in the singing voice well known to

professors of the lyric art, which require the aid of the physician to effect a cure. These defects are the loss of control over some one of the notes of the diatonic scale, whether the lower, the middle, or the upper, but chiefly of the middle, in either the chest or falsetto registers. This loss of power occurs to some of the most accomplished vocalists of the day, arising from many of the causes mentioned when considering contending phonia, which impair, or for the time destroy the equality in the power of tension possessed by both vocal cords; possibly the result of a want of harmony in the tonic contraction of the delicate little muscles on both sides of the larynx; may be influencing certain fasciculi of the thyro-arytenoid muscle in direct contact with the true vocal cord affected. These defects, although tolerably frequent amongst professional singers, are by no means rare in the singer of private life; they require careful investigation with the aid of the laryngeal mirror, and multiplied experience to thoroughly understand, for a simple inspection of the larynx and vocal cords, with the utterance of ejaculatory sounds, will not reveal the essential or critical nature of the disease. We will take, for instance, a lady who may be a good vocalist with a fine contralto voice; through some cause, probably a draught of air, or impaired health, in singing the different notes, from the lowest to the highest, there is a break in the middle, which is painfully perceptible to the ear. She will sing the lower notes well, and as she ascends in the scale the middle become weak or break down, and on still persisting the higher notes are reached and accomplished without hindrance or strain. To estimate the behaviour of the vocal cords under such circumstances, it will be necessary for the vocalist to run up the notes of the scale in a falsetto voice with the laryngeal mirror at the back of the mouth; and usually this is not a difficult proceeding in the throats of those devoted to singing, whether for love or profit, because in them, in females especially, there is such a capacious throat for singing purposes as to leave nothing to be

desired. Some little energy is necessary to accomplish the inspection satisfactorily, and ladies are usually so anxious to recover their singing powers that they do not mind a little trouble to accomplish it. Now, the varieties of voice most commonly affected are the tenor, contralto, and soprano; the two last, in females, and the first in males, and the compass of the voice is diminished by several notes in some part of the diatonic scale. Occasionally the power of producing a note has gone altogether, and singing has to be abandoned, unless by some piece of good fortune the cause giving rise to such a misfortune can be removed, even although but partially at first. Further on an instance is detailed occurring in a young lady where this happened, and also in a gentleman who had lost the power of singing bass.

As it is not my desire, at present, to enter fully into this subject, the phenomena observed in the middle and higher notes may be noticed:—When the former are imperfect, namely, the middle, and the person is required to ascend the scale slowly from the lower notes, the tension and parallelism of the vocal cords are found to be good and without fault; as the middle notes are reached, both are altered, for the tension becomes irregular and the parallelism is destroyed, especially if the tension of one cord is good and the other imperfect, for then the fissure of the glottis corresponds to a small, thin segment of a large circle. As the notes now rise, the natural tension of the cords, or the affected cord, is regained and both perform their proper vibrating function to the termination of the notes of which the singer has been accustomed to go, whatever that may be. When both cords are affected in the middle notes, they equally lose their power of tension, and consequently of vibration, at that part of the scale, and parallelism, although it may be not wanting, is powerless for perfection of melodious, or rather, harmonious sounds.

Although I might say much more upon this subject, I think

the desired object will be gained by a few typical illustrations from my case-books. I cannot resist the opportunity of stating in this place that, aided by the kind co-operation of the fair patients themselves, I have been successful in restoring to their full power and compass, without the slightest break or irregularity in the notes, the singing voices of some of the first vocalists of Europe—some of them, too, who were brought over to London to be placed under my care, after being ineffectually treated by Continental physicians of the highest repute.

CASE. *Acantophonia from overstraining the higher notes, with total loss of singing power; cure in three months.*—Miss P—, a vocalist, æt. 21, of great personal attractions, consulted me on the 18th December, 1861, accompanied by her mother. She had a fine contralto voice, but from overstraining in the higher notes, the singing voice gradually went away, particularly for the last eight months. There is no hoarseness nor imperfection in speech. Was recommended by Professor Garcia to abstain from attempts to sing for a while. With some slight throat derangement, the health was good in other respects. The laryngoscope showed loss of tension over both cords in musical phonation; but on two or three occasions when she had gained more power, the moment the higher notes were reached the power of tension was lost and vibration destroyed. This was carefully treated by tonic solutions directly applied to the part, including the occasional use of one of the nitrate of silver and mercury, and by the 10th March I pronounced her cured, for then the highest notes were reached without break or irregularity, and the voice possessed its full compass and power. The behaviour of the vocal cords was perfect. This lady has been a most popular public favourite and her voice has never since failed her. She had been treated many months homœopathically before she came to me.

CASE. *Acantophonia from draughts on the stage, with great vocal weakness and loss of singing power.*—Signor B—, æt. 47, with a fine tenor voice, consulted me in February, 1862, recommended by Lord —; a popular singer, from the degree of feeling with which he sang, and the fine melody of a most excellent tenor voice. Much exposed to draughts when overheated on the stage, his voice gradually gave way, being preceded by huskiness, and when he came to me he could not sing at all. The vocal cords were relaxed and inflamed, and the general health bad. By careful and persevering tonic and alterative *local* treatment after the inflammation was subdued, he quite recovered, but I would not allow of his accepting an engagement until five months from the time he first came to me.

I may here observe that the huskiness of singers and speakers I commonly remove at a single sitting with zinc showers, when the voice has to be used the same night, and I have even tried the same thing upon myself with good results.

CASE. *Acantophonia with the higher notes; recovery in one month.*—This was in a lady, æt. 30, who consulted me July 11th, 1862, recommended by Mr. Luther Holden. She had a cold in March, followed by inability to sing the higher notes, in a good contralto voice. Seven and ten years ago she was ill with sore throat, and cured by Dr. Waggstaff.

Professor Garcia had advised rest for a while. In the laryngeal mirror the tension of the cords was seen to fail when the higher notes were reached. She felt languid and tired after singing or speaking. She was cured in a month, but advised to rest the singing voice for some weeks. I have seen this lady recently, and her cure has been permanent.

CASE. *Acantophonia for two years, from cold caught in passing through a draughty passage on leaving a concert.*—

Miss D—, æt. 20, consulted me November 20th, 1862, accompanied by her mamma, recommended by the lady in the previous case ; was able to sing quite well in a very fine contralto voice up to two years ago, when, on leaving a concert, she caught a cold, in passing through a draughty passage, being lightly dressed. She at that time sang the lower notes better than the higher. The loss of singing power occurred suddenly after the cold and has never been regained. There was now some follicular disease of the fauces, and the vocal cords were seen tremulous from relaxation and feebleness of tension during phonation ; indeed, nervous power seemed much impaired, and the subglottis and trachea were much congested. Besides local applications and constitutional remedies, Faridisation was applied direct to the vocal cords and to the upper part of the spine and various parts of the neck. She gradually recovered her singing powers, and when she paid me her last visit, on 19th March, 1863, she was quite cured in every respect, and about to become a pupil at the Academy of Music. Galvanism greatly assisted the cure after the healthy state of the throat and larynx was brought about.

CASE. *Acantophonia for some months, chiefly with the middle notes ; early cure.*—Mrs. E. Y. H—, æt. 20, consulted me 17th December, 1862, recommended by Mr. Critchett. Accustomed to sing for years ; singing power has been gradually failing the last few months, and lost altogether for the last three ; probably originating in a cold. She has a perfect singer's throat. The vocal cords were quite flaccid, laying flat against the walls of the larynx ; by an effort they approximated, but there was no tension nor vibratile elasticity. By the 30th (*i. e.*, thirteen days) she recovered her singing powers perfectly, in time to make use of them amongst her friends at that festive period of the year.

CASE. *Acantophonia with the higher notes for five years.*—

This was in a young lady, æt. 18, with a very small neck, who had lost the power of singing the higher notes for five years, in a contralto voice. This depended upon loss of nervous power, with congestion of the cords and larynx, and the higher notes were recovered after some weeks' treatment, and it was expected by her musical friends that her voice would ultimately reach even higher still.

Of five ladies who were brought from the Continent to be placed under my care, I shall give the details of the case of one only, as briefly as can be.

CASE. *Acantophonia for three years in the middle notes of a fine soprano voice; complete cure in eleven weeks.*—Madame C— was brought to me on the 31st January, 1863, by two gentlemen, one a well-known barrister. She is a vocalist of European fame, in good health, but with loss of power over her middle notes in singing for nearly three years, but especially bad the last three months. She had been at various places for treatment, the last being France and Spain. At Paris she was under Trousseau without benefit; she then came to London and was placed under my care. At first I examined the vocal cords in a state of rest; they were short and broad, of a silvery grey colour. I would not test the capacity of the cords until she had been under treatment for a few days, and then it was observed that vibration ceased from incomplete and irregular tension when the middle notes were reached, the right cord being much more at fault than the left, for its relaxation or flaccidity was such as to give the glottis a very slightly arched form. As the notes were persisted in, the tension was recovered and the highest notes of the soprano voice were readily completed. By the 14th February, the impaired tensile power was mastered, and with great care and attention, the treatment adopted, as in previous cases, brought about a most satisfactory cure, so that I pronounced her free from any singing defect on the 14th April, hearing her myself

practice at the piano. She left for one of the German watering places in July.

CASE. *Acantophonia. Inability to sing the bass notes from follicular disease of the throat and chronic tracheitis; speedy cure.*—Mr. J. W. L—, æt. 69, residing in the county of W., came to me on the 31st of December, 1862. Sore throat some years on and off, with a cough at night, sometimes most persistent, which seemed to him to come from the throat, and he had to sit up in bed a long time before it ceased. If he begins to sing at church he is sure to cough, and has had to give up singing, in a fine bass voice. Is worse lying down than sitting up. Very hoarse sometimes in talking; no dyspnœa nor dysphagia; health good in other respects; takes five or six glasses of port wine daily for dinner.

Laryngoscopy.—Mucous membrane of fauces relaxed and follicles enlarged, larynx congested, trachea of a dark red colour from chronic inflammation, vocal cords relaxed, but otherwise normal. No obstruction in trachea nor any growths. Approximation of cords in the utterance of sounds pretty fair, but tension feeble. He was submitted to general treatment, as well as local with my *laryngeal fluid pulverizer*. Four applications with it effected a complete cure. The cough and other symptoms disappeared, and he was enabled to sing in a fine and deep bass voice in church without any discomfort.

C. *Diplophonia, double voice, or Vox Convulsiva.*—This singular affection is known by the possession of a voice of two distinct sounds, namely acute and grave, or tenor and bass. In the production of these varieties of sound, peculiarly discordant and harsh in some persons, no effort of the will can keep them to anything like a natural tone. Even in those persons who have obtained a sufficient mastery over themselves to keep the voice in the one grave strain, a laugh or other ejaculation will quickly convert it into an acute one. Instances of the double voice must be familiar to almost every one. It

has been surmised that the cause of this was disordered contraction of the muscles of the larynx, but never proved. The laryngoscope, however, has cleared up any doubts upon this subject, and has shown me that the muscle chiefly at fault, and probably the only one, is the *thyro-arytenoid*. This I infer from the irregular contraction which is seen to take place, giving to the vocal cords a peculiar angular form, the projection of the angle being either outwards or directly inwards. The simultaneous and uniform contraction of this muscle at any rate is seen to be quite impaired, and this view is confirmed by a curious instance, detailed further on, where one vocal cord was wounded in a person whose voice was always good before the accident, but from division of some muscular fibres, as well as the part of the cord shown in the sketch given with the case, the uniformity in the contraction of the fibres of the two sides of the larynx was forever destroyed and the discordancy of sound rendered hopelessly incurable.

As to the curability of diplophonia there is not much to be said, for it has been noticed throughout a person's lifetime, a good instance of which I can call to mind in a gentleman whom I remember when myself a child, whose alternately grave and acute sounds greatly amused me; this has remained permanent with him. There can be no doubt, however, that the congested and inflamed state in which the larynx is frequently found in such persons, mainly keeps up the vocal peculiarity, which becomes less, and more under control, when it is removed, as in the following instance; if it occurs late in life as a result of congestion, or other cause, it is more amenable to treatment.

CASE. *Diplophonia occurring as a result of cold, but commencing when a youth; at one time a bass, then a treble voice.*—Mr. J. A. N—, æt. about 38, consulted me 20th February, 1863, accompanied by Mr. Ashton, of Cavendish Square. His

voice is a fine bass; but whenever he takes cold, it changes to a treble in speaking. Has had this double voice since youth, but it has been more permanently bass of late years. General health is good, but is subject to a relaxed throat, which on examination is found to be follicular, with a very long uvula not affected by acute sounds. The laryngoscope showed the laryngeal surface of the epiglottis blood red and rough, the same colour pervading the larynx and the trachea. The vocal cords were narrow in outline, the right natural in appearance and motion, but the left was sluggish, slowly coming into action, approximation beginning more at its posterior third.

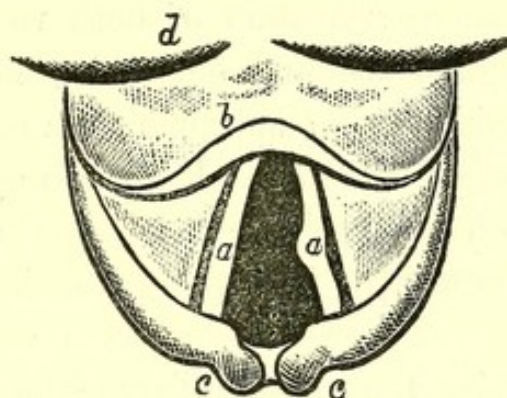
Its contraction therefore was irregular and incomplete, and with the congested state of the larynx to some extent accounted for the double voice.

In the treatment constitutional and local measures were adopted; and as the condition of the throat improved and the congestion diminished, so was power of control gained over the voice, and a clear bass note maintained. On July 18th, Mr. Ashton informed me that Mr. N.'s voice had improved so much that there was no further occasion for coming to see me.

I need scarcely add, that this good result was quite unexpected on my part. In a second case the same peculiarity was noticed of irregular action of *both* vocal cords, with less power over contraction.

CASE. *Diplophonia, tenor and bass voice, with chronic inflammation of the larynx and trachea.*—Mr. T. C. D—, a surgeon

FIG. 56.



a, a. The true vocal cords, the left undergoing irregular contraction. *b.* Epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of tongue.

in the suburbs of London, consulted me on 8th February, 1861, with partial aphonia and alteration of the voice for three years, although subject to the latter since he was a boy. Speaking caused some irritation, and the fauces were congested and relaxed. In the laryngeal mirror was seen punctiform vascularity and redness of the larynx and trachea; in the latter the redness was quite bright, and seen far down from the extreme relaxation of both vocal cords, with narrowing and angular bending outwards; in colour they were of a dark pinkish grey; approximation of both was irregular, with imperfect vibration. I saw him again on 27th November, 1862, with no visible change, the result really of inattention to treatment. But the possibility of great relief, with more control over the voice, was very great in this case, especially under the use of silver showers, if carefully and regularly carried out.

I have had some other equally interesting and instructive cases, but will cite the following as throwing some light on the pathology of the disease.

CASE. *Deformity of the larynx with a double voice. Diplophonia, the result of a wound of the left vocal cord.*—The subject of this was a young man, æt. 21, a ship's officer, who, about three years ago, when at Hong Kong, and recovering from an attack of fever and ague, fell off some spars on the deck of his ship with an open penknife in his hand. The blade of the knife penetrated the left side of his neck and wounded the larynx; about an inch-and-a-half of the blade entered, for that much of it was stained with blood. This was followed by dysphagia and aphonia; on recovering from which his voice was double, being a mixture of tenor and bass, at one moment the former and the next the latter. This he found very inconvenient in his calling. A small cicatrix was visible in the neck.

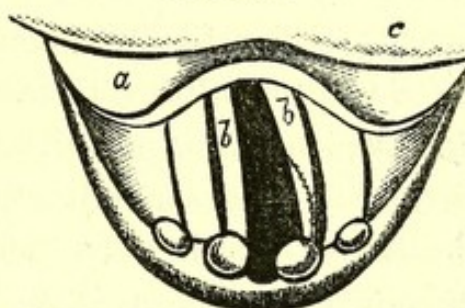
Laryngoscopy was easy, and showed a fine capacious larynx

and trachea. The true and false cords took an oblique direction from before backwards towards the left side. The right vocal cord was natural, but the left was narrowed and contracted near its attachment to the arytenoid cartilage, and did not meet its fellow at this situation during phonation. A very distinct oblique cicatrix could be seen, showing where the cord had been at one time divided. These peculiarities are exemplified in the drawing (fig. 57).

His sentences were short, only three or four words at a time, commencing in a tenor, and ending sometimes in a low bass. It was an unfavorable case to treat, yet some slight improvement in speech resulted from remedies local and constitutional, which permitted of greater freedom of movement of the affected vocal cord.

D. *Stuttering and stammering—Ischophonia and psellismus.*—I have examined cases of both stuttering and stammering with the laryngeal mirror, with the sole view of observing the action of the vocal cords in the utterance of sounds. As contrasted with the double voice already considered the action of the cords is very different. Constant and irregular contraction and rapid approximation of the cords, with a tendency for the glottis to remain shut, are the phenomena noticed in cases of stuttering before undergoing treatment. These irregular spasmodic actions are decidedly less in degree in cases of stammering. When the person inspires and utters a continuous humming noise, the vocal cords resemble in their action a couple of strings being alternately and rapidly pulled towards one another, and striking their free borders with such apparently spastic rigidity as to produce a

FIG. 57.



- a. The epiglottis. b, b. The two vocal cords; on the left is seen the cicatrix of the wound.
c. Back of the tongue.

distinct flapping noise. All the laryngeal muscles are no doubt in a condition that might almost be compared to St. Vitus' dance, involuntarily contracting and relaxing under the influences at work. Several times this action has extended to the aryteno-epiglottic muscular fibres, and the epiglottis has been suddenly pulled downwards and backwards. But the action of the thyro-arytenoid muscles is sometimes so energetic as to cause their projection in the middle of the larynx, and actually to conceal the true vocal cords beneath. If a long or full breath is taken, to see the expansion of the glottis, the view is only momentary, for the tendency is so strong to irregular contraction of the muscles, that it is almost instantly closed. In persons who have undergone some amount of treatment, there is more control over the laryngeal muscles, although the tendency to irregular contraction, I believe, long remains, which really proves that the means to effect a cure must be perseveringly and energetically carried out. As to the pathology of stuttering and stammering, and the causes which give rise to them, I do not propose to enter into, considering it sufficient in this place to point out what may be observed with the laryngoscope. For the views and various opinions held upon these diseases, I would refer the reader to Dr. Hunt's excellent 'Manual,' where indeed there is much information concerning them, including the philosophical opinions of the author himself. Of that work I can truly say, that seldom indeed have I perused one so full of useful and really valuable instruction as it contains, and which shows that Dr. Hunt has paid great attention to the study and successful cure of a very distressing and certainly most inconvenient malady.

E. General disease.—The voice is sensibly altered in the atheromatous changes which take place in the yellow elastic structure of the vocal cords, as occur in the same tissue in the interior of the bloodvessels. These changes may be the result of advanced life, extreme old age, or of peculiar defects in the

middle-aged or even younger, as pointed out in Chapter VI (Section I). The character of the voice is harsh, or cracked ; crankey, shaky, brassy or tremulous. In the larynx nothing is seen abnormal, except the alteration in colour of the cords, which is quite visible through the mucous membrane. It will be of a patchy yellow on a white ground, or a variegated white and yellow, but never with breach of surface. Several cases in which these changes had occurred are scattered through these pages.

The voice is modified or altered in tone from affections of the tonsils and soft palate, especially if the latter has undergone ulceration. Palsy after diphtheria gives rise to the nasal voice or twang. Although the soft structures modify the voice, perfect phonation cannot be carried on without the integrity of the vocal cords.

The cavernous throat, arising from a wasting of the muscles, previously noticed, interferes with the natural sound of the voice ; and this continues until its original healthy condition is restored. Anything tending to diminish the calibre of the larynx or trachea affects the voice, as shown in the pressure exercised by tumours from without, or tumours growing from within.

CHAPTER III.

ACUTE INFLAMMATORY DISEASES OF THE THROAT AND LARYNX.

SECTION I.—ACUTE INFLAMMATION OF THE LARYNX—ACUTE CATARRHAL LARYNGITIS.

THIS truly formidable disease, as Mr. Porter has shown in his able treatise,* is almost exclusively confined to the wind-pipe in adults; it comes on very suddenly, and runs a remarkably rapid and fatal course, sometimes in a few hours, unless timely checked by the most vigorous and energetic treatment. It is essential, therefore, that the symptoms should be well understood from the beginning. The varieties and subdivisions of acute laryngeal disease, given by some writers on this subject, are calculated to mislead our attempts at diagnosis. In order, therefore, to simplify the subject, I shall consider acute laryngitis as of two varieties (preferring the division of Cruveilhier, as adopted by Ryland), namely, one form affecting the mucous membrane alone, and the other the submucous areolar tissue. The second variety, under the name of *œdema of the larynx*, is considered separately in the succeeding section, although the two often run together. The first variety is called *acute catarrhal laryngitis*, to distinguish it from any other affection of the larynx, and involves the proper mucous membrane.

Symptoms.—It may commence with the usual symptoms of a sore throat, with general fever, preceded by shivering; usually, however, the attack will be sudden. At first, a dull pain is felt at the upper and front part of the throat, attended by a feeling of constriction as if a cord were tied around the thyro-hyoid membrane; the larynx is found to be tender on pressure; there is difficulty of swallowing, and very soon a

* 'On the Surgical Pathology of the Larynx and Trachea.'

difficulty of breathing; there is a frequent, though slight, irritating, stridulous, harsh or husky cough, unaccompanied by expectoration, which is very distressing; and the voice is hoarse, or altogether inaudible, being replaced by a whisper; the patient points to the pomum Adami as the seat of all his trouble. The fauces are seen red and inflamed, whilst the epiglottis is sometimes seen with the unaided eye to be erect, red, and thickened; it can be felt in most instances by introducing the finger down the throat beyond this membrane, when it will give the sensation of "a round and solid body, possessing the size, smoothness, and consistence of a cherry."* This is now verified by the laryngeal mirror. All these are accompanied by thirst, hot and dry skin, full and hard pulse. As the disease advances, symptoms of obstructed breathing and imperfect purification of the blood show themselves, the former is laboured and peculiar, inspiration is harsh and whistling or hissing, and requires an unusual muscular effort, the cough is truly laryngeal, and has a brassy or metallic tone, whilst expectoration is at first accomplished with comparative ease. As the aperture of the glottis becomes narrower, a terrible picture of distress presents itself, for strangulation seems to be imminent, and the patient tosses himself anxiously about, gasping for breath; the face is pale and livid, the eyes start from their sockets, the poor sufferer asks for fresh air, walks about, and goes to the window for it; and, finally, delirium and coma close the scene; in fact, to use the expression of an able observer, "he dies strangled."

The *Laryngoscopic appearances* are those of intense inflammation, for the lining membrane of the larynx is seen to be of a bright and vivid scarlet redness, with tumefaction varying in amount, but generally prominent on the false vocal cords, which may sometimes wholly conceal the view of the true cords. The membrane covering the latter partakes of the same vivid redness, and extends into the subglottis and

* Porter, op. cit.

trachea. On the other hand, the laryngeal surface of the epiglottis and its free borders are of a scarlet-red colour, with thickening, sometimes rigidity; and the arytenoid cartilages and boundaries of the larynx are equally inflamed. I have seen the membrane covering the true vocal cords of a purple redness, whilst the remainder of the larynx was a bright scarlet. It is the approximation of the swollen false vocal cords which generally gives rise to the whistling or hissing respiration and the most urgent dyspnœa, and not the closure or narrowing of the true glottis, as has been generally supposed, although sometimes the glottis, is spasmodically narrowed. The laryngeal mirror is well borne in all cases of acute disease of the larynx, and, contrary to what might be supposed, even better than in many examples of painfully chronic cases.

The *Duration* of this disease may be from a few hours to five or six days; when fatal, its course is generally rapid. Those cases primarily commencing in the larynx without extending to the fauces, seem to be the most dreaded, because they terminate so rapidly. It was this form of disease which carried off the illustrious Washington within twenty-four hours. On the other hand, the disease may be mild, and extend to seven or eight days, before a fatal result; it may completely yield, or else the acute form may lapse into the chronic.

Pathology.—The mucous membrane of the larynx, as, indeed, is proved by laryngoscopic inspection, is extremely inflamed, of a deep red colour and much thickened, having a thick tenacious or frothy mucus adherent to its surface, thus resembling acute bronchitis in general characters; this, however, is not always present. There is always some sub-mucous infiltration, the consequence of the increased or inflammatory action in the vessels of the affected membrane, and which does not *originate* in the sub-mucous tissues, as is the case in œdema of the larynx.* The inflammation does not extend

* See pathology of that disease, in the next section.

beyond the borders of the cricoid cartilage, although in rare instances it will pass into the trachea. The epiglottis is found red, erect, thickened, and swollen, and during life has been compared to a piece of raw meat. The sub-mucous tissue of the parts above the glottis and around the epiglottis may be infiltrated by serum, in consequence of the inflammation; that is, when the complaint has terminated rapidly. In more tardy instances, a sero-purulent fluid is observed in the same structure. Some amount of œdema of the parts below the rima is generally present, but ulceration is very rare. The inflammatory redness sometimes extends to the mucous membrane of the fauces generally.

The excessive *Danger* of this complaint is, the almost complete closure of the rima glottidis, from the tumefaction of the surrounding parts, which may quickly suffocate, or else the patient may struggle on with obstructed respiration, and perish by congestion of the lungs or brain. The tumid and tender condition of the membrane, common to the larynx and pharynx, explains the difficulty of swallowing, usually, but not invariably, present. There is much spasm, as occurs in croup, for the patient has periods of tranquillity, and then attacks of dyspnœa, from the spasmodic contraction of the muscles which close the glottis.

For the reasons already assigned, it is important to recognise the true nature of the disease early; and the affections we have to *diagnose* it from are, diphtheria, croup, cynanche tonsillaris, pharyngitis, œdema of the larynx, and asthma. But such is the peculiar nature of acute laryngitis, that a mistake is hardly possible even without the aid of the laryngoscope, for the symptoms clearly point to the seat of mischief, yet when there is doubt a careful scrutiny with the laryngeal mirror will very soon decide the question.

Causes.—The disease is met with as the result of exposure to wet and cold, sitting in draughts of air when in a state of perspiration, and, occasionally, great exercise of the voice,

especially in the open air. Those who habitually suffer from chronic sore throat are liable to it; fortunately, it is not a frequent disease. It follows in the wake of many other severe and dangerous forms of laryngeal disease, as pointed out in the section on erysipelas of the windpipe, and diffuse inflammation of the areolar tissue. It occurs in specific diseases, as diphtheria, syphilis, gout, and cancer; also in many of the exanthemata, particularly smallpox and scarlatina; and in typhus and typhoid fevers. And very commonly it is traumatic, of which examples are by no means rare in hospital practice.

Treatment.—This must be prompt and energetic. If venesection is adopted, it is only in the *earliest* stage that it can be done with any chance of success, and then vigorously, when the strength of the patient is unimpaired, with a full pulse, flushed face, and hot skin. It should be carried to an approach to syncope. When, however, the symptoms advance, showing deficient respiration, it is then utterly useless. Leeches and blistering have not met with favour, nor has antimony nor mercury. The treatment I have adopted and advised since the early part of 1860,* is the direct application to the inflamed larynx of a strong solution of nitrate of silver (from three to four scruples to the ounce of distilled water). This should be done with a curved full-bellied brush, or with my laryngeal fluid pulverizer, with the aid of the laryngeal mirror to ensure the certainty of its application. The effect of this proceeding is some considerable amount of burning heat, associated with comparatively little spasm, and sometimes dyspnœa, the last two persisting for may be a few seconds only, but very much increased if a sponge probang is used in place of the instruments named. The relief experienced and the amelioration in the general symptoms is observed in periods ranging from half an hour to four hours, and the dyspnœa subsides very speedily. Indeed, the relief is

* See Section II of Chapter II, for its use in *Chorditis vocalis*.

so decided and so quick, that the impression is conveyed that the case could not be acute laryngitis, but experience has abundantly shown that if allowed to proceed unchecked tracheotomy will soon become necessary.

In my first edition it was mentioned that Dr. Horace Green had treated this form of inflammation with success by using a solution of nitrate of silver (forty grains to the ounce) after having used venesection, emetics, and nauseating doses of antimony. The solution increased the difficulty of breathing and cough, for a few minutes only, but much ropy, viscid mucus was discharged. In half an hour the patient (a female) was better, and made a good recovery.

If there be any return of the laryngeal symptoms, the application of the silver solution must be repeated until they are wholly checked; but so far as my present experience will permit me to form an opinion, the one occasion suffices to quickly and effectually arrest the inflammation, providing that it has been properly accomplished, aided by the laryngeal mirror.

If there should be failure in the use of the silver solution in the hands of those who have not acquired the necessary experience, inhalation of the *steam of boiling water* must be practised from a proper inhaler, a practice that is used in many of the hospitals. This will give much relief, and has been known to arrest impending suffocation. Direct inhalation through the open mouth will be far more efficacious and certain than through the nose, for the vapour instantaneously reaches the larynx through the former, which it does not do in the latter, from the numerous interruptions it meets with in the various channels and passages among the turbinated bones.

Yet again, if the above practice is not sufficient, which was the case in a patient under the care of my colleague, Dr. Radcliffe, in the Westminster Hospital, our last reliance must be placed upon the operation of tracheotomy, which not only holds out the best chance for recovery, but has proved suc-

cessful in apparently the most hopeless cases. This is explained by the fact that there is usually no complication of disease of the trachea and bronchi in the adult, such as is seen in the croup of children.

Mr. Porter advocates early cutting into the windpipe, as likely to prove more serviceable to the patient; for when the disease has continued for some time, the lungs are not only engorged with venous blood, but they are œdematous. To be successful, then, it must be done early; delay is indeed dangerous, and every writer insists upon the point of *not waiting too long*; nor, again, must it be omitted because it may appear to be *too late*.

If the case is favorable, it will be followed by great relief to the general breathing, and a restoration of the healthy condition of the blood in the lungs. Careful attention must be paid to the tube in the throat, and assistance rendered to keep it clear of mucus.

It is left to the discretion of the physician whether he shall employ small doses of mercurials, but he will, of course, be guided by the after effects of the operation itself. I have seen the operation done in some twelve cases, when suffocation was impending, and eight out of the number recovered.

The following examples of acute laryngitis are taken from among several others, as illustrating the laryngoscopic appearances and value of local treatment.

CASE. Acute laryngitis with supra-glottic œdema; tracheotomy; recovery.—This was a bandmaster, who was admitted into the Westminster Hospital, under the care of my colleague, Dr. Radcliffe, with symptoms of acute laryngitis, followed pretty rapidly by supra-glottic œdema, as seen in the laryngeal mirror. As attacks of dyspnœa and spasm were frequent and dangerous, tracheotomy was performed by Mr. Holthouse. On the 28th July, 1863, I examined him in the presence of Dr. Fedeli, of Rome, and found the inflammation and swelling

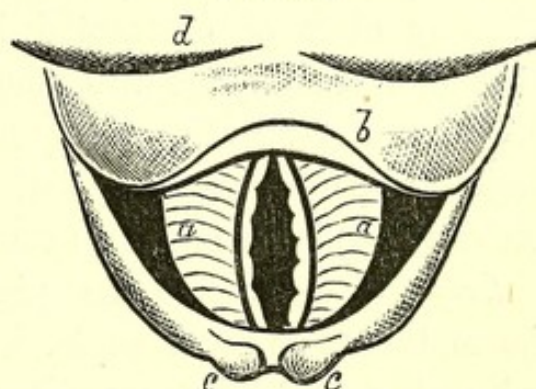
to have so much subsided as to permit of a view of the vocal cords of a dirty gray colour, with irregular and eroded free margins. The false cords were still a little swollen, but as the glottis opened largely, the tube was removed on the 31st. He remained tolerably well for some weeks, when sub-glottic contraction was found to be going on, giving rise to dyspnoea, which necessitated the reintroduction of the canula. For some days the odour from the neck was that of exfoliating cartilage, and he could speak by placing his finger on the mouth of the tube. The glottis was sufficiently expanded in the latter part of December to permit of a view of the silver canula through it, and he was altogether much better.

In January, 1861, I was requested to see a case of acute laryngitis at Croydon, in a patient of Mr. T. L. Henley, in whom the acute symptoms were extremely severe, with frequent attacks of spasm, not associated with œdema. And in August, 1862, Mr. W. J. French, of Wilton, brought me a patient who had recently been attacked with acute laryngitis, nearly requiring tracheotomy, but in whom there was still much inflammation remaining, as shown by the laryngoscope. The topical application here of a solution of nitrate of silver proved of great service.

Commencing laryngitis, with tumefaction of the false cords, arrested by early treatment.

—This was in a gentleman, æt. 30, brought to me by Dr. Druitt in the early part of October. He had had aphonia for three months, with dysphagia the last thirty days, but worse the last ten. Much pain and irritability of the throat were now the prominent symptoms. There

FIG. 58.



a, a. The swollen false cords, tapering on to the true. *b.* Epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of tongue.

was disease of the left lung. The laryngoscope showed a distinct bright red swelling of the false cords, tapering towards the free edge of the true, the narrower margins only of which, slightly serrated, were seen as per sketch. There was general vivid redness of the larynx, and also of the lower part of the left side of the pharynx, with swelling, where pain was felt in swallowing. A solution of iodide of silver was freely applied, and suitable internal remedies prescribed, with good results.

Acute laryngitis, with disease of the lungs and heart ; peculiar condition of the epiglottis.—In October last I was telegraphed to see a gentleman in Yorkshire who had been subject to a cough for some time and throat-disease for upwards of a year. A few weeks before, the obstruction was so great that œdema of the larynx was correctly diagnosed by his medical attendant. The more urgent symptoms passed away, yet the patient's condition was extremely critical. On my arrival I found him a thin, spare person, aged 36, pale and wan, with a laryngeal voice and but little dyspnœa, as the spasms had ceased some forty-eight or more hours. The breathing was hurried ; evidences of disease were present at the back part of the middle lobe of the left lung, where were heard râles of softening tubercle. The other parts, although not healthy, were tolerably clear of obstructed breathing. Pulse 142, very weak and small. He was coughing a little now and then, and expectorating white frothy mucus and pus. He had been subject to former attacks of rheumatism, and there were the remains of old peri and endo-carditis.

Laryngoscopy showed the epiglottis partly pendent, bent in the middle at an acute angle, its glossal surface being quite red and denuded of epithelium in several places, as per sketch. The interior of the larynx was unobstructed ; the true vocal cords were congested, and the false were swollen ; this last was well seen on the fourth examination. The glossa

surface of the epiglottis was particoloured, being a mixture of deep red, pink and white.

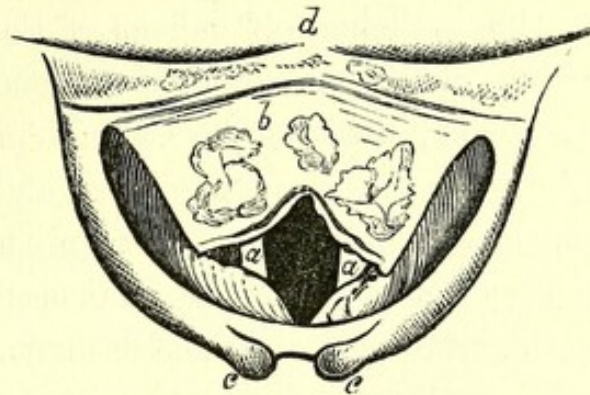
The membrane of the fauces was pale and relaxed, the velum and uvula projecting forwards, quite shiny and moist; tongue furred, of a thick drab colour. I applied a solution of nitrate of silver to the interior of the larynx with a brush, and then sent some of the spray down the trachea; this

did not cause even a cough, and produced a sensation of heat. I requested this to be repeated every other day. I prescribed suitable medicine and other treatment, and advised very early departure for the south of Europe, as holding out the only chance to save life, an opinion which had been likewise given by another gentleman.

It was quite clear in this case that, although the laryngeal symptoms would be subdued, change of climate was necessary to keep in abeyance the complications of chest-disease, so as to afford a chance for recovery in an otherwise vigorous constitution.

The condition of the epiglottis, and state of the false cords, pointed to the subsidence of a previous state of supra-glottic œdema involving those parts.

FIG. 59.



a, a. The false cords. *b.* The denuded and pendent epiglottis. *c, c.* The arytenoid cartilages. *d.* The back of the tongue.

SECTION II.—ŒDEMA OF THE LARYNX.

The pathology of œdema of the larynx teaches us that the disease is sometimes wholly confined to the upper boundaries of the larynx, involving the aryteno-epiglottidean folds, and not extending to the rima; sometimes, and most commonly, it involves the folds mentioned and those of the false cords as well, and extends as far as the glottis; and occasionally it involves the membrane covering the false cords alone, producing a dangerous form of obstruction. Now and then it is confined to one side of the larynx. All these conditions constitute what has been hitherto recognised under the general term of *œdema of the glottis*, and if no other form existed, they might have been subdivided with advantage. The laryngoscope, however, which has already produced so many innovations in the classification of laryngeal disease, has revealed yet another form of œdema, which occurs *below the true glottis*, wholly distinct in its nature and character from that existing *above the glottis*. In the one form the effused material is invariably fibrinous, in the other serous. If we will regard the *rima glottidis* as double, one placed horizontally above the other, the upper one between the upper or false vocal cords and the lower or true rima between the lower or true vocal cords, we shall have a limiting boundary between the two forms of œdema, the ventricles in reality forming the point of separation between the two. It will be convenient, therefore, to speak of œdema of the larynx as of two forms, one the *supra-glottic*, situated above the glottis, and the other the *sub-glottic*, situated below the glottis. This division has been adopted throughout the present work, and correctly gives the precise position of the œdema anatomically, more especially as the true glottis is never involved in the œdema, and therefore the expression of *œdema of the glottis*, as ordinarily applied, is actually a misnomer. Precision of language and correct anatomical detail should hence-

forth be the rule in laryngeal affections, now that the laryngeal mirror has opened up such a large field of investigation and inquiry. The divisions of œdema of the larynx, then, are—

A. Supra-glottic œdema of the larynx.

B. Sub-glottic œdema of the larynx.

A. *Supra-glottic œdema of the larynx.*—In acute laryngitis the essential element of the disease, as described in the previous section, was a dangerous and active inflammation of the mucous membrane, producing a certain set of symptoms and results. In that now to be noticed, the inflammation is not acute nor yet active, but is low and asthenic, and is confined to the tissues internal to or beneath the membrane. It is a question with some pathologists whether this is a real inflammation that shall pour out a distinct fluid in such a situation, without some more active and palpable evidence of its existence. There can be no doubt, I think, that it is a low inflammatory process, and is important to recognise, because the danger is not only imminent, as in acute laryngitis, but must not be treated in the same manner, especially in so far as depletion is concerned at the commencement. We have here a serious impediment to breathing without any violent inflammation, although often occurring as a result of the latter. Indeed, it will come on suddenly in the night time, in persons of good health, and kill them in a few hours, as I had the opportunity of observing in two striking instances at St. George's Hospital. It would seem to occur under various circumstances and in peculiar conditions, and it is noticed by many writers as a coincident, and not a dangerous complication with other affections of the respiratory apparatus. What does its minute anatomy teach us?

The *pathology* of the disease shows that the effusion is here poured out in the submucous areolar tissue, as the result of the inflammation commencing in that structure, and not in

the mucous membrane ; the external surface of the latter is free from much inflammatory redness, the swollen parts possessing a pale yellow colour. The serous effusion beneath the membrane covering the false vocal cords and surrounding parts produces an approximation of their sides in the form of a roundish or oval tumour, hanging down and overlying the true glottis in such a way as to offer a mechanical obstruction to the passage of air to the lungs. The air is readily expired through a narrow opening at the posterior part of the swelling, and this is nearly closed during inspiration, which explains the rasping or see-sawing breathing so often heard. The epiglottis exhibits some degree of redness and increase in size. Serous deposition, or dropsy of the submucous areolar tissue, is by no means peculiar to this affection, as it is found varying in degree in almost every fatal case of acute laryngitis, but combined with symptoms of active inflammation and the result of that process. When it runs an active and fatal course, serum alone is observed, as my dissections have confirmed ; if it has been somewhat protracted, and the death a slow one, the serum has become converted into a sero-purulent fluid, permitting the areolar tissue lying between the mucous membrane in the upper part of the larynx and the subjacent cartilages to be drawn away in shreds, as has happened in my experience. In the majority of instances tumefaction, varying in size from a sparrow's to a robin's egg, closure of the upper or false rima, and serum, alone are noticed.

The supra-glottic œdema may be confined to a part of the larynx only, the rest remaining free, as pointed out by Mr. Porter and Sir Henry Marsh ; thus, it is no uncommon occurrence to see only one side of the larynx puffed out and swollen, and the slit-like aperture of the true glottis converted into a curve. Sir Henry Marsh particularly describes many such cases of partial œdema.*

* 'Dub. Journ. Med. Science,' March, 1838.

According to the anatomical relations of the submucous areolar tissue, so will the œdema involve the aryteno-epiglottidean folds as well as the false vocal cords, and a mere vertical chink is noticed at the upper passage to permit of the entrance of air. Many specimens illustrating this are preserved in the museums, but especially in that of the College of Surgeons.

As may be seen throughout this work, œdema of the larynx is often brought on as a consequence of other affections of the larynx.

In the *symptoms*, the great feature of this malady is the extreme dyspnœa, which continues to increase, with a hissing inspiration, and all the appearances indicating impending strangulation. There is no difficulty in swallowing, as in acute laryngitis, unless the epiglottis is also involved; nor is there any external pain, but a feeling of constriction, with an increasing impediment to the act of inspiration. There is an absence of fever and other symptoms of laryngitis, and generally no inflammation of the fauces. The patient undergoes frequent spasmodic attacks of painfully suffocative breathing. Bayle has pointed out* that, commonly, the first indications of the existence of œdema of the glottis are a sense of uneasiness in the larynx, and a continued effort on the part of the patient to expel, by means of forcible expiration, mucus and other matters, which appear to him to be clogging the laryngeal aperture. He also frequently tries to swallow some supposed phlegm at the upper part of the throat.

The general health is undisturbed in the earlier stages of the disease.

The *laryngoscope* reveals two tense, smooth, and rounded swellings, immediately behind the epiglottis and sometimes partly concealed by the cartilage. These swellings may be globular or oval, meeting in the centre with a sulcus between them, generally more prominent in front. If one side only is affected, there is observed a prominent swelling projecting

* 'Dict. des Sciences Médicales,' Art. "Œdème de Glotte."

across the larynx. According to the extent and stage of the œdema, is a view permitted of the true vocal cords or the parts beyond the true glottis. The œdema reaches its highest degree in the false vocal cords, where the strata of areolar tissue are but loosely covered by the mucous membrane, and hence is explained the nature of the urgent dyspnœa which is ready to strangle the patient. The consistence of the swelling can sometimes be determined by the introduction of the finger into the mouth, but, as sometimes seen, it may be slightly corrugated and loose on its surface.

From two to five days is the duration of the complaint, although it will terminate fatally in a much shorter space of time—even a few hours.

Treatment.—Most writers concur in the opinion that the only remedy which holds out any grounds for hope in the extremity of danger is tracheotomy—which, to prove efficacious, must be done at such an early period as shall afford the best chance for the patient. Before this operation is resorted to, scarifications should be practised with proper instruments, with the aid of the laryngeal mirror, upon the œdematous false cords, the edges of the epiglottis, and the aryteno-epiglottidean folds. If carefully and judiciously managed, this will afford abundant relief by the discharge of serum, and may be repeated every four or five hours. Sometimes, however, obstacles will arise to prevent its performance, especially if the patient lay exhausted and motionless in bed, with an almost insurmountable difficulty in the opening of the mouth to permit of the introduction of the mirror and scarificator together. Under such circumstances it is advisable not to delay opening the trachea.

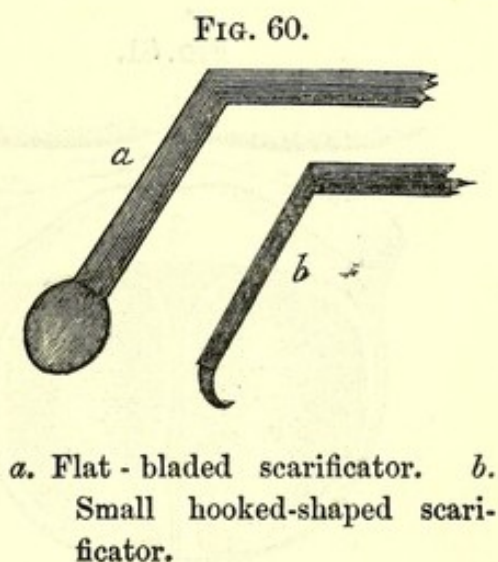
Before the laryngeal mirror was regularly employed, Lisfranc punctured the œdematous swellings, guided by the sensation of the finger; and Mr. Busk treated two sailors thus affected by numerous minute punctures made with a sharp-pointed bistoury into the back of the tongue, the uvula, and the

pharynx, every two or three hours. The relief is stated to have been sudden and decisive, as a great quantity of serum was discharged. Warm-water gargles were employed during the intervals.

In addition to laryngoscopic scarifications, when practicable, if decided and immediate relief is an object of the greatest moment, before time is afforded for tracheotomy, catheterism of the larynx may be practised, with the aid of a bougie half an inch in diameter, with a suitable curve. This squeezes out the serum through the punctures made, as if the œdema was a sponge, and clears the larynx in a remarkable manner, as actual experience has proved in my hands.

It will be necessary afterwards to inhale the steam of boiling water, to encourage the evacuation of serum; and when all danger has passed away, small doses of mercurials have been found useful, in the hands of some practitioners, especially in the milder forms of œdema, so as gently and decidedly to affect the system.

The scarificators I am in the habit of employing are of the following shapes; the larger (*a*) is used when it is desirable to make a free incision into very prominent swellings; the blade is flat like a gum lancet, as represented in the drawing; and the smaller (*b*) when more numerous incisions are indicated, of a less depth.



Trousseau speaks highly of inhalation of pulverized liquids, as that of tannin, in œdema of the glottis; and amongst other cases he refers to one of tuberculosis in a female attacked with œdema; she was pregnant and on the eve of labour;

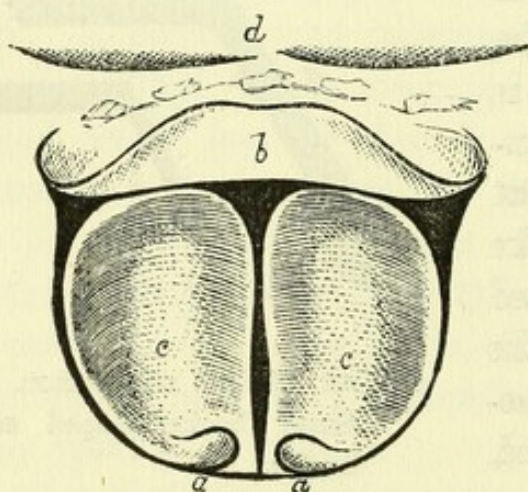
this method of treatment saved her life for a time, and enabled her to reach the period of parturition.

Supra-glottic œdema, apparently more dangerous than the sub-glottic form, is in reality more amenable to treatment when early scarifications are practised, associated, perhaps, with laryngeal catheterism, as already mentioned. Very strong astringent solutions are occasionally of extreme value; among many others tannic acid is one of the best, and should be freely applied once or twice a day. When the œdema is slight, it will often completely cure it.

The following cases are selected as good examples of supra-glottic œdema, indeed that first given is a remarkably good instance of it.

CASE. *Supra-glottic œdema, forming two oval swellings, almost completely obliterating the entrance into the larynx; perforating ulcer of the velum palati.*—Mrs. S. C—, æt. 26, married seven years, with three children, the youngest eight months old, was sent to me on 20th October, 1862, by Mr. A.

FIG. 61.



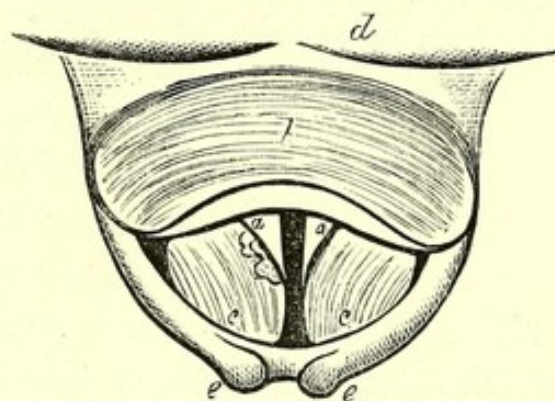
a, a. Arytenoid cartilages. *b.* Epiglottis.
c, c. The greatly swollen and œdematous false cords, with a narrow chink between them for breathing.
d. Back of tongue.

B. Barnes, surgeon, of Chelsea, who had written to me about her case. Had been ill two years with sore throat, the voice was gradually lost during the last twelve months, and she could now utter a whisper with extreme difficulty. There was a specific history dating from shortly after marriage. She breathed with a loud whistling noise, and was in great distress from

extreme dyspnœa; face swollen and anxious; eyes bulging forwards; could not swallow well. The fauces were inflamed and the velum perforated in two places by ulceration (see figure in Section II, Chapter IV). With gentle perseverance, the laryngeal mirror showed the upper part of the larynx to be closed by two prominent oval tumours, of a deep pink colour, with the merest fissure in the middle to permit of entrance and exit of air, as per sketch. The epiglottis was rigidly erect. This was supra-glottic œdema, involving the false cords. Loud tracheal breathing was heard in the upper part of the chest. As my opinion only was asked, I did not do more than apply a topical agent, and prescribed what I thought was indicated.

CASE. *Supra-glottic œdema, associated with phthisis laryngea et pulmonalis.*—Wm. Smith, æt. 34, was admitted into the Westminster Hospital under my care, on the 25th September, 1863, having been sent to me by Mr. F. M. Corner, of Poplar. He had had aphonia on and off for two years, but continuously for six months, and was in an advanced stage of phthisis, quiescent until lately, when dysphagia commenced, with great pain and soreness in the right side of the neck, due to inflammation there of the thyro-hyoid articulation; was feeble, emaciated, and sleepless. The laryngoscope revealed swelling and œdema of the epiglottis, bulged out, as per sketch, and partly pendent, as well as of the false cords,

FIG. 62.

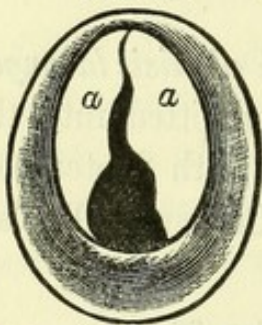


- a, a.* Portions of the true vocal cords.
b. Epiglottis. *c, c.* False cords, œdematous, with an ulcer on the free margin of the right. *d.* Back of tongue. *e, e.* Arytenoid cartilages.

which partly overlapped, but did not wholly conceal the true cords, which were seen of a white colour. Ulceration of the swelling on the right side of a tuberculous character.

Although the left lung was much diseased, he was much improved under general and local treatment, and went on remarkably well up to the 7th of October, when dyspnœa suddenly set in, the result of acute general tuberculosis of the hitherto unaffected portions of both lungs, which carried him off on the 9th. At the autopsy, besides acute miliary tubercles throughout both lungs, small cavities in the upper part of each were found. The trachea was extremely distended at the bifurcation. The epiglottis, the aryteno-epiglottic folds,

FIG. 63.



The sub-glottis seen from below, and showing the appearance of the glottis between the two true vocal cords, *a, a*.

and the false cords as far as the ventricles, were œdematous; the ventricles were not obliterated. The epiglottis was nearly a quarter of an inch thick and quite erect; its laryngeal surface was ulcerated in several places, especially at the base of the free portion, and in time, had the patient lived, it might have been destroyed. The mucous membrane below this to the right side, and that on the true cords, was covered with small minute ulcers, of the usual tuberculous character. The membrane in the sub-glottis was a little swollen and œdematous; the view of the glottis from below is given in fig. 63.

The preparations from this case were exhibited before the Pathological Society on the 25th September, 1863; but the fatal result was brought about by the lung-disease, no doubt aggravated by the laryngeal mischief.

On the 17th December I examined, by request, a patient of Dr. Pitman's, at St. George's Hospital, a young woman, upon whom tracheotomy was performed a few days before for acute laryngitis. The false cords were œdematous, in contact, and

formed two prominent oval cushions, as shown to several of the pupils and others with the laryngoscope. The tenseness of the œdema was beginning to diminish.

In Section III of Chapter V is given a very good case of supra-glottic œdema which might have appeared here with advantage; and in Section III of Chapter I is another example, wherein the œdema was the consequence of inflammation and necrosis of the cricoid cartilage. In the latter case scarifications proved of the greatest advantage.

B. *Sub-glottic œdema of the larynx*.—As the present form of œdema is described for the first time, it is necessary that a few particulars in relation to the anatomical peculiarities of the sub-glottis should be given, with some of the views held in relation to the limiting boundary of the supra-glottic form of œdema.

Being at one time a pupil of the perhaps greatest anatomical school in the world, that of Dublin, and having had, moreover, the advantage of instruction from a not less renowned anatomist, the universally known Professor Jacob, I am necessarily a subscriber to the views held by the Dublin professors, *e. g.*, “The submucous tissue at the upper part (of the larynx) is loose, and quickly admits of infiltration and swelling, or œdema, during inflammation; but below, as well as in the trachea, it is less in quantity, and of a more dense quality, therefore inflammation is not succeeded so rapidly by submucous effusion as it is by exudation of lymph upon its surface.”*

Some anatomists state that the membrane below the glottis is intimately connected with the perichondrium of the cartilages, which gives it great firmness. In my dissections of the larynx I have sometimes found a thin yet distinct layer of areolar tissue between the cricoid cartilage and mucous membrane, and sometimes it is somewhat lax; under such circumstances, if inflammation were present, a submucous effusion

* Harrison's ‘Dublin Dissector,’ vol. i, p. 66.

would be liable to occur ; but as the resistance is greater below than above the glottis, serum is exuded from the surface of the membrane, and fibrine remains behind.

Hasse observes that the swelling (of œdema of the glottis), being dependent upon infiltration of the submucous cellular texture, cannot extend to the inferior surface of the glottis, because there no layer of cellular texture exists.* In no example recorded (he further says) did the œdematous infiltration beneath the mucous membrane show itself in any marked degree beyond the glottis. Mr. Erichsen states that it is a pathological fact of much importance that this effusion never extends below the true vocal cords, being limited at this point by the direct adhesion of the mucous membrane to the subjacent fibrous tissue, without the intervention of any cellular membrane.† In a valuable paper published by Mr. Prescott Hewett, recommending the operation of laryngotomy in preference to tracheotomy in adults, for the reason that the effusion never passes beyond the glottis, he states that the explanation of this limitation is easily found in the anatomical structure of the larynx and trachea, for below the vocal cords the cellular tissue, being very short and very dense, forms so firm a bond of union that it is difficult to separate the mucous membrane from the parts lying below it. Moreover, Mr. Hewett mentions that, if water or air be injected into the cellular tissue of the larynx, it will be found not to pass beyond the upper margins of the inferior cords ; further than this spot, it cannot be forced downwards.‡

The views enunciated by those whose writings have been quoted are held by all pathologists, and it might seem an unwarrantable presumption on my part to dispute their correctness ; indeed, such is not my intention ; but as a searcher after truth, whilst I acknowledge that, as a rule, œdema of a

* 'Pathological Anatomy,' p. 272, Old Sydenham Society.

† 'Science and Art of Surgery,' Ed. 3rd, p. 819.

‡ 'London Journal of Medicine,' vol. i, 1849, p. 129.

supra-glottic nature rarely extends below the true glottis, yet the laryngoscope has revealed that isolated or exceptional cases do sometimes occur. If the two forms coexist, it is not by extension of the one to the other, for the simple reason that the effusion in one is chiefly serous and in the other fibrinous; and, as has been most correctly, and I may say indisputably observed, the true cords themselves do not become œdematous, and therefore the one cannot extend or pass into the other.

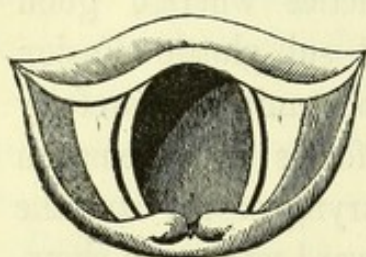
Cases have come before me in practice wherein good grounds were afforded for believing that sub-glottic effusion had occurred, and I therefore lost no opportunity of carefully studying the clinical history of both forms of œdema in different stages, with the aid of the laryngoscope, and the evidence which shall now be brought forward will go to show, whether we are justified for the future in speaking of œdema of the larynx according to the situation it occupies.

I shall give the following case firstly.

CASE. *Sub-glottic œdema, originating in acute laryngitis; aphonia and disease of the nose; good recovery.*—In January, 1863, I examined a little girl, æt. 14 (Temperance F—), in University College Hospital (for Mr. Erichsen), who had been admitted, with a severe attack of acute laryngitis, three days before. The symptoms were very urgent, but under general treatment the dyspnœa became less, and she escaped tracheotomy. In my examination with the laryngoscope the interior of the larynx was seen to be much inflamed, the inflammation extending to the vocal cords, the *free margins only* of which were of a grayish-white colour, thus giving them a narrow outline. They were widely separated, but approximated during the examination—the left cord, however, not very freely. In the sub-glottic region, below the posterior two thirds of the left vocal cord, was a red, fleshy swelling, pressing inwards, much encroaching upon the aperture of the

glottis, and extending to the posterior part of the sub-glottic space, thus explaining the peculiar wheezing noise in breathing. The mucous membrane around was somewhat tumid, and of a vivid redness, which latter pervaded the trachea as far as could be seen. The case was clearly one of acute laryngitis, with considerable œdematous swelling of the sub-glottic region, now no doubt somewhat diminished from the treatment pursued. The uvula and central part of the soft palate were

FIG. 64.



The swelling is seen, below the left vocal cord, encroaching upon the glottic aperture.

destroyed by ulceration, and rhinoscopy was very easy, showing extension of this process to the left nostril. This general examination was made with great ease in the presence of Dr. Ringer, Mr. Rickards (the house-surgeon), and several of the hospital pupils. The sketch shows the position of the œdematous swelling.

Subsequent inspection showed the gradual subsidence of the swelling, and a good recovery was made.*

My first impression was that this was an illustration of the manner in which tumours form in the larynx, but on consideration it seemed to me to be an instance of effusion of lymph beneath the sub-glottic mucous membrane, chiefly confined to one side and projecting across to the opposite, a condition that subsequent experience will prove to be occasionally, though no doubt rarely, present in syphilitic laryngitis.

During the past summer an instance was admitted under my care at the West London Hospital, of acute laryngitis in a severe form, which afforded me much clinical study with the laryngoscope. The necessity for tracheotomy appeared urgent two or three times. The details are as follow :

* A fuller report of this case appears in the 'Lancet,' 14th Feb., 1863.

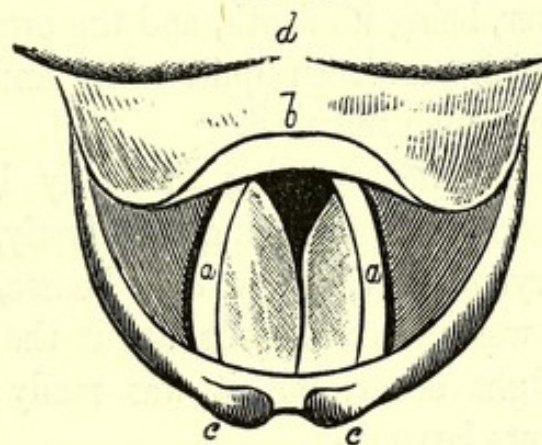
CASE. *Sub-glottic œdema, with acute laryngitis; a double swelling seen below the true vocal cords; aphonia; recovery.*—

Mary L—, æt. 37, was admitted into the West London Hospital, in April, 1863, with dyspnœa, associated with general symptoms of acute laryngitis. She had been ill for some months with chronic laryngeal disease, with acute symptoms three days only before admission, the dyspnœa was not only most urgent, but the breathing possessed a peculiar croupy stridor during inspiration, with great distress, and a hoarse laryngeal whisper and cough. The laryngoscope showed acute redness of the whole of the larynx, the vocal cords were of a white colour, and each side of the sub-glottis was occupied by an irregular swelling, as shown in the wood-

cut, surmounted, as it were, by the two cords, being more prominent on the right side. The diagnosis at first was uncertain; but as laryngeal obstruction had occurred pretty rapidly, and was clearly seen to be *below the glottis*, I inferred that it must be sub-glottic effusion of some kind or the other. This was shown and explained to the two resident house-surgeons, who had often examined many of my cases.

Tartar emetic and acetate of ammonia with small doses of mercurials were ordered, and the inhalation of steam; a solution of nitrate of silver was daily applied by Mr. Atkins, the senior house-surgeon. The urgency of the symptoms gradually yielded, and in about four days the sub-glottic swelling had much subsided, but it remained persistent for the period of

FIG. 65.



a, a. The true vocal cords, below which are seen two sub-glottic swellings, meeting in the centre. *b.* Epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of the tongue.

eleven days, when no further trace of it was visible. She was discharged from the hospital at the end of five weeks, and returned to her family. The voice was restored, but had a slight laryngeal tone about it.

Although Mr. Erichsen's case preceded this, it was not until the opportunity was afforded me of closely watching the progress of a case from the beginning that my mind was alive to the occurrence of a form of œdema that was quite new. The position and form of the cricoid cartilage explain the circumstance why sub-glottic œdema occupies the sides and back in preference to the front part of the sub-glottic region.

Now, in the foregoing instance the swelling was on both sides, with a narrowish fissure nearly in the middle, as we see in the supra-glottic form, the distinguishing mark, however, being its depth, and the presence of the true vocal cords, which were seen quite white and fixed, although the larynx was much inflamed.

As the swelling gradually became absorbed, the voice slowly returned, being that, firstly, of decided obstruction, then laryngeal or croupy, then hoarse, and, finally, nearly natural. I was rather anxious about the patient, lest sudden spasm might occur, but it was really not as bad as met with in acute laryngitis.

CASE. *Sub-glottic œdema, necessitating tracheotomy; good recovery, with an impaired voice, found to depend upon the remains of the old effusion; absorption.*—The patient was a butler, æt. 39, upon whom tracheotomy was performed in August, 1862, by Mr. T. W. Nunn, and a tube was worn for three months. His illness, however, had existed on and off for eighteen months before the operation, characterised chiefly by attacks of dyspnœa. When he came to me in June, 1863, his voice was tremulous, rough, and a little hoarse; it was not strong enough to permit him to earn his

living. In the left subglottic region was a little swelling, which I believed to be the remains of former subglottic œdema, and prominent enough to simulate true growths of the larynx. He was examined several times in the presence of friends. For this swelling he was treated constitutionally, with the result of its absorption and perfect cure. My last inspection of this patient was on the 7th of September, 1863, on my return from Newcastle-upon-Tyne, he was then able to halloo and shout out loud, without any break or inconvenience to the voice.

He was sent to me by Mr. Nunn, and I watched him carefully for some time.

CASE. *Subglottic œdema; tracheotomy; permanent approximation of the true vocal cords, with good speech; view of the subglottis from the tracheal fistula.*—The subject of this case was a shoemaker, æt. 33, sent to me for examination by Mr. T. W. Nunn, 22nd December, 1862.

In the month of April, 1862, Mr. Nunn performed tracheotomy upon him in the Middlesex Hospital for obstructed breathing, the result of syphilitic laryngitis; he was then aphonic. He left the hospital the end of May, and spoke in a loud sonorous voice without having to place the finger upon the orifice of the tube; his breathing was a quiet snoring noise, and he could not dispense with the wearing of the tube for longer than two minutes.

From the possession of good speech, I made up my mind beforehand that the cords were probably normal, and so this proved, for in the laryngeal mirror they were seen of a grayish white, but closely approximated. By great efforts they divaricated slightly in the centre, but not enough to distinguish if anything was present in the trachea; he could not take a deep inspiration through the glottis. It was clear some obstruction existed below, which I was not able to determine until the 9th of June, 1863, by a view

of the subglottis from the tracheal fistula, when two swellings were noticed meeting in the centre, but free at the front and rear. This swelling was the remains of the former disease which necessitated the operation, and could be nothing else than subglottic fibrinous submucous exudation, which had become permanently organized. I had many opportunities of examining him, and showed him to various persons, among others to Professor Czermak, Mr. Lund of Manchester, and Dr. Walker of Birkenhead.

If my views were worth anything, they required confirmation by those great storehouses of pathological knowledge, our London museums, and the result of a minute and laborious examination afforded the following results: it may be stated, however, that I rejected some cases that might well have been included, but which were not sufficiently positive.

Examples of subglottic œdema in the Hospital Museums of London.

1. In *St. Bartholomew's Museum* is a preparation of acute laryngitis in a man of twenty-five, laryngotomy was done on third day, and patient lived twelve hours. The larynx is completely lined with layers of lymph extending to the bronchi. Published by Mr. Lawrence in 'London Medical Gazette,' 1845, vol. xxxvi, p. 307. (*The right subglottic portion is œdematous and prominent.*)

2. In *St. George's Museum* is a specimen of considerable œdema of the glottis, epiglottis, and neighbouring parts, with great enlargement of the glands of the tongue, from a man aged thirty-one; the patient died of erysipelas of the head and face extending to the larynx. (*In addition to the general œdema of the glottis above, and the epiglottis, there is subglottic œdema, very well shown because the larynx is opened from the front. A distinct prominent cushion has formed beneath the vocal cords of either side, of dimensions quite sufficient to almost obliterate the passage through the glottis.*) Series vii, No. 91.

3. In *St. Thomas's Museum* there are not less than four instances of subglottic œdema, viz. :—

W. 21. Great thickening of the mucous membrane and œdema of the rima glottidis and larynx, so that in the recent state the air passage was nearly closed, the opposite walls of the larynx being almost in contact; from a young woman who had just been cured of a syphilitic sore throat; she expired suddenly. (*There is certainly some subglottic œdema, for the swelling is even more prominent below than above, especially on the right side.*)

4. W. 22. Chronic inflammation and thickening of the membrane of the larynx. At the lower border of the cricoid the passage was so constricted as barely to admit a director. (*This comes into the category of subglottic effusion, which appears to have extensively contracted the tube, and is very prominent on the right side also.*)

5. W. 24. The larynx and part of the trachea of a man who died of smallpox on the eighth day. (*Although not mentioned this is an instance of subglottic œdema occurring in smallpox. The effusion appears to have been greater at the posterior half of the subglottis.*)

6. W. 51. "Fibrinous deposits in the muscular and cellular tissue connected with the larynx, producing almost complete closure. The mucous surface of the larynx, for quite half an inch below the vocal cords, instead of being concave has become bulged inwards on each side so as to form two perfectly flat vertical walls, which, in the natural condition of parts, were in contact with each other. The protrusion of the mucous membrane is due to the presence of a soft elastic substance beneath it. This deposit is symmetrically disposed in connection with the lateral portions of the cricoid, and forms protrusions almost equal in degree, both towards the canal of the larynx internally, and towards the thyroid cartilage externally." (*This is in fact a splendid example of subglottic fibrinous œdema, and typically illustrates*

what I have described of its appearance in the living. It is fully described by Dr. Bristowe in 'Path. Tran.' vol. xi, under the name of "Fibroid deposits in the tissues of the larynx.")

7. In the *Westminster Museum* is a preparation of the ordinary œdema glottidis, with some *slight* subglottic infiltration. G. G. 15.

8. In *St Mary's Museum* is an instance of œdema glottidis, which caused the death of a patient in the Lock Hospital, under the care of Mr. James Lane, with rupial ulceration on the face and body. There is thickening of the mucous membrane of the larynx, and the left sacculus is apparently closed. (*This is quite correct, but there is also subglottic œdema on that same side, and the swelling there forms a marked contrast to that of the right side.*) F. A. 25.

9. A case in the same museum of ulceration of the larynx and trachea with considerable apparently œdematous swelling of the left subglottic space. No history of case. F. A. 9.

10. In *King's College Museum* specimen 382. 2. In 'Post-mortem Case Book,' vol. i, p. 407. "There was an ulcer about the size of a threepence on the right side of the larynx, just below the right vocal cord. This filled up the space a good deal and pushed the vocal cord forward." (*In the catalogue it is erroneously called a tumour of the larynx but it is not one. It is a beautiful instance of extensive subglottic œdema from fibrine of the right side, the surface possibly becoming ulcerated from close contact with the opposite side of the larynx.*)

11. In the *Army Medical Museum* at Chatham (now at Netley) there is an instance of the sacs of two small abscesses situated behind and immediately beneath the left vocal cord. No. 455 (*This was probably an example of subglottic œdema chiefly confined to one side of the subglottis, and ending in suppuration.*)

Other instances of Subglottic Œdema.

1. In the Fothergillian prize essay on the 'Diseases of the

Larynx and Trachea,' by Dr. T. P. Bryant, in the library of the Medical Society of London, there is given a coloured drawing (No. 2) of the larynx of a patient (George Sparrow) aged 75, with "œdematous inflammation of the glottis occupying the sacculus laryngis and surrounding parts of the right side." If the drawing is accurate, and I have no reason to believe it otherwise, then there is considerable subglottic effusion, and it seems to me not at all improbable that the disease commenced below and extended upwards. The author of that essay, in speaking of œdema of the glottis, observes, "that it sometimes confines itself to the larynx and produces so much swelling as to require tracheotomy; *the same state occasionally, however, is found to extend even low down into the trachea.*"

Dr. Bryant's essay has proved him an accurate observer and a high authority. I have therefore italicised what is so important as bearing on the present question.

2. In the museum of the College of Surgeons of Dublin is a larynx, wherein the rima of the glottis does not exist, and the ventricles filled up; the tube opposite the thyroid cartilage is greatly contracted. An artificial opening in the trachea is present in the form of a cylindrical tube, perfectly smooth and cicatrized. It is some years since I examined this preparation (*C, a, 51*), but I think it will properly come into my category of examples of subglottic œdema, resulting from syphilis.

C, a, 28 is an illustration of abscess surrounding disease of the posterior part of the cricoid cartilage, which so encroached upon the cavity of the larynx as to require tracheotomy. It is not improbable that fibrinous submucous effusion may have preceded the perichondritis, giving rise to the abscess.

3. Cruveilhier relates an instance in which the cricoid cavity was nearly filled up by submucous indurated tissue, in which the voice was hissing during life.*

* 'Dict. de Méd. et Chir. Prat.,' vol. xi, Paris, 1831, page 45.

The subject of it was a woman of 40, with aphonia and hissing respiration, the result of old syphilitic disease; she was cured in eight months, and got bad again, and from the 20th of August to the 20th of October, 1821, she had constantly a croupal cough, voice, and breathing. The voice and cough resembled those of croup in a very severe form. She died on the 24th of October. At the autopsy, to Cruveilhier's great astonishment, the obstacle to breathing was found to be in the subglottic region on a level with the glottis. The cavity of the cricoid cartilage was almost entirely filled by indurated tissue, which formed two callosities, or swellings, which in one part had ulcerated, and in another adhered to the cartilage. The induration had invaded the inferior or true vocal cords, which were much altered. The ventricles had undergone thickening; the superior or false cords were intact, and a narrow fissure existed between the two subglottic swellings.

(I may mention in a parenthesis that Cruveilhier has described four cases of what he calls subglottic laryngitis, wherein the symptoms are those indicating stricture of the glottis, though its progress is less rapid than the supraglottic form. The seat of the inflammation explains, he says, the pain in the lower part of the larynx, and there is less dysphagia.)

Taking the preceding observations into account, we may say that, for the present, they represent some eighteen instances where the disease under consideration was probably present in all. If time had permitted of reference to various works, there is no doubt that the number might have been augmented. Nevertheless, it is large enough at the present early period of the inquiry, to engage the attention of pathologists.

I am attending a lad, æt. 12, brought to me by Dr. Sturt, with dumbness from closure of the larynx, after the operation of tracheotomy six years before for croup. The tracheal tube is worn permanently, and there is no apparent passage upwards into the larynx, and I have several times endeavoured to pass a bougie from above downwards, but my

efforts have as yet been fruitless. Nevertheless, if obliteration of the larynx has positively happened, it must have been from subglottic fibrinous exudation, for the upper part of the larynx is clear down to the true vocal cords. As I purpose examining the larynx shortly after an opening is made in the cricothyroid space, I have not included it in my series of cases, although I believe it might have been with great propriety.

Symptoms and Treatment.—They are those of acute laryngitis primarily, followed by obstructed breathing, as in the supra-glottic form; but laryngoscopic inspection alone can determine which form of œdema is present. It may be taken as a rule that the swelling never extends farther than the commencement of the first ring of the trachea, and if found to be seriously embarrassing the breathing, the trachea (not the larynx) must be opened to give relief. The breathing in the subglottic disease is more stridulous and wheezing, and has a peculiar laryngeal or croupy hoarseness about it. There is moreover, intense dyspnoea, laryngeal cough, and much mucous secretion. If constitutional remedies are early applied, they should consist of tartar emetic and acetate of ammonia, and, if necessary, some anodyne. Inhalation of hot steam, poultices to the neck, and small doses of mercurials to absorb the effused material. Small quantities of brandy, or other stimulant, should be frequently administered.

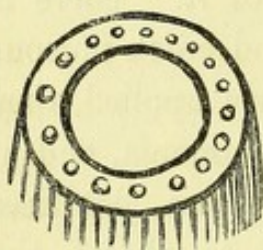
Subglottic œdema is a more dangerous disease than the other form. Scarifications would be useless in it, from the nature of the effusion, and in the great majority of cases (although hitherto not suspected) has no doubt demanded early tracheotomy. It is the form, also, more likely to demand the permanence of the fistulous opening, and probably has obliterated the passage upwards from filling up of the calibre of the cricoid cartilage. Additional information will be very desirable to complete its clinical history.

The two following cases are given in this place, as especially

proving the fibrinous character of the secretion which takes place in the subglottic region.

CASE. *Expectoration of rings of fibrine from the subglottis, where the mucous membrane was seen to be excoriated.*—A gentleman, æt. about 45, consulted me in January, 1863, recommended by Mr. J. N. Radcliffe, of Guildford Street. For some years he had been in the habit of expectorating from the throat what he called a circular ring of mucus; this usually occurred twice a week, latterly but once a month, and it caused him some anxiety. Sometimes in bed the breathing was whistling as the secretion formed; in his ablutions about the neck he had felt a little pain corresponding to the pomum. The tenacity of the expectoration was such that it was readily dried, and could be strung upon a string. The sketch of the expectoration is given herewith: one half of its under surface

FIG. 66.



Annular fibrinous sputum from the subglottis.

had a number of little filamentous processes as if it had been firmly attached, and the upper surface resembled epithelial scales. The secretion was for the most part pure fibrine. The laryngoscope showed a fine capacious larynx, with some congestive redness and excoriation (not ulceration) on the right side of the subglottis. It was not observed elsewhere, and was clearly the seat of the

disease, as the results of treatment subsequently proved.

CASE. *Anterior subglottic excoriation secreting lymph which was expectorated every three or four days, in the form of rings, for fifteen years.*—Mrs. H. T—, æt. about 38, consulted me November 25th, 1863. Had been some years in India. For fifteen years she had *hemmed up* (not coughed up) an oval-shaped dark sputum, tinged with blood the last few days, as she had severe sore throat during the past week. This had

occurred every three or four days, and first commenced when in India; she showed me a sample of it, which is sketched; it consisted almost wholly of pure fibrine, was thicker at one part, and the opening was occupied by a thin film of mucus. She sings a good deal, and her voice is always clearer and better after getting rid of this sputum.

FIG. 67.



Dark ovoid sputum from the subglottis.

The laryngeal mirror reflected a beautiful throat, with well-formed larynx and healthy vocal cords. Beneath the last on the front and sides of the subglottic space, was seen the redness of irritation with some slight excoriation anteriorly; this subglottic circle was the seat of the expectoration. General health perfect in every other respect. The treatment consisted of showers of zinc with some medicine internally. Up to the 14th December, when I last saw her, she had expectorated but twice only, and I prognosticated complete recovery.

It may be taken as a curious and undisputed fact, that the subglottis, from its anatomical peculiarities, secretes fibrine, which may be poured out on the surface of the membrane, or beneath it according to the special exciting circumstances inducing it.

SECTION III.—CROUP—CYNANCHE TRACHEALIS.

Croup is an inflammation of the windpipe, which may extend upwards into the larynx, and occasionally downwards into the bronchial tubes. It occurs especially in young children, and mostly of the male sex, after they have been weaned. The essential and peculiar feature of croup is, the formation of a membrane which lines the windpipe, and forms a distinct mould of that tube and the larynx or bronchi, according to its extension. This circumstance engenders an amount of

gravity to the disease, according to the perfection of its development and the consequent obstruction which it offers to respiration.

The symptoms are usually ushered in during the night, when the child manifests symptoms of catarrh, with sneezing, coughing, and *hoarseness*. It is the last which should at once excite attention. The cough is of a loud, ringing, and barking character, and has been called "brassy;" it is, however, seldom to be mistaken; the breathing becomes difficult and stridulous; each inspiration, whether after the cough or not, produces a loud crowing noise. This last symptom, with the hoarseness, are the striking signs of the disease. There is high inflammatory fever, flushed face, hot skin, thirst, frequent and hard pulse. There is no morbid appearance in the pharynx, and there is no difficulty in swallowing, as occurs in diphtheria. Sore throat is, however, complained of, if the child be old enough to do so.

The rapidity with which croup runs its course, oftentimes within twenty-four or forty-eight hours, expresses more than words can convey the expediency of seeking early relief. Indeed, I am fully impressed with the belief that if the child is seen within a few hours after the disease has set in, a cure is sure to follow. On one occasion I had to visit a gentleman in the country, and passed the night at his residence; during the night one of his children was attacked with croup, which seemed to be unnoticed by its nurse or any of the family: I therefore got up and awakened them, and the child was at once attended to, and recovered after two or three days' illness. This gentleman had already lost a little girl by the same disease. My eldest daughter, Cecilia, has had five distinct attacks of croup, which were dispelled by attending to them myself almost as soon as they broke out during the night.

The general duration of croup is from five to seven days—over which the three stages of the disease may extend, namely,

the precursory or catarrhal, the confirmed or stage of development, and the suffocative or stage of collapse. I have examined several children in the different stages of croup with the laryngoscope, and it has shown general congestion of the larynx and trachea in the catarrhal stage, with some slight swelling of the false cords and a contracted glottis; in the second stage a white exudation is seen commencing in the subglottis, usually in front, and thence spreading downwards along the trachea, probably into the bronchi, and upwards into the larynx, covering every part of the membrane including that upon the true as well as the false cords. But it may be stated as an invariable rule, that the exudation commences to form at the anterior part of the subglottis, between the origin of the true vocal cords. In the second stage the membrane, where uncovered, is of a bright scarlet or deep crimson redness. In the third stage the examination is difficult, and when practicable, shows detachment of the membrane in some part of the larynx or trachea, but not always so.

As the disease advances, the respiration becomes slower and convulsive, from the obstruction to the passage of air; the skin becomes livid, the face is pale, the pulse feeble and irregular, the voice is lost, the head is thrown back, the cough is husky, or ceases altogether, the extremities are cold, drowsiness comes on, and asphyxia, perhaps, closes the scene.

The cause of death is the membrane which has blocked up the windpipe, and probably extended to the bronchial tubes, or even to the air-vesicles, although, as Dr. Stokes has observed, bronchitis or pneumonia, which are present in fatal cases, may have had as much to do with it as the mischief in the windpipe. This membrane or albuminous exudation, has been found to extend from the tip of the epiglottis to the bifurcation of the trachea, as mentioned by Dr. Watson, in his 'Lectures;' the preparation I have seen in the Middlesex Hospital Museum, as well as some others in the London

Mucous. Sometimes it exists in grains or patches occupying different parts, or it may form demi-cylinders, between which the mucous membrane is seen mostly of a bright-red colour from inflammation. It is thinner and more easily broken in the larynx than in the trachea, and thinnest in the bronchial tubes.

Differing from most of the diseases of childhood, croup is not contagious; it however recurs several times, at different periods, as mentioned in the case of my eldest girl. Indeed, some children are habitually liable to frequent attacks of croup, and this may pervade all the children of a family. I cannot help thinking that this will be found to depend upon some cause that shall some day be found removable. The prognosis will of course depend upon the presence or absence of the graver signs—of complete obstruction to breathing, and the influence it exerts upon the child. If the false membrane is expectorated and the breathing becomes easy, it is to some extent favorable; there is, however, the danger of its reforming, and return of the spasmodic dyspnoea, with now intense drowsiness. When there are complications of disease of the lungs or bronchi, or a predominance of nervous or spasmodic symptoms, they greatly add to the general danger.

Treatment.—Without entering into any disquisition as to the merits of one plan of treatment over another in croup, no more can be done in this place than to recommend those remedies which general experience has proved to be the most reliable. And as the treatment, to be useful, must be energetic, it consists in depletion by venesection from the arm, or by cupping, if the child is old enough, or by the application of leeches in the very young. I am by no means an advocate of bloodletting in children, but it must be adopted in croup, if the symptoms are violent and the fever runs high, if there is a full pulse, and if the child is seen sufficiently early. The

most convenient plan for children under six or eight years of age, is to apply two or more leeches, according to the age, to the upper part of the sternum, so that when they fall off, the bleeding can readily be arrested by pressure. And now emetics may be resorted to with advantage, and the choice lays between antimony and ipecacuanha. I have long trusted to the former, which, in exerting its special influence, promotes not only the expectoration of the membrane, but also prevents the recurrence of its formation. A solution of antimony, two grains to the ounce (the strength of the vinum), in the dose of a teaspoonful every ten minutes, may be given until vomiting is produced. Some persons prefer giving a drachm (two drachms if the child is over two years of age) of a mixture of equal parts of the wines of antimony and ipecacuanha every five minutes, until vomiting ensues. And, following the practice of Dr. Cheyne, the vomiting may be repeated every one or two hours (Dr. Stokes recommends at least once in every three quarters of an hour). In mild cases, perhaps, this need not be insisted upon, reliance being placed on nauseating doses of either. After the first emetic, the child should be placed in a warm-bath of ninety-six degrees for ten minutes, wiped dry, and placed in bed, and the antimony may be continued every two or three hours. My own practice usually is, when early called to a case of croup, to administer an emetic at once, and follow it up by a warm-bath, and then nauseating doses of the antimony. I have seen cases in which vomiting could not be induced, and they afford ground for much uneasiness. As a substitute for this, I can confirm the value of Dr. Cheyne's recommendation of calomel, in doses of from two to four grains, with two or three grains of James's powder, given every two or three hours. This has a purgative influence, which proves most serviceable. The value of calomel alone in doses of from one to four grains, according to age, every hour, until it freely purges or produces vomiting, is confirmed in nearly a thousand cases treated by Mr. C. Ferguson's father,

near Carlisle.* Sometimes 50, 60 or even 100 grains were given before the disease succumbed in very hopeless cases. With regard to the use of antimony, I have only to repeat the caution that its effects must be watched, so that the alarming prostration which it sometimes causes may be arrested. Now, a very simple remedy for this is a little strong tea, which acts at the same time as a mild stimulant, and has a wonderfully restorative effect. Besides this, if the prostration is extreme, it may be necessary to give a little wine or brandy, and aromatic spirits of ammonia, to restore animation. A good deal could be said upon croup, but I trust sufficient has been given to prove useful to those who may find it necessary to consult these pages. I may mention, that my friend, the late Dr. Badgley, of Malvern, was in the habit of using the ethereal tincture of lobelia as a substitute for the antimonial emetic, and he spoke to me very highly of its efficacy; and I know, from the reputation it has in the United States, that it must be a valuable remedy.

Tracheotomy.—With respect to this operation for croup, I have now seen it done in some dozens of cases, and with a few exceptions all died; therefore I cannot be much impressed in favour of it. In nearly all, the membrane extended downwards into the lungs, or there was extensive lung-mischief co-existent. If the membrane were solely confined to the larynx and trachea only for a short distance downwards then we might hope for relief; yet apparently, in such cases, the operation has produced expulsion of its membrane, and death has ensued from exhaustion.

If tracheotomy is to be performed in croup, it should be done early; and I would advise the removal of a circular or oval portion of the trachea, as recommended by Dr. Marshall Hall ('Lancet,' vol. ii, 1848, page 530), and no

* Dr. Handfield Jones, in the 'Lancet,' 10th March, 1860, and confirmed by Mr. Davies of Heytesbury, in the same journal the week following.

tube worn, the soft parts to be kept separated laterally by two steel hooks, with an india-rubber or gutta-percha band running round the neck. This would obviate the risk of pulmonary inflammation, which kills the majority of children, as the result of the irritation produced by the silver tube. There is something in the trachea of the child which is obnoxious to the presence of a tube, this is the reverse in the adult.

I am free to admit that the operation *has* saved life in a few instances, and it must not be discarded in croup. Moreover, I will assert that when it has proved unavailing, it has not been due to that proceeding itself. Notwithstanding all this, however, we are justified in trying the most powerful revulsives, in preference to tracheotomy. Emetics of a *very strong decoction* of senega are what I have used in desperate cases, and I found them serviceable in saving life and effectually expelling the fibro-albuminous exudation. But the senega must be used with an unsparing hand as to the strength of its decoction—it can do no harm whatever; and I generally prepare it myself for administration at the residence of the child, and give it with my own hand. In five instances that were looked upon as utterly hopeless, and too bad almost for tracheotomy, the strong decoction of senega saved life, expelled the false membrane, prevented its reformation, and a cure resulted. The way of preparing this decoction is as follows: Take two ounces of the good root of senega, well bruised or broken up, and boil it in a pint and a half of water in a small saucepan down to a pint, strain and cool it, and administer it in doses of a dessert-spoonful every ten minutes, until free vomiting takes place, with expulsion of the membrane. It may be repeated, if necessary, but it is only in such cases where other remedies fail, that this strong decoction should be employed. Carbonate of ammonia may be added sometimes, in the dose of a grain or half a grain, *after* the emetic influence is produced, and occasionally the mixture may be given by the rectum; it is as well to sweeten it, when

taken by the stomach, with syrup, or bruised liquorice root, which cover both the acrimony and flavour peculiar to it.

An infusion of the senega may be substituted for the decoction, made in the proportion of two ounces of the root to a pint of boiling water, and given in the same doses.

I have recently employed the spray of a solution of nitrate of silver (thirty grains to the ounce) as an injection into the larynx and trachea in croup, and the severity of the symptoms was so speedily diminished, that I almost doubted whether the disease was actually croup, yet all the well-marked symptoms were present. I would therefore unhesitatingly advise local treatment to the upper air-passages in the manner referred to, in conjunction with other measures. The solution certainly prevents the tendency to fibrinous exudation.

The application of cold water round the neck is strongly recommended by Dr. Erlemneyer and M. Fraenkel, at the first appearance of the symptoms, in the form of a compress dipped in the cold water and renewed every five minutes. The latter uses the wet sheet besides.*

One of the latest remedies for croup is the muriated tincture of iron, recommended by M. Courty, of Montpellier.

SECTION IV.—ERYSIPELAS OF THE WINDPIPE—ERYSIPELATOUS LARYNGITIS.

When erysipelas has been raging as an epidemic, particularly in hospitals, it will attack the structures of the throat, either by extension from the head and face, or else by a sudden metastasis from some other part of the body. This is a truly formidable disease, and is certain to prove fatal, when the low

* 'Gaz. Med. Prov. Venet.,' and 'Brit. Med. Journ.,' January 25th 1862, p. 95.

and typhoid character of the inflammation is considered. Some nine or ten cases have come under my notice in the London hospitals during the last eleven years, and nearly all ended in death. The symptoms noticed are sore throat, preceded by shivering and fever, vivid redness and swelling of the fauces, difficulty of swallowing and pain externally in the larynx. The voice is hoarse, sometimes whispering; and what is perhaps an early and an unfavorable sign, urgent dyspnoea is present.

Fortunate is it for the patient if the erysipelas appears externally, as there is then a prospect of recovery, for the activity of the symptoms subsides, and they gradually disappear. More usually the patient rapidly becomes typhoid, and dies from exhaustion.

I was permitted on one occasion to use the laryngeal mirror in a case where the head and neck were primarily affected with erysipelas, and had thence extended to the throat and larynx. The fauces were of a bright and shiny scarlet redness; and so was the mucous membrane covering the laryngeal surface of the epiglottis, the interior of the larynx, the vocal cords and the trachea, associated with some tumefaction, but not at that moment affected with œdema. The treatment consisted of the muriated tincture of iron combined with quinine, supporting the strength by nourishing diet and stimulants, and the local application to the throat and larynx every six hours of a solution of nitrate of silver (four scruples to the ounce of water). Supraglottic œdema was about commencing when the topical agent was first applied. In twenty-four hours the most marked relief had taken place, and in forty-eight hours the patient was out of danger, and the erysipelas was slowly subsiding externally.

When a fatal result has ensued, after death, the mucous membrane is found of a dirty-greenish or brown colour, and its submucous tissues in a sloughy or putrefied condition. If the termination has been sudden, the epiglottis and parts above

the glottis are noticed to be œdematous. Besides these, the surface of the epiglottis may be inflamed as well as swollen, and pus replace the serum in the submucous tissues. The mucous membrane of the fauces generally is inflamed, and sometimes covered with patches of lymph.

In erysipelas of the scalp, it is usual for some amount of sore throat to be present, and this is liable at certain times to take on the same action; from the fauces it rapidly extends to the larynx and trachea, and is followed by extreme dyspnœa, and a suffocation as rapid as in the worst forms of acute laryngitis. In fact, the erysipelatous inflammation is so violent, that it runs through its stages with remarkable rapidity, and is followed by extensive purulent infiltration throughout the whole of the submucous tissues of the structures entering into the formation of the larynx, which become wholly disorganized.

Mr. Ryland has detailed some cases to show that erysipelas will attack the fauces, and extend to the larynx, without there being any external manifestation of the disease.

Hitherto, among the various plans of treatment which have been resorted to, none have proved of any avail, and tracheotomy has been pronounced all but useless. The most rational proceeding under these circumstances is, to treat the throat disease *before* the dyspnœa becomes urgent, by the internal use of the tincture of the sesquichloride of iron with dilute hydrochloric acid and chlorate of potass, as recommended in diphtheria, more particularly if the patient is already suffering from erysipelas of the head. But quinine will be found a valuable adjunct. The inhalation of the steam of hot water will prove of great benefit, and especially soothing. Wine, brandy, and other stimulants, should be freely administered with nourishing diet. Tracheotomy *must be performed* when suffocation is impending, to afford even a chance for life, and it should invariably have the preference over laryngotomy, when the larynx is seriously involved. Not any lowering or

depleting measures of any kind can be permitted in erysipelatous laryngitis.

SECTION V.—DIFFUSE INFLAMMATION OF THE AREOLAR TISSUE
OF THE LARYNX.

In July, 1860, Mr. Henry Gray informed me that he had seen several cases in hospital practice of diffuse inflammation of the areolar tissue of the larynx, not connected with erysipelas externally. My attention had been drawn to this form of laryngeal affection before, but I always associated it with erysipelas and diffuse inflammation of the neck, or rather looked upon it as a consequence of either. Mr. Gray has given a short account of this disease in the third volume of 'Holmes' System of Surgery' (p. 232). An isolated instance has come before me in some one of the hospitals of London every now and then, one of the last being a male patient, aged forty-three, in St. George's Hospital, under the care of Mr. Pollock, who kindly showed me the patient three or four times. In this man the neck became enormously swollen from the jaw to the clavicle, with fibrinous infiltration from deep cellular inflammation, which soon involved the larynx, for which laryngotomy was performed. The operation occupied nearly an hour, the difficulties attending its performance were so numerous; and although it was done with but little hope of saving life, the patient actually recovered. The details of the case I recorded in the Hospital Mirror of the 'Lancet,' for September 5th, 1863.*

As described by Mr. Gray, diffuse inflammation of the areolar tissue of the larynx may be known as follows:

* For the last nine years I have edited the "Hospital Mirror and Clinical Records" of the 'Lancet,' and as a consequence have seen a vast amount of disease in the practice of all the large hospitals of the metropolis. Anything unusual or remarkable is generally brought under my notice.

The symptoms at the onset point to the larynx or the parts in its immediate neighbourhood. The free surface of the membrane is unaffected, the obstruction arising from infiltration of the submucous areolar tissue of the larynx with lymph or pus; sometimes the effused products surround the larynx, trachea, and œsophagus, infiltrate the whole of the cellular tissue of the neck, and extend into one or both mediastina.

For some days the patient feels unwell, complains of headache and depression of spirits, soon followed by rigors, soreness of throat, and symptoms of fever. The fever increases, there is a sensation of weight and oppression at the chest, much dyspnœa and slight hacking cough, and expectoration of a little white glairy mucus. The soreness of throat increases, there is great difficulty of swallowing, the fauces and tonsils are swollen, of a dusky red colour, and sometimes ulcerated. One or both sides of the throat become painful, and the glands in the neighbourhood of the jaw very much enlarged. Occasionally, there is a constant and copious discharge of saliva. As the disease proceeds the neck becomes greatly swollen, the breathing more oppressed, and the dysphagia complete; the fever assumes a low typhoid type, and the patient gradually sinks. Generally, death occurs from asphyxia, or a sudden attack of dyspnœa.

Besides the conditions already mentioned, the cellular membrane of the neck is observed to be sloughy, putrid and infiltrated with pus. Sometimes the effusion of lymph is confined to one side or the whole of the neck may be involved.

The treatment advised is leeches early to the neck and warm fomentations, and deep and free incisions if the swelling becomes brawny or tense. Although not recommended by Mr. Gray, tracheotomy should be attempted to hold out a chance for life.

For additional information the reader may consult "*Observations pour servir à l'histoire de l'erysipele du pharynx, par*

M. Cornil, interne des hôpitaux." 'Archives Gén. de Méd.,' March, 1862. Also an article in the 'Amer. Med. Times' of 31st January, 1863, by Dr. Rufus Brown, "On Gangrene of the Mouth and Fauces."

CHAPTER IV.

SPECIFIC DISEASES OF THE THROAT.

SECTION I.—DIPHTHERIA.

WITHIN the last few years no disease has attracted more attention than that now recognised as diphtheria. Its ravages have been such that whole families have been cut off by it—child after child has been snatched away, and the most persevering efforts of our art have failed in arresting its progress. This it is that has given rise to so much uneasiness in the public mind regarding the malady. Fortunately, the complaint and its consequences are now much better understood, the practitioner is more on the alert for the earliest symptoms, and as a consequence, treatment has been more successful. At one time, almost every affection of the throat was looked upon as diphtheria, and the fears of the patient's friends have influenced, in some cases, the judgment of the medical attendant. Now, this is not so, and the complaint is generally recognised, unless some of the more prominent symptoms are absent.

Diphtheria is a malady that has existed most probably in ancient times, and is well described by Aretæus. It has prevailed over various parts of Europe during the last 350 years, and has been described in the writings of various authors. In 1748 Dr. Fothergill published the first account of the malady in this country. Bretonneau, of Tours, was the first modern writer who described it under the name of diphthérie, in

1821. For an account of his researches, and those of Trousseau and others, the reader is referred to the 'Volume of Memoirs on Diphtheria,' selected and translated by Dr. Semple for the New Sydenham Society. For other information, the works of Dr. Jenner, Dr. Greenhow, and Mr. Ernest Hart on the disease, may be consulted with advantage; they embody almost all that is known of the disease as it has occurred in England. Some excellent hints on diphtheria, by Dr. Wade, are in the 'Lancet' of August 23, 1863.

In the present chapter a concise and clear account of the disease is given, divested of superfluous detail, yet omitting nothing of importance, so that a faithful mirror is presented which may serve as a guide to the symptoms and treatment of what may be essentially considered a grave malady under all its different aspects.

Diphtheria is both infectious and contagious, and may hereafter be determined to present the peculiarity of attacking persons at least once in the course of their lives. It occurs both sporadically and as an epidemic, and is remarkably virulent in limited areas which are deficient in good sanitary regulations. It is allied in some of its phenomena to both the scarlatinal and malignant sore throat, but is unquestionably a distinct affection from scarlatina, which is proved by its attacking persons who have had the former disease, even in years gone by. It has occurred at all periods of the year, but especially in the spring and autumn.

Three well recognised forms of the disease have been observed in the large number of cases brought before the profession; and as these have certain general symptoms in common, I shall dwell on their pathology before describing them individually.

Pathology.—Diphtheria is essentially a blood-disease, and manifests its great peculiarity in all its forms by the exudation of a distinct membrane over some part of the throat-apparatus, namely, on the tonsils, soft palate, uvula, and pharynx; the

lining of the mouth, cheeks, and the nose; the larynx, trachea, and bronchi; and even the eyes and other external exposures of the mucous membrane may be affected, as well as the skin. In this manifestation, it resembles the other exanthemata and similar zymotic affections; that it can be diminished in its frequency, and its propagation arrested, by the most vigorous sanitary measures, is a fact which is indisputable. The mucous membrane beneath the exudation is generally reddened from congestion in various degrees of intensity, and the submucous tissues thickened and sometimes engorged with fluid, which can be pressed out of the follicles; and from there being found the compound granular corpuscles, it would seem to indicate the first stage of inflammation. Dr. Jenner says its anatomical character is, spreading inflammation of the mucous membrane of the pharynx, attended by exudation of lymph. Occasionally the membrane is slightly adherent at points, and bleeds on removal. There is an absence of ulceration, unless in rare instances; and this, be it observed, is essentially characteristic of diphtheria, and, as remarked by Mr. Hart, "it is an important pathological character which goes far to establish the specific nature of the disease." The fauces and respiratory tract are the parts principally affected in the disease, and prolongations of false membrane will be found running down to the œsophagus, into the back part of the nose, the entire fauces, and into the larger bronchi; sometimes, even to the stomach.

Nature of the exudation.—In its chemical character the membrane is a coagulated albumen, and is analogous to that occurring in croup or other diseases of the air-passages. Under the *microscope* it is found to consist mainly of masses of epithelial scales or cells of all forms, mixed with granules and molecular particles; it can be split into a number of layers, which thus rather shows its distinct epithelial character. If blood and pus are found, they depend upon some local cause, but they are not necessary ingredients. In rare cases,

when the exudation is found to exhibit minute fibrillation, the composition is a mixture of albumen and fibrine.

In many cases the *oidium albicans* has been found ; but, in common with many others, I do not believe in its being a cause of the disease—it would be unphilosophical to suppose it ; the presence of epiphytes is an accidental or exceptional circumstance, although found in many cases by some very accurate observers.

A pathological symptom of some importance, first noticed by Dr. Wade, of Birmingham,* is the presence of albuminuria, which is a forerunner of grave mischief in the majority of instances. It is noticed both in the mild and severe forms, and when observed in the former, when no risk is apprehended, the patient is perhaps suddenly seized with croupy breathing, and in a few hours life is sacrificed. The necessity of examining the urine frequently, or morning and evening, is a matter that should not be overlooked in the apparently mild cases.

The division of the disease by Mr. Hart into three forms, so accurately defines their general characters, and is, in other respects, so suitable, that I have no hesitation in adopting it. They are clearly recognisable, and instances of each have either been under my own care, or have come under my notice elsewhere in the great field of metropolitan hospital practice. They are—first, the simple diphtheria ; second, the croupal diphtheria ; and third, the malignant diphtheria.

Dr. Jenner divides diphtheria into 6 varieties in his little work, which ought to be in the hands of every practitioner, viz., 1, the mild form of diphtheria ; 2, the inflammatory ; 3, the insidious ; 4, the nasal ; 5, the primary laryngeal ; and 6, the asthenic.

Simple diphtheria.—This form, fortunately, is not only the mildest, but at the same time the most frequent. It is ushered in by slight fever and headache ; there is loss of appetite, and

* ‘Observations on Diphtheria.’

some slight difficulty in swallowing; the tongue is covered with a thick creamy deposit, through the front part of which some of the papillæ may be noticed. If the throat is now examined, it will be generally found reddened and swollen, and on one of the tonsils, which is prominent, a small patch of the white membranous exudation is seen. This may be observed on both tonsils, but rarely so, and sometimes extends to the arch of the palate, the uvula, the posterior surface of the soft palate, and the back part of the pharynx, adhering rather tenaciously. The submaxillary glands only are slightly swollen and enlarged, but none others. The absence of any severe symptoms, and particularly no putrefying odour being present, will distinguish this form from the two following. The patches of membrane mostly retain their white colour. The duration is from five to nine days, and the prognosis is favorable.

Croupal diphtheria.—The significant expression of this form of diphtheria, shows it to be the more serious and dangerous, for, in the first or simple form the membranous exudation was confined to the fauces, here it extends into the larynx. The symptoms of the first form are here all aggravated and increased in their intensity; thus, the fever is more active, the skin is hot, headache intense, swallowing not only difficult but painful, the countenance is flushed, the lips livid, the breathing is hurried; the tongue is coated with a thick yellowish brown, or dirty slate-coloured deposit; the entire pharynx, tonsils, and velum are covered with a yellow or brownish leathery exudation. There is a hoarse, barking cough, and alteration in the voice; which, as the symptoms increase in severity, are followed by extreme dyspnœa, or stertorous breathing; and, finally, suffocation. The obstruction to the respiration has been the extension of the exudation down the windpipe to the bronchial tubes; this is sometimes coughed up, and for a little while the breathing is relieved, but it is mostly but temporary, as the same symptoms recur, with great difficulty of

swallowing from extreme pain, especially in young children. Sometimes the symptoms are primarily laryngeal, the exudation first appearing in the larynx, and subsequently extending to the pharynx. Such cases have come under my observation, and were generally fatal. The *insidious form* of Dr. Jenner may be included in the croupal form of diphtheria: "There is no severity in the general symptoms, no marked soreness of throat, no notable swelling of the lymphatic glands, but suddenly, and, if the pharynx has not been examined, unexpectedly, laryngeal symptoms supervene, and death rapidly follows from suffocation."

The glands of the neck are swollen and enlarged in this form, which may be said greatly to resemble croup, only with the severity of the symptoms greatly magnified, and the prostration of the most rapid character, preceded usually by obstinate vomiting. Although it is mostly in children and young people that we meet with diphtheria, yet it is seen in adults, and is nearly as fatal among them. The prognosis of this form is extremely unfavorable, but much will depend upon early and energetic treatment; it is sometimes the result of the first or simple form, if the pharynx has not been carefully examined.

Malignant diphtheria.—This, the worst form, is recognised by its putrid type, as evidenced by the intolerable fetor of the breath, and a livid and gangrenous appearance of the tonsils. All the symptoms of the croupy form are present, but increased in intensity, associated with sudden nasal and other fluxes—as observed at Walsall, where bleeding occurred from the nose, mouth, rectum, and other mucous canals. Besides pain in the throat and difficult swallowing, the parotid, submaxillary, and cervical glands become enlarged, often remarkably so, and the surrounding cellular tissue is infiltrated with fluid.* The

* Whilst Trousseau attaches much diagnostic value to the enlargement of the lymphatic glands of the neck in diphtheria, Dr. Jenner does not. The latter has never seen it greater in proportion to the local primary mischief, than in other forms of cynanche pharyngea.

exudation-membrane, covering the throat, tonsils, and soft palate, becomes gangrenous, resembling dirty wash-leather, and covered with blood and sanies, and the odour is really intolerable—so much so that, as Dr. Ranking has remarked, the most tender mother cannot nurse her child without feelings of repulsion.* Typhoid symptoms now ensue, as evidenced by rapid pulse, pallor and lividity of the face and lips, slobbering, dysphagia, ichorous discharge from the nostril, and finally coma and quiet death, as contrasted with the restlessness of the croupy form. This form is the most active and fatal, and has been pretty frequent—death occurring almost before the symptoms have had time fairly to develop themselves, particularly in children under six years of age. Sometimes convulsions precede death. The asthenic and the nasal forms of diphtheria of Dr. Jenner, justly come within the malignant type; in the former death ensues not from apnoea always, but from asthenia; that is, failure of the heart's action, and not want of breath, causes death.

It must be remembered that the three forms of diphtheria just described, often run into one another, and present various intermediate shades of difference, yet most cases will come under one of the forms. Sometimes an apparently simple and mild case will become suddenly converted into the second form, or modifications of the third. If a mild case passes over the seventh day, extension of the disease to the larynx may be looked upon as unlikely.

Diagnosis from other throat affections.—Those diseases with which it is liable to be confounded, are croup, scarlatina anginosa, cynanche maligna, tonsillitis, and herpes of the pharynx. The distinction between them is best shown in a tabular form :

* Two Lectures in the 'Lancet,' January 8th, and 15th, 1859.

Diphtheria.

1. The exudation begins in the fauces, and reaches the windpipe by extension, in a certain number of cases.

2. Uneasiness first referred to parts subservient to deglutition; that is, in the throat.

3. Fever of adynamic or typhoid type.

4. Pharynx diseased.

Diphtheria.

1. Exudation easily removed, leaving mucous membrane congested, but smooth and entire.

2. Distinct membranous exudation, without loss of substance.

Diphtheria.

1. Varying redness, and even lividity and œdema of the pharynx, covered by the exudatory membrane.

2. The diphtheritic membrane, covering the throat like a piece of superadded skin, with no sloughs.

Malignant Diphtheria.

1. Yellow leathery membrane, covered with sanies and other secretion, with a putrid odour, but no loss of substance.

2. Death generally from asphyxia, breathing obstructed.

Diphtheria.

1. The characteristic membrane of diphtheria to be seen, not so painful.

2. No eruption on the lip.

Croup.

1. It commences in the windpipe, and extends to the glottis from below upwards.

2. The earliest symptom is stridulous voice and breathing; this in diphtheria is the final development of diseased action.

3. Fever inflammatory.

4. Pharynx healthy.

Scarlatina anginosa.

1. The substance of the tonsils is eaten away and destroyed.

2. Extensive and deep gangrenous eschars, if present in the malignant form.

Tonsillitis.

1. Varying redness, and in malignant forms, lividity and œdema of the pharynx, but no false membrane.

2. Inspissated mucus soluble in water, or ashy sloughs from destruction of tissue.

Cynanche Maligna.

(Putrid Sore Throat.)

1. Gangrenous eschars, known by their defined character, putrid odour, and covered with an ashy film.

2. Death from asthenia, breathing clear.

Herpes of Pharynx.

1. An herpetic eruption is seen on the pharynx, very painful; pain limited to a single spot of the pharynx.

2. Commonly associated with herpes of the lip.

The main feature in the diagnosis is the lymph on the mucous membrane in some part of the fauces. The occurrence also of other examples of the disease in the same house or neighbourhood. Bleeding from the nose is described as an early sign of it.

Prognosis.—As it is one of the most dangerous diseases oftentimes, from the uncertainty of its progress, in even apparently very mild cases, vigilance is at all times necessary. The younger the child the greater danger from extension of the disease to the larynx, and in the adult from the general effects of the disease. Albumen in the urine is always a grave sign, and so is a rapid and feeble pulse. Dr. Jenner says an infrequent pulse is of fatal significance. In certain families the influence of constitution is particularly unfavorable.

Complications.—Simulating the exanthemata, diphtheria may occur singly or combined with other affections; thus concurrently scarlatina and diphtheria may almost commence together, or the former may be replaced by actual croup. The throat symptoms are generally mild when the rash of scarlet fever is well marked and proceeds to desquamation. It may attack children during their convalescence from scarlatina, measles, and whooping cough. It may supervene upon scarlatina, and assume the worst form of the disease; the correctness of this is fully borne out from what I have myself seen, together with the observations of Mr. J. P. McDonald, of Bristol, Mr. J. Prowse, of Clifton, and many others. Mr. Henry Smith saw two cases occurring subsequent to measles; both died; in one he performed tracheotomy.* During the prevalence of diphtheria many other maladies will become tainted with the disease.

The diagnosis between these will of course depend upon the watchfulness of the physician, but as they all assume the asthenic or adynamic form of disease when thus mixed, the

* 'Lancet,' for March, April and November, 1858.

same general principles of treatment already described must be adopted.

Treatment.—Of the *simple* diphtheria :—In this form it is simple and clear, and consists of the local application of either a solution of the nitrate of silver, forty grains to the ounce of water, or of dilute hydrochloric acid once a day ; and the administration of the tincture of the sesquichloride of iron, combined with chlorate of potash, every three or four hours ; and mild evacuants suited to the age of the patient.

If the fever runs high, with much heat of skin and firmness of pulse, salines are indicated, such as the acetate of ammonia and citrate of potash, and stimulants are to be avoided.

Of the *croupal* form :—Without enumerating all that has been recommended in this form, it is sufficient for us to employ what general experience has found to be the most efficacious. The same solution of nitrate of silver as in the first form (forty grains to the ounce), should be most effectually and thoroughly applied to the whole of the fauces, once, perhaps twice, in the twenty-four hours, by means of a large camel's-hair brush. Or the hydrochloric acid may be substituted for the silver solution—I think it preferable in many instances, and is, perhaps, more to be depended upon ; it can be used both in its diluted and undiluted forms. The mixture of honey and hydrochloric acid seems to me objectionable for reasons that have appeared elsewhere. The spread of the diphtheritic patch may often be arrested by applying the solid nitrate of silver around its margin. The false membrane should never be torn off, for it is reproduced.

Dr. Hauner found the application of a solution of the nitrate to the larynx, most successful in ten cases of diphtheritic laryngitis,* a practice the value of which I can fully confirm, when freely applied with my angular brush or fluid

* Froriep's "Notizen," in 'Med. Times,' 10th March, 1860.

pulverizer. Dr. Casali recommends topical treatment through the nostrils as more efficacious than through the mouth.*

An emetic is the first thing to be administered, and should be active—*ipecacuanha* is one of the best and most speedy. In my own practice I employ the *sanguinaria* as an emetic in diphtheria; it acts with energy, and produces a thrilling effect upon the entire mucous membrane of the fauces and respiratory tract, with a feeling of warmth. It alone seems to impart vitality to the suffering throat, and I recommend it with the very greatest confidence.† Then, the mixture composed of the tincture of the sesquichloride of iron, associated with the chlorate of potash and dilute hydrochloric acid, may at once be commenced, and given every three or four hours. If the depression is extreme, I have found the addition of the muriate of ammonia an advantage. Emollient fomentations externally will prove soothing and comforting; but, on the other hand, the application of a bandage around the throat, that has been soaked with cold water, and so wrung out as not to drip, and covered by a similar dry one, or a handkerchief, will produce effects very much resembling those of the emollient fomentations.

Tracheotomy:—If the larynx has become invaded, and the croupal symptoms show that the danger to life is becoming threatening—when the patient's voice, breathing, and cough clearly point how imminent that may be, then tracheotomy must be resorted to for relief. It becomes a question, in reality, of life and death, and the patient *must* receive the benefit of the chances in favour of the former. To rely upon this operation alone, however, without other measures, is, I

* "L'Imparziale," in 'Brit. Med. Journ.,' October 10th, 1863.

† Emetics of *Sanguinaria* are given as follows: A decoction made by boiling six drachms of the bruised root in a pint and a half of water, down to one pint; or an infusion made from the same quantity, macerating for four hours; the emetic dose of either is from four to eight drachms, at short intervals, until vomiting ensues.

think, the great cause of the mortality from it. Something must be given to stimulate and to support, whilst it will at the same time prevent the pouring out of any more diphtheritic exudation—and nothing, as yet, has been found that will accomplish this more effectually than the sanguinaria—the strong tincture of which, in from forty to sixty drop doses for adults, may be given every two hours, and a smaller quantity of ten drops for a child. Without undertaking to promise too much, I feel satisfied that those who may employ this valuable and powerful remedy, in the manner indicated, will find no reason to regret its use; its properties are very similar to the senega in croup.

Several lives have been saved by the operation, and as Dr. Jenner most properly observes, a thousand failures of the operation in saving life cannot, after seeing even a single case of success, prove that it ought not to be performed. He gives a case in illustration, in a father of a family. Dr. Hillier has recorded a successful case in a medical man. Trousseau has performed the operation over 200 times with success in one fourth of his cases.

On the 19th October, 1863, Dr. Reece showed a boy, *æ*t. 6, before the Medical Society of London, on whom the operation was done by Mr. William Adams, in September, 1861, for acute croupal diphtheria. The symptoms were urgent, general treatment unsuccessful, and the lungs sound. Great relief followed, and the tube was worn for three weeks. All the other children of the family had the disease afterwards, and this little boy subsequently had paralysis. I found the old cicatrix exceedingly tender.

Tracheotomy should never be withheld in diphtheria, for if it does not cure, it affords temporary relief, prolongation of life and an easy death. The satisfaction of saving life even in a single case must not be overlooked.

The trachea should be selected in the adult as well as in the child, to avoid injury to the vocal apparatus.

Of the *malignant* form of diphtheria:—Not a moment is to be lost in applying the most energetic treatment, such as hydrochloric acid or Beaufoy's concentrated solution of chloride of soda to the fauces. A gargle, composed of two drachms of the latter to eight ounces of water, is recommended concurrently with the foregoing, and two ounces of glycerine may be added, as recommended by Dr. Cammack; or a warm decoction of the sanguinaria in vinegar, &c.; or, as Dr. Ranking recommends, two drachms of the tincture of sesquichloride of iron to eight ounces of water. These gargles may also be used to the nose if it is implicated. Of the internal remedies, the tincture of the sesquichloride of iron, as in the other forms, appears to be the best, combined with the chlorate of potass, chloride of ammonium, chloric ether, and hydrochloric acid, in the form of mixture, sweetened with syrup, in full doses, frequently repeated, according to age. Quinine may be added sometimes with advantage. If there be vomiting, it is best allayed by iced stimulants internally, and sinapisms to the epigastrium. It must be remembered that antiphlogistic remedies are wholly and studiously to be eschewed; blisters and leeches can do no good.

In all the forms of the disease it will be found advisable to confine the patient to bed, enveloped in a flannel gown from head to foot, in a well-ventilated room, and isolated from other members of the family. The diet must be liberal, unsparing, and supporting: and should consist of strong beef-tea, wine, jellies, coffee, eggs in brandy or wine freely, milk and farinaceous food. If these cannot be introduced into the stomach, they must be administered by enemata in small and frequently repeated quantities.

In the asthenic condition wine in large quantities will be required from the very commencement, and brandy if necessary. For a child of three or four years one or two drachms of the latter may be given every hour if necessary.

The diphtheritic inflammation sometimes extends to the œsophagus, the mouth, eyes, the vagina and pudenda, ulcerated and blistered surfaces and wounds; it must be treated upon the general principles already laid down.

M. Grand—Boulogne, met with remarkable success in the Havannah, by causing the patients to keep constantly in their mouths small fragments of ice until convalescence ensued.*

Dr. Wade recommends iodide of potassium in two to four grains every two or three hours, combined with five or ten grains of chlorate of potass, and has not had a fatal result where this treatment was pursued. Dr. Lyell speaks well of the sulphite of soda internally and the insufflation of calomel.†

Sequelæ of Diphtheria.

Should convalescence fortunately become established, the following are some of the sequelæ or after-results due to disordered innervation, which will tax the physician to get over; these are chiefly paralysis of the muscles of the neck, in which the pharynx and larynx take part; paralysis of the soft palate, known by the nasal twang of speech (rhinophonia), incapacity for suction, the regurgitation of fluids by the nostrils, and insensibility to the contact of substances. Dr. Gull met with an instance involving the upper extremity; and Dr. Kingsford relates aphonia and dysphagia as present, in an instance of recovery, combined with partial blindness, and paralysis of both arms.‡ The paralysis is sometimes associated with anæsthesia of particular parts and muscles, and disorder of many if not most of the special senses.

Next to the pharynx the heart is most frequently affected, a striking case of which is given by Dr. Jenner in his work, of a boy in whom infrequency and feebleness of the heart's

* "Presse Med. Belge," in 'Med. Times,' September 5th, 1860.

† 'Brit. Med. Journ.,' January 31st, 1863.

‡ 'Lancet,' 6th November, 1858.

action and vomiting were fatal signs. The pulse came down to 32 and 24 before death. In another case the pulse was 16 some time before it.

The par vagum is the nerve chiefly affected in these cases, and in its origin the paralysis would thus seem to be local. When, however, it is general, it is no doubt from toxication of the blood. The sight is sometimes impaired, cases of which were published by Mr. George Lawson in 1861, and Mr. Hutchinson, in 1862.

The following are some examples of paralysis which have come under my observation.

CASE. *Paralysis of the velum palati after diphtheria.*—On the 20th February, 1861, I saw with Dr. Langmore a girl, æt. 4½ years, recently recovered from diphtheria; afterwards her voice assumed the nasal twang, and in swallowing fluids some regurgitated through the nostrils. She had had sloughing of the tonsils, and the primary diphtheritic affection supervened upon an attack of measles, partaking of the nasal form, for there was then running from the nostrils. Three or four other children in the same family had mild diphtheria, and were going on well. The nasal twang in the little girl had been getting worse before I saw her. Under the use of strychnine and iron she got over this, but Dr. Langmore subsequently told me that the disappearance of the nasal twang was followed by weakness of the lower limbs amounting almost to complete disuse for a time.

CASE. *Commencing paralysis of the velum palati, quickly checked by treatment.*—Major J— was brought to me by my colleague, Dr. Logan, on 30th November, 1862. He had had an attack of diphtheria on the 6th, and about the tenth day of his illness fluid commenced to regurgitate through the nostrils, and as it continued, he came up to town from a marshy district in Kent. On seeing him the nasal twang was

just beginning, he had no taste except at the front part of the mouth, and his food passed down without any sensation. The heart's action was weak and slow, the pulse regular, limbs very tottering. There were four or five ulcers on the back of the pharynx, running up behind the soft palate; there was one on the tonsil, a portion of the uvula had sloughed away. There was already anæsthesia of the fauces, for the laryngeal mirror was not felt. It showed the epiglottis much relaxed and worn, requiring some management to see the larynx. The larynx was normal, but the vocal cords were already becoming affected, from their very wide separation, although they approximated well during the utterance of sounds. A solution of the nitrate of silver and mercury was applied to the fauces, freely touching all the ulcers. From that moment the nasal regurgitation ceased, and under the use of the citrate of strychnine and iron he very speedily recovered, all the paralytic symptoms subsiding in one week.

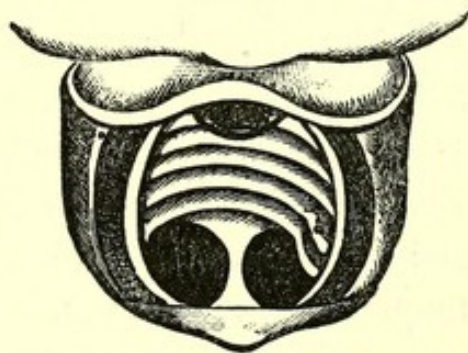
CASE. *Paralysis of the larynx and pharynx after diphtheria, permitting of a view of the bifurcation of the trachea. Rhinophonia.*—The paralysed condition following diphtheria readily permitted of a correct appreciation of the extent of the loss of nervous power, as seen in the present instance, probably for the first time, with the aid of the laryngoscope. The larynx and trachea seemed to form one continuous and expanded tube, which when straightened by position, permitted of a remarkably distinct view of the commencement of the right and left bronchial tubes.

J. W—, æt. 33, employed in a fat-melting factory, at Kensington, contracted diphtheria from his three children, one of whom, a girl of five years old, died. One of the girls who recovered had paralysis of the pharynx, with the usual symptoms. The attack in the father, three weeks after that of his first child, commenced with shivering; the fauces were lined with a thick, yellowish-white, leathery membrane, a piece

of which became detached one morning and nearly produced suffocation, until it was removed by the surgeon who attended him. A week before he came under my care at the West London Hospital, in September, 1862, his voice became affected, and fluid passed through the nostrils. The voice had a peculiar nasal twang, like a person with cleft palate; his eyesight was likewise affected, he could read only large print held at a distance, and in writing the paper had to be placed far from him. The gums were sore and tender, but not from mercury. Had no sensation in the fauces. The mucous membrane looked red and raw, with patches of ulceration at the back of the pharynx; the velum was prominent, with a considerable space behind it, and the tonsils were enlarged and ulcerated. He was exceedingly weak and tottering, and the slightest exertion threw him into profuse perspiration.

From the insensible state of the throat and the limited mobility of the parts, laryngoscopy was very easy, and a remarkably clear view of the larynx and trachea was at once obtained on the first introduction of the laryngeal mirror. The larynx seemed to be much expanded; the vocal cords lay close against its walls; they were apparently thin, of a greyish-white colour, and slightly approximated on phonation. The rings of the trachea were readily observed all the way down to the bifurcation, which was remarkably distinct, the patient's neck becoming straight from the head being well thrown backwards. The outer part of the trachea, immediately above the origin of the left bronchus, bulged slightly inwards, resembling a sort of tumour, but in reality not one. This was readily seen several times, and is depicted in the drawing taken at the time

FIG. 68.



Bifurcation of the trachea, and expansion of the glottis, in diphtheritic paralysis.

(see fig. 68), although it is not represented sufficiently prominent.*

He was treated by the internal use of the citrate of strychnine and iron in infusion of calumba, with the topical use of a solution on one occasion only of the argento-nitrate of mercury, which healed up the ulcers. In two months he was convalescent, the natural voice was restored, and the paralytic symptoms had mainly disappeared. The bifurcation could be seen only the first few days, so long indeed as the vocal cords remained paralysed.

Although I have now seen the bronchial tubes in many cases of disease, the most favorable to permit of a good view are cases of severe diphtheritic paralysis, when there is not only an almost total absence of sensation in the fauces, but the parts are freely expanded.

I might relate several other cases of diphtheritic paralysis, especially two remarkable examples I saw under the care of Dr. Farre at St. Bartholomew's Hospital, but the foregoing are sufficient to illustrate the subject.

The two following show some of the sequelæ under another aspect.

CASE. *Follicular ulceration and general redness of the throat the result of diphtheria, nasal breathing not free.*—A young gentleman studying for the church at Oxford came to me on 31st October, 1860. He had diphtheria in the spring of 1859, and recovered well, using ice *ad libitum* to swallow. Ever since his throat has been sore, his nose partly obstructed, and in the morning hawking up quantities of tough phlegm; frequently he feels as if about to vomit. General health good, can speak well but not sing as formerly. The membrane of the entire fauces was of a blood redness, vividly injected, with ulceration of the follicles in various parts of the pharynx, extending nearly as high up as the vault above. The back of

* A full report of this case appears in the 'Lancet,' vol. ii, 1862, p. 564.

the nose was in a similar condition without ulceration, but with much tumefaction of the membrane almost obliterating the passage. The left tonsil was ulcerated and projecting, and altogether the throat was in a highly irritable and congested state. The epiglottis, larynx, and vocal cords, were in a similar condition without ulceration.

The treatment was successful, and consisted chiefly in the use locally of a solution of the argento-nitrate of mercury, which soon healed up all the ulcers. The use inwardly of iodine with general tonics, and soothing gargles containing a little of the corrosive sublimate, soon brought about a cure. The nasal obstruction was partly constitutional, as his mother and grandmother were similarly affected.

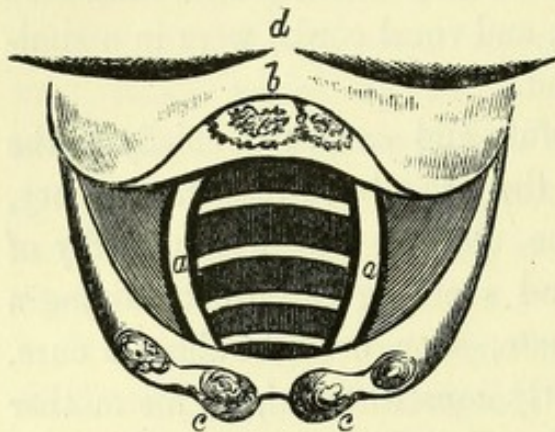
CASE. Impaired vocal power and extensive ulceration of the fauces and epiglottis, after an attack of diphtheria five years before.—Miss T., æt. 34, came to me with her brother, from Little B—, in Essex, on 17th of September, 1863. Sixteen years before she had a bad attack of quinsy. In December, 1858, suffered from diphtheria and nearly lost her life. Throat has been ulcerated ever since, affected by every change of weather. The voice sometimes wholly disappears, and is habitually weak; speaking is an exertion, and at times painful, a great privation, for at one time she was a beautiful reader. General health fair in other respects. Feels as if a line was drawn across the neck; cheeks flushed; almost constantly hems, and has to make an effort to swallow; at night she has itching and dryness of the throat, which is very distressing.

Inspection showed distinct ulcers in the pharynx and on the left tonsil with red margins. The mucous membrane was in a state of chronic congestion; the follicles enlarged here and there.

In the laryngeal mirror was seen chronic redness of the entire larynx; partial paralysis of the vocal cords, which were widely separated and possessing very feeble action; and a

large ulcer at the upper part of the laryngeal surface of the epiglottis (See fig. 69,) which fortunately was not pendent.

FIG. 69.



a, a. The true vocal cords, below and between which are seen the rings of the trachea. *b.* The epiglottis with ulceration of its laryngeal surface. *c, c.* Arytenoid cartilages. *d.* Back of the tongue.

This ulcer had red margins and looked very irritable. The trachea seen very far down was unaffected.

The treatment was the local use of a solution of iodide of silver and showers of a solution of sulphate of zinc, with citrate of iron, nux vomica and iodide of ammonium internally, combined with a soothing and slightly stimulating gargle. Her second visit to me, on October 2, showed nearly all the ulcers healed up,

those on the epiglottis completely so, and altogether she was much better. On October 21st she spoke well and strong, and the cords had good action. In a short time after she was quite cured and has remained so.

I shall conclude this chapter with the following case, but may premise that the simple form of diphtheria is rarely complicated with inflammation and enlargement of the parotid gland, although occasionally, nay, frequently, seen in the croupal form of the disease.

CASE. Diphtheria in a pregnant female, associated with parotitis, causing great swelling of the throat.—Mrs. W—, æt. 27, six months pregnant, I saw in January, 1862. Had been ill two days with general symptoms of cynanche tonsillaris, associated with cynanche parotidea. The throat could not be seen for the great swelling at the back of the tongue. Two days after she was extremely low, the throat could now be seen

and a diphtheritic membrane covered the pharynx, soft palate, and tonsils. The swelling of the parotid gland was still persistent, and added much to the general discomfort. Under treatment in five days she was comparatively well. The urine at one time was albuminous.

The foregoing case is published at length in 'Path. Tran.,' vol. xiii, p. 261.

In my experience the treatment of the strictly nervous symptoms following diphtheria is on the whole comparatively simple, more particularly the dysphonia, whether nasal or otherwise, which so commonly attends it, sometimes amounting to aphonia. The combination of strychnine and iron in many of these cases will be found extremely valuable and perfectly reliable. The examples just related will show how much dependance is to be placed upon these remedies associated with such other local treatment as may be deemed necessary. In this form of voice affection galvanism applied locally to the cords is not recommended; in fact, I know of one instance related to me by the medical attendant himself, where the general nervous debility was so much increased by it, in a young lady, that he was fearful of losing his patient altogether. He followed the plan of treatment which has been illustrated in the foregoing pages, and a cure was effected in five weeks.

In a paper by Dr. Mackenzie, in the 'Brit. Med. Jour.,' for September, 1863, are the particulars of a case of diphtheritic dysphonia of fourteen months' duration, in a lad of nineteen, cured, as he states, by twenty-five (!!!) applications of galvanism to the vocal cords, over a period of two months. If no other treatment of a constitutional nature was adopted, there must still exist some impaired nervous power not necessarily confined to his larynx.

SECTION II.—SYPHILITIC DISEASE OF THE THROAT.

In the first edition of the present work it appeared desirable to devote a limited space only to this form of disease of the throat and larynx, but as it is one of the most frequent that presents itself to our notice, especially among the poor, and as the ravages it sometimes occasions are very serious and considerable, it is now dwelt upon somewhat more at length.

It is in persons whose health has become broken down from the ravages of the specific disease, whose habits at the same time may not have been very temperate, and who have taken large quantities of mercury, that this form of diseased throat is most frequently encountered. Indeed Mr. Porter states that he has never seen the larynx engaged in a case of venereal where no mercury had been used, an assertion which my own experience leads me in the main to concur in, for I have never seen a case of the kind where mercury had not been taken.

This form of throat disease may be divided into two kinds, the acute and chronic; in the former rapid ulceration may spread to the larynx and rapidly destroy the patient by supraglottic œdema, a very common termination; or the chronic disease of the fauces gradually extends to the larynx, affects the mucous membrane and subjacent parts, and induces a slow and irritating form of laryngitis ending in œdema of the supraglottic parts, especially the false vocal cords, which may suddenly increase and destroy life. In the majority of these chronic cases there is some amount of supraglottic œdema always present, as I have seen on many occasions; indeed, one of the last cases which I examined with the laryngeal mirror was at St. George's Hospital, on the 17th December, in a young woman who had had tracheotomy performed a few days before for syphilitic laryngitis, at the request of Dr. Pitman, under whose care she was. The false cords alone were found œdematous, meeting in the centre, and with the epiglottis

covering them partly over, left no breathing space at all. From what was related to me of her history, chronic œdema must have been present for some weeks, and had suddenly increased, requiring the trachea to be laid open.

As the affection commonly comes before us, it is usually chronic, and the parts engaged are the fauces, the tonsils, uvula, and soft palate, which may become swollen and red, denuded of epithelium, with perhaps general ulceration and suppuration of the follicles at the back of the pharynx, besides a scooped-out ulcer of the tonsil.

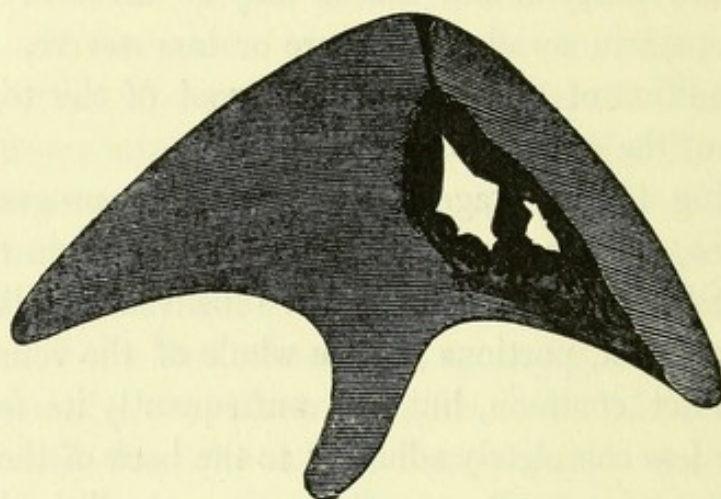
The entire pharynx and fauces may be involved in ulceration, with pain in swallowing more or less severe, according to the condition of the parts at the root of the tongue, and especially of the epiglottis.

According to the stage of the ulcerative progress and its continuance, will be observed certain alterations in the fauces, such as destruction of one or both tonsils and pillars of the fauces, the uvula, portions or the whole of the velum palati; the last is not common, but not unfrequently its free margin is more or less completely adherent to the back of the pharynx, with either a very small passage or none at all leading up to the back of the nostrils. Under these circumstances there is rhinophonia and difficulty in getting down food at all. Occasionally the margins of the velum and of the uvula also, are adherent to the pharynx, excepting the tip of the latter, which permits of a channel leading upwards of the diameter of a pea, as in a case under the care of my colleague, Mr. Holt, at the Westminster Hospital, related in Chapter I, Section IV, where there was loss of the epiglottis as well.

Not unfrequently the velum is found to be perforated in one or more places by ulceration, a form of lesion which Dr. Thomas Williams, in an admirable paper in the 'Brit. Med. Journal,' 19th July, 1862, has characterised by the name of "Perforating ulcer of the throat," of which I must have seen at least some three or four dozen examples in an experience of

many years. In the first edition of this work I did not think it necessary to draw special attention to this form of ulcer more than any other; but it is always desirable to arrest its progress as early as practicable, for there is the tendency sometimes to sloughing, which will rapidly involve the greater part of the velum. In the section on supraglottic œdema (Chapter III), is given an instance of that form of lesion, associated with a perforating ulcer of the velum, which is graphically shown in the annexed woodcut.

FIG. 70.



Perforating ulcer of the soft palate.

It gives the correct form of the arch of the hard palate at its junction with the soft; it was intensely red, and perforated in two places, the apertures being surrounded by a vivid ulceration, extending in a groove running from the smaller obliquely downwards.

I quite agree with Dr. Williams in avoiding the use of mercury in such cases, and giving full doses of the salts of iodine; and whilst I acknowledge that a cure will be readily effected by the latter, yet it is much assisted by some suitable topical application.

Most usually, there is an extension of the ulceration, by continuity from the fauces to the larynx, when there may be present all the symptoms of chronic laryngeal disease, with

loss of voice, or if the patient speaks, it is in a hoarse stridor ; there is suffocative cough, and expectoration of pus and blood. The vocal cords, and other parts of the larynx are seen in the laryngeal mirror to be ulcerated at the same time, as well as some portion of the false vocal cords, the aryteno-epiglottidean folds, the posterior surface of the larynx, the subglottis, or the trachea, instances of which are to be seen in abundance in most of our anatomical museums.

The epiglottis is similarly affected, only that the anterior, or lingual surface is the most frequently ulcerated, and now and then its tip. Occasionally its base is involved, and now and then its entire free portion is wholly destroyed. Mr. T. Holmes showed me a preparation in the museum of St. George's Hospital, taken from a female of twenty, who died of syphilis, in whom the cornua of the os hyoides were exposed, as well as the cartilages of the larynx itself.

The base of the tongue, and the hollow on either side of the frænum of the epiglottis is often the seat of deep ulcers, which may penetrate deeply. In fact, all that has been stated in other chapters in relation to the destruction of parts, will more especially apply to this specific form of throat disease. The laryngeal mirror often reveals the projection of portions of the soft structure of the interior of the larynx in the form of little folds or prolongations simulating growths, as in a case related further on.

The symptoms vary much, but pain is referred to some particular spot, which not unfrequently points to perichondritis, even although the laryngeal mirror may not confirm it. Abscess is no uncommon event, and fatal dyspnœa has been induced by its pressure inwards, thus simulating either a supra- or sub-glottic œdema.

The history and appearance of the patient will plainly indicate the true nature of the laryngitis, which is sometimes so acute, with supra-glottic œdema, that suffocation is imminent. There may be secondary eruptions, with emaciation,

great debility, and a look of misery about the patient, whose constitution is at the same time probably broken down by his disease. The laryngeal mischief is secondary to the other disease, which has been noticed probably for some time. My experience leads me to say, that almost as a rule, the syphilitic ulcers are larger, more extensive, deeper, and irregular, than the tuberculous, which are smaller, rounder, more superficial, and scattered over the superficial structures.

In the treatment of the ulcerated larynx, it will be necessary to combine local with constitutional measures; among the former, the solution of nitrate of silver, or argento-nitrate of mercury, before spoken of, must be employed; and in the latter, some one of the preparations of mercury or of iodine, according to circumstances; but by no means is mercury to be used, unless there is some special indication for it. If suffocation is threatened, tracheotomy is to be resorted to, as in any other affection of the windpipe requiring it. Of the majority of cases in hospital practice, in which I have seen or known the windpipe to be opened, they were chiefly for supra-glottic œdema in syphilitic ulceration of the larynx; and, terribly bad as most of them were, in the greater number a recovery ensued, by well supporting the patient's strength after the operation. In no class of cases, then, does the operation hold out such a favorable chance for relief as in the present. As an example of its success in a very bad case, I may cite one which I heard Mr. Hilton narrate before the Medical Society of London on the 31st of October, 1859: it was that of a female, upon whom he had operated twelve years before, for most extensive disease of the larynx, which was cured; but the upper aperture became entirely closed, and she has worn a tube ever since in her windpipe. The voice is hopelessly gone. Shortly after it was necessary to remove a piece of rag from the tube, which got in when cleaning it out, and Mr. Bryant had to cut through a couple of the rings of the trachea before it was extracted. Now, this is one of those cases in which a

permanent fistulous opening would be preferable to the continued presence of a tube, as I have stated in other parts of this work.

I would advise, as a general rule in syphilitic disease of the throat, when an operation is necessary, *invariably to open the trachea*, because of the most frequent presence of ulceration in the lower part of the larynx, thus holding out a fair chance for a better recovery with some voice, than if the larynx had the preference.

In syphilitic laryngeal disease, the inhalation of pulverized liquids will be found exceedingly beneficial and restorative; the spray of nitrate of silver, or other metallic salts, can be applied with great certainty, and will readily reach ulcers as low down even as the bifurcation of the trachea, which nothing else will touch, unless the spray propelled from my laryngeal fluid pulverizer.

Soothing and astringent gargles will be advisable; when the ulcers are chronic, the following, first recommended to me by Mr. Wm. Coulson, has proved most serviceable in this and some other forms of throat disease: it consists of six grains (four for a lady) of bichloride of mercury, twenty drops of dilute hydrochloric acid, seven drachms of syrup, and seven ounces of water. To be used two or three times a day.

But all the ulcers about the pharynx, and frequently at the back of the velum and nostrils, must be carefully made out, and touched seriatim with the aid of the rhinoscope and pharyngoscope, so that a complete and permanent cure may be effected. When such is accomplished recurrence is rare.

The following are a few selected typical illustrations of syphilitic disease of the throat.

CASE. *Chronic follicular disease of the throat, with adhesion of the left velum to the pharynx, and displacement of the uvula to the left side; considerable ulceration.*—Mrs. Susan A—, æt. 40, consulted me in October, 1860, recommended by Mr.

Baker Brown. She had had sore throat for two years, with occasional aphonia, and has been a great and constant sufferer from ulceration of a specific nature.

The velum was seen to be adherent at the left side to the pharynx, where there was considerable ulceration. The uvula was drawn downwards to the right side; a small fistulous opening was observed at the anterior part of the hard palate, present twelve months, and fluid used to flow out through the nose, but not now. The pharynx was follicular and raw, which extended to the larynx as well seen in the laryngeal mirror, where also there was much hyperæmia, but no breach of surface.

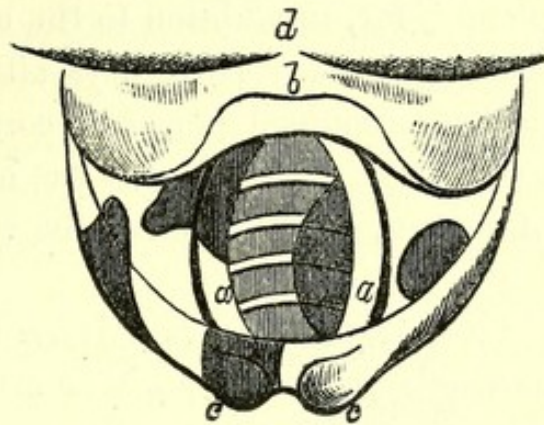
By careful topical treatment, and iodine internally, a cure was effected in three weeks.

CASE.—*Laryngitis and hæmorrhage from the larynx, from syphilitic dyscrasia.*—This occurred in a lady, æt. 36, brought to me by Dr. Ballard, April 2, 1863, with a recent specific history, through the agency of her spouse. This day the mouth filled with blood three different times, of a bright florid colour. No cough at all, but a little dysphagia. The laryngoscope showed general vivid redness of the larynx and trachea, and partly so on the vocal cords. In the mucous membrane above the left ventricle was a breach of surface of a very intensely red colour, the seat of the hæmorrhage; this corresponded too with a pain in the left wing of the thyroid externally. She was treated in accordance with the indications, and speedily recovered under Dr. Ballard's care.

CASE. *Discoloration of the interior of the larynx in dark patches, as also the fauces.*—This peculiarity occurred in a married female, æt. 48, sent to me by Mr. George L. Cooper, of Woburn Place, June 4th, 1863. Thirteen weeks ago she had sore throat, aphonia, and other symptoms, following an inoculated finger; the dysphagia was most distressing. The

body was covered with syphilitic lichen; dark purple patches were seen on the velum palati, inside of the lips, sides of the tongue and cheeks. The laryngoscope showed the same deep red patches in the larynx, almost proceeding to ulceration, as per sketch. The dark shading indicates the deep red patches, extending even into the trachea for as far as could be seen. There was some thyro-hyoid tenderness on each side. She soon recovered under Mr. Cooper's care.

FIG. 71.

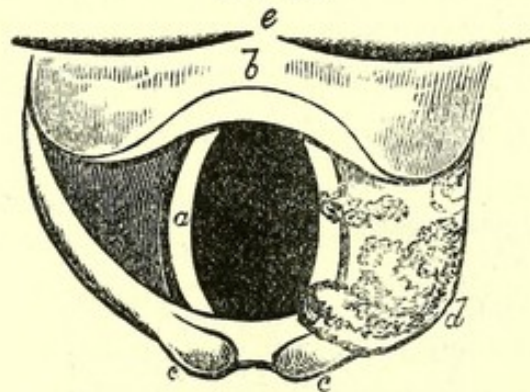


a, a. The true vocal cords. *b.* The epiglottis. *c, c.* Arytenoid cartilages. *d.* Back of the tongue. The dark spaces represent the discoloration.

CASE.—*Specific ulceration of the larynx, with aphonia, in a young married woman; paralysis of left vocal cord.*—

On July 4th, 1863, I examined a young married woman in the Westminster Hospital for my colleague, Dr. Radcliffe, with secondary symptoms and aphonia, the latter of two months' duration. The tongue was covered with denuded red patches. In the laryngeal mirror was seen the right vocal cord, narrow and white, whilst the left was red and ulcerated at its posterior part, in common with the false

FIG. 72.



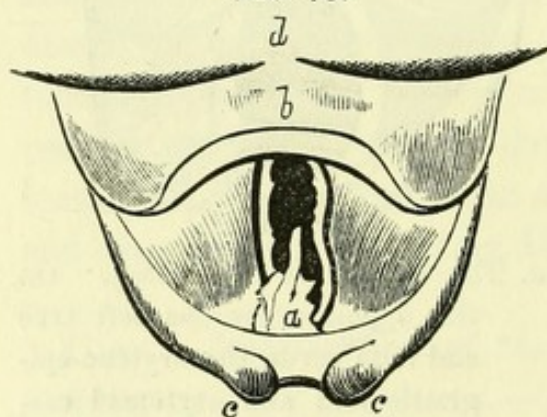
a. The right true vocal cord. On the opposite side the left true and false cords, the aryteno-epiglottic fold and arytenoid cartilage are seen ulcerated; the ulcer extending to the boundary of the larynx at *d*. *b.* Epiglottis. *c, c.* Arytenoid cartilages. *e.* Back of the tongue.

cord and aryteno-epiglottic fold to the boundary of the larynx. The ulcer, rather large, possessed a distinct red margin, and was apparently indolent in character. The aphonia was explained, for, in addition to the ulceration, the left vocal cord was paralysed. Three days after Dr. Radcliffe informed me he had examined her, and corroborated what I saw. The woodcut accurately depicts the nature and extent of the breach of surface, which involved the ventricle as well.

CASE. *Dysphonia and hoarseness from syphilitic laryngitis and subsequent supra-glottic œdema.*—M. A. S —, æt. 33, was admitted into the Westminster Hospital under my care November 2nd, 1863, being recommended to me by Mr. Dunn. Five years ago she contracted syphilis from her husband, and had frequent attacks of laryngeal disease. She was confined in April, and has been hoarse ever since, with pain in speaking; she had an attack of fever and of cholera during the past summer. She was now much emaciated, had a croupy cough, great dyspnœa at times, much dysphonia and strain to talk, and decided hoarseness, with dysphagia for some days.

Laryngoscopy showed the epiglottis slightly thickened, both

FIG. 73.



- a. Sharp-pointed œdematous growth between the swollen false cords, which give to the true cords a narrow outline. b. Epiglottis. c, c. Arytenoid cartilages. d. Back of the tongue.

false cords were much swollen, permitting of a view of but a narrow part of each true vocal cord, quite white, with finely serrated edges. Between the false cords posteriorly was a sharp pointed growth, extending from behind forwards as seen in the woodcut. The true cords approximated beneath the growth and speech was not therefore lost. This

growth I looked upon as an œdematous fold of membrane in front of and below the arytenoid cartilages, which was proved correct in the progress of her case. Under treatment, topical and general, she greatly improved, and by the 20th she could speak in a loud, smooth, even tone, the whisper and hoarseness were gone, and the general tumefaction of the larynx had almost wholly subsided, the smallest projection occupying the position of the growth referred to. In December she had an attack of laryngeal hæmorrhage, with a return of some of the dyspnœa dependent upon commencing supra-glottic œdema, and as there were several cases of fever in the same ward, she left the hospital at her own request on the 22nd, still delicate and requiring much care and attention. I have not seen her since.

CASE. *Aphonia from syphilitic ulceration of left vocal cord, subglottis and trachea.*—On the 8th December last, a woman, æt. 37, presented herself to me at the Westminster Hospital with aphonia of three months' duration. She had chronic bronchitis, was then intemperate, and said she was going to walk that day all the way to Hastings. On examination with the laryngoscope, the posterior third of the left vocal cord was seen to be destroyed, by active ulceration, which extended into the subglottis and trachea. The other cord was white and normal, and so was the remainder of the affected one. The nature of the ulceration was made out to be syphilitic, and the case was shown and explained to the pupils present.

SECTION III.—GOUT IN THE THROAT.

It may be stated with great propriety that an affection of the throat depending upon gout is tolerably rare; yet, as it is likely to be treated in vain as a local affection, unless its true nature be ascertained, a short description of it will not be

out of place here. The fact is well known, that gout occasionally wanders from its usual track, and attacks the eye, the kidney, the bladder, and the stomach; the testicle, the lungs, and once in a while the throat. It is of great importance to the sufferer to have the true nature of his complaint made out, especially when the last of these is affected, on account of the very distressing nature of the symptoms. For if overlooked, the danger is highly imminent for the patient, who may slip through the hands of his medical adviser before he is aware of it. The symptoms which are present in such rare instances, as I have myself observed on one occasion, are those of intense laryngitis, commingled with general faucial inflammation; the voice is reduced to a whisper, with a considerable amount of dyspnœa depending upon constriction of the larynx, from some amount of supra-glottic œdema. Practitioners cannot plead ignorance of this form of misplaced gout, because attention has been drawn to it by Dr. Watson, in his admirable 'Lectures on the Practice of Physic.' He refers to but a single example, occurring in an eminent physician of his acquaintance, who suffered a violent and dangerous attack of what was considered to be gout in the throat. In my own experience, a gentleman was subject to attacks of the malady in his great toe; he was in the habit of frequently speaking, took cold, and had a dangerous throat attack. This was fortunately recognised and treated as gout, and it speedily yielded to the measures adopted, although the symptoms were at one time most alarming. It need scarcely be said, that topical treatment is useless in such a case, and that colchicum alone will effect a cure.

It is by no means uncommon to find the bronchial mucous membrane inflamed in gout, when it has manifested itself in other parts of the body; in such cases we observe some amount of huskiness of the voice, irritation of the throat, and dyspnœa; and if there is a prevalence of throat-disease, the gout is apt to locate itself in the throat alone. This

situation of gout has not met with that attention its importance demands. The diagnosis of gouty cough or bronchitis is still incomplete; it may either precede a fit of gout, or follow the subsidence of the attack, as mentioned by Dr. Stokes. The gout may begin in the usual way, and end in a fatal bronchitis; or inflammation of the trachea may first appear, succeeded by slight arthritis, glandular enlargements, and gout. Dr. Todd speaks of a kind of cough in gouty persons, which he thinks is not referable to bronchial irritation, but is due to an accumulation around the larynx of mucus. He, however, refers to gouty bronchitis preceding attacks of gout.*

I had the opportunity of examining the larynx of a patient the subject of chronic gout under my care as an out-patient at the Westminster Hospital in July last, and subsequently admitted as an in-patient under my respected colleague Dr. Basham. It was one of the most remarkable cases I had ever seen, the hands and fingers resembling large and irregular round knobs. Both auricles were studded with small tubercles varying in size up to a pea. The voice was good but cranky, and the laryngoscope showed fatty degeneration of both vocal cords distinctly visible through the transparent mucous membrane, the orange yellowish patches closely resembling the atheromatous changes noticed in the aorta, but without ulceration. There were no minute tubercles to be seen as on the external ears; but the epiglottis was quite pendent, and at first offered some difficulty in obtaining a view of the larynx, it had a careworn appearance.

* 'Practical Remarks on Gout, Rheumatic Fever,' &c., London, 1843.

SECTION IV.—THE INFLUENCE OF ELEPHANTIASIS UPON
THE THROAT.

Although elephantiasis græcorum is a disease seldom to be seen in this country, yet as occasional instances present themselves to our notice, a few observations are necessary in so far as the disease involves the throat. The general description of the disease will be found in most works on diseases of the skin; the face is one of the principal seats of elephantiasis, and according to the extent in which it is involved so does it give to the physiognomy a peculiar expression which was described by the ancients under the names of *leontiasis* and *satyriasis*, an example of which will be presently detailed.

The extension of the disease to the throat causes much inconvenience from the state of the membrane brought about and the offensive odour of the discharge. Tubercles form in the soft palate, and in the pharynx; the mucous follicles enlarge, ulcerate, and pour out matter; and the entire fauces present a raw ulcerated surface. The uvula is sometimes destroyed by ulceration, or else it becomes adherent to the pillars of the soft palate. The larynx is next invaded, and the mucous membrane of the aryteno-epiglottic folds becomes swelled, fissured and altered, which conditions pervade the membrane covering the true and false cords, and surrounding parts. The epiglottis is thickened, stunted, and deformed, and the vocal cords assume an irregular outline.

The voice has a peculiar character described by all writers on this disease, and when once heard can never be forgotten; in the 17th chapter of the Gospel of St. Luke, in speaking of ten lepers who approached our Saviour, he says that they were immediately recognised afar off by the sound of their uplifted voices, when calling upon him to have mercy upon them.

It forms, according to my own observation, a sort of shrill squeak or false tenor, but at first it has an unusual hoarseness about it, which may partake of a nasal sound if the uvula is affected or destroyed. This peculiar hoarseness and nasal tone occurred frequently with swelling of the tonsils, in Iceland,* and also in Madeira (places wide apart), but without any hindrance to deglutition, until the disease had made considerable progress.

Finally, as the vocal cords become much ulcerated, or completely paralysed from thickening of the membrane covering them, the voice is extinguished, and aphonia is the result. This is usually towards the very last.

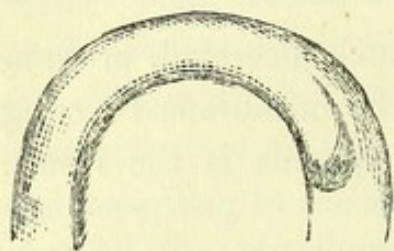
CASE. *Elephantiasis græcorum and leontiasis, affecting the throat as well, and seen by the aid of the laryngoscope.*—Mr. R. H—, æt. 44, consulted me on the 16th of March, 1863. He was suffering from *elephantiasis* of the Greeks, which began to affect him *after* his return to England some five years before; he had been twenty-five years constantly on the coast of Malabar in the merchant service. The disease commenced in the hands in the usual way, afterwards it appeared in the feet; then the mouth, throat, face, and ears, became affected. The eruption and breaking out, he said, was nothing, but the tubercles were the things that caused him the most trouble. The wrinkles and folds of the forehead, face, and ears, together with his general aspect, give a true representation of *leontiasis*. Tubercular swellings were seen on the forehead, the cheeks, the nose, lips, and other parts; associated with these were small sores covered with a scaly eruption, which were exceedingly painful. In the hands and wrists, and about the feet, beneath the skin, were hard lumps, devoid of sensation; some of the phalanges of both feet and hands were lost, and the nails had ulcerated at their terminal ends, so that he was obliged constantly to wear gloves on his hands. The hair had

* 'Travels in Iceland,' by Sir George Stuart Mackenzie. 4to, 1811.

changed to a light colour, a sort of yellowish-brown. The body generally was not involved at present, although when abroad he had spots in various parts of the trunk, in size from a shilling to half a crown, but which were *not* of a secondary nature.

The throat and fauces were raw and granular, with ulceration of the mucous membrane in patches; the velum formed a continuous narrow semicircle from side to side. On the left, the uvula was incorporated with the velum as per sketch (fig. 74).

FIG. 74.

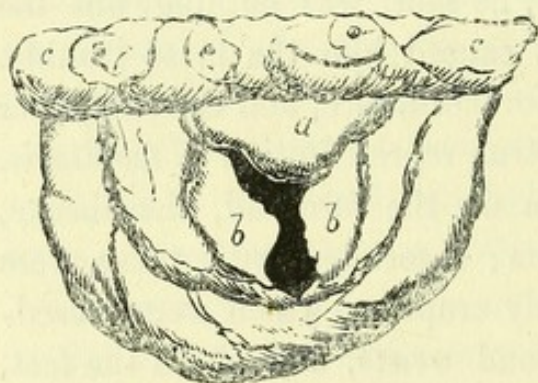


The soft palate with adhesion of the uvula to the left side.

The tongue was swollen, fissured, dry, raw, and ulcerated, yet there was no pain anywhere. The mouth could not be well opened, and the tongue, therefore, could only be

slightly protruded on account of the swelling, yet I was able to make a good laryngoscopic examination; the breath, however, was offensive, and partook of the odour of rancid pus. The parts composing the larynx were much thickened, puckered, and

FIG. 75.



a. The epiglottis. b, b. The irregular vocal cords, surrounded on either side by the thickened false cords and aryteno-epiglottic folds. c. The back of the tongue.

irregular, with no trace of symmetry in the disposition of the folds. The sketch (fig. 75) shows the puckered base of the tongue, the narrow but thick epiglottis, and the thick folds of mucous membrane running down to the vocal cords, which were absorbed in the same, thus giving to the glottis an irregularly-shaped fissure. The epiglottis was a little larger

and thicker than is represented, but the form is correct. He had a loud cough. The voice was a sort of shrill, loud squeak, or false tenor, which might be expected from the condition of the throat and larynx, and was of that character described by various authors, which permitted of the immediate recognition of the disease in ancient times.

As the patient was brought before the Pathological Society on the 17th of March, and answered questions put by the fellows, the correctness of the foregoing description will be at once recognised. It was the first case of elephantiasis of the throat I had examined with the laryngoscope, and probably the first in this or any other country which had been thus inspected. I may observe, that in such cases the voice is at first hoarse, then as it was in this patient, and finally it may become extinguished from the causes previously mentioned.

Under the use of bromine and vegetable tonics, and the application of astringent solutions to the mouth and larynx, his health much improved and his voice became stronger. But the general anæsthesia, the result of the disease, continued.

It would appear that the mucous follicles are the parts especially prone to the presence of the tubercles, which are sometimes united in groups, particularly on the arch of the palate. After death the redness of chronic inflammation is often seen on the vocal cords, whilst the other parts are thickened and of a dull yellowish colour, with a true hypertrophy of the submucous areolar tissue, thus constituting in reality an elephantiasis of the throat. There is a preparation in the museum of St. Bartholomew's Hospital, of elephantiasis of the larynx, from a negro affected with that disease.

SECTION V.—CANCER OF THE LARYNX.

The epithelial form of carcinoma is more commonly met with than any other in the pharynx, upper part of the œsophagus, and (more rarely) in the larynx. Sometimes, however, the medullary form is noticed, and large globular masses are found projecting in various directions and involving different important parts. A reference to my 'Essay on the Diseases and Injuries of the Hyoid Bone' will show several striking instances of both forms of cancer involving the tongue, pharynx, and larynx, with a brief note of many specimens preserved in the various museums of London, all of which I had the opportunity of carefully studying. In the Guy's Museum it was but the other day that I examined a case of cancer (1704, 50) of the pharynx extending to the back of the larynx and trachea, with complete denudation of the posterior or pharyngeal surface of the cricoid cartilage. How the patient could have survived to reach such an advanced stage of his disease seemed to me most remarkable. There is a specimen in the museum of the London Hospital of epithelial cancer extensively affecting the larynx from the vocal cords downwards. Another in the museum of St. Mary's Hospital of the same form of cancer confined to the larynx in a patient who had been under Dr. Alderson's care.* I have been shown various examples of cancer of the throat and larynx, in the living during the last ten years, in the twelve or more London hospitals, but have not preserved any note of their special features.

On the 21st January, 1862, I exhibited before the Pathological Society, for Dr. McOscar, a specimen of cancer of the larynx, which was of an extremely interesting and instructive nature, and may be taken as a good typical example of this

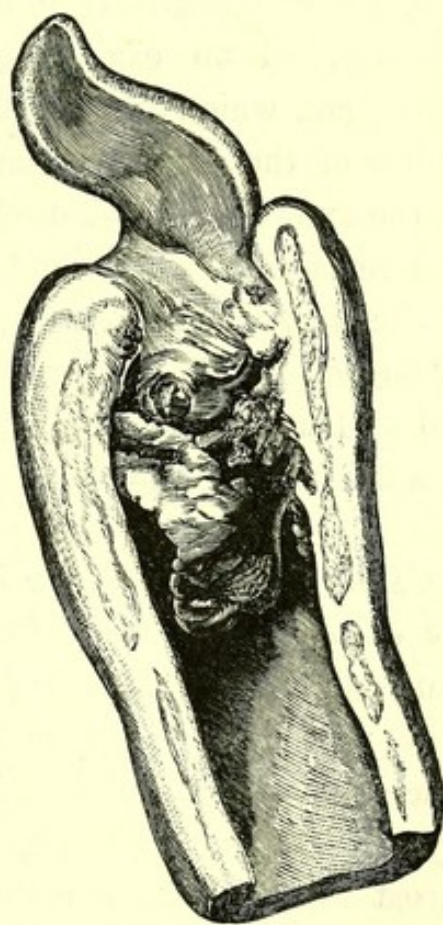
* 'Path. Tran.,' vol. xii.

form of disease. The following is an abstract of the particulars.

CASE. *Epithelial cancer of the left side of the interior of the larynx, communicating with an abscess in the neck, causing aphonia.*—W. P., æt. 43, a tailor, was seized with partial loss of voice and tenderness over the larynx, with increase of an old cough, from riding on top of an omnibus at night twelve months since. Four months later the aphonia was complete and his cough intolerable; he had an haggard and anxious look. A swelling formed at the base of the thyroid cartilage, to the left of the median line, which increased and threatened suffocation. Twice he expectorated a large quantity of pus without diminution to this swelling. Dr. McOscar opened the swelling and about half a pint of thin pus escaped. The neck then became level, and a fistulous opening remained communicating with the larynx lower down. He died from pleuropneumonia, but there was no history of hereditary cancer.

The disease was confined to the left side of the larynx, and there was no deposit of tubercle in the lungs. I had the opportunity of dissecting the specimen, and found lateral flattening of the trachea, and projection of the anterior part of the right wing of the thyroid cartilage at the pomum adami, a couple of lines in front of the left wing. The disease was confined to the inner surface of the left wing,

FIG. 76.



Epithelial cancer of left side of the larynx.

engaging, also, the left half of the inner surface of the cricoid cartilage, and a portion of the mucous membrane of the trachea of the same side. An opening was present at the extreme left side of the crico-thyroid space communicating with the abscess externally. The left side of the larynx was filled up with the disease, which is well shown in the wood-cut. The surface was ulcerated, and presented the physical and microscopical characters of epithelial cancer. The superior cornu of the left wing of the thyroid cartilage was absent, and also the left thyroid-hyoid ligament, no doubt congenital.

A complete account of this interesting case of primary epithelial cancer of the larynx is published in 'Pathological Transactions,' vol. xiii.

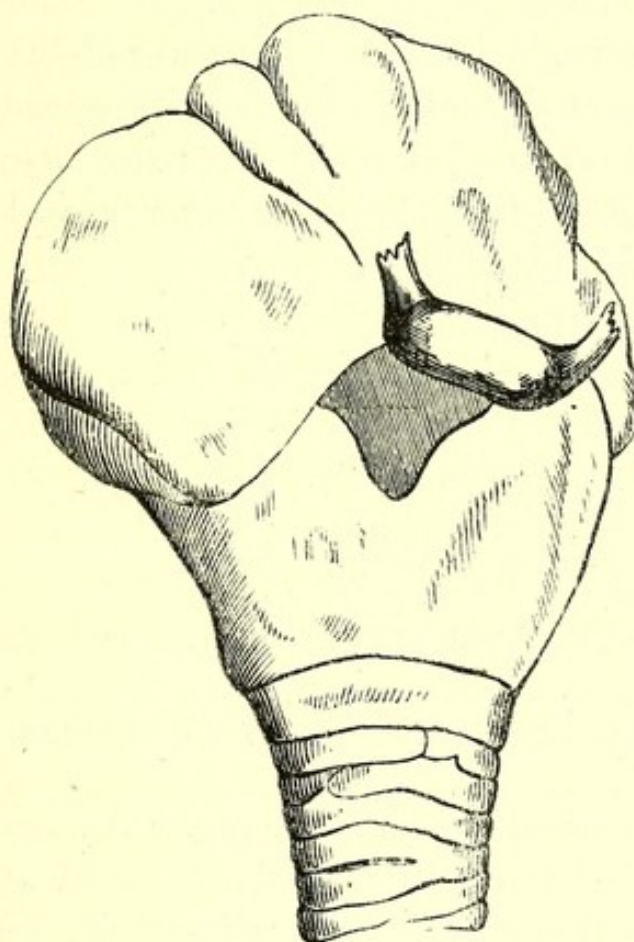
As a primary disease occurring in the larynx, it is extremely rare, for comparatively few cases are recorded of it. Louis has supplied an example of primary scirrhus-encephaloid of this organ, which is noticed in Dr. Walshe's work on cancer. Cancer of the larynx is commonly secondary, that is, it occurs by the extension of the disease from neighbouring textures.

A remarkable example of cancer of the larynx was exhibited at the Pathological Society in April, 1861, by Mr. Henry Thompson for Dr. William Tindall Robertson, of Nottingham, and as I was appointed, with Dr. Dickenson, to report upon it, a brief account is subjoined.

CASE. Cancerous tumour involving the larynx, and dislocating the epiglottis and hyoid bone; death from sudden spasm.—A man, æt. 30, complained of sore throat twelve months before death; six months after the right tonsil was excised with relief; it subsequently enlarged with glands in the neck. Dysphagia now appeared, and an ulcerated opening in the throat formed with a malignant aspect. Dyspnoea now set in, and when on his way to the hospital he dropped down dead in the street.

A tumour the size of an orange was situated above the greater part of the thyroid cartilage and overlapping its right wing. The hyoid bone was pushed obliquely towards the left side. The tumour projected posteriorly and filled up the concavity of the thyroid, displacing the epiglottis to the extreme left, and so compressing it laterally as almost wholly to obliterate the passage, where a mere slit could be noticed. The sides of the larynx were in complete contact. The disease was medullary. A full account of this case is given in the twelfth volume of 'Pathological Transactions.' The woodcut

FIG. 77.



Cancerous tumour of the right side of the larynx.

in outline shows the position occupied by the tumour and the manner in which it shoved the os hyoides out of its natural situation.

In neither of these two interesting cases was the laryngo-

scope used. It would have proved of great value in an early stage of the complaint.

In the museum of St. Bartholomew's Hospital is a very similar instance to the foregoing, the tumour springing from the left wing, size of a pullet's egg, from a man of sixty.

Haller mentions a case of aphonia in a woman depending upon a malignant tumour seated upon and covering one half of the epiglottis. Aronsohn describes another, wherein a tumour grew from the right side of the base of the epiglottis of a male, æt. 60; its presence prevented depression of the epiglottis, and *was* the main cause of dysphagia under which the patient suffered.*

Much more might be said upon cancer of the larynx as a primary disease, but as the cases are infrequent, and as no good case has occurred to me for using the laryngoscope, for the present I leave the subject as it is, having said sufficient to attract general attention to it.

CHAPTER V.

EXANTHEMATOUS AFFECTIONS OF THE THROAT.

SECTION I.—THE SORE THROAT OF SCARLET FEVER.

IN most cases of scarlet fever, in all the varieties of the disease, there is some amount of inflammation of the throat, which may become a prominent and striking feature of the disease. Taking it for granted that every practitioner is familiar with the different forms of scarlatina, my remarks shall be confined to the condition of the fauces in each, and of the importance to be attached to it.

* Dr. Walshe, op. cit.

In this remarkable malady, either the external surface of the body is affected by the poisonous influence in the blood, or else the mucous lining of the fauces. In one form (*Scarlatina simplex*) there is no throat affection, whilst the skin suffers. Another, and a very common form, is remarkable as partaking of the usual symptoms of scarlet fever, complicated by inflammation of the fauces (*S. anginosa*). A third and malignant form is characterised by gangrenous inflammation and sloughing of the throat (*S. maligna*), sometimes complicated with diphtheria,* but generally with tumefaction of the parotid and cervical glands, and acrimonious discharge from the nostrils and ears. It is this last form, which no doubt is the representative of the "putrid sore throat," the "ulcerous sore throat," which has reigned epidemic, and been described by many of our older writers: the prominent symptoms being ulceration and sloughing of the throat, which extended to the nose, the eruption, if it were present, being wholly unnoticed or disregarded. Sometimes, at the present day, instances are observed wherein the efflorescence is confined to the mucous membrane of the mouth and throat, and does not appear upon the skin at all: this is the *S. faucium* of Dr. Tweedie, and the *S. sine exanthemate* of other writers.

In an epidemic of the disease, it is important to readily recognise the difference in the condition of the throat, as a guide to its local treatment, and this may be assisted by remembering the condition which it presents in the three forms of the disease in the following table:

S. simplex.—Mucous membrane of throat *not* inflamed, *but* it may be red in mouth, throat, fauces, larynx, nostrils, and eyelids at the same time.

S. anginosa.—Stiffness of neck and sore throat from the beginning, with dysphagia; second day more painful, and efforts to expel viscid secretion from pharynx and tonsils. Florid redness and considerable swelling of

* See Dr. Burrow's able "Essay on Scarlet Fever," in the first volume of the 'Library of Medicine.'

tonsils, uvula and soft palate, extending to posterior fauces and larynx. In severe cases, small dark patches, often covered with grayish-white exudations, or gray aphthous crusts, likely to be mistaken for sloughs. Gargles remove these, and membrane is entire. Fever and throat affection abate with fading of eruption, *but* sometimes both continue a week or ten days after rash has wholly disappeared.

S. maligna.—Throat like the foregoing at the commencement, but soon becomes typhoid. Throat dusky red, little swelling, dark exudations (not sloughs) on velum, uvula and tonsils. Sometimes gangrenous inflammation of these, which are destroyed by sloughing. Also acrid discharges from nostrils and a viscid secretion from fauces, with dyspnœa from supra-glottic œdema and stridor. Pharynx inflamed and irritable, rejects fluids through nose. Bleeding sometimes from nose, throat, bowels, or bladder.

The difference in the state of the throat in the anginose and malignant forms, is sufficiently striking, and the general symptoms will be equally so. Usually the anginose and the simple forms terminate in resolution. A bright florid redness of the throat is always more favorable than a dark or livid aspect. In scarlatinal sore throat, as in many other forms, any sudden swelling, with its accompanying dyspnœa, must be anxiously responded to, else *supra-glottic œdema* will rapidly form, and quickly destroy life. Enlargement of the submaxillary and parotid glands is sometimes enormous, and produces constriction of the fauces by mere pressure; this adds much to the general danger.

It is not my intention to enter into the treatment of scarlet fever, as that will be guided by the circumstances of its type and intensity, but I may merely allude to the value of emetics in the anginose form, early administered. My own experience accords with that of many others as to their value. The throat, however, should be well looked to in all the forms, as the key-stone of the disease to be attacked; and, with that view, some are in the habit of swabbing the fauces and neighbouring parts, at the onset, with a strong solution of nitrate of silver, a practice which is very commendable; others use the nitrate in its solid state. And here I would refer to the *brochure* on scarlatina, by Mr. Baker Brown; his treatment is

simple and so successful—by dilute acetic acid internally—that it cannot be too widely known. In common with many hundreds of practitioners, I add my testimony in its favour. He most properly lays great stress upon the early attention to the state of the throat. Dr. Billings esteems the sulphuric acid, and the lemonade drink, or lemonade made with lemon-peel and the mineral acid, of the greatest use as a lotion to the fauces and primæ viæ, which are in an inflamed or congested state in scarlet-fever.* In the malignant sore throat, a weak solution of the chloride of soda is recommended as a gargle, which must be injected into the fauces, if the patient be a child. Dr. Jennings, of Virginia, found gargles of the infusion of sanguinaria in vinegar, and a solution of chlorate of potass, perfectly successful in an epidemic of the malignant form of scarlatina. Wine and tonics, in this last form, are our chief dependence, combined with attention to the throat.

Chlorine and milk are strongly recommended by Mr. Conway Edwards in Scarlatina,† and chlorine and the chlorine acids by Dr. Henry Osborn of Southampton,‡ whose papers are well worthy of attentive perusal. Dr. Watson advises chlorate of potass and hydrochloric acid.

I must not overlook an affection of the neck which sometimes occurs in scarlatina; it is described by Dr. Graves in his 'Clinical Medicine.'

The head is observed to be turned to one side, the face is awry, severe pain may or may not be present in one side of the neck, and the cervical vertebræ are curved forward to the affected side. This is supposed to be the result of the extension of the inflammation from the fauces and back of the pharynx to the neighbouring parts, and is treated by leeching and mercurials.

* 'Principles of Medicine.'

† The 'Lancet,' June 28, 1862.

‡ Ibid., September 13, 1862.

Dr. Leney records two cases of the kind,* ending fatally, which he terms *indurated cellulitis* of the neck; the parotid and submaxillary regions, and sides of the neck as low down as the clavicles were immensely swollen and hard, a yellow ichor ran from the mouth and nose, the respiration was crowing, and death ensued from asphyxia. In reply to his questions, I would advise the early application of a strong solution of nitrate of silver to the fauces (ʒiv to the ʒi of water) and the strong iodine paint freely to the swollen and hard part of the neck, together with stimulating enemata.

In the chapter on affections of the nose is related an instance where ulceration of the throat and nose occurred consequent upon scarlet fever when a child, and the ravages of the disease were at the time very extensive, as the details of the case fully prove.

Albuminuric aphonia.—Albuminuria is a manifestation of the renal disease now known as Bright's, and gives rise occasionally, though rarely, to laryngeal symptoms which result in aphonia, to which Dr. Charles Fauvel, of Paris, has recently given the name of "aphonie albuminurique."† As this loss of voice occurs also in the renal dropsy following scarlatina, its consideration appears to be the most suitable in the present section.

It must be in the experience of most hospital physicians to have witnessed cases of extensive anasarca resulting from Bright's disease, and as a sequel to scarlet fever, involving the submucous areolar tissue of the larynx and producing hoarseness, stridor, and aphonia. Although this cannot be an extremely rare complication, for several examples have come under my own notice in the wards of the larger hospitals of London, yet scarcely a writer that I am acquainted with even mentions such an occurrence. It was but the other day (January 29th) that a male child two years and a half old,

* 'Med. Times,' 22 November, 1862.

† 'Compte-rendu du Congrès Médico-Chirurgical de Rouen,' 1863.

was brought to me amongst the outpatients at Westminster Hospital, with Bright's disease of recent date, associated with general dropsy. The child had been much exposed to cold, was blanched, puffy about the eyelids, had bled at the mouth, and the voice was completely gone. The urine was scanty and albuminous, which was from the disease mentioned, as it had not had scarlatina. With assistance I was enabled to see in the laryngeal mirror supra-glottic œdema of the larynx, of a very pale, indeed almost a white colour. Here was an instance of albuminuric aphonia in a young child. The laryngeal dropsy was purely passive, yet the dyspnœa was urgent.

It is well known that one of the causes of death in dropsy, is effusion beneath the mucous membrane of the air passages, and the larynx is liable to become involved, and add much to the patient's sufferings.

I am indebted to Dr. Charles Fauvel for a copy of his original essay on albuminuric aphonia, and the following is a summary of his observations.

The laryngeal mirror only can discover this affection, which is a white œdema, either chronic or intermittent of the vestibule of the larynx and vocal cords, preceding or following albuminuria, and more often present without any external manifestation to afford even a suspicion of the existence of Bright's disease. This œdema at one time abruptly manifests its presence, and at another slowly, by complete aphonia or slight dysphonia. The first symptom which appears is hoarseness, the patient neither coughs nor expectorates, has no feeling of a foreign body; he complains only of slight uneasiness of breathing, and a little oppression at the chest; very soon he is compelled to make great efforts at inspiration, and some days after the voice is weak and obscure, sometimes altogether lost; and a whisper occurs only with the lips.

No cause can be made out in the patient's history to explain the condition of the larynx. If, however, it is recog-

nised either by a direct examination of the larynx, or by the appearance of an œdematous swelling of the face, or prominence of the eyelids or general anasarca, the proper treatment for albuminuria will arrest the progress of the laryngeal affection. If the disease be not diagnosed, it will, nevertheless, disappear in a few days, because it will have been the consequence of an intermittent albuminuria. On the other hand, when the intermission disappears, and the disease returns in an aggravated form, the obstruction becomes so great that tracheotomy must be performed.

Dr. Fauvel cites the particulars of two or three well-marked examples, and has seen many patients attacked with aphonia or dysphonia in the best of health, without any other explanation to account for the swelling of the larynx, than albuminuria; very sensible traces of albumen being discovered in the urine by the application of nitric acid.

If supra-glottic œdema of the larynx suddenly arises as a forerunner or primary symptom of Bright's disease, its early diagnosis is of great importance, and the profession cannot be too soon made aware of it.

SECTION II.—THE SORE THROAT OF MEASLES.

The striking difference between measles and scarlet fever, is in the manner of their commencement; the former by coryza, sneezing, suffusion of the eyes, and catarrhal symptoms generally; whilst in the latter the first sensation of uneasiness is referred to the throat. Coeval with the appearance of the rash of measles, sometimes small, dark, red, confluent patches are observed on the palate, uvula, and the tonsils. There is a soreness of the throat, but it is not followed by any lesion of the part; and this state of the fauces disappears as the rash declines from the surface of the body. The hoarseness of the early stage depends upon some slight inflammation

of the larynx. Contrasted, therefore, with scarlatina, the throat affection is insignificant. In the malignant form of measles, however, the dyspnœa is often distressing, and the mucous membrane of the tongue, fauces, and larynx, assumes a dusky-red, or livid colour. Supra-glottic œdema has occurred in the severer forms with aphonia, as in scarlatina and in smallpox, from the influence of the inflammation on the sub-mucous areolar tissue, which has poured out serous fluid. The entire gastro-pulmonary mucous membrane is affected in measles, and thus explains the various symptoms.

Although I have examined the throat and larynx in measles with the laryngeal mirror, at present I can offer no further remarks on rubeolar sore throat, and differing from scarlatina, smallpox, or diphtheria, the sequelæ of measles so far as the throat is concerned are few and unimportant, unless in exceptional instances.

SECTION III.—THE PUSTULAR THROAT OF SMALLPOX, AND ITS CONSEQUENCES.

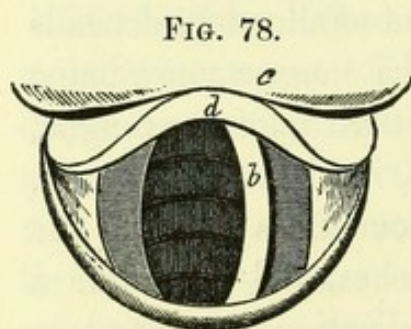
In smallpox, the throat is always engaged, and is of much more importance than any similar derangement in measles. The tonsils, uvula, and fauces are swollen and red, and the soreness experienced, with the difficulty of swallowing, depends upon the presence of pustules on the mucous membrane covering these parts. They are also noticed upon the tongue, the roof of the mouth, the soft palate, inside of the cheeks, and at the back of the pharynx. Sometimes the specific eruption extends to the larynx and trachea, and it follows a similar course to that of the skin. Salivation is present in both forms of the disease, but more extensive in the confluent variety. But when the mucous membrane is thus affected the mouth is hot and the throat painful, there is difficulty of swallowing from congestion and tumefaction of the epiglottis

and neighbouring parts, associated with œdema of the membrane covering the false vocal cords giving rise to urgent dyspnœa, which at last produces suffocation from the closure of the passage.

In addition to the general treatment adopted for the various disease, a solution of nitrate of silver (twenty grains to the ounce of water) applied daily with a brush to the larynx in the early stage of the complaint will be found of considerable advantage, and of which I speak from personal experience. If the dyspnœa is most urgent the trachea should be opened to afford a chance for life, with better prospects of success than in many other diseases, for usually the mischief is confined to the upper part of the larynx, and the lungs are not commonly involved.

When recovery ensues after severe laryngeal disease, the patient in some instances is liable to chronic laryngitis for many years, or the voice becomes altered from lesions sustained by the vocal cords. Of the latter the following is one amongst many others which have come under my notice.

CASE. Deformity of the larynx, and alteration of speech, from smallpox.—The subject of this was a female, æt. 43, sent me by Dr. Wright, of Somerset Street, 15th December, 1862, to examine on account of deficient phonation.



b. The left and only vocal cord. *c.* The back of the tongue. *d.* The epiglottis.

When four years of age she had smallpox; a fit occurred, and after it the upper part of the neck became much swollen; she remained speechless for six months. She was very weak and nervous up to the age of fifteen. She married and had three children. Her speech remained indistinct until she grew up, when it became a little clearer, although still imperfect. All her

other faculties are good; she was operated upon for strabismus by Mr. Ure, at twenty-one. Never could sing. The laryngoscope showed the right vocal cord to be destroyed, no doubt by the smallpox; the left was normal. Her language is that of a child in pronunciation. *e. g.*, calling

good — dood	silly — chilly
clever — chever	thin — chin
stout — tout	stopped — topped.

and so on.

The woodcut shows the view obtained, but in phonation the left cord moved freely across to the right side.

I do not mean to say that her peculiar mode of speaking is entirely due to the condition of the larynx, but the voice is to some extent modified by it, especially in relation to its feebleness.

CASE. Hoarseness and aphonia from chronic laryngeal disease for thirty-eight years, after smallpox.—On the 4th October, 1863, at the request of Mr. W. Hall, of Tottenham, I went to see Mrs. I—, æt. 60. At the age of twenty-two she had smallpox, and was unfortunately inoculated whilst going through the disease. The consequence was, that the severity of it was increased and the malady prolonged, and her throat and larynx were much affected. On her recovery the throat was much ulcerated, but for thirty-eight years she has been the subject of varying aphonia, hoarseness, and chronic laryngeal disease. On one occasion she had persistent aphonia for two years. She has been hoarse and aphonic constantly now for the last four months.

She was breathing with an inspiratory stridulous noise from obstruction, she could speak in a loud whisper, but with pain. Felt a weight at the upper part of the chest; deep-seated pain in the right wing of the thyroid cartilage, and left thyro-hyoid articulation, and a line of distress across the former. Atheromatous expression well marked. Had attacks

of retching, with expectoration of bloody mucus, which came from the larynx.

With the laryngoscope the false cords were seen so swollen and œdematous, that the upper passage was almost closed, and no possibility of seeing the interior of the larynx existed. A small abscess was manifest on the right half of the swelling (see fig. 79), quite yellow, on the eve of bursting. The fauces were streaked, patchy, and denuded in several places of epithelium. Some dysphagia with fluids.

She materially improved under treatment, and went on well for some days, when after an attack of vomiting she was seized with severe dyspnœa and noisy breathing; and as the laryngoscope showed almost complete closure of the upper larynx, it was deemed prudent to open the trachea, although no attacks of spasm were present. This was done by my colleague, Mr. Holthouse, in the presence of Mr. Hall and myself, on the 12th October, with truly wonderful relief, and the best success up to the present time.

The sketch shows the condition of the parts presented by the laryngeal mirror on the first examination.

When attending the meeting of the British Association for the Advancement of Science at Cambridge, in October, 1862, I examined the anatomical museum of the university, and came across a preparation taken from a patient who died of smallpox. The tongue was excoriated, the pharynx inflamed,

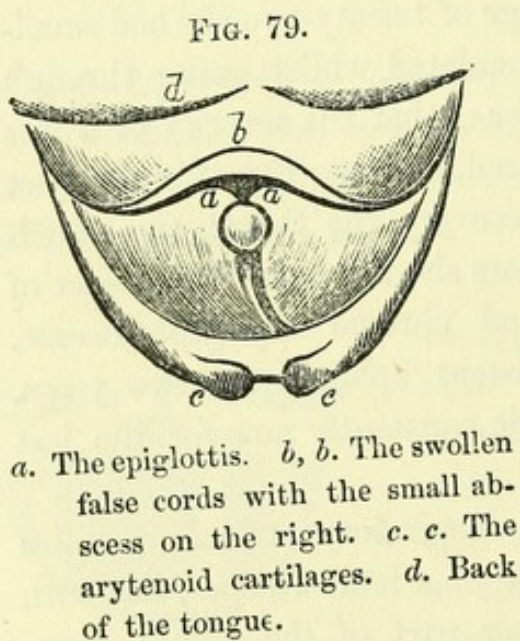


FIG. 79.
a, a. The epiglottis. *b, b.* The swollen false cords with the small abscess on the right. *c, c.* The arytenoid cartilages. *d.* Back of the tongue.

and the trachea studded with distinct elevated spots of coagulable lymph like the pustules of smallpox. It was purchased (with others) from the collection of Professor Macartney, T.C.D.

In June, 1861, a woman was admitted into the Hôtel Dieu, Paris, for smallpox, and was suddenly seized with œdema of the glottis; the symptoms were so urgent that life was immediately imperilled, and Trousseau requested M. Robert to perform tracheotomy; before resorting to the knife, a pulverized solution of tannin was inhaled, and the relief was so instantaneous that the operation was postponed; the inspiration of the pulverized fluid was repeated at short intervals, and on the very same evening a cure was effected.*

SECTION IV.—PERTUSSAL SORE THROAT.

According to the frequency of the paroxysms in whooping cough, with their violence, severity, and duration, so will there be a soreness or uneasiness at the upper part of the larynx. This condition may of itself pass away without any special notice being taken of it. But when the voice is very hoarse, the faucial membrane very red, although not inflamed, it should at once receive attention, for cases of the kind have been brought to me, wherein this redness was progressing from the stage of congestion to that of inflammation, and extending down the larynx and trachea, thus adding a very serious complication to the pertussal disease. When such symptoms are present, it will be advisable, therefore, to apply a solution of the nitrate of silver (twenty grains to the ounce of water) to the larynx, and at once check the tendency to further mischief. This practice is the more necessary, because in all the children I have examined with the laryngoscope, the mucous membrane of the larynx, vocal cords, and subglottis, is in a state of active congestion, varying according to the number and persistence of the paroxysms, and very liable to conversion into inflammation. The disease is not a suppurative inflammation

* M. Trousseau before the Acad. of Medicine, 'Med. Circular,' 2nd July, 1862.

of the laryngeal mucous membrane, as stated by a recent French writer.

Many of the more dangerous affections of the larynx and trachea are found to be complications in whooping-cough, and they are probably the most dangerous with which we have to contend, for not only do they present the usual symptoms of such maladies, all of which are noticed in this work, but their intensity is increased by the spasmodic character of the pertussal disease. The mucous membrane of the trachea, larynx, and epiglottis, has been noticed of a scarlet or purple redness in fatal cases, and this may extend even to the pharynx and œsophagus. In one of M. Blache's cases, the redness in the ventricles of the larynx was found to be very marked.

Besides the foregoing consequences of inflammatory action, the following conditions have been observed by Astruc, Macintosh, Alcock, and myself, in fatal cases from complicated throat disease: a thickened, soft, and pulpy state of the mucous membrane, feeling like velvet to the touch; ulcerations in the glottis, the larynx, and in the trachea, and the inflammation of the larynx may be so great as to close the glottis mechanically, and of course produce instant death.*

Astruc affirmed that the disease principally consisted in inflammation of the mucous membrane of the pharynx and larynx, especially the former, because many cases with such complications came under his notice. Similar evidence of inflammatory action was found by many other observers. But, as I have had occasion to show in my work on that disease, these were superadded complications to the original malady induced by various causes, but probably by those of an epidemic character, in which throat affections were predominant.

When diphtheria, scarlet fever, and throat affections generally are prevalent, it has been a rule with me to pay particular

* See my 'Treatise on Whooping-Cough' (p. 155), 8vo. London, 1854.

attention to the throat in whooping-cough, and I have not hesitated to cauterize the larynx with a solution of the substance already named; and, on more than one occasion, the value of this conservative treatment has been apparent. The internal treatment, which has now been employed by myself for many years, namely, the diluted nitric acid, especially acts as a prophylactic against throat complications,* and the cases which have come under my notice are those in which such additions to the original disease have been rather present, either before or at the time of their being brought under my notice for treatment.

Although I have myself occasionally combined the topical use of the nitrate of silver to the lips of the glottis with my nitric acid mixture in the treatment of whooping-cough, it affords me very great satisfaction to refer to the efficacy of this plan of treatment in the hands of Dr. Pearce, of Hatton Garden, who published a short paper in the 'Lancet,'† on this "combined and local treatment of whooping-cough," in which he mentions that seventy-five cases (thirty-two boys and forty-three girls), in age from two to eight years, in a school of over 1000 children, were cured by it, in an epidemic of the disease the previous autumn. What is chiefly gratifying besides the cure, is the striking fact mentioned in his interesting and valuable communication, that all escaped any of the troublesome and dangerous complications of this malady, a feature which I prognosticated from this plan of treatment, and which my own experience all along, together with that of many accurate observers, has tended most completely to confirm.

In the treatment, therefore, of pertussis, more particularly if epidemics are prevailing, it will be advisable to combine topical measures with constitutional treatment.

The bromide of ammonium, from its peculiar effects upon

* See my 'Treatise on Whooping-Cough.'

† Vol. i, 1857, p. 378.

the nerves of the larynx and pharynx, I have found, in common with Dr. Harley, of University College, to be valuable in the treatment of hooping-cough, in doses of two or three grains for infants thrice a day, to older children from four to ten grains, and in some cases where the symptoms are severe, twelve or even more grains. The simpler the vehicle the better; but if there is a tendency to bronchial or pneumonic inflammation, it should be combined with a mixture, or the wine of ipecacuanha.*

The formulæ I am now in the habit of prescribing of the nitric acid mixtures are the following :

℞ Acidi Nitrici diluti, fʒviiij ;
Tincturæ Cardamomi Compositi, fʒiv ;
Syrupi Simplicis, fʒivss. M.

or

℞ Acidi Nitrici diluti, fʒviiij ;
Tincturæ Cardamomi Compositi, fʒiv ;
Glycerinæ, fʒj ;
Syrupi Simplicis, fʒiijss. M.

For an infant the dose is a teaspoonful every three or four hours, and for children from two to five years of age, two to three drachms at the same periods.

For other information upon the pertussal disease I must refer the reader to my monograph on hooping-cough.

SECTION V.—CONDITION OF THE LARYNX IN FEVERS.

A form of subacute laryngitis is occasionally seen in typhus, typhoid, and even certain other fevers, and this may proceed to the ulcerative stage and seriously complicate the general malady. This condition in typhoid fevers especially is noticed by Dr. Stokes, Dr. Jenner, Dr. Murchison, and others,

* See the 'Lancet,' September 26th, 1863, for reports of cases with clinical remarks by Dr. Harley and myself.

Although it does not seem to have attracted particular attention. I have myself seen instances of it, especially during the great outbreak of emigrant fever in Canada, in the years 1845-6, and early part of 1847.

The attention of the profession has recently been attracted to it by some clinical remarks of Dr. Wilks, on the subject of ulceration of the larynx in typhoid fever.* Some years ago, in the Crimea, it had been noticed that cases of typhoid fever became complicated with emphysema. The explanation of this was then rather difficult, and was attributed by some to decomposition of the gases of the tissues during life. Dr. Wilks, however, believed the true cause to exist in the larynx. Some years ago, he had exhibited before the Pathological Society a larynx taken from a patient who died of typhoid fever, in which there was ulceration at the back part of this organ. The fact that ulceration of the larynx is often a part of the diseased process in typhoid fever has been long noticed, especially in Northern Germany. In the case alluded to there was, however, also a simple explanation of the emphysema, for an ulcer had perforated the larynx, and air had escaped between the trachea and the œsophagus. In the inspection which gave rise to these remarks, there were the usual appearances in the small intestines, and a small ulcer at the back of the larynx. Dr. Wilks believed that the disease in the larynx went through the same stages as the disease of Peyer's patches in the intestinal canal—first there was deposit of typhous matter, then ulceration, and as a further step, occasionally perforation.

I think no one will dispute the logic of Dr. Wilks, because it is well supported by facts, and the analogy is strong between this affection and tuberculous laryngitis, where sometimes the bowel is affected as well.

Dr. Vose exhibited a larynx before the Liverpool Medical

* 'Medical Times,' September 13th, 1862, p. 276.

Institution in April, 1863, affected with acute inflammation in a case of fever, but without ulceration.

I have examined the preparations in the Guy's Museum, and the following are their numbers and description. The first specimen is the one particularly referred to in the remarks made by Dr. Wilks.

1698¹⁰.—Typhoid ulceration of the larynx, producing perforation and leading to general emphysema, from a boy aged 10, under Dr. Addison, in 1857, with typhoid fever. The diseased intestine is also preserved.

1698²⁰.—Typhoid disease of the larynx. This is seen as a small cavity situated in the posterior part of the vocal cords, and when recent contained a soft brown deposit. H. B., æt. 33, under Dr. Addison, in 1859, for typhoid fever with the usual symptoms as rose-rash, &c.; died of pneumonia. The intestine is also preserved.

1698³⁰.—Typhoid disease of the larynx. At the posterior part of the vocal cords and base of arytenoid cartilages an ulcer is seen. The ileum is preserved also. 1862.

A reference to Dr. Murchison's 'Treatise on the Continued Fevers of Great Britain,' published in 1862, will afford much information on *laryngitis*, as a complication and sequel in enteric fever. The anatomical lesions witnessed are, at the same time, noticed.

The disease assumes various forms; the larynx may be œdematous, or affected with erysipelatous inflammation, with submucous purulent infiltration; or again, there is croupy exudation and ulceration. Ulceration of the larynx and trachea forms the *laryngitis typhosa* of Rokitansky and others. Dr. Murchison states that it is occasionally found after death, when there have been no symptoms during life referable to the larynx.

When ulceration occurs in the larynx the ulcers are usually found near the posterior junction of the vocal cords. They are sometimes superficial, and at other times spread deeply,

destroying and laying bare the subjacent cartilages. They are rarely, if ever, it appears, found before the fifteenth day of the disease. Louis met with these ulcers in only three out of ninety-six cases; Chomel, in one out of forty-two cases; and Jenner in one of fifteen cases examined after death. In the event of recovery, the sloughing ulcer is likely to give rise to future trouble, especially to the voice and breathing.

CHAPTER VI.

DISEASES ARISING FROM SYSTEMIC CHANGES.

SECTION I.—OSSIFICATION AND CALCIFICATION OF THE CARTILAGES.

THERE is a curious relationship between the cartilages of the larynx and the arterial blood-vessels, in their undergoing certain transformations of structure, which would appear to be somewhat analogous with one another. The chief of these is their atheromatous conversion with their degeneration into calcification, the latter being more pronounced in the larynx. These changes are by no means the necessary accompaniment of advanced age, but are rather observed in middle age, and sometimes much earlier, originating oftentimes in various diseases of the larynx, and vicious habits of living, of which intemperance is one of the most common. In old age the changes observed in the larynx may properly be called ossification, because the phosphate of lime enters largely into its structure, and sometimes the ossified parts are found to possess the microscopical characters of true bone, with lacunæ and Haversian canals, as in an example brought before the Pathological Society by Mr. Canton in 1861, taken from a

man 103 years old, and referred to further on.* Whereas, at an earlier period of life, the larynx is *calcified* and contains principally the carbonate of lime, mixed up with the elements of fat, the result chiefly of saccharine conversion in the economy. When the cartilages become affected in young persons by such transformations as the result of continued irritative or chronic inflammation, the change is not an ossification as stated by Trousseau and Belloc, but a calcification with atheromatous depositions. This distinction is founded upon careful experiment in the examination of a number of specimens, in both classes of persons, and I have as yet seen no reason to change my opinion. It must be remarked, however, that the calcification of early life, will, in the event of old age being reached, become partly converted into ossification; that is to say, there will be a mixture of the carbonate and phosphate of lime, in the thyroid and cricoid cartilages, very different from that solely arising in old age.

FIG. 80.

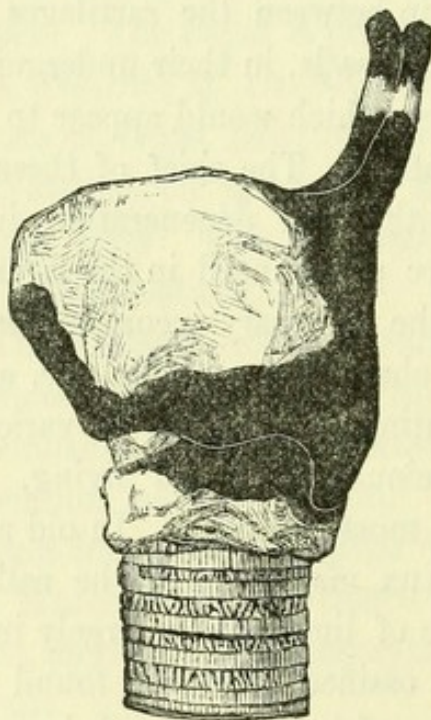
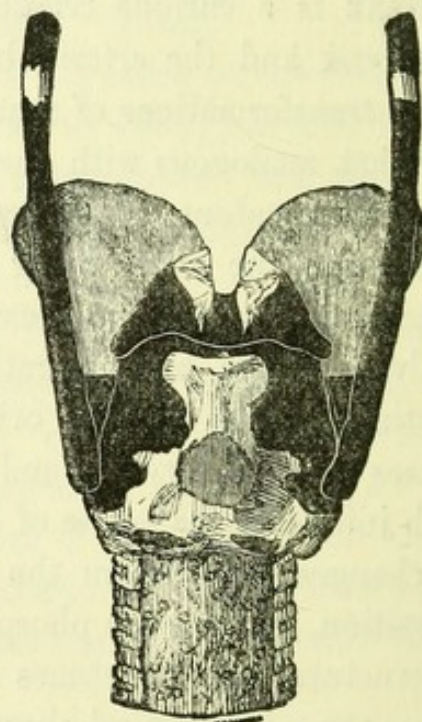


FIG. 81.



Larynx of a man aged 103 years, showing the ossified parts in black.

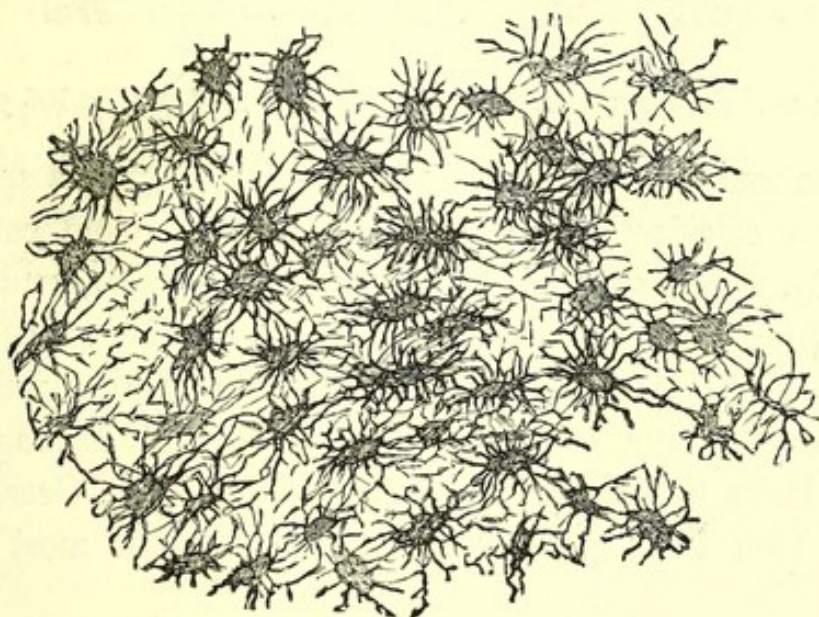
* 'Path. Tran.,' vol. xii, p. 55.

The *ossification* of old age is then a natural process, in which the cartilages become converted into the elements of true bone, with their microscopical characters, and assume a more or less solid yet spongy form, but rarely compact.

This fact has been most conclusively shown by Mr. Canton in his work on the 'Arcus Senilis,' wherein he has figured the larynx of the man 103 years old, already referred to, and which he has most kindly permitted me to introduce here. The black parts show those portions of the laryngeal cartilages, respectively, which have become completely ossified; whilst the remainder of them is still cartilaginous, though these latter parts are, more or less, in a state of fatty degeneration, and brownishly discoloured. The partial ossification in the larynx of one so aged, proves that it is not absolutely essential to old age, in so far that it should necessarily be as complete as we sometimes find it in individuals of sixty or seventy. This old man had enjoyed an almost uninterrupted continuance of good health during his long life, and died from the effects of an accident.

The microscopical appearances of the ossified parts of the larynx in this old man are figured below, also taken from Mr.

FIG. 82.



Microscopical appearance of the lacunæ in the larynx of the man 103 years old.

Canton's instructive work. In fig. 82, the lacunæ are seen to be fully formed, more or less closely aggregated, of large size, and assuming somewhat of an oval form; their canaliculi unite with those adjoining, as in ordinary bone. In fig. 83 the Haversian canals are seen to be of large size, comparatively few in number, and intercommunicate by means of wide branches.

FIG. 83.



Appearance of the Haversian canals in the larynx of the man 103 years old.

In the museum of St. George's Hospital there is a specimen of entire calcification of the thyroid and cricoid cartilages (No. 82), which are *twice the natural thickness*, and apparently true ossification. The thickness is due to perichondritis. There is another in the museum of the College of Surgeons, where a completely ossified thyroid cartilage (No. 1829), looks like the most compact bone. Dr. Gross states he has seen them quite hard and firm, like the most perfect bone.*

* 'Elements of Pathological Anatomy.' 3rd Edition. Philadelphia, 1857.

The *voice* in these cases is harsh and constrained, or it is cracked, brassy, and tremulous, and no other inconvenience is observed beyond this. Cases are related, in which the cartilages, besides being ossified, have become hypertrophied, and by their pressure on the œsophagus have caused difficulty in swallowing, which in the course of time has destroyed life, but this is very rare. Sir Astley Cooper mentions an instance of ossification in an old person who sustained a wound of his throat, which was followed by the exfoliation of the thyroid cartilage in an ossified condition, with an actual cure in the course of several weeks.

If any disease should arise in the vocal apparatus of old people, the ossified cartilages are quite liable to undergo any of the changes of ordinary bone, such as caries, necrosis, and exfoliation. A very striking case of the kind is related by Ryland,* in the person of an old man, aged seventy-five, who died of chronic bronchitis. He had soreness at the upper part of the trachea, and a feeble, veiled voice. The rings of the trachea were found osseous, carious, absorbed, and some of them denuded.

In April, 1859, I exhibited before the Pathological Society of London some specimens of complete ossification of the thyroid and cricoid cartilages, taken from an old soldier, seventy years of age, who died from senile catarrh. His voice possessed a peculiar but harsh sound, and his neck was unusually skinny from emaciation. Some of the rings of the trachea were likewise similarly affected. In November, 1859, Mr. T. Holmes, kindly showed me a preparation, in the museum of St. George's Hospital, of "ossification and calcification" of all the cartilages of the larynx, as well as the thyro-hyoid membrane, all the rings of the trachea, and some of the bronchi; no history of the case exists. The order in which the cartilages become ossified or calcified is the thyroid, cricoid, and arytenoid. I possess specimens of calcification

* Op. cit.

of the cartilages of the larynx, including the arytenoid from a man aged forty-one. In the last it is complete. This process is considered to be very rare by some pathologists in the arytenoid cartilages. Andral has never met with it. A single instance is given by Ryland in his work on the 'Larynx and Trachea;' and he refers to another published by Dr. Travers in the 'Med.-Chir. Trans.' I have examined a dry preparation of the kind in the Guy's museum, which shows this condition in the arytenoid cartilages, but not so complete as in my own specimens. Although supposed to be very rare, I believe that these small cartilages are not uncommonly affected. I have come across a considerable number of specimens in which calcification had occurred in them conjointly with the other cartilages of the larynx. Several of the London Museums contain specimens, but the richest collection is to be seen in that of the Charing Cross Hospital, chiefly collected by the exertions of Mr. Canton. In some of these, even the cornicular appendages of the arytenoid, have become impregnated with calcareous matter. Mr. Canton justly observes in his book, that ankylosis of the crico-thyroid and crico-arytenoid articulations, has never been seen.

Atheromatous thickening of the epiglottis is not a rare occurrence in calcification of the larynx. Miescher found the epiglottis ossified, but this depended upon the dissemination of osseous points or patches, without, however, possessing the true structure of bone. In the museum of St. Bartholomew's Hospital is a preparation of the larynx ossified, with some plates in the epiglottis, and also in the thyro-hyoid membrane. In the museum of the College of Surgeons is a preparation described as follows (No. 1825):—"Complete ossification of larynx, trachea, and commencement of bronchi. The epiglottis and membrane extending from it to the arytenoid cartilages, contains numerous small deposits of bone. In the crico-thyroid membrane also, and in the membrane uniting some of the rings of the trachea, there are a few similar

eposits." The ossification is of the true kind, not calcification, and is the most genuine specimen that has come under my notice, involving the arytenoid as well.

Mr. Canton himself, no mean authority on this subject, has never seen the epiglottis to be otherwise than in an unaltered condition, and this he says is in accordance with the experience of Cruveilhier and the majority of anatomists and pathologists. He quotes Columbus, who wrote 300 years ago, and Spigelius, who say the epiglottis never becomes bony. Cloquet, Van Heckeren, Andral, and Morgagni, acknowledge that it does occur.* Gross believes that there is hardly a well-marked case on record.

The two instances referred to in the London museums, which I have carefully examined, demonstrate the proof of its occurrence, and possibly there may be many others if carefully looked for.

With regard to the *tracheal rings*, instances have been previously mentioned of calcification and ossification occurring in them, and also in the larger bronchi. Mr. Canton quotes Gross, Littré, Vieussens, Deidier, and others, who have seen them thus affected. Cases have been related by some of the older writers, that ossification of the larynx or tracheal rings has actually prevented death in cases of hanging. Governor Wall was long in dying from this cause.

It must not be forgotten, that in cases of calcification of the cartilages of the larynx, there may be, or perhaps is usually observed, an arcus senilis, or complete annulus, associated may be with general fatty degeneration of the tissues. Whilst medicine is ranked as a science, Mr. Canton's name will ever be associated with that condition of the eye, to which he first drew the attention of the profession many years ago, and which he has most philosophically considered in the work which he has recently published on the 'Arcus Senilis.'

Calcification of the laryngeal cartilages may be suspected in

* 'On the Arcus Senilis,' p. 147.

the class of persons who are subject to the saccharine throat described in the next section. When the rings of the trachea are likewise implicated, the flexibility of this tube is equally affected with that of ossification, and there is a difficulty experienced in the expulsion of phlegm. As I have mentioned before,* this simulated ossification in persons of the age of from thirty to forty years, and in many cases much younger, is an indication that life is advancing rapidly to a termination, the age of maturity is passed; and when found, for example, in a person of thirty-five years, taken with a general fatty degeneration of the tissues, associated with atheromatous deposits in the coats of the blood-vessels, and probably an arcus adiposus, life has nearly run its span, although the patient may have a most healthy and ruddy aspect. It is in subjects of this kind that the saccharine element predominates, which becomes rapidly transformed into fat, and gives rise to a condition of body which is analogous to that of old age.

In calcification of the cartilages, they are observed to be brittle, and at the same time mixed with minute particles of fat, oil, and plates of cholesterine. There is a regular disintegration of structure in the majority of instances. The voice is loud, loose, and husky, or possesses a cranky, feeble or shaky-brassy sound, and not unfrequently there is a great noisy, barking cough, associated with this form of degenerated larynx. The surfaces of the vocal cords are seen in the laryngeal mirror to be undergoing similar atheromatous changes, as occur in the larger blood-vessels; an irregular patchy appearance, with a mixture of yellow and chalky white is noticed, not proceeding to the stage of ulceration, thus differing from the same condition in the blood-vessels. The heart and cerebral blood-vessels are mostly affected by the same cause that produces the alteration in the larynx; some one of the various forms of the "atheromatous expression" is generally very striking in such instances, and the tendency to rupture of

* 'Trans. Path. Soc.,' vol. x.

the minute arteries in the brain is not only imminent, but likely to prove fatal in such bad constitutions.

Can anything be done to arrest the atheromatous changes in early life and prevent their bringing on premature age? Yes, much, by the individual himself, in altering his system of regimen which helps to keep up the vicious tendency in the system. He must be treated as if he were a corpulent person, by the means suggested in the next chapter, with the assistance of the effervescing bromide of ammonium as prepared by Fincham, of Baker Street, alternated with small doses of nitrate of uranium, which I have reason to believe dissolves the calcareous material already deposited in the larynx and blood-vessels.

In the eleventh volume of 'Pathological Transactions,' will be found several examples of extensive calcification of the arteries, with abnormal distribution of their trunks; with others illustrating the atheromatous and calcareous expressions, which I brought before the society in May, 1860.

SECTION II.—SACCHARINE THROAT, A NEW AND DISTINCT MALADY.

The appellation chosen to designate this form of throat may seem to be, at first sight, peculiar; but I have now distinctly recognised it many times, and prefer to continue it amongst the distinct diseases of the throat in the present edition. It is a disease of considerable importance, and therefore worthy of particular notice. It may be here stated, however, that in 'The Lancet' of 12th May, 1860, I published a paper upon "the Atheromatous Expression," a remarkable yet very striking feature characterised by indications in the countenance of certain changes going on in the system generally, but especially of the conversion of the saccharine element (now called hepatic or amyloid substance) into fat

and its compounds, which either become deposited in various parts of the body, producing polysarcia, or else causing a fatty disintegration of the tissues, associated with an atheromatous ulceration of the lining membrane of the cerebral and larger blood-vessels. In individuals so circumstanced, but especially when this form of malady is present in the middle-aged, a dry throat and husky voice are oftentimes concomitant, the result of the changes going on in the vocal apparatus, as well as in other parts of the body. Occasionally there is a preternatural secretion from the faucial mucous membrane, which if examined, is observed to be covered with a thin layer of gelatinous matter, in which the fatty element predominates. When this secretion is removed, the fauces and mouth, in some individuals, are observed to be very greasy, the mucous follicles are slightly prominent, and would seem to pour out an oily fluid. The patient's tongue is slightly furred, and he tells you that he has a sweet taste in his mouth, and that when he eats his food, it not unfrequently tastes as if sugar were mixed with it. He frequently hems very loudly to clear his throat, and occasionally the noise is of a barking or cracked character. This, in reality, depends upon what has been erroneously termed early ossification of the cartilages, but which consists of a calcareous degeneration, with a mixture of the adipose, or perhaps atheromatous element, combined with true structural change in the yellow elastic tissue of the vocal cords themselves, very similar to the atheromatous in the blood-vessels; this I have seen in the laryngeal mirror, and verified by post-mortem dissection. The face has a greasy aspect, the nose and both upper and under lips seem as if slightly swollen, the eyes are bright and watery, there may be an arcus senilis or annulus adiposus, and the conjunctivæ look fatty. The skin of the face is smooth and even, and often covered with many small red vessels, ramifying in patches of a stellated form. There may or may not be corpulence; it is by no means a necessary accompaniment. The patient will

consult his adviser for a cold which seems to hang about him, and to which he is remarkably subject, and on examining his throat the conditions mentioned will be noticed. The irritation about the throat and larynx is sometimes terribly annoying, giving rise to harassing cough. There is no necessary connection between this affection and diabetes, because of the sweet taste of the mouth; nevertheless, I have occasionally noticed a small quantity of sugar in the urine.

As a good illustration of the general symptoms, and appearances presented in the laryngeal mirror, I cannot do better than relate the following case, occurring in a surgeon well known to a large number of sorrowing friends, and possessing a large practice in a fashionable watering place in Derbyshire.

CASE. Saccharine throat, with general follicular derangement, and gelatinous secretion, with a sweet taste in the mouth; recovery.—Mr. J. A. Pearson, F.R.C.S., a consulting surgeon at Buxton, visited me August 6th, 1862, accompanied by Mr. Southam and Dr. Enos Wilkinson, of Manchester. His throat had troubled him for some time past; he had to speak constantly for some hours daily, and at night he had dyspnoea, as if he were asthmatic; discharged gastric flatus sometimes without control. Although the throat was painful and uncomfortable, he was more uneasy about his voice. His stout with all the appearances of the atheromatous expression well marked; said he was a regular and temperate liver, fond of sparkling acid drinks, and on inquiry said that he had frequently a sweet taste in the mouth, and the saliva was sweet, and hence the desire for acid drinks.

The irritability of the throat was so great that I could get only momentary glances with the laryngeal mirror, for retching was brought on by it. A gargle of the bromide of ammonium in twenty-four hours so diminished this that I was enabled next day to make my inspection. The entire larynx

was free from any lesion, but the mucous membrane was congested, relaxed, and freely secreting; that of the fauces had a muco-gelatinous or oily glistening appearance, with general relaxation and congestion, and secreting freely. The follicles were prominent in some situations. He hemmed loudly and frequently to clear the glottis, beneath which the congestion was of a deeper and more intense character.

His diet, wines, and course of living and exercise were regulated, and *small doses* of iodinal preparations were ordered.

On the 18th October he called upon me, and in every respect he was better; the dyspnœa had wholly gone, the flesh was firmer, he was not so stout; the throat was greatly improved and the membrane more natural; the sweet taste had diminished and was not so frequent. Shortly after this he was completely cured.

On the 6th June, 1863, he was in his usual health and spirits dining with some friends, and suddenly became insensible and died from an apoplectic seizure. His throat was in reality a secondary matter, as compared with what the atheromatous expression indicated.

CASE. *Saccharine throat, with follicular disease, and a sickly sweet taste in the month; cure.*—Mrs. Mary S—, æt. 52, from Devonport, consulted me 28th November, 1860. She had a sore throat for two years, and had been under Dr. Hastings four months, and many others without relief. She cannot sing as she used to, and the voice is sometimes quite hoarse. Atheromatous expression well marked. All the symptoms of throat disease resembled those in the previous instance; the mucus “that comes from the back of the throat has always a *nasty, sickly, sweetish taste*,” she voluntarily stated. “It is not coughed up, but comes,” she says, “of its own accord.” The same state of larynx and fauces, with irritability, simulated that of Mr. P—. She was submitted to

treatment, and by the 28th February was pronounced cured. She was occasionally shown to medical friends as a good illustration of the saccharine throat. The urine was frequently saccharine in this patient, and at first she passed four pints per day, specific gravity 1040.

CASE. Saccharine throat, with follicular disease, and sweet taste in the mouth.—This was in a medical gentleman residing in the country, who consulted me 30th April, 1863, with a relaxed throat and larynx for some years, which proved to be follicular and saccharine, as in the two preceding instances. The epiglottis was very pendent, and streaked with red vessels. The follicles were much enlarged, and the taste in the mouth exceedingly sweet, and constant. The atheromatous expression was striking, with an arcus senilis.

In these cases of saccharine throat the disease is as readily and distinctly recognised as is Bright's or Addison's disease; the distinctive features in the diagnosis are three—namely, the atheromatous expression, the follicular affection, and the peculiar nature of the secretion with the sweet taste invariably present.

Although this form of throat affection has been familiar to me for the last seventeen years, and has not been before described, I feel satisfied it will be readily recognised by physicians, in connection with the atheromatous expression, and will be found worthy of the name and the importance which are attached to it.

Treatment.—Now, cases of this kind often prove very troublesome to treat, because it is almost impossible to overcome the conditions producing the symptoms. It has been the custom with many physicians to exhibit alkaline remedies in such instances, with the view to neutralising the acid secretions of the stomach—when these have depended upon the remarkable predisposition, in such cases, to the formation of sugar and its acids in that organ, and which are absorbed into the blood as such, and deposited as cholesterine, or as fat, into

some of the most important tissues. The treatment which has seemed to be the most useful in my hands, is that recommended in the section on follicular disease in the first chapter, consisting mainly of preparations of iodine and bromine in small doses, but chiefly of ammonium for a base, and conjoined with some good vegetable astringent tonic. The syrup of matico will be found an agreeable adjuvant in one or two drachm doses. Astringent and alterative local treatment must be combined with the constitutional. Small doses of cypripedin (lady's slipper), about three grains, in the form of a pill will be found exceedingly valuable as a sedative and alterative, in the spasmodic cough and dyspnœa occasionally present. Leptandrin and podophyllin every second day in pill will form an agreeable and effective laxative. Nitrate of uranium or the effervescing bromide of ammonium, as prepared by Fincham, Baker Street, I have found useful.

Regulation of the diet is most important—meat once a day, and that mutton; it should be light, carefully abstaining from *all malt beverages*, which, in certain constitutions, is the great cause of fatty conversions, degenerations, and disintegrations of tissue. Instead of the latter, weak whisky or gin and water should be taken, and the light dry wines. The avoidance of much farinaceous food is most desirable; thin dry toast is preferable to bread.

If the transformation of sugar into fat has not progressed too rapidly, and the atheromatous expression is only developing itself, the effect of the above treatment will be to arrest the destructive power of the saccharine assimilating processes in the stomach, and a marked improvement will ensue. But unfortunately these cases do not always come sufficiently early under treatment, to receive all the benefits so desirable.

SECTION III.—SORE THROAT FROM TOBACCO.

It may seem that I am going somewhat out of the beaten track, when the sore-throat produced by the effects of tobacco is here brought forward for consideration. Notwithstanding the large array of champions in favour of the use of this drug, very few indeed will be found who can declare that, however apparently harmless it may be in all other respects, that is to say, when moderately used, the throat is comparatively free from its influence. I have for many years noticed in various parts of the world, under different shades of temperature and of climate, as well as in England, that the mucous membrane of the fauces in all classes of smokers of tobacco, is subject to a state of chronic irritation which is almost invariably set down to some other cause. It is true that in many instances individuals in this condition may go through perhaps even a long life, without serious inconvenience. There are others, again, who are more or less delicate, and who suffer from weakness of the chest, in consequence of the extension of the throat-irritation downwards to the lungs. Some persons of susceptible nervous temperament will tell us that they experience a burning sensation in the stomach, and a dryness and heat about their fauces after the most moderate indulgence in smoking, and hence are compelled to resort to it only at intervals.

Now, what is the effect of tobacco upon the throat? If due reflection is bestowed upon the matter, it will be remembered that the smoke of tobacco almost constantly comes in contact with the soft palate, the tonsils, and the pharynx; if chewing is the preference, the juice equally influences the same parts, by lubrication during the act of swallowing; the result of this is an irritation of all the secreting apparatus of the mucous membrane of the fauces, which is at first preceded by slight heat and dryness, and then followed by excessive secretion poured out by the mucous follicles, which, from

their being thus constantly stimulated, become hypertrophied, and elevated beyond the surface of the membrane to which they belong. This condition may very well be seen on looking into the fauces, and will be found remarkably persistent in severe cases, at the back of the tongue, and around the epiglottis.

Moreover, in cases of excessive smoking I have seen with the laryngoscope, the mucous membrane of the larynx and of the trachea, very red, slightly tumefied and dotted over with small red points indicating the irritation produced upon the follicles of these parts. This state of chronic congestion has pervaded the membrane covering the vocal cords, and sometimes gives rise to hoarseness and aphonia.

The mouth and the bronchial tubes are occasionally affected by the smoke; but, as a rule, the intervening portions just mentioned are those chiefly involved. Should throat disease exist, however, independently of smoking, it is much aggravated by the latter, and sometimes causes very great misery and suffering, many examples of which I could relate.

I should wish it to be understood, nevertheless, that by no means is the moderate use of tobacco here condemned, which to so many seems a luxury and enjoyment of no ordinary kind. For this chronic condition of the throat is not produced, unless when its use is abused, and then its acrid nature soon becomes apparent.

The only writer who touches upon this subject is Dr. Horace Green, of New York, whose corroborative testimony is of that value which necessarily attaches to all of his writings. He relates that,—“As an exciting cause, the use of tobacco, in my experience, has proved a powerful agent in the production of follicular disease of the throat. Acting as a stimulant, directly and constantly, upon the mucous follicles of the fauces and throat, and greatly increasing, as it does, the secretion of these glands, its employment, as we should conclude *à priori*, must have a direct tendency to develop the disease, especially

if a predisposition to the affection exists.”* This extract is sufficient to confirm the accuracy of my own opinion; but were it necessary to go further to show its influence upon the mucous membrane by extension downwards to the stomach itself, I may observe that that great philosopher, Dr. Prout, considered it to disorder the assimilative functions, both primary and secondary, but particularly of the saccharine principle. In a paper upon the ‘Pathology of Saccharine Assimilation,’ which I had the honour to read before the Medical Society of London, on the 27th January, 1855, and published in a series of numbers of the ‘Lancet,’ I stated, as the result of many years’ careful observation among smokers and chewers, that “one of the substances which I thought especially likely to derange saccharine assimilation was tobacco, when used to excess in smoking and chewing.”† Further experience has only convinced me of the correctness of that view, and of the specific influence which tobacco exerts on mucous membranes generally, of which we have a remarkable instance in the enemata employed to reduce certain cases of hernia.‡

This form of sore throat, besides general measures to be observed—topical and constitutional—can be relieved only and finally cured by reducing the consumption of tobacco to something like a reasonable standard. There will be no actual necessity to abstain altogether, unless the patient’s condition is such that his life is the forfeit; and yet it must be acknowledged that such instances are far from being uncommon. The treatment adopted for follicular disease of the throat in the first chapter will be in great measure applicable here, and the most moderate amount only of smoking must be allowed whilst this is being practised. Special attention will be neces-

* Op. cit.

† See the ‘Lancet,’ vol. i, 1855.

‡ M. Triquet describes a peculiar form of deafness and otitis associated with dryness of the pharynx and nasal fossæ from the immoderate use of tobacco.—*Med. Circular*, May 13th, 1863.

sary to restore the healthy condition of assimilation, and everything likely to turn acid upon the stomach is to be avoided; the measures necessary to effect this will at once suggest themselves to the mind of the intelligent practitioner.

SECTION IV.—DYSPNŒA—DIFFICULT BREATHING: ITS CAUSES AND INFLUENCE ON THE THROAT.

Difficulty of breathing arises from two distinct sets of causes, which require to be described in respect to the influence they exert upon the throat. The first of these is the various diseases of the lungs and heart; and the second is the presence of tumours which, in some way, compress the windpipe and diminish the free entrance of air.

The dyspnœa arising from the first set of causes is witnessed in inflammation of the lungs, or of the pleura, or of any special disease of the pulmonary texture in which the blood is not properly arterialized; it is seen in consumption, in emphysema of the lungs, and in asthma, and the distress from the want of breath may be so extreme, that the patient is compelled to remain in the semi-erect position, to relieve the horizontal pressure of his abdominal viscera upon the diaphragm, this is called *orthopnœa*, and the patient cannot lay down. The effects of disease of the lungs and pleura, such as effusion into the pleura, give rise to dyspnœa; so does disease of the heart, and dropsy of the pericardium, or the undue pressure of any tumour beneath the diaphragm upwards: as, an ovarian tumour, a gravid uterus, an overloaded stomach, or an ascites. Paralysis of the muscles of respiration, from any cause, such as pain, rheumatism, or disease of the brain, produces it. But we find it the most severe in those active inflammatory conditions affecting the lungs themselves. Cardiac dyspnœa is perhaps not less distressing, in some cases the sufferings of the patient from this cause are most terrible.

Dyspnœa may be one of the earliest symptoms of phthisis, from any undue exertion;* we see it in fevers, when the circulation of the blood is accelerated; and the same thing is noticed in persons who are out of breath from any great exertion, but the latter is not actual disease. Whatever may be the cause of the dyspnœa, it seems quite clear, that the special nervous centre which presides over respiration is, as has been observed by many eminent writers, constantly influenced in some peculiar way.

The second set of causes is illustrated by the effect of *tumours*, in their pressure upon the respiratory organs, which is sometimes so great as to cause terrible dyspnœa, with symptoms of almost impending suffocation. The chief of these is thoracic aneurisms, or enlargement of the bronchial glands from strumous deposits, cancer, or simple hypertrophy. These spread upwards from within the chest, and either dislocate the windpipe, or seriously compress it, and cause tracheal breathing. In the newly-described and very interesting disease, *anæmia lymphatica*, dyspnœa is occasionally a prominent symptom, when a continuous chain of tumours form along the whole length of the spine upon each side of the aorta, sometimes encircling the arch, no matter what their size may be. Enlarged bronchial or cervical glands, in the same disease, equally cause dyspnœa. Besides the windpipe, the œsophagus will be pressed upon, and difficulty of swallowing is complained of. The jugular vein of one side may be distended, and the pupil of the eye, on the same side, may be dilated by the pressure of the tumour, whether cancer of the lung or otherwise, upon the sympathetic nerve, as was first pointed out by my friend Dr. Macdonnell, of Montreal.† The displacement of the trachea will of course be much greater as the tumour—an aneurism, for instance—rises higher and

* Cotton on Consumption.

† 'Montreal Med. Chron.,' vol. vi, p. 64, and 'Brit. Amer. Med. Journ.,' June, 1850.

higher, and the breathing becomes stridulous, and thus such cases have been mistaken for chronic laryngitis.* The diagnosis will be easy on observing that the stridor seems to come from the upper portion of the sternal region, and the laryngoscope shows the larynx to be quite normal. The voice is hoarse, and sometimes lost from pressure on the recurrent nerve, which latter is confirmed if the vocal cord of the affected side is paralysed, and the pupil of the same side is dilated.

I have seen death ensue, under such conditions, from simple exhaustion; the patient has been worn out. In other cases, a fatal result has occurred from suffocation; a striking example of the kind is given by Mr. Lawrence in the 'Med.-Chir. Trans.,' vol. vi.

In the hands of an experienced physician familiar with the use of the laryngoscope, a mistake in the diagnosis of such cases could now hardly be made; Dr. Watson, however, relates that he has known tracheotomy to have been performed for acute laryngitis, when the symptoms depended upon aneurism of the thoracic aorta. The aneurism may still so obstruct the veins leading from the larynx as to cause the parts above the glottis to become tumid and dropsical; this may give rise to dyspnœa—and tracheotomy is recommended as not only justifiable, but is actually demanded. I have now used the laryngoscope in several cases where the diagnosis was doubtful, and it has at once cleared up any uncertainty, for although the symptoms may strongly simulate laryngeal disease, yet if we find the larynx and trachea free and unobstructed, it greatly helps towards arriving at a correct conclusion. I will cite the following case in illustration:—

CASE. *Dyspnœa and aphonia, probably due to an aneurism; the right bronchus only seen.*—Mrs. E. S., æt. 45, was admitted into the West London Hospital in November, 1862, under my colleague, Dr. Goddard Rogers. The mother of eleven

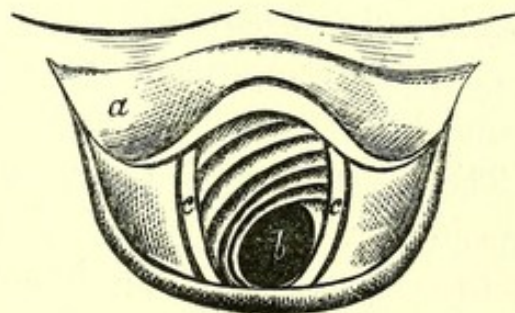
* This subject is ably considered in Dr. Stokes' work on the Chest.

children, six of whom are living. Always healthy up to four weeks ago, when she experienced sudden dyspnœa and pain at the root of the neck in front. The voice then began to fail, dyspnœa came on, and subsequently aphonia. At Dr. Rogers' request I examined her with the laryngoscope on the 3rd of December, and found the larynx normal. I could see as far as the tenth tracheal ring. The voice was sometimes natural, and at other times reduced to a whisper, with an occasional croupy sound and a cough. There was pain in the right side of the base of the neck and across the upper part of the sternum, with occasional severe dyspnœa at night. Thirsty, mouth very dry, pulse same at both wrists. Is stout, with ruddy complexion and atheromatous expression. Deep strong pulsation is felt on the right side of the neck, but no distinct bruit; sometimes there is pain between the shoulders. There were no special symptoms of cardiac or lung disease, and yet I suspected there might be an aortic aneurism.

On the 1st of January, 1863, I again examined her. There was now pain and soreness continually on the right side of the neck, extending to the right side of the head, face, and eye. The veins were prominent on the right forehead; she felt giddy, and disposed to fall on stooping; cough spasmodic, and distressingly persistent; pain not so uneasy about sternum; voice has returned; is thinner and weaker; orthopnœa at night. Has had a lump in the left breast five years.

Laryngoscopy showed the mucous membrane of the vocal cords relaxed, and a good view was obtained of the right

FIG. 84.



- a.* The epiglottis. *b.* The opening of the right bronchus. *c, c.* Vocal cords, between which are seen the rings of the right half of the trachea.

bronchus. This was well seen three times, but all my efforts, by change of position, reversing the mirror, and other artifices, failed to obtain a view of the left. The aneurismal symptoms seemed to be clearer.

Although she has remained under observation, with improvement in the more distressing of her symptoms, no fresh feature has appeared to call for special note beyond the fact that the evidence afforded by the laryngoscope proved that the symptoms did not depend upon any laryngeal disease. I am inclined to believe that the inability to see the *left* bronchus is due to spasm, in some way influencing the trachea, which is more contracted on the left than the right side.

Besides the tumours arising *within* the chest, which, by their growth, cause dyspnœa and other symptoms, we have a set growing in the neck above, and altogether external to the chest; these do not exert such a deleterious influence as the others, although they sometimes seriously compress the wind-pipe, especially large bronchoceles, and they deserve mention. Glandular, lymphatic, malignant, and fibrous tumours; abscesses, aneurisms of the carotid, and any growth that may encroach upon the larynx, will produce dyspnœa. Yet, again, it is by no means a necessary fact that dyspnœa *must* be produced, for in many instances tumours are noticed both within and external to the chest in the situations mentioned, and the breathing has been wholly unaffected. The abnormal course of the subclavian artery between the trachea and œsophagus, is stated by Demme, as causing dyspnœa sometimes.

The progress of all these causes of dyspnœa will of course depend upon the nature of their production and the rapidity of their growth, if from tumours. As the dyspnœa, in the great majority, arises from a deficiency in the supply of air to purify the blood; and as the cause is mostly irremovable, our efforts should be directed towards supplying the deficiency of that agent which is so essential to life, namely, oxygen gas. For many years I have been in the habit, in such cases as

these, of making up for the want of *quantity* of air to be respired, by regulating its *quality*, by the admixture of large proportions of oxygen gas; and the relief that has been afforded, has been in many instances astonishing; the patient, for the time being, gets rid of that feeling of want of air. Sometimes, when the use of inhalations has proved wearisome, I have caused the generation of the free gas, in a small chamber, with very considerable relief. This practical plan of treatment is worthy of attention, and is recommended with great confidence.

There is a form of dyspnœa arising from any obstruction within the larynx or trachea, known as laryngeal dyspnœa, from the impediment offered to the passage of air to the lungs. (Edema, whether above or below the glottis, inflammation of the larynx, tumours or growths within the larynx or trachea, diseases of the cartilages, especially the arytenoid, and pendency of the epiglottis, give rise sometimes to most urgent and highly dangerous dyspnœa. All these conditions are readily seen in the laryngeal mirror. Diphtheria and croup are also associated with some amount of dyspnœa; and so is gout and erysipelas when involving the neck and larynx. In many forms of laryngeal dyspnœa, the breathing is slower than that arising from the heart or lungs. The treatment of all these is considered in the separate chapters in which they are described.

If the dyspnœa arises from the pressure of tumours in the upper part of the neck above the trachea, and suffocation is imminent, we are fully justified in making a hole into this tube, and keeping it permanently open. The treatment of the dyspnœa in special thoracic affections, it is not my purpose to enter into, but I may here remark that there is an agent of great value in lung dyspnœa, which is worthy of special mention. It is the preparation known as the Peroxide of Hydrogen, introduced into practice by Dr. B. W. Richardson. (*The Lancet*, 12th April, 1862.) It supplies through the stomach what cannot be taken in by the lungs, namely, oxygen, and I

have seen marvellous results ensue from its use. Its dose is from one to four fluid drachms in half a wine-glassful of water, every four or six hours. I have seldom exceeded one or two drachms for a dose. It is prepared by Garden and Robbins, 372, Oxford Street. In laryngeal dyspnœa, its caustic character gives rise to pain.

SECTION V.—DEFORMITIES OF THE LARYNX.

Malformations of the larynx of a congenital nature have been looked upon as extremely rare up to the present time; so much so, indeed, that the subject was unnoticed in the first edition of this book, and one of my reviewers took me to task for omitting their consideration. It will be proper to consider the cartilages and other structures separately.

The *epiglottis* has been found absent by Targione Tozzetti,* and Meckel has found it divided.† I have met with three or four instances of the latter where there was a fissure through the centre of its upper part, in a couple associated with cleft palate. In two instances in deaf mutes, detailed further on, it was shortened and seen to originate low down in the larynx, below the origin of the true vocal cords. Obliquity and curve of the epiglottis has been noticed as a deformity.‡

Thyroid cartilage.—The upper horns of this cartilage have been found wanting,§ and necessarily the thyro-hyoid ligaments. In a larynx affected with cancer (described and figured in Chapter IV), which I exhibited at the Pathological Society for Dr. Mac Oscar, there was an absence of the superior cornu of the left wing of the thyroid cartilage, and of the left thyro-hyoid ligament. Mr. Canton informs me he has seen several instances of this deficiency.

* 'Prima Raccolta.' Florence, 1752.

† 'Handbuch der Pathologischen Anatomie.'

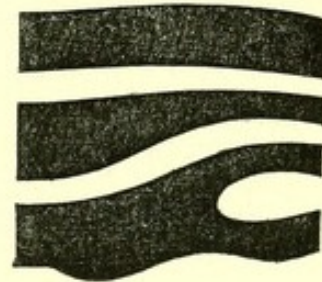
‡ 'Atti di Siena,' vol. iii, p. 232.

§ 'Sandifort Exerc. Anat.'

The *cricoid and arytenoid cartilages* have been found absent,* which Meckel thought very curious, as establishing an uncommon resemblance between the larynx and the trachea.

Besides the foregoing the larynx has been imperfectly divided by a cord directed from above downwards as described by Meckel.† Sandifort has described the termination of the trachea into three branches, instead of the usual two.‡ Mr. W. T. Colby recounts a case of entire absence of the trachea, the rima of the glottis leading into a *cul de sac* half an inch long.§ In 1862, I saw a headless child dissected at St. George's Hospital, by Dr. Dickenson, with an entire absence of the larynx, trachea, and lungs; a tongue protruded from the middle of the sternum. Dr. R. L. Macdonnell describes a monster in his *brochure* on empyema, in which there was an absence of both lungs; the trachea extended a quarter of an inch below the larynx and terminated in loose cellular tissue.|| In the Guy's Museum is an instance of deformity of the upper tracheal cartilages with ossification (1683⁸⁸). The annexed sketch I made of it on the 5th of March, 1861, and represents the natural size.

FIG. 85.



In the first case annexed there was an absence of the left aryteno-epiglottic fold of mucous membrane and arytenoid cartilage, and a consequent deformity in the right. The vocal cords were absent, and so, also, were they in the second case. In the third case the aryteno-epiglottic folds were attached in front to the base of the tongue.

Deformities in the deaf and dumb.—The impression seems

* Roederer, "De Foetu Paralytico," in the 'Com. Soc. Gott.'

† 'Handbuch der Path. Anat.,' vol. ii.

‡ 'Exerc. Anat.' cited by Otto.

§ 'Medical Times,' August 30th, 1862.

|| 'Dub. Journ. Med. Science,' March, 1844.

to be pretty general amongst physiologists, that in deaf dumbness, the organs of speech are not only present, but complete and perfect, and that the dumbness is the result of the congenital deafness, because the hearing of speech is lost. If this view be correct, then the larynx ought to be healthy, and natural in conformation in those born deaf. It is computed that the number of deaf and dumb persons in Europe is about 250,000. Can it be possible that their ears alone are at fault, and their vocal apparatus not so? I think not, and believe that in a certain number coincident malformation or deformity of the larynx will be found, together with a like condition of the ears. The laryngoscope will add much to our knowledge on this point, if advantage be taken of any opportunities that may present themselves for inspection. I have been the first to draw the attention of the English reader to this subject in the 'Medical Times' of the 12th November, 1862; and although I have examined a considerable number of cases since then, even among families where several were thus affected, I have not come across any other than the three following cases of congenital malformation and deficiency.

CASE. *Remarkable congenital deformity and arrest of development of the larynx, in an adult deaf-mute.*—A man, æt. 54, born deaf and dumb; married three years—no children. Is very intelligent, and can read and write and converse by means of a slate. Examined with the laryngoscope in October, 1862. The epiglottis was seen low down, about one-half of its usual length, and was concealed or exposed, according to the action of the right aryteno-epiglottidean fold of mucous membrane, which projected across the glottis, encroaching upon the left side; the left aryteno-epiglottidean fold, and no doubt the arytenoid cartilage of the same side, were wanting, but the mucous membrane dipped into the larynx, where it met the right fold, and thus formed the glottis.

The vocal cords were wholly absent, and the movements of

the larynx were chiefly, indeed for the most part entirely, confined to the right fold of membrane described, which appeared alone to perform opening and closure, as shown in the woodcuts. The epiglottis was useless for all practical purposes, and constantly maintained the erect position in the situation which it occupied, being uninfluenced by the act of deglutition, with or without food.

The right aryteno-epiglottidean fold, in some views of it, formed an apparent cushion, as seen in Fig. 87.

FIG. 86.

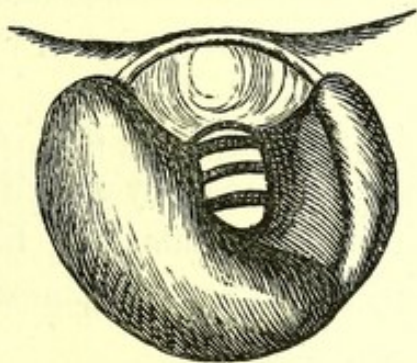
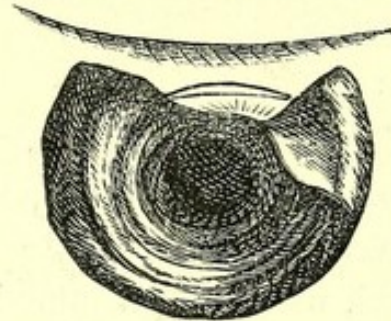


FIG. 87.



The parts are reversed in the drawings, as seen with the mirror, for the right side is situated on the left in each.

FIG. 86.—The epiglottis is shown at the back of the tongue, with the right epiglottidean fold extending across to the left side, with the malformed glottis open, through which are noticed the rings of the trachea.

FIG. 87.—The action of the fold is shown in closing the glottis, but the apex of the epiglottis is left to indicate its position when the glottis is completely closed. The prominent cushion formed by the middle of the fold is noticed in this figure.

The rings of the trachea could be seen on deep inspiration, and they presented nothing unusual. The tongue was large and thick. The throat looked like a confused jumble of the parts, as if the result of disease about the larynx, but it was clear that the deformity was congenital. Externally, the prominence of the pomum Adami was visible rather sharp, but the thyroid cartilage was considerably flattened and spread out laterally; its base, *i. e.* the junction with the cricoid, was as large as its

upper part. The interval in front, between the hyoid bone and the thyroid cartilage, was much greater than is natural.

CASE. *Congenital absence of the vocal cords in an adult deaf-mute.*—This patient's wife, æt. 47, equally educated and intelligent, examined at the same time, was found to possess no vocal cords at all, the opening and closing of the larynx being performed by the aryteno-epiglottidean folds. This showed a large and wide air-tube, commencing at the upper larynx, thus permitting of an expansive view of the trachea. The husband articulated sounds more distinctly than the wife. They were childless.

CASE. *Congenital deformity of the larynx in a deaf and dumb boy.* A boy, æt. 14½ years, was examined by myself in November, 1862, at the Deaf and Dumb Asylum, Old Kent Road, with a large number of others, through the kindness of the Rev. James H. Watson, the principal.

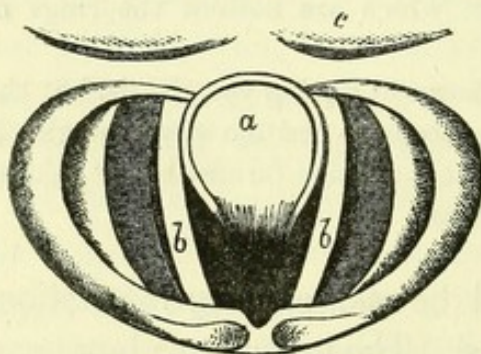
In this boy, the epiglottis originated low down, as in the previous case, close to the vocal cords, being about one-half

of its usual length, and therefore practically useless in deglutition. The glottis was covered by the two usual folds of mucous membrane, originating from the back of the tongue. The vocal cords and other parts were normal. He could utter the vowel sounds.

In about 13 per cent. of the cases here examined, the epiglottis was more or less

pendent backwards; and I have observed a tendency to the same thing in many other cases which have come under my observation.

FIG. 88.



a. The epiglottis. b. The vocal cords. c. Back of the tongue.

Acquired deformities of the larynx.—A considerable number of examples might be related, but the following is one of the most curious preserved in the museum of the College of Surgeons, Dublin (C. a., 45, 'Path. Cat.'). It is a thyroid cartilage in which the two wings are twisted so that the pomum is not in the median line, the anterior edge of one lying in front of the other. Dr. John Barker, the curator of the museum, kindly examined the specimen for me in March, 1861, and mentioned that it was not congenital, as the wings were of equal size, and not affected by disease. The distortion seems to be analogous to crooked nose.

CHAPTER VII.

NERVOUS AFFECTIONS.

SECTION I.—NEURALGIA—NERVOUS SORE THROAT.

ALTHOUGH this form of throat affection is not usually described by medical writers as an independent disease, it is one, nevertheless, that is occasionally encountered, and gives a good deal of trouble to cure effectually. It is a true nervous affection, as much so as facial neuralgia, sciatica, or any other special manifestation of individual implication of the nerves. Now, those nerves which are engaged in neuralgia of the throat, the larynx, and the windpipe, are the inferior laryngeal or recurrent, and the superior laryngeal, both branches of the pneumogastric. All the small and delicate muscles are supplied with minute branches given off by these, and are often, to some extent, affected by severe pain when neuralgia exists of the parent trunks. The pain, generally most acute, is felt along the front part of the neck and throat,

and extends to beneath the upper part of the sternum; this may be the only seat of the pain; it may, however, be associated with pain at the back part of the throat, in the tonsils and pharynx, through the communicating branches of the par vagum. This neuralgia of the front part of the neck is exceedingly distressing to the patient, and when affecting the pharynx and its connexions, feels as if a string were tied round the back part of the fauces. The pain is not continuously persistent, but varies in its nature, like neuralgia in the face and other parts of the body, and assumes a paroxysmal character. It has been described as sometimes accompanied with spasm of the muscular fibrés; that it is so, is quite true, but fortunately it is rarely present. I believe that neuralgia of the throat has been mistaken for spasm of the glottis, and has caused much uneasiness and alarm. Any of the causes of the other forms of neuralgia will give rise to the present, but the chief is exposure to cold, in a nervous and debilitated constitution, wherein the general health is disordered. Irritation in any of the nervous centres, or along the course of the pneumogastric nerve and any of its ganglia, are equally causes. Sometimes a tumour in the neck pressing on these will give rise to neuralgic pain along the larynx and trachea. It will be always readily recognised by the absence of the signs of inflammation; the suddenness with which the pain commences, and the equal rapidity of its disappearance, although it may have persistently continued for many hours; there is no fever, and usually the face is pallid and worn. The laryngoscope reveals nothing, for the larynx is seen perfectly normal, not even congested. Dr. Wood, of Philadelphia, considers gouty and rheumatic irritation in a constitution of a nervous character as the most frequent cause of throat neuralgia. Neuralgia and rheumatism are often encountered together, but the appearance of *gout in the throat*, I look upon altogether as a different thing, and essentially of a more dangerous nature, as my observations upon that disease in another chapter prove;

and it is of importance that a distinction should be drawn between gout and neuralgia when attacking the throat, for the treatment is widely different. And the diagnosis will be assisted by carefully inquiring into the history as to any attack of gout. We may rest assured that gout has never in any single instance primarily appeared in the throat, and the symptoms of distressed breathing, when it wanders from another part of the body to the larynx, are of the most distressing kind; that is not so in neuralgia, for although the pain is very great, there is no urgent dyspnœa.

An interesting case of nervous sore throat, without neuralgia, but with dysphagia and dyspnœa, depending upon some affection of the nervous system, causing partial paralysis, is recorded in the 'British Medical Journal,' of November 14th, 1863, by Dr. Walker, of Peterborough. A laryngoscopic examination showed the entire absence of any disease.

In November, 1862, I was called in to see the late Dr. Maddock, for terribly severe neuralgic pain across the throat and neck; the thyroid cartilage was very tender, yet on laryngoscopic examination nothing was seen to be wrong. He had old heart disease, and had been seen shortly before by Dr. Markham, and was then suffering from pneumonia, which proved fatal. He described the pain in the larynx as if a cord were tied around it, but his sufferings were most acute. The pain was dispelled as if by magic by the internal and local use of the bromide of ammonium.

I examined a case of neuralgia of the thyroid cartilage of sixteen months' standing, for Dr. Edwards at St. Bartholomew's Hospital, on the 12th of December, in a woman, aged about thirty-three. The laryngoscope showed a little anterior subglottic congestion only; the vocal cords in appearance and action were models of perfection, and she had a fine singing voice.

Dr. Handfield Jones has recorded five cases of neuralgia of the throat in the 'Medical Times,' May 2nd, 1863, a disease

which, he said, was not noticed, as far as he was aware, in standard works, although I drew attention to the subject in the first edition of this work about four years ago, having been familiar with it myself for upwards of twenty years.

Like every other form of neuralgia, when the throat is affected, we must be guided in great measure, in our application of remedies, by the general symptoms and the causes which give rise to them. The general health must be improved, the secretions regulated, and the particular cause, whatever it may be, got rid of. The digestive organs must be attended to, for it is well known that their derangement is one of the commonest causes in certain constitutions. If there is frequent or constant acidity of the stomach, it should be corrected by alkalies, besides our application of remedies to the general health. The preparations of iron are especially indicated in throat neuralgia, the saccharated carbonate or some other equally good preparation, of which the practitioner has ample choice at the present day. Iron and quinine are good combinations; or the tincture of the sesquichloride with the muriate of ammonia in quarter drachm doses thrice a day. Anodynes that will not constipate to relieve the pain, and produce sleep. Locally I have been in the habit of applying the *aconitina* ointment, in the proportion of a grain to the drachm of cerate or lard (as originally recommended in Dr. Watson's Lectures), now for some years, with decided advantage. A little of this smeared over the origin of the painful nerve if possible, or along the seat of pain, and repeated two or three times a day for a few days, will be completely successful. It will give more decided relief to throat neuralgia than that of the face, because the pain is more superficial. In the summer of 1858 I was attacked suddenly with neuralgia of the portia dura of the right side of my face, which, for a time, not only caused me great agony and suffering, but stopped hearing in my right ear. The ointment prepared by Mr. Morson, of Southampton Row, Russell Square, applied in very small

quantity, relieved me in twelve minutes, and two more applications only were necessary to banish the pain, namely, on the third and fifth days. There is a numbness produced, with a sort of creeping sensation, from pulsation of the vessels in the part; and after its use, there is a rapid increase in the flow of urine.

Besides these measures, the patient must avoid breathing cold air, or going into a cold room; he must use a respirator whilst ill, if necessity compel him to go out; and, on recovering, he must commence the use of the shower-bath, moderately taken at first, with the water not too cold, nor in too large a quantity.

Since the foregoing was written, I have been in the habit of prescribing large doses of the bromide of ammonium, thrice a day, with the best results in such cases, for the cure has remained permanent. In others, again, where a rheumatic tendency has been found, iodide of potassium, or of ammonium, has readily effected a cure.

SECTION II.—HYSTERICAL AFFECTIONS OF THE THROAT.

It is not my intention to do more than briefly notice those forms of apparent disease of the throat which present themselves in that remarkable disease—hysteria. The chief of these are loss of voice (already noticed in Chapter II), difficulty of swallowing, and inflammation of the larynx and windpipe. When such symptoms present themselves in an undoubted case of hysteria, wherein the hysterical paroxysm is known, or has actually been seen to occur, the true nature of the affection is apparent. Of the innumerable forms of acute disease which hysteria assumes, such as the various inflammations, palsy, diseased spine; breast, joint, and urinary affections; perhaps none are so common as affections of the throat. When we observe aphonia in young females subject to hysteria, the

voice has suddenly disappeared, and no previous symptoms were present to denote that it depended upon any other cause. When considering functional aphonia (Chap. II), it was mentioned that hysteria was one of its causes; and if sudden loss of voice does arise, it is owing to some *rapid* pathological change that may have occurred, and the voice seldom or never became suddenly restored. The converse of the latter takes place in hysteria, for although the voice is suddenly lost, it as suddenly returns, and we have no appearance of wasting debility or exhaustion in hysteric aphonia.

Of hysterical inflammation of the larynx—*mock laryngitis*, as it has been called—a better idea cannot be conveyed than in the following quotation from Dr. Watson's able Lectures on the "Practice of Physic." He says: "I remember being asked by Sir Charles Bell, some years ago, to see a young woman, in the Middlesex Hospital, under his care. She had recently arrived, and was breathing with the stridulous noise peculiar to inflammation of the larynx. She had twice before, in the country, had tracheotomy performed for similar attacks; and there were the scars of the operations on her neck; but both Sir Charles and myself were satisfied, upon considering all the circumstances of the case, that the difficult inspirations were spasmodic and hysterical; and she recovered under the remedies which do good in hysteria." (Vol. i, p. 689.)

The same subject is referred to by some other writers; and, in one instance, tracheotomy was on the eve of being performed upon a plump, well-developed girl, when an experienced physician, who was called in, at once detected the true nature of her malady. One of the causes of the frequency of hysterical throat affections, is no doubt the occurrence of the *globus hystericus* in the paroxysm, which, after rolling about the abdomen, rises to the stomach, and then up to the throat, producing a choking sensation. When this is the case, the patient makes frequent attempts to swallow. Dr. Graves

relates, in his 'Clinical Medicine,' what he calls a singular hysterical affection. A young lady was sitting up in bed, sipping every few seconds an extremely small portion of water, which was immediately swallowed with a considerable effort at deglutition. She said she should be immediately choked if she discontinued this perpetual sipping; and she referred to an intolerable uneasiness at the root of her tongue, and in her throat, threatening immediate suffocation the moment she ceased to employ herself in swallowing; and so urgent was the feeling that impelled her to this act, that the moment an attempt was made to take the cup out of her hand, she began to scream with agony, was agitated with convulsions, and to all appearance seemed in the last agony. This scene went on for some hours, she had had a number of leeches applied around her throat, the blood from which was trickling down her neck. Dr. Graves, on the most careful examination, detected nothing wrong with her larynx, nor any swelling or redness of the tongue and fauces; and, *as she was subject to hysterics*, he readily determined the nature of her illness, which was treated accordingly, and all these peculiar symptoms vanished. In all such cases as these, the introduction of the laryngeal mirror will speedily remove any doubts as to the real nature of the case.

Not less remarkable is the inability to swallow in hysteria, which has been carried so far, as to simulate stricture of the œsophagus. The introduction of a probang will, however, soon determine the nature of the constriction; the appearance of the patient, and her age, will be most probably quite inconsistent with the presence of organic disease.

All the usual remedies and other measures in use for the treatment of hysteria, are equally appropriate in hysterical affections of the throat, and it would be a needless repetition to enter into a detail of those in this place. It may be observed, however, that irregular, suppressed, or painful menstruation, is the great cause in hysteria of the loss of voice

which occurs, continuing, may be, for months, or even years, unless advice is sought. Particular attention to the regulation and restoration of this function, is therefore necessary to obviate, not only this consequence, but the many others which present themselves in this complaint. Trousseau has recommended the topical use of the nitrate of silver to the larynx and pharynx in hysterical aphonia, and certainly with a cure, in so far that the voice was restored. He cured two cases of aphonia—one hysterical and the other bronchitic—by introducing a probang charged with a solution of sulphate of copper into the rima glottidis; the cure was instantaneous.* In my experience, this form of aphonia is the most amenable to treatment; but, unless the constitutional predisposition to hysteria is overcome, the loss of voice is liable to frequently occur.

SECTION III.—LARYNGISMUS STRIDULUS: SPURIOUS CROUP,
OR CHILD CROWING.

This disease is described by many writers as a spasm of the glottis, because the child is suddenly seized during its sleep, or whilst suckling, by an interruption in its breathing, which, after various struggling efforts, during which the face turns red or purple, is followed at last by an inspiration of a loud crowing or whistling sound, to some extent similar to that in whooping-cough and the inspiration of croup; this no doubt depends upon the narrowing or contraction of the fissure of the glottis. The symptoms of this complaint are not easily mistaken; the suddenness of its invasion, the extreme difficulty of breathing, with the most intense agitation and efforts of the child to get breath, at once point to its nature. During the paroxysm all the appearances of impending suffocation are present, namely, red face, projecting eyeballs, clinched hands,

* 'Lancet,' 25th February, 1860, p. 207.

and extreme jactitation. In a couple of minutes it passes off, the child cries violently and tumbles off to sleep. At first, these attacks are few and occur at long intervals; after some time, if not checked by treatment, they may occur many times in the twenty-four hours, as I have witnessed, and the duration of the disease may extend to over two years. There is a great liability to convulsions, which may be feared when the thumbs are spasmodically contracted and turned into the palms; this is also observed in the toes, and was first pointed out by Dr. Kellie. This flexion will sometimes extend to the wrist and ankles, and the backs of the hands and feet are noticed to be swollen and puffy. During the intervals, longer or shorter, the child is quiet, free from fever, and, in many instances, seems as if nothing was the matter with it, unless when the affection has become chronic, and then we have the presence of a constant stridor, the breathing is stridulous; and I expect it is this circumstance which originated the name at the head of this chapter, given by Dr. Mason Good—one that seems to me especially suitable and preferable to any other.

In December, 1858, a male child, *æt.* 2½ years, was brought to me by its father, who stated it had the disease for two years, and that the mother also had it when the child was born, although the latter remained in good health until six months old. All the symptoms of the disease were present, but the inspirations were stridulous, and occasionally made a great noise; when asleep, however, and the mouth open, the breathing was quiet and tranquil. The mother died of some chest affection twelve months after the birth of the child; and it was presumed by several practitioners of eminence, who had seen and examined the latter, that there was a fleshy body in the throat. The child was easily influenced by cold, had convulsions occasionally when attacked with laryngismus, but at other times it looked plump and healthy, although pale and emaciated about the body. It could not eat meat nor fatty substances, but lived principally upon boiled milk and oat-

meal. The nose was always itchy, but there were no worms, nor any special cause for the disease that could be made out; there was assuredly no tumour nor growth of any kind obstructing the breathing, but the lips of the glottis were thickened from chronic irritation, and were somewhat approximated. This was determined with the point of the finger. The glands of the neck were slightly enlarged, and may have had much to do with the complaint, but there was no evidence of chronic throat disease. The mouth was filled with teeth. Iodine had been given without relief by others. For some time I treated it with drachm-doses of the tincture of sanguinaria, three times a day, increasing the dose by degrees, and with evident advantage, for it improved in every way; it could speak a few words, and a cure was anticipated, when I lost sight of the case.

I gave the sanguinaria here, because almost everything had been tried before; but the plan which at one time proved the most useful in my hands is that I am in the habit of adopting in whooping-cough, namely, free doses of dilute nitric acid, combined with some bitter tonic or stomachic, and plenty of syrup.

The duration of the complaint varies very much; usually it is cured in a few weeks, but it will remain chronic for a long time, as in the case just related, especially if dentition or any other cause is present to keep up the irritation. Unfortunately, however, it often proves suddenly fatal by spasm of the glottis during one of the attacks; it is, therefore, a perilous disease, and gives cause for great anxiety. I shall refrain from entering into its pathology, because of the diversity of opinion which prevails upon this point; but whatever the true cause of the disease may be, there is no doubt that it exerts itself principally upon the pneumogastric nerves, and, in this respect, resembles pertussis; but the great distinction between the two consists in the fact, that in pertussis, besides the forcible inspiration common to both, there is the accompanying cough, which is absent in the other. There is no

kink, no expectoration nor vomiting, nor any catarrhal sounds in the lungs in laryngismus;* there is, on the other hand, the crowing inspiration, with purple or red complexion, from the temporary congestion. In some children the symptoms of this disease have arisen from the presence of warty growths in the larynx, a disease by no means uncommon in them, if we study the table of examples given in a previous chapter, and which would appear to be sometimes congenital. The diagnosis may always be made out either with the laryngoscope, the child being firmly held, or with the aid of the tip of the forefinger.

In the treatment, as I have already mentioned, the dilute nitric acid has proved of the greatest value, and in my hands has cured some very bad cases. In a few I have cauterized the lips of the glottis with evident advantage; although there is no lesion there, beyond mere congestion for the time being, the caustic acts in some way as a counter-irritant. If there are any teeth to be scarified, that should be at once attended to. The use of an ointment of the biniodide of mercury rubbed into the neck daily, on each side of the windpipe, produces a powerful revulsive effect, and gives relief by acting smartly on the bowels. The strength of it is three to four grains to the drachm of lard, and about as much as a bean in size is to be used; but when it brings out a specific eruption, it must be intermitted for a short time. My friend Dr. David, of Montreal, speaks highly of this ointment of less strength, rubbed into the upper part of the spine.† The remaining treatment is hygienic and regimenal, taking care to give nourishing and easily digestible diet, and particularly avoiding anything likely to disagree. The bowels should be always kept regular, and the skin attended to.

I gave a trial to the bromide of ammonium, and found it to cure the disease like magic, in the dose of from three to ten

* See my treatise on 'Hooping-Cough,' p. 246.

† 'British Amer. Journ.,' March, 1860.

grains, three times a day. The same good results were experienced by Mr. Edward Cousins, of Camden Road Villas, as he lately informed me. We have, therefore, in this agent a remedy which, from its exerting some peculiar specific influence over the pneumogastric nerve and its branches, would seem to point out the pathological nature of the disease.

During the paroxysm, dashing a few drops of cold water in the face is a useful measure; and if too long continuous, holding the child on its stomach, to allow the tongue and epiglottis to fall forward, and thus permit the lips of the glottis to become relaxed, will be found invaluable. Experience has taught me the value of this treatment. Occasionally, a warm bath is useful during the paroxysm, or the speedy application of a large sponge to the throat, from which hot water has been squeezed, as recommended by Dr. Watson. After recovery, it will be prudent to commence a course of steel, particularly if pallor and struma are leading constitutional characteristics, but the treatment I have recommended will cure in the great majority of cases.

A somewhat similar condition to that described, occurs in adults, usually females, in whom paroxysms of crowing inspiration show themselves, with great dyspnœa, and a feeling of suffocation, for which tracheotomy has been frequently performed under the impression of the existence of serious laryngeal mischief. The application of the laryngeal mirror of course readily clears up the nature of the case, and shows that there is no actual disease present beyond some temporary congestion arising from the state of the breathing. If a careful examination is made no enlarged cervical or other glands will be found, nor any disease of the blood-vessels pointing to the presence of an aneurism. As an almost invariable rule the breathing is tranquil during sleep, although it is generally at night time that the paroxysms are worst; strong evidences of hysteria are often present, for even when the patients are seen during their periods of immunity, they

become agitated and nervous, and mild stridor begins and lasts until they are again alone.

From among several cases which were brought to me for diagnosis, I select the following :—

CASE. *Laryngismus stridulus and cough of six years' duration in a girl of twenty-three ; the vocal cords seen to be streaked with longitudinal red lines.*—Frances B—, æt. 23, single, applied to me 13th April, 1863, from Mr. John Sharman, of Lower Norwood. Has always been weak and delicate. Six years ago, her throat became affected with dry irritation, and she had a cough from sleeping in a damp room. She has been hoarse at times ever since, but never lost her voice. The cough, although bad, was not followed by any expectoration. Fifteen months ago, a peculiar inspiratory noise commenced, accompanied with dyspnœa, which has since been constant ; has to hem frequently to get relief. The catamenia are regular.

When I saw her, a dry, semi-stridulous, inspiratory, crowing sound was present, with almost constant hemming ; it partook of the character of a peculiar hoarse squeak. She could speak perfectly well, but sometimes was very hoarse. She was very nervous and low spirited, and felt constantly as if she should be choked, and as if there was something in the throat ; she breathed worse indoors, and had a difficulty in filling the chest with air. There was much hysteria present.

Laryngoscopy was extremely easy. The arytenoid cartilages were seen small and round ; the mucous membrane of the entire larynx was red and congested ; the vocal cords were white and natural when the glottis was open, but during phonation they were streaked with longitudinal red lines ; the trachea was seen to be normal for some distance downwards. There was no actual disease present to explain the peculiar symptoms of her disease, and nothing could be seen in the neck, nor made out in the chest, to account for it.

She was admitted into the West London Hospital, under

my care on the 23rd, and remained an inmate for nearly twelve weeks.

Under the use of large doses of the bromide of ammonium she improved, slept well at night, and was free from attacks during the day. The larynx became quite normal and free from congestion. The disease then seemed to recur with great violence, and suffocation was imminent several times; she now had hiccup, followed by sickness and vomiting, which remedies had scarcely or no effect upon. Turpentine was tried as a local application, but without the least effect. Aconite was smeared along the course of the pneumogastrics with a little benefit. Finally, the paroxysms produced great feebleness of voice and prostration, with emaciation, and at her own wish she was sent to the seaside, with what results I am not aware of.

From the experience I have had of this disease in adults, it leads me to believe that most examples will be difficult to cure for a certain time, but that providing the general health does not suffer, the cure is a question of time. The inspiratory stridor produced by some reflex influence acting upon the vocal cords does not show any disease of that part of the throat itself, but rather points to some agency at work at a distance. Local treatment alone, therefore, is of but little value, and this should not be forgotten in our scientific reasoning upon this curious malady.

On the 16th June, 1863, I examined a single woman, *æt.* 32, for Dr. Meadows, at the Home for Incurables, Mortimer Street, who had suffered from periodical attacks of aphonia and great dyspnœa on and off for four years, with some stridor of an inspiratory character. She was sometimes nearly suffocated, was hysterical, with, nevertheless, regular catamenia. The laryngoscope revealed nothing beyond some redness of the trachea, and as no other disease could be found, the nature of the case was clear enough.

SECTION IV.—PALSY OF THE THROAT.

Impaired or defective innervation of the throat, amounting occasionally to complete paralysis, is briefly noticed in several sections of this work, especially in that devoted to diphtheria and in the one upon organic aphonia. A few short observations separately given will be convenient.

In cases of cerebral disease, according to its nature and the part of the brain involved, is palsy, sometimes produced, either of the parts involving speech, or of deglutition, mastication, &c. If the disease should be hemiplegia following effusion into the substance of the brain, there will be palsy of both sides of the larynx at first, and of the velum palati, until the patient regains his senses, and then it may be confined to the side only of the larynx corresponding to the hemiplegia. Of several cases of hemiplegia which I have examined a few days after the occurrence of the attack, the arytenoid muscle and vocal cord were paralysed on the affected side of the body, and speech was impossible. As the condition of the patient improved, and permitted him to walk and to speak, although imperfectly, the paralysis had for the most part disappeared from the larynx, or had so much diminished as to permit of almost complete approximation of the vocal cords.

In these cases the cerebral lesion affects generally but the one laryngeal nerve, combined with impaired power in some of the other nerves taking their origin from some neighbouring part of the brain. In some severe instances the palsy is permanent, and speech is irrecoverably gone; there is incurable organic aphonia. Under these circumstances the vocal cords are seen to become atrophied, discoloured, irregular in outline, shrivelled, and sometimes affected with atheromatous degeneration.

This last condition of atrophy will arise in chronic cerebral disease, softening, tumours, and other lesions, which slowly

destroy speech. I have an instance in mind of small tumours disseminated through the brain of a person who became childish and speechless, yet whose hearing remained. On interrogating him he constantly uttered the ejaculatory sound *eh* ! The vocal cords were narrow and shrivelled, and partially approximated to permit of the sound. Even to the last day of life he continued to pronounce the sound *eh* !

In these cases of aphonia, the lesion of speech is at first functional, but afterwards becomes incurably organic ; they are, however, cases of considerable clinical interest, especially as sometimes the atrophy is confined to one side, and in doubtful cases, not hemiplegic, would point to the side of the brain affected.

In cases of hemiplegia, the movements of the aryteno-epiglottic fold of the affected side are sluggish, and this explains why oftentimes, in attempts to swallow, the food can be scarcely got down, and violent choking is produced on its entering the larynx.

For an account of the palsy following diphtheria, the reader is referred to the section upon that disease.

CHAPTER VIII.

DISEASES OF THE MOUTH, NOSE, AND CONTINUOUS PASSAGES.

SECTION I.—AFFECTIONS OF THE MOUTH.

Cancrum oris, or gangrenous erosion of the cheek, is usually met with in ill-nourished children as a sequel to some of the eruptive diseases of childhood, and is known by a tense and shining swelling of one cheek, with a red spot in the centre. Inside of the mouth is perceived a deep and ex-

cavated ash-coloured ulcer, which is covered with a brown slough. The breath is fetid, the saliva is putrescent, the gums are dark and ulcerated, and as the disease extends sloughing of the cheek ensues, and a large cavity leads into the mouth. Recovery is rare, and said to be one in twenty cases.

In the treatment, attention must be paid to the stomach and bowels. The ulceration is to be checked by the application of nitric acid or the nitrate of silver, and syringing the mouth with Condyl's fluid, as in diphtheria. Chlorate of potash has been recommended in full and frequent doses. Beef tea, wine, ammonia, and other stimulants, should be freely given according to the age of the child.

Syphilitic affections involve the mouth and lips, as well as the tongue, pharynx, and continuous parts. They are generally secondary, occurring in some one of the varieties of the disease, in the form of flat mucous tubercles, or squamous eruptions of the mucous lining of the cheeks.

When syphilitic stomatitis has occurred in the young, certain well-marked changes in the temporary and permanent teeth are observed, as was first pointed out by Mr. Hutchinson.

The *lips* are affected with fissures and cracks in adults, and are not only indurated, but painful, and sometimes they are also observed inside of the cheeks. The treatment of these affections must be general, as pointed out in other parts of this work. For the fissures the nitrate of silver should be applied in a pointed form.

Ulcerations are not infrequent in the cheeks, arising as the result of some circumscribed inflammation of a syphilitic, mercurial, or scrofulous nature. They have a peculiar red tinge, with defined edges, and sometimes spread very rapidly. Aphthous ulceration of the cheeks and lips is frequent in young children, and is occasionally disposed to extend, if not early attended to.

Tumours occasionally appear beneath the mucous membrane lining the cheeks, and I have seen several removed; their

nature is various, but usually cystic, and containing fluid. The well-known tumour *ranula*, situated under the tongue, sometimes attains to considerable dimensions, and displaces the tongue upwards or to one side, and causes great inconvenience. It is noticed in this place as an affection of the mouth, although more especially coming within the province of the surgeon.

Injuries.—These are very uncommon, and are seldom seen unless as the result of gunshot injuries.

SECTION II.—AFFECTIONS OF THE TONGUE.

These shall be briefly noticed in the order of their importance. Affections of the tongue and throat together are very often concurrent, especially in some of the varieties of specific disease.

Inflammation:—*Glossitis*.—Of this disease, usually in an acute form, I have seen several examples in the various London hospitals, and the history was generally to the effect that the swelling occurred suddenly, and the organ so filled the mouth as to threaten suffocation. Sometimes it supervenes upon salivation or syphilis. When thus enlarged, it is infiltrated with blood and serum, and protrudes or hangs out of the mouth; there is extreme salivation, and speech and deglutition are impossible. Considering that the tongue is in a state of œdema, and suffocation sometimes imminent, long and free incisions should be made along the dorsum of the tongue on each side of the raphé, as recommended by Mr. Erichsen. This gives free and immediate relief by the escape of blood and infiltrated fluids. Saline aperients may be given afterwards, and mild astringent gargles used, such as alum, or honey and borax with myrrh.

Abscess may follow acute inflammation, when it forms a deeply seated elastic but firm tumour. It is uncommon.

Cases have been recorded of abscess under the tongue which threatened suffocation from pressure on the larynx ; they will have to be punctured beneath the chin, whilst those in the substance of the organ must be opened from above.

Hypertrophy and prolapsus.—Enlargement of the tongue, with its consequent protrusion, occurs often from simple hypertrophy of the tissues of the organ, not necessarily associated with inflammation, although this affection occasionally follows it. Some remarkable cases are recorded in the thirty-sixth volume of the ‘Medico-Chirurgical Transactions,’ especially one by Mr. G. M. Humphry. I have seen it as the result of profuse salivation. Prolapsus is occasionally congenital.

In the *treatment* it is recommended either to cut out a V-shaped portion, or remove a part of it by the ligature or knife, as may be required.

Ulceration is perhaps the most common lesion presented to our notice, and is frequently seen as a result of specific disease in some one of its stages. It was only on the 9th January, 1864, that I examined two girls in St. Bartholomew’s Hospital under the care of Mr. Wormald, who had frightful ulceration of a primary nature, involving in both the under surface and sides, accompanied by salivation and some inflammation. Ulcers of less magnitude are seen in the secondary and tertiary stages. The constitutional treatment is obvious, assisted by gargles and topical applications.

Small isolated ulcers may be readily healed by the nitrate of silver applied to their base.

Fissures and cracks are exceedingly troublesome and painful, and often difficult to heal, very frequently depending upon impaired health. If neglected, they will form deep ulcers, with a foul odour. Borax and glycerine are especially useful, with some internal remedies.

Epidemic changes are noticed in the form of isolated spots coincident with a cutaneous eruption. In psoriasis, the sur-

face becomes shrivelled and dry, having cracks upon its surface, and white patches in size from a pea to a walnut, as described by Mr. Erichsen. This condition, he says, resembling psoriasis of the palms of the hands, may occur with or without any scaly disease of the external integument. Arsenic, Plummer's pill, and sarsaparilla, are recommended for it.

Tumours and growths.—In most of our modern works, there is scarcely even a mention made of tumours originating in the tongue, yet cases are presented to our notice every now and then. In the museum of the College of Surgeons is a fatty tumour, No. 190, removed from the substance of the organ. Mr. Paget removed an oval bilobed tumour from the tongue of a young man, the size of a small marble; it was near the apex, and had been growing for three years.

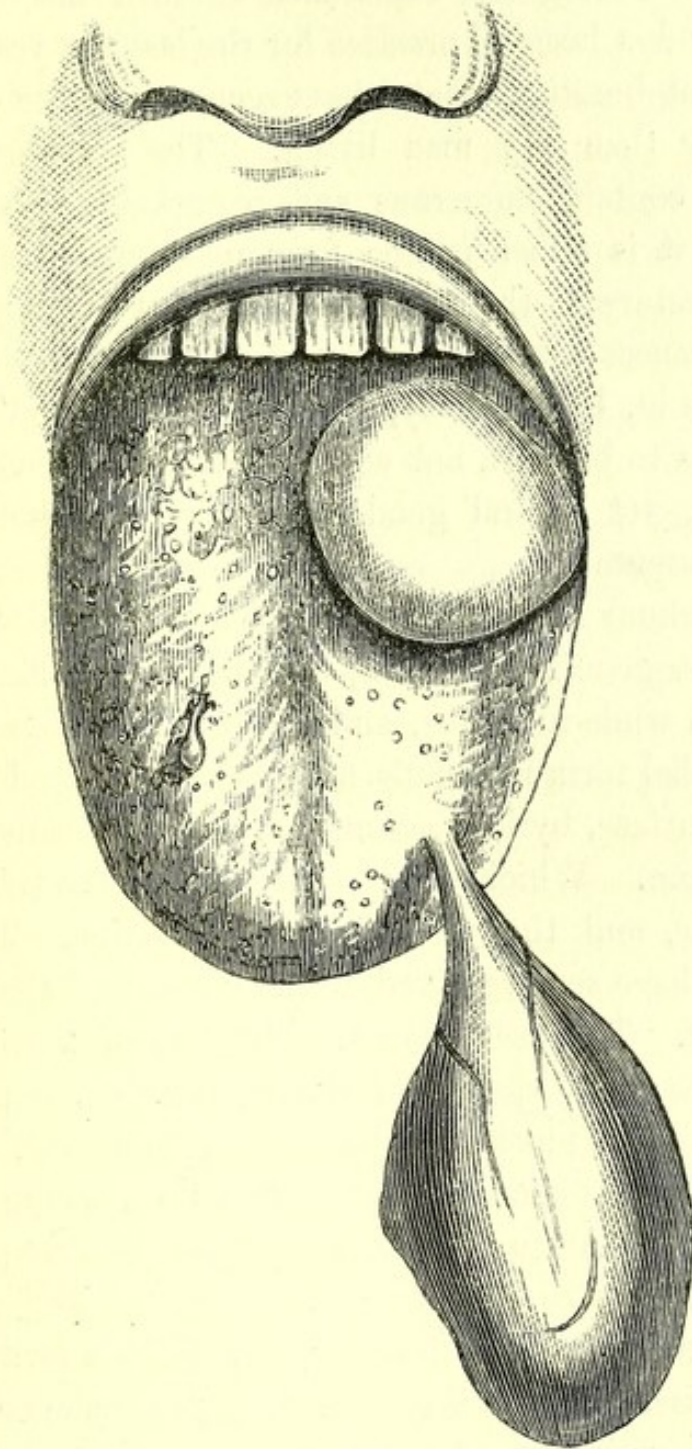
In July, 1862, I removed a fibrous tumour the size of a small marble, with the aid of the laryngeal mirror, from the left side of the back of the tongue of a married lady, which caused great inconvenience and suffocative attacks from its coming in contact with the left side of the epiglottis. Encysted and erectile tumours and polypi are occasionally, though rarely, met with in the substance of the tongue, as a congenital occurrence. One of the most interesting and remarkable cases on record occurred to Mr. Francis Mason, of King's College Hospital, of which the annexed woodcut is a representation, which he has kindly permitted me to make use of.

The subject of it was a woman, aged twenty-seven. At the time of her birth, attention was directed to the tongue, to which were attached three tumours, situated in the positions indicated by the engraving. They had been about the same size since birth, and as long as she could remember they never varied until a month before Mr. Mason saw her, when the anterior growth swelled slightly. The swelling, however, disappeared in a few hours.

The smallest was the size of a pea; the next as large as a

shilling; and the largest two inches and a quarter in length. Each tumour was attached by a narrow pedicle. When *in situ*,

FIG. 89.



the anterior tumour lay upon its dorsum; speech was scarcely impaired, and there was no difficulty in mastication.

Mr. Mason removed the largest in August last; it proved to be fibro-cellular in character. I had the opportunity of examining it when he exhibited it at the Pathological Society.

Cancer.—Taking the experience afforded me by the great field of London hospital practice for the last ten years, I might say, without boasting, that I have seen more cases of cancer of the tongue than any man living. The museums, without exception, contain numerous and remarkable examples. As met with, it is either in the form of scirrhus, involving the proper structure of the tongue, or in that of epithelioma or epithelial cancer affecting some part of its surface. This latter is met with in, I should say, about 80 per cent. The medullary form is to be seen, but exceedingly rare as compared with the others, yet several good examples are preserved in the London museums.

The scirrhus form usually commences in nodular enlargement, either general or partial, with pain and difficulty of use; this after a while ulcerates, and forms a foul deep excavation. The epithelial form is usually more superficial, and commences upon the surface, by induration, and when ulcerated may form a deep chasm. Whichever form is present, the treatment will be the same, and that is necessarily operative. The affected portions I have seen removed, which has stayed the disease for a time only. The best chance, therefore, of a complete and radical cure is extirpation of the entire organ, as practised by Mr. Syme, Mr. Fiddes of Jamaica, Mr. Nunneley, and others. If this were done more commonly at an early stage, the probability is that a cure could be safely reckoned upon without any great danger to life.

In December, 1860, I was consulted by a gentleman with follicular disease of the throat and extensive ulceration of the soft palate, with loss of the uvula. The membrane at the hollow of the base of the tongue, in front and at the sides of the epiglottis, was seen in the laryngeal mirror to be extensively

ulcerated. The tongue was generally enlarged and nodulated; this was more so on the right than the left side. On the right side it had already ulcerated by projecting against a sharp molar tooth; there was dysphagia and some salivation, and enlargement of the submaxillary and cervical glands. Although there was some improvement under constitutional treatment, the nature of the case—scirrhus—was quite apparent, and the result could be anticipated.

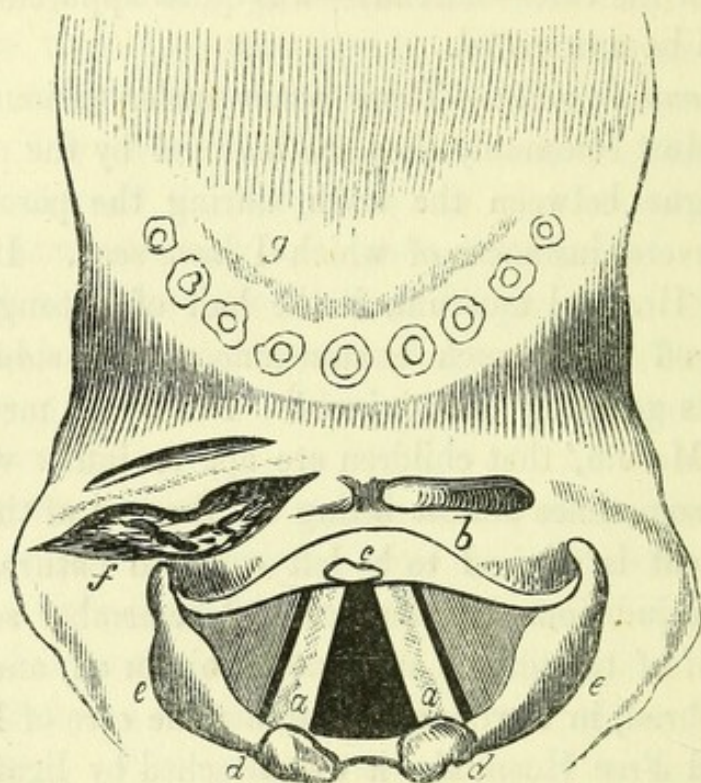
Wounds and Injuries.—These occur under various circumstances. Most commonly they are inflicted by the protrusion of the tongue between the teeth during the paroxysms of epilepsy, several instances of which I have seen. In St. Bartholomew's Hospital museum, is the half of a tongue bitten completely off under such circumstances; the sides and tip are the parts generally thus injured. Dr. Druitt mentions, in his 'Vade Mecum,' that children are apt to inflict very severe bites, even sometimes almost biting off the end of the tongue. The treatment is advised to be left solely to nature, as preferable to injudicious interference. I remember seeing the anterior half of the tongue accidentally bitten off, and hanging by a mere shred, in a young man under the care of Mr. Gant, at the Royal Free Hospital; it was attached by ligatures, and recovered its vitality.

The following curious case was for some time under my observation.

CASE. *Hollow at the back of the tongue, the result of a punctured wound three years before.*—In September, 1862, a shoemaker, æt. 31, was sent to me by Mr. Ernest Hart. Three years before, he had an attack of sore throat, probably diphtheria from the description, for the odour was so offensive that he could scarcely be tolerated; he had an operation performed, which, from what I could gather, must have been an attempt to open an abscess, with a guarded blade. His health and throat have never been well since; dysphagia and some-

times dyspnœa were common symptoms. In swallowing food, a second gulph is necessary to get it down. The laryngoscope revealed a great hollow in the right side of the back of the tongue, in front of the right half of the epiglottis, and in close proximity to it. The point of the finger could be passed into

FIG. 90.



a, a. The true vocal cords. *b.* The epiglottis. *c.* Wound of epiglottis. *d, d.* Arytenoid cartilages. *e, e.* Aryteno-epiglottic folds. *f.* The wound in the tongue, with a little ridge at the bottom. *g.* The body of the tongue, on which are seen the papillæ.

it, when the contraction of the muscular fibres could be felt like a lot of small worms. An ulcerated line, three fourths of an inch long, was seen in front of the hollow. The hollow, whilst partly in front of the epiglottis, ran towards the right side for half an inch. There was a rugged projection on the middle of the laryngeal surface of the epiglottis, as if done with a knife. The larynx was normal, and I could easily see the bifurcation of the trachea. The wound in the tongue was above and probably behind the commencement of the right

horn of the hyoid bone. I showed this patient to the Medical Society of London, on 15th December, 1862, with the laryngoscope.

SECTION III.—AFFECTIONS OF THE TONSILS AND UVULA.

As the mucous membrane covering the tonsils and uvula has been already considered, in connection with the particular affection in which it was engaged, in some of the preceding chapters, we shall now briefly take up some of the special diseases of their proper structure.

Tonsillitis, quinsey, or common sore throat.—This is, perhaps, the commonest affection of the throat, affecting all classes of persons, varying in its intensity, its duration, and in many cases looked upon as trivial, unless the symptoms are acute. It affects the parts which form the circle of the fauces, namely, the tonsils, uvula, veil of the palate, and root of the tongue, and may spread to other parts. The symptoms are dysphagia, dryness, or constriction of the throat, a feeling as if there was some obstruction in the back part of the throat, and swelling of one or both tonsils. The throat is seen to be red and inflamed; and these glands extend inwards, and sometimes are considerably enlarged, which gives rise to pain during the frequent attempts at swallowing. The dryness is soon followed by a copious viscid and adherent secretion, which causes constant efforts to get rid of it. The voice is thick and guttural, and can scarcely be uttered sometimes. If the inflammation is severe, it may extend to neighbouring parts, and give rise to additional and more important symptoms; an abscess may form on one or both tonsils, and their enlargement almost obliterates the arch of the fauces; a pain is now felt shooting from the throat to the ear, along the course of the Eustachian tube, and deafness will be present as well. The impediment to breathing is sometimes very great; there is high fever, rapid pulse, pain in the head, and constitutional

disturbance. In efforts at swallowing, fluids often pass through the nose; there is no dyspnœa usually. Spots of secretion are seen on the tonsils, arising from the mucous follicles, and the uvula is perhaps swollen and elongated. The membrane of the larynx is seen much congested, slightly swollen and thickened, and the laryngeal surface of the epiglottis is of a deep scarlet redness, with tumefaction and slight pendency. The prognosis is always favorable, but the tonsils are very liable to remain enlarged.

Emetics are valuable at the onset of the disease, and again after suppuration has become established, when the mere act of vomiting will cause evacuation of the matter. Active purgatives may be given at first, followed by some saline medicines. I have commonly seen a good emetic check the febrile symptoms. Besides all these, some smart embrocation may be used to the neck, with poultices, flannel, or perhaps leeches, if required. Sometimes it is necessary to scarify the tonsils. Gargles of warm water alone, or with milk, are serviceable at first; and afterwards of some stimulating substance to cut the phlegm. The steam of hot water may be inhaled at an early stage of the inflammation.

Hippocrates describes several varieties of quinsey, including various diseases of the parts about the fauces, and among them the disease named *hypoglottis*, by which appears to be meant an abscess below the tongue attended with great swelling of that organ.*

Enlargement of the tonsils.—In grown-up persons this is usually the result of chronic disease of the throat from repeated attacks of inflammation. In the young it arises from some of the affections described in other parts of this work, as well as from cold, scrofula, the diseases of childhood, impaired digestion, and other causes. Dr. Yearsley† states that the enlarge-

* Works of Hippocrates, Old Sydenham Society, vol. i, p. 92.

† 'The Enlarged Tonsil and Elongated Uvula,' and other works by the same author. See also Mr. Harvey's work on 'Excision of the Enlarged Tonsil.'

ment is not a true hypertrophy, but depends upon the deposits of fibrine, which are gradually thrown out during the inflammation or irritation to which they are subject, and in process of time become organized. This may be so in some instances, but generally a true hypertrophy of the gland-structure is revealed by the microscope, which I have now seen several times. Some fine examples are preserved in the museum of Guy's Hospital. Without describing the symptoms of an enlarged tonsil, inspection of the throat will readily detect its condition; they sometimes cause great inconvenience, but especially to the sense of hearing; the voice, the breathing, and the swallowing, are all more or less affected.

They may be reduced to their normal standard in many persons by the local use of caustic, liquor potassæ, argentonitrate of mercury, or the tincture of iodine, combined with internal remedies, of which the preparations of iodine are the best. And here I would remark, that the use of that valuable agent, or any of its compounds, does not produce the slightest influence on the absorption of healthy organs, as has been supposed; and I speak from a rather extensive experience of its use myself, as well as from watching its employment in the hands of most of the hospital physicians and surgeons of London for the last eleven years. My testimony, therefore, is of value on this point. Besides the substance just named, guaiacum has been found useful by Mr. Harvey, when other remedies have failed. The bromide of ammonium or of potassium will also reduce an enlarged tonsil. If a speedy and effectual cure is desirable, especially when they are indurated as well as enlarged, in the adult, excision may be performed, by means of a pair of forceps and blunt-pointed bistoury, as I have been in the habit of seeing Mr. Fergusson do it, and whose method I have successfully practised without any inconvenience, cutting downwards and inwards towards the median line. The removal is not a painful proceeding, and there is but little bleeding. Dr. Larghi advises the enuclea-

tion of the tonsil, whole or in part, by means of the nail of the index finger, according to the practice of ancient times. The tonsils are not firmly adherent, and thus may be readily detached.* Chassaignac removes them with the *écraseur*. I have seen Mr. Lawrence do this at St. Bartholomew's Hospital, in a case of extreme hypertrophy. Dr. Edward Fournie has used Vienna paste and bichromate of potass concentrated, for the destruction of the tonsils, uvula, and nasal polypi, in children and adults.

In strumous and other children, topical medication with iodine or its preparations dissolved in glycerine will cause their diminution to their natural standard, if combined with the iodide of ammonium or of sodium internally. In this way I have succeeded in curing a number of cases, especially among the children of the poor, when there was induration as well as considerable enlargement. Mr. Harvey opposes the excision of tonsils in children, and I fully agree with him in the propriety of leaving them, unless they cause serious inconvenience, more especially as he maintains that the enlargement will often disappear spontaneously at the age of puberty, both in boys and girls. Sometimes, however, they will not disappear by all the treatment adopted, and excision must be practised. Although I am free to admit that their long continuance in some children gives them a thick guttural voice not easily got rid of, yet I cannot uphold the view of one of my reviewers, that they interfere with the full development of the body.† Dr. Yearsley, whose experience in the treatment of enlarged tonsils has been immense, recommends their immediate removal in all cases, wherever they exist, and his observations are certainly entitled to very great weight, for no one has been better able to form an opinion of the success of this practice than himself. When co-existing with follicular disease of the throat,

* 'Brit. Med. Journ.,' 22nd March, 1862.

† 'Med. Times,' March 31st, 1860.

they should be excised at once, to allow of a cure of the former. The value of removal is well shown in a case of "Monster Tonsil," reported by Mr. Falloon, of Liverpool, in the 'Lancet' of November 20th, 1858.

Small cysts in the tonsil occasionally appear on the surface and resemble small abscesses, but they are collections of cholesterine, and when punctured give immediate relief to what sometimes simulates an obstinate throat-affection.

Ulcerations are sometimes present on the chronic enlarged tonsil, probably co-existent with follicular disease of the pharynx. They generally form an obstacle to the treatment of the latter, and the tonsils should be removed, unless by the healing of the ulcers they should contract to their normal dimensions. Strong solutions of tannic acid are often very useful locally. The uvula, if also elongated, must be truncated.

Calculi of the tonsils.—Dr. Yearsley has found deposits of calcareous matter in the centre of these glands, when enlarged and indurated. He discovered a calculus on one occasion, which resembled in its peculiar form a piece of rock coral. In March, 1860, I exhibited before the Pathological Society a calculus from the tonsil, sent me by my friend Dr. Baker, of Dawlish. (See 'Path. Trans.,' vol. xi.) On analysis, I found it composed of carbonate and oxalate of lime, with some animal matter. Mr. Bryant had a case under his care at Guy's Hospital, of a man who ejected a calculus from the tonsil, the size of a small nut, which he showed me.* My view of the formation of these calculi, is that they are usually the resolution of tuberculous deposits in the tonsils, which subsequently gives rise to inflammation, suppuration, and ejection.

Cancer of the tonsils and uvula.—If cancer affects the tonsil, it is usually by extension from some other part of the throat; but I had the opportunity of examining a case of idiopathic cancer of the left tonsil in a man aged forty-nine years,

* The 'Lancet,' 17th November, 1860.

in October, 1859, under Dr. Marsden's care, at the Cancer Hospital. It was eaten away by the disease, forming a large excavation in front of the left pillar of the fauces; the disease was hereditary in him.* Cancer commencing in the tonsil primarily is a very rare affection.

A remarkable case of cancerous tumour of the uvula and soft palate occurred to Mr. Birkett, at Guy's Hospital, in 1851, in which he successfully extirpated the diseased mass from a man aged fifty-four, with the result of a good recovery. It is published with engravings, in the 'Lancet' of May 22nd, 1852. The tumour in that instance hung down either into the pharynx, resting upon the back part and root of the tongue, or into the mouth, covering the posterior two thirds of the tongue, was freely movable from side to side, and seemed as if it would fall out.

Elongated uvula occurs from long-continued and repeated attacks of inflammation, and from general relaxation of the fauces, especially in follicular disease of the throat; it causes an inclination to cough and to vomit, sometimes difficulty of swallowing, a feeling as if there was a body at the back of the throat to be constantly swallowed, with a tickling sensation from contact with the epiglottis or larynx, and gives rise to much uneasiness and irritative cough. Its follicles are large, and often seen quite gelatinous at the extremity of the organ. It is lengthened in chronic disease of the throat, phthisis, bronchitis, and other affections, and will give rise to the symptoms of serious chest-mischief, but with an absence of the true physical signs. It occasionally produces a sense of suffocation, when long enough to enter the glottis.

When arising from relaxation, which is one of the causes of its annoyance to singers, and to those who are in the habit of using their vocal organs in continued speaking (I have seen it become relaxed in one hour from this cause), it can be restored to its natural healthy condition by astringent gargles, and

* I recorded it in the 'Lancet' of October, 1859, p. 339.

attention to the general health. On the other hand, when it is indurated, thickened, and so excessively long as to be inconvenient, it must be removed; and this to the extent of two thirds, and sometimes the whole of it, as recommended by Dr. Yearsley. I seldom adopt the latter, but it is quite necessary that a considerable part of it be taken away, and this is readily accomplished by means of a pair of forceps and curved scissors. The relief afforded by its truncation is sometimes most astonishing, and is generally immediate.

I have had several cases of the kind, one in the colonel of a regiment, who had been many years in India, and who was troubled with persistent tickling in the throat. The truncation of half an inch cured this.

Split or bifid uvula I have seen numerous examples of. A striking instance of this deformity I examined in the Children's Hospital at Paris, on September 7th, 1848, which I then saw treated by the application of the actual cautery in the hands of M. Guerseant.

I am indebted to Dr. Wright, of Somerset Street, for an inspection of several cases: one in a female, aged fifty-three, with sore throat for three weeks, in whom the split uvula formed long and slender bodies; another in a boy of five; in both of these cases the bifid ends divaricated outwards. On one occasion Dr. Wright sent me a young man, aged twenty-six, upon whose uvula grew a mucous polypus on the right side.

Palsy of the tonsils, uvula, and palate.—This is frequently observed as a result of diphtheria when there is anæsthesia of the parts; sometimes the soft palate dangles like a loose curtain. The symptoms and inconveniences to which this condition gives rise are noticed in the chapter on diphtheria, where likewise the treatment is considered.

Although the voice is exclusively formed through the agency of the true vocal cords, yet it is modified in its tone by any affection of the tonsils and soft palate equally with any deviation in position or condition of the epiglottis. Enlarged

tonsils, meeting almost in the centre of the pharynx, give a thick guttural sound, as if the person was speaking with a mouthful of food. Ulceration and inflammation of the velum is sometimes attended with the same phenomenon. Palsy of the velum gives rise to rhinophonia, as occurs in diphtheria.

SECTION IV.—AFFECTIONS OF THE NOSE.

Mr. Alexander Ure is our great authority on diseases of the nose, and no one has devoted more attention to the subject ; his article in the third volume of Holmes's 'System of Surgery,' is full of practical information, and may be consulted with advantage.

Affections of the interior of the nose demand consideration in these pages, because they frequently involve the throat, and cause very distressing symptoms ; on the other hand, many throat-ailments extend to the nose along the intervening mucous membrane, and therefore it is incumbent upon the physician, who is in the habit of using the laryngoscope and pharyngoscope, to employ the rhinoscope, to make himself familiar with diseases to which he has heretofore been a stranger.

Diseases of the external nasal integument, such as lupus and certain skin affections, are commonly treated by the hospital physician. They are excluded here, and the remarks and cases offered relate exclusively to the interior of the nostrils.

Epistaxis, or bleeding from the nose, is a common symptom in girls before and at the age of puberty, and is sometimes most persistent and difficult to arrest. It is either active or passive, and occurs spontaneously often in cases of obstinate headache, when the blood is poured out by the *emissary* veins, which, as Mr. Ure states, have no analogy with the arteries in their distribution, but which establish between the nostrils and the cranial veins an intimate communication. Diseases of the

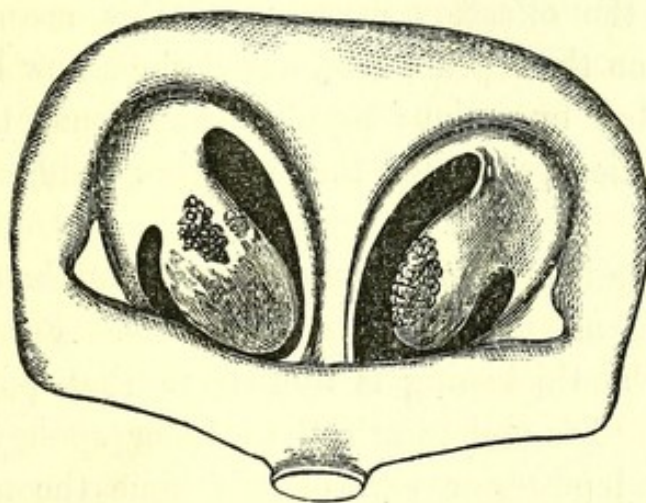
heart and liver; the blood, as in scurvy and fever, give rise to epistaxis. Chronic vascular ulcers on the turbinated bones, as in the following case, is a cause made out by the rhinoscope.

The treatment.—Cold water and ice to the forehead and bridge of the nose, or some styptic solution in the nostrils, such as tincture of benzoin or of matico; holding up one or both arms; cold to the back of the neck; increased frequency of deep respiration; syringing the nose with cold or tepid water until it ceases; or dry cupping to the nape of the neck. Should all these fail, then the nostrils must be plugged with sponge by means of Bellocq's canula, or a curved catheter, the steps of which need not be here described.

The following case is at present unique, from the cause giving rise to the epistaxis.

CASE. Ulceration of the membrane covering the turbinated bones, the cause of epistaxis for thirteen years, as seen by the rhinoscope.—J. G—, æt. 17, a girl of strumous habit, pale and delicate-looking, admitted under my care at the West London Hospital, on the 8th of November, 1862, for epistaxis. She had had pertussis, rubeola, and scarlatina, when four years

FIG. 91.



The left turbinated bone is seen to the right of the figure, and the right to the left of the figure, the parts being reversed in the mirror.

old ; after the last, she became subject to epistaxis, which remained persistent, occurring daily from both nostrils, but more so from the left than the right. The catamenia had commenced seven months ago. Rhinoscopy was difficult, on account of the contraction of the velum palati from the scarlatinal angina (no doubt attended with ulceration, as cicatrices were seen here and there), yet it was performed, and showed very red and vascular ulcers on the posterior surfaces of both inferior turbinated bones, which gave rise to the bleeding which had blanched the patient. These ulcers are shown in the engraving. (Fig. 91.)

With the laryngoscope were seen two deep, round hollows, not ulcerated, on either side of the ligament of the epiglottis, at the back of the tongue ; the cartilage itself was thin and worn, not such as is usually seen in the young. The larynx was normal, and the movements of the vocal cords free ; a tubercle the size of a small pea was present on the surface of the right aryteno-epiglottidean fold, near its outer border. On looking through the nostrils in front, the mucous membrane covering the turbinated bones appeared very red and swollen.

Topical treatment here, and attention to the general health, were the chief means relied upon to bring about a cure.

Affections of the pituitary membrane.—The remarkable distribution of the olfactory nerve upon this membrane, more especially upon the septum nasi, would show how liable it is to become affected by various peculiar conditions ; these can be but briefly noticed, although they possess considerable importance.

Hypertrophy is occasionally met with, throughout the whole extent of the membrane, in both nostrils. Frequently, Mr. Ure states, the thickening is limited to that portion which folds back and lies underneath the inferior spongy bone. At the border and posterior part of this bone the membrane is naturally thick, and this depends, says Kölliker, upon abundant venous plexuses in the interior. Hypertrophy often

follows coryza, and occurs spontaneously. In damp and cold weather it causes nasal dyspnœa and much discomfort. The membrane is seen to be tumefied, and resembling a polypus, but of a deeper red, and not pedunculated. I had a gentleman under my care who had been subject to this affection for many years, following coryza; he was often seized with nasal dyspnœa during sudden changes of the weather, in the night time, and has often felt as if he should be suffocated. He was generally relieved by an attack of coryza lasting twenty-four or forty-eight hours.

Astringent injections are valuable—nitrate of silver, acetate of lead, alum, nitrate of uranium, and argento-nitrate of mercury; besides constitutional measures.

Coryza, the common and well-known catarrhal affection of the pituitary membrane, is a swelling of the membrane, with diminished area of the nasal cavities, which is associated with nasal dyspnœa and a running at the nostrils, with lachrymation. Although commonly arising from cold, it may be symptomatic of nasal polypus, or a forerunner, as Mr. Ure points out, of ozæna, or of caries or necrosis of the turbinated bones, whether of a scrofulous or a syphilitic origin.

In chronic coryza the malady is most obstinate, and occurs from the slightest cold. Rhinoscopy shows the membrane to be of a deeper red colour, and sometimes eroded here and there. All the ethmoidal, maxillary, and frontal sinuses are affected; there is headache, rhinophonia, and either impaired or loss of the sense of smell. It may exist for years, and suddenly subside, or degenerate into mischievous disease.

Mr. Ure advises small doses of bichloride of mercury twice a day, and this may be alternated with iodide of potassium, sodium, or ammonium, if there is any erosion to be seen. Locally, solutions of nitrate of silver, or of alum, or tannin, may be used twice a day, or, what I have found valuable, the bromide of ammonium used several times a day.

If the patient is strumous, syphilitic ozæna is liable to

supervene, and this is attended with destruction of the nasal bones and cartilages.

Coryza is induced by a variety of causes; amongst others, the odour of gardens in which roses are chiefly cultivated, as pointed out by Dr. Canuti. The Damascus rose is said to be the most powerful in producing this effect.

Perversion of the sense of smell is a peculiarity that follows local congestion of some part of the pituitary membrane, although it is a natural thing with some persons, who, for example, cannot distinguish the odour of the different sweet-scented flowers, as the syringa, &c., in the same way as certain individuals cannot see particular colours, or hear certain sounds. A very bad smell is experienced by some persons, as originating in their own nostrils, when there is neither a discharge nor any odour perceptible to another. This sometimes may be the precursor of commencing caries, but in the majority of cases arises from some local congestion. The following case is one of a few that have come under my care.

CASE. *Perversion of the sense of smell, associated with follicular disease of the throat; cure.*—Capt. W—, æt. 36, consulted me 19th August, 1863, about a smell of matter from the nose. He has had a cough for many months, and has since been subject to colds about the head. The mucus from the left nostril has a smell of matter to him, especially when he comes from the cold air into a warm room. This smell originated in a cold some months ago, and there is nothing of it in his handkerchief. He can always detect it before he snuffs up. Has been much in the tropics, and very susceptible to cold. In returning home from a late voyage, he had an ulcerated throat (last June) and a sore tongue; he got well of these. He suffers much from indigestion. The mucous membrane was relaxed and follicular in the fauces and pharynx, and also in the larynx; this condition extended upwards also behind the velum, and was found to involve the left nostril

especially, where the membrane covering the inferior turbinated bone was of a deep crimson colour.

He was treated locally and constitutionally as for follicular disease, the affected part of the nostril being touched with a curved brush passed from behind, as well as occasional showers, and in a month he was cured. On October 16th, he told me he had had only one touch of the smell since the 21st of September.

This perversion of smell was not an imaginary proceeding, but existed as the result of impaired nervous power in the left nostril, originating in the follicular congestion.

Rhinorrhœa, or ozæna, is an offensive discharge from the nose, one or both nostrils, and is a symptom only of disease in some part of the nasal cavity.

Inflammation or ulceration of the mucous membrane in the deep recesses of the nose is followed by a discharge, not unfrequently, which possesses an offensive odour, not necessarily from diseased bones, but oftentimes because it has lain there for some time and putrefies. Periostitis, ending in suppuration, caries and necrosis, in a strumous subject, or from syphilis, is another cause of ozæna. When syphilitic, the ravages are often most severe and extensive, for they seldom stop until the nose is converted into one large cavity, and the bridge falls in.

In the diagnosis of the seat of disease giving rise to ozæna, much assistance will be derived by the use of the rhinoscope, which in some cases permits of a ready inspection of the deepest recesses of the nostrils, and the discovery of the part affected. This has happened to myself several times, and a few cases are very briefly given as examples.

In the *treatment*, however, cleanliness is half the cure, and frequent syringing of the nostrils with a syringe and warm water, to wash away collections of pus or inspissated matters, will be found of extreme value and great comfort to the patient. To the warm water may be added a little of Condyl's

fluid, or Sir W. Burnett's (the liquor of chloride of zinc), or the dilute acetic acid or acetate of zinc. Daily, or sometimes twice a day, will be sufficient to do this.

If ulceration is clearly seen, it may be touched with some of the solutions spoken of in other pages, as nitrate of silver, argento-nitrate of mercury, &c., and a weak solution of chloride of zinc or of bichloride of mercury may be used, independently of the warm-water syringing. The preparations of iodine and bromine are advisable, with bark, steel, and cod-liver oil. Trousseau's snuff for ozæna consists of calomel half a drachm, red precipitate one scruple, white sugar half an ounce, to be snuffed up in form of powder twelve times a day. If any of the bones are necrosed and loose, they should be removed with slender forceps, and not suffered to remain to undergo disintegration.

CASE. *Ozæna in a young lady*.—A fine healthy girl, æt. 20. I inspected with the rhinoscope, on 22nd May, 1863, with Dr. Copland. She was subject to occasional discharge from the nose, which simulated that of diseased bone, and occurred after colds. The membrane covering the turbinated bones of both nostrils was tumefied and of a deep red, velvety appearance. There was no ulceration nor exposure of bone anywhere.

CASE. *Ozæna for three years*.—A young married woman, æt. 26, was sent to me by Dr. Wright, of Somerset Street, to be examined. She had had an offensive discharge from the nose for three years, but it had to be blown out, and a considerable quantity flowed into the back of the mouth. Had pain across the forehead over frontal sinuses, and a discharge of blood and pus three weeks ago. Rhinoscopy on several occasions in May, June, and July, 1863, showed tumefaction and redness of the membrane at the summit of each nostril, leading to the ethmoidal and superior turbinated bones, the

result of general periostitis. This view was confirmed by treatment, for when last seen she was almost cured.

CASE. *Ozæna for ten years in a young lady.*—This occurred in a young lady, æt. 21, whom I examined at Nottingham, in August, 1863, for Dr. Massey. She was a fine healthy girl, but with a most offensive yellow and green discharge from both nostrils for a period of ten years. Tumefaction and dark-crimson redness of the turbinated bones of both nostrils was seen; probably ulceration in the whorls existed.

Ulcers of the nasal fossæ.—These may be present without much discharge, and therefore not strictly coming under the denomination of ozæna. They are seen in the front part of the nose, without involving the posterior part, but occasionally they extend the whole length of one or both nostrils, and can be seen in the rhinoscopic mirror. In the details of several cases in other sections, the nose was ulcerated as well as the throat diseased. (See pages 72 and 213.)

When the ulcers are specific, there is often a disagreeable, purulent odour, which is difficult to get rid of; but constitutional treatment is here of great value, with local applications. The pharyngo-nasal cavity is a frequent seat of ulceration.

In February, 1863, I examined a soldier of the Horse Guards, brought to me by Mr. J. C. Agnis. He was aged 34, six feet three inches high, and had hemiplegia of left side a year ago, from which he recovered. For three weeks he had a discharge from the left nostril resembling coryza; it could be collected in large quantities, and looked like the contents of some cyst. Rhinoscopy showed an ulcer on lower surface of left inferior turbinated bone, with tumefaction and general congestion. The anterior surface of this bone could be seen ulcerated as well, through the nostril in front. Notwithstanding the lesions present, I believed the fluid came through the ethmoidal cells, and was most probably cerebral. This was confirmed by subsequent events.

In May, Mr. Ernest Hart sent me a patient, æt. 39, from whom he had removed a large central piece of the upper alveolus in a necrosed state, leaving an opening through which the turbinated bones could be seen. Rhinoscopy showed cicatrices of old ulceration in the right nostril, with a swelling of the membrane covering the vomer near the floor.

Diseases of the turbinated bones arise from inflammation and its attendant periostitis, sometimes idiopathic, although more generally specific. They are seen mostly among the poor, who have taken much mercury and been exposed to the ravages of want and cold. I have seen many instances in public and private practice. The following example, however, is one where the disease appeared to be idiopathic.

CASE. *Disease of the turbinated bones and floor of the right nostril, with exudation of fibrine; and disease of the throat.*—A married lady, æt. 35, without family, from the county of Worcester, consulted me by letter, in April, 1862. She had had disease of the throat for twelve years, commencing with mumps. The tonsils and uvula became diseased, and the former were removed. It is in the right side of her throat where she suffers great pain, and an ulcer there, she says, “leads up into her head.” The pain in the head and throat is at times more than she can bear; it used to be very severe over the frontal sinuses; she has likewise a great discharge from the back of the throat, copper-coloured from the head, and almost black from the lower part of the throat, and it appears to her to gather in the nose and head. The right side of the throat feels raw, there is dryness of the fauces and soreness of the chest. When the frontal pain is present she is a great sufferer. Had been under some eminent men without relief, nearly all of whom had evidently treated her for neuralgia, from the nature of their prescriptions.

In the latter part of June she came up to London, and I carefully examined her. She seemed in good condition of

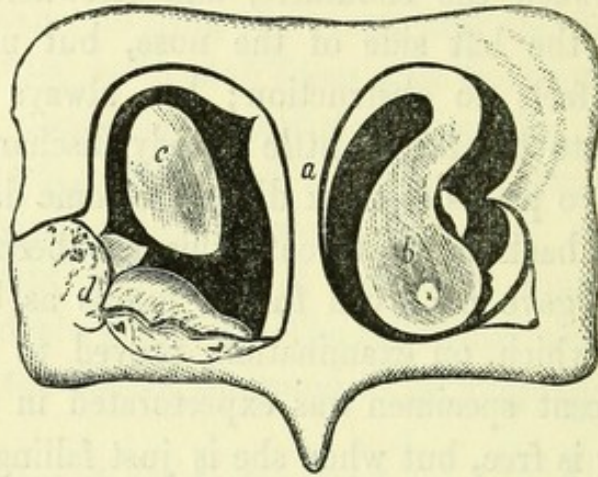
body, pale, and suffering from neuralgic pain in various parts of the face and head, on either side of the nose, but especially on the right side, which was tender on pressure. Pain was present behind the lower jaw on each side, in the right side of the chest, between the shoulders, and elsewhere. Breathes clear through the left side of the nose, but not the right although she feels no obstruction; has always a tightness running up into the head; little bloody discharge from the nostrils, and two pieces of thick discharge come daily, working down from the back of the throat; this has been so for three years, and she gave me a vial full of lumps as big as a pea and upwards, which, on examination, proved to be masses of fibrine. A recent specimen was expectorated in my presence. Her breathing is free, but when she is just falling off to sleep at night it is suffocating.

Inspection.—Pharynx covered with a dryish and gray secretion at its back part. Membrane on right side, running up and down, is very red, raw, and ulcerated. Back of the tongue is fissured, nodulated, and deeply ulcerated. Base in front of epiglottis not diseased. Epiglottis hangs over the glottis and lies nearly flat, preventing a view into the larynx with the mirror, unless during a sudden inspiration. It is very thin, with small serrated margins; colour altered. The position of this cartilage explained the sense of suffocation at night from extreme relaxation of its proper ligament.

Rhinoscopy.—General bright redness of the membrane at the back of the right nostril was seen, the result of inflammation, with a large, ulcerated, projecting mass on the floor, and a small one to the right of it, covered with secretion of a yellowish and pink colour. The turbinated bone was partially destroyed, and covered with inflamed membrane. The ulceration of the floor of the nostril extended to the velum and right side of the pharyngo-nasal cavity. The left nostril, although congested, was otherwise normal. The extent of disease can be understood on comparing the two nostrils in the annexed

drawing. The right nostril is the left in the picture. A red projecting swelling was seen in the right nostril from the front, probably continuous with that behind.

FIG. 92.



a. The posterior nasal septum. *b.* The superior turbinated bone of left side. *c.* The remains of the same bone of the right side. *d.* Ulcers and granulations on the floor of the nostril.

The physical signs pointed to commencing disease of the chest; there were fine mucous râles heard posteriorly between the shoulders, peurile breathing in the left chest, and indistinct in right.

I carefully applied a solution of the argento-nitrate of mercury to the back of the throat and the nose, with most marked benefit, for immediately the pain in the latter was relieved.

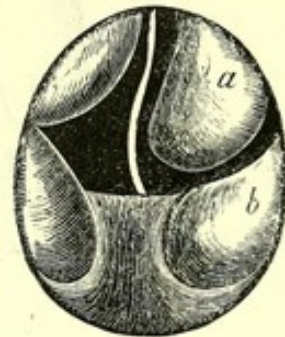
The treatment consisted of remedies internally besides local applications, and her improvement was slow and gradual, and for some time she wonderfully improved, but was very liable to accessions of cold and cough.

Although I have not heard from her now for some time, I have every reason to believe that the ulceration of the nose has healed and the inflammation subsided, and that she is free from the pains to which they gave rise. The case was most satisfactory, in that the diagnosis was clearly made out by the rhinoscope, after a long period of uncertainty as to the nature of the complaint.

As showing the ravages committed by specific disease, the following case is selected as a good illustration.

CASE. *Destruction of the right turbinated bones, vomer, and both nasal bones, permitting of a view into the nose through a fistulous opening in front.*—Eliza F—, æt. 36, was admitted under my care at the Westminster Hospital in November, 1863, for chronic syphilitic laryngitis. She has been subject to sore throat on and off for ten years; six years ago she lost the nasal bones, and an oval opening formed in the face at the top of the nose, which now permitted of a view within its cavity, as represented in fig. 93. The opening is represented of the natural size, and shows loss of the vomer, almost all the cartilaginous septum, and the turbinated bones of the right side, which are replaced by the remains of the mucous membrane at one time covering them. A small bridle of membrane is seen at the back part of the cavity. A circular opening the size of a sixpence is present in the anterior part of the hard palate, which leads upwards into the cavity of the nose. In swallowing, the velum is seen to rise up at the back of the nostrils, and the floor of the nose is more or less naturally flat. The sense of smell was not lost, although impaired. The laryngoscope showed chronic inflammation of the entire larynx; the vocal cords were quite red, thickened, and inflamed, and so was the epiglottis; there was commencing œdema of the membrane covering the false cords. Yet she was able to speak in a semi-hoarse voice, and had a rough

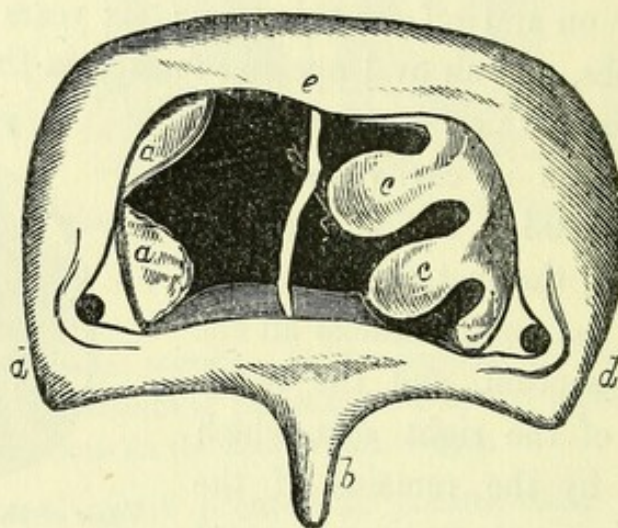
FIG. 93.



View of the nostrils from the front. *a.* The left middle turbinated bone. *b.* The left inferior turbinated bone. The membrane only of the lost bones is seen on the opposite side, and in the centre a bridle of membrane running from above downwards at the posterior part of the nose.

laryngeal cough. She was put upon the iodide of potassium and strengthening medicine, and topical applications were made to the larynx. On the 14th December she was examined with the rhinoscope at the back of the fauces, and again on the 25th January, when the appearances were observed as depicted in fig. 94. They form the counterpart of what was

FIG. 94.



View of the nose from behind. *a, a*. The membrane of the lost right turbinated bones. *c, c*. The left turbinated bones. *b*. Uvula. *d, d*. Eustachian tubes. *e*. String of membrane running from above downwards.

seen through the opening in the nostrils through the face, and accurately display the nature and extent of the ravages produced by the disease.

Her health has materially improved, the voice and cough are better, and she avoids cold by keeping the opening in the nose and roof of the mouth plugged with pieces of moist lint.

Diseases of the septum.—The septum, both in its cartilaginous and bony divisions, is the seat of tumours of various kinds, which when seen require removal. They are usually cartilaginous or gelatinous, sometimes bony; I have seen examples of each.

Abscess occurs as the result of syphilis and scrofula, and often follows in the wake of some of the exanthemata. It was a peculiarity noticed in the case last detailed. Early opening should be practised, on account of the danger of necrosis of the cartilages and bones. Indeed, as Mr. Ure asserts, the prognosis in diseases of the septum ought always to be guarded, for when an apparent cure is effected destruction of the parts mentioned may be going on.

In a female patient, aged twenty-four, sent to me by Mr. Henry Thompson to examine, in November, 1863, the membrane covering the posterior septum was seen with the rhinoscope to be swollen and intensely red, from probably syphilitic periostitis. The velum near the floor of the left nostril was in a state of ulceration.

Rhinolithes, or calcareous concretions, developed in the recesses of the nostrils, must not be forgotten. Many curious examples are given by Mr. Ure in his article already referred to, and they are generally detected by careful exploration of the cavity with a probe or forceps, a peculiar dead sound being emitted characteristic of the presence of a calculus.

Foreign bodies are often introduced into the nostrils by children at play. They can be readily detected and removed by small polypus or dressing forceps.

Occlusion and contraction of the nostrils.—Occlusion is seen as a congenital affection, when the obstruction is caused by a membrane, which must be perforated. It may arise at any period of life when the cartilages of the alæ of the nose adhere to the septum.

The frontal sinuses are the seat of disease in ozæna and coryza, but as yet very little is known about them.

Polypus.—The consideration of nasal polypi and tumours can only be entered into in so far as the diagnosis is effected by the physician with the aid of the rhinoscope. The ordinary soft gelatinous polypus, of a pale or grayish light brown or greenish colour, is usually attached to the superior and ex-

ternal wall of the nostril, but occasionally proceeds from the ethmoidal cells, the lower meatus, or the thick membrane covering the inferior turbinated bone. It is seldom or never met with on the septum. When the growth passes backward in the fauces, it may hang down into the pharynx behind the velum. Its correct position can be determined with the rhinoscope.

With a good light, and dilating the nostril, a polypus can be readily made out in front.

The fibrous polypus is much more to be feared than that just described, and after a time produces the deformity known as *frog-face*. The naso-pharyngeal polypus springs from the basilar process of the occipital bone, and is truly formidable; such instances I have seen submitted to operation by Mr. H. C. Johnson, Mr. Fergusson, and others; and lastly, we have the malignant or cancerous polypus. The rhinoscope is of great assistance in diagnosing the nature and position which any of these growths may present at the posterior part of the nostrils and pharyngo-nasal cavity. Several such have come under my observation, but I refrain from extending this section. For the treatment of these various tumours, the reader is referred to Mr. Ure's article, and various works on surgery.

It ought to be mentioned, however, that a saturated solution of bichromate of potass, applied to the portion of the ordinary polypus accessible to the eye, in the hands of M. Fredericq, has set up inflammation in three or four days, sometimes extending to the nose, and shrivelled up the polypus.* This occurred in twenty cases.

* 'Annal. Soc. Méd. de Gand.,' 1862, and 'Brit. Med. Journ.,' August 2nd, 1862.

SECTION V.—POLYPUS OF THE THROAT.

The appearance of soft fleshy growths in the throat is fortunately of rare occurrence, but when they do appear they give rise to distressing symptoms, which demand urgent interference. Symptoms of irritation of the throat produced by the pressure of a polypus, with cough, sensation of choking, and difficulty of swallowing and of breathing, are occasionally noticed. As the growth increases in size, an examination, either with the laryngeal mirror or sometimes without, will readily detect it. If projecting from the back part of the nostrils, or from the back of the palate, it can be seen hanging downwards, over the epiglottis. They spring from the sides and walls of the pharynx, and from the back of the tonsils; three instances of the kind have come under my notice; one was a patient of Mr. Curling's, at the London Hospital, from whose right tonsil sprang a large fibrous growth, which almost blocked up the pharynx and produced serious dyspnoea. The tumour was not distinctly circumscribed nor movable, as is the case with Syme's "fibrous tumour of the fauces," and was successfully extirpated by the ligature. A second instance occurred in a patient of Mr. Tatum's, at St. George's Hospital, in whom a fibrous tumour grew from the body of the sphenoid bone, in a lad of sixteen, whose entire upper jaw had to be removed to get the tumour away, which hung, as it were, into the pharynx. Both of these operations I had the good fortune to witness. The third instance was in a female aged thirty-seven, who was suffocated from a tumour of a fibro-cartilaginous character, situated at the back of the left tonsil, and which partook of the nature of the "fibrous tumour of the fauces" of Professor Syme. It was in immediate contact with the great vessels of the neck.

The nature of these growths is firm and fleshy, more so than those common to the nose; and their attachment is usually by

a short and thick pedicle, but sometimes much larger, with a considerable base, as was the case with Mr. Curling's patient. There is a sense of rawness, produced by the rubbing of the food in swallowing, which keeps up a continued irritation, sometimes proceeding to actual ulceration.

The only effectual cure is by removal, through the aid of a ligature, as preferable to any other; although I think they may be cut off with the knife and scissors, if favorably situated for doing so. Extreme symptoms of suffocative irritation and congestion of the head may sometimes follow the application of the ligature, which may be lessened by scarifying the swelled polypus; and it is recommended with propriety to tighten the ligature if there is bleeding. The tumour will slough off, but should not be left till putrescence has ensued.

In October, 1859, Mr. Birkett showed me a man, æt. 34, in Guy's Hospital, with a flat and soft polypoid growth, as large as a five-shilling piece, situated on the anterior surface of the soft palate, half an inch in front of the uvula. It was growing only three months, and was first detected by the man's wife. There was no pain nor dysphagia; it was easily removed, and consisted of a multitude of small lobules, kept together by fine fibrous tissue.

If a polypus is growing in the œsophagus, and can be clearly made out with a probang, the only effectual method of extirpation is to do so through the operation of opening into that tube, unless an instrument was devised upon the same principle of my laryngeal ecraseur, described in another part of this work.

There are several instances of polypus of the throat preserved in the London museums, which I have examined; one in St. Bartholomew's Hospital particularly, where an epithelial growth involved the base of the tongue, tonsils, and portions of the larynx. (Series 25, No. 35.)

One of the most remarkable on record is preserved in the museum of the Westminster Hospital, of a pendulous fatty

tumour of the pharynx and larynx, occurring in a robust and active man, æt. 80, who had throat-symptoms for twelve years, and four years before death, during the act of vomiting, a large mass protruded, which he was obliged to return as speedily as possible, to prevent immediate suffocation. He died suddenly while smoking his pipe. A large, pendulous, fatty tumour was found filling the pharynx, and extending downwards into the œsophagus to the extent of nine inches. It was attached by an envelope of mucous membrane and fibrous tissue to the left side of the epiglottis, dragging it downwards and to the left side, so as entirely to prevent perfect closure of the larynx; it was also connected with the upper part of the pharynx; but with these exceptions, it hung perfectly loose in the pharynx and œsophagus.

The tumour was exhibited before the Pathological Society by my colleague, Mr. Holt, and is figured in the fifth volume of their 'Transactions.'

Dr. Arrowsmith has recorded an instance of a cellular tumour the size of a walnut, hanging by a narrow pedicle from the commencement of the œsophagus, immediately behind the larynx. ('Med.-Chir. Trans.,' vol. xxx.)

SECTION VI.—FIBROUS TUMOUR OF THE FAUCES.

This name was given by Professor Syme to a form of tumour of the fauces described in a clinical lecture in the 'Lancet' of 12th January, 1856, of which he had seen four examples. Its characters are—"a firm consistence, a round or oval form, somewhat nodulated, distinct circumscription, more or less mobility, and the production of inconvenience proportioned to its bulk." It is liable to be mistaken for an abscess of the tonsil, enlargement of that gland, and malignant tumours of the same situation. If allowed to remain, it will increase in size, and produce the same inconveniences as are described in the

foregoing section of "Polypus of the Throat," and the only means of treatment is that of excision. This would appear to be easy, for the tumour lies immediately beneath the mucous membrane which constitutes the arch of the fauces. Mr. Syme recommends, in the removal, a free incision to be made in the first instance, and followed out by a careful dissection, until the anterior surface of the tumour is completely exposed, when the process of removal may be accomplished chiefly by the aid of the fingers. The adhesions of the mucous membrane will be found to be the most intimate at the arch of the fauces. Mr. Syme informed me (October 21st, 1859) that another example of this form of tumour was then admitted under his care in the Royal Infirmary of Edinburgh, in a man æt. 42, sent to him by Mr. Dunnet, of Moy.

When at Cambridge, in October, 1862, I examined a preparation in the Anatomical Museum, of the *larynx of a horse*, with a globular tumour as large as a small orange, beneath the mucous membrane in *front* of the epiglottis. When cut into, it was found to contain hydatids. The horse died suddenly, having suffered for two or three days from sore throat.

SECTION VII.—AFFECTIONS OF THE ŒSOPHAGUS.

The connection between the gullet and the throat is so very obvious, that a short sketch of the diseases of this part of the throat-apparatus cannot but prove of service to the reader.

The musculo-membranous bag or sac which forms the pharynx, situated in front of the cervical portion of the spinal column, is well seen on looking at the back part of the mouth; it extends from the base of the skull to a point corresponding with the cricoid cartilage in front and the fifth cervical vertebra

behind, and ends in the Œsophagus, which begins at this place and continues to the stomach, passing behind and rather to the left of the windpipe.

The Œsophagus is subject to inflammation, which is an extremely rare affection, and seldom witnessed, unless from injury. Mechanical violence from the introduction of hard or very large bodies down the tube will give rise to it. It has been ascribed to extension from the stomach or from the throat. It has been attributed to rheumatism; and there can be but little doubt that the muscular coat is sometimes the seat of this affection, without any symptoms of an inflammatory character.

Stricture is by far the most important affection of the gullet, and is made known by the slowly increasing and continuous dysphagia which may have been present for years. Its detection can readily be made out by the introduction of the probang. But, independent of this, the symptoms point to the nature of the affection, for the patient after a time swallows nothing but liquids, or may cease to swallow at all, the fluid regurgitating upwards from the dilatation above the stricture. The result of this painful affection is, that the strictured part may assume the characters of epithelial cancer, and the patient will die of starvation, as it has been my lot to witness on several occasions. It may not be out of place here to observe, that in such cases, where the ultimate result of the disease can be clearly foreseen, the patient *should not* be allowed to proceed to the stage of starvation. An early effort should be made to produce an inflammation by means of caustic issues in the skin over the stomach; and when it has subsided, and apparently formed an adhesion between opposed serous surfaces, the viscus should be opened; and when the risk of danger has subsided, the process of feeding commenced by the aperture. If gastrotomy is thus done at this stage, it would prove one of the greatest blessings, with a better chance of success than if performed as a *dernier ressort* to save life

from starvation, as I have now seen on two occasions at Guy's Hospital.

Spasm of the œsophagus—which sometimes gives rise to very painful dysphagia—arises from some morbid muscular contraction of the tube, which comes on suddenly, often for the first time after a meal. Its cause would seem, in the majority of instances, to arise either from too rapidly eating, or swallowing morsels of food in succession not sufficiently masticated. The food may pass into the stomach after a few minutes, when the spasm becomes released. It may be rejected immediately with some force; or, if retained for a time, will rise by regurgitation. The spasmodic contraction is said to be near the upper extremity of the tube when the former occurs, and near the lower when the latter takes place.

The influence of spasm of this canal is seen upon the neighbouring parts, by its producing severe pain during its continuance, which may extend to the windpipe, or even the lungs, causing much dyspnœa, with a feeling of impending suffocation.

Ulcers, softening, and abscesses, besides cancer, are observed in the œsophagus. Polypi are sometimes developed, and have been known to be so long as to descend to the stomach. The malformations to which this tube is liable are some of them very remarkable, and necessarily fatal. They are the termination of the upper end in a *cul de sac*, and a division of a part of the tube into two passages situated at the side of each other; of the former there is a good illustration in the museum of St. George's Hospital.

Dr. Horace Green has treated cases of stricture of the œsophagus successfully, by passing down a probang and sponge saturated with a solution of nitrate of silver through the stricture, at intervals of two or three times a week, for perhaps some months; increasing the size of the probang as dilatation has ensued. The cases he relates are those of a lady affected

with stricture for ten years, and another for five years. In another instance lasting eighteen years in a lady, associated with malignant disease, the same plan of local treatment was successful, in permitting the swallowing of food in large quantities. Dr. Green has treated eight cases of stricture in two years with success, and he attaches no value to mechanical dilatation, unless in purely spasmodic cases.

Cases have been sent to me for diagnosis with the laryngoscope, to determine, in fact, whether the larynx was involved as well as the œsophagus. Amongst several, the following are selected as possessing points of interest.

CASE. *Stricture of the œsophagus for eighteen months.*—Mrs. Hannah W—, æt. 43, was sent to me by Mr. Gay for examination, in December, 1862. Has had dysphagia for eighteen months from stricture at the upper part of the œsophagus. The laryngoscope showed the larynx to be normal. I got her admitted into Guy's Hospital under Mr. Cooper Forster, but she died suddenly two or three days after.

CASE. *Stricture of the œsophagus for six years.*—Mrs. Burrett, æt. 41, was sent to me by Mr. Ernest Hart, August 4th, 1863. Has had dysphagia for six years, and was nearly choked lately from food. Contraction is at the upper part of the tube. The larynx was perfectly natural and unaffected.

CASE. *Stricture of the œsophagus at its lower part.*—Capt. J. H. G—, æt. 71, consulted me July 15th, 1863. Had a bad throat and bronchitis twelve months ago; now there is a stricture at the lower end of the tube; can swallow fluids, but not solids; larynx healthy. He very much improved under treatment, but his death was announced in the 'Times' as occurring at Deal on the 9th November.

CASE. *Stricture of the œsophagus at its upper end for seven years.*—Mrs. S—, æt. 50, was brought to me October 14th, 1863, by Dr. Furley, of West Malling, near Maidstone. She has had a stricture of the œsophagus for seven years, latterly getting worse. I passed a probang down, and the obstruction was felt in two places at the upper end of the tube. She immediately swallowed better after this. The larynx was healthy; two fleshy tubercles were seen on the right side of the epiglottis, like peas.

CASE. *Malignant stricture of the pharynx and œsophagus.*—On 10th August, 1863, I examined a lady in Camden Town, with Dr. J. Kidd, of Moorgate Street, who had had symptoms of stricture at lower part of the pharynx for a few months only. The back of the throat was seen in the laryngeal mirror to be a mass of malignant disease. She was dying when examined, but was not inconvenienced by it. The disease had extended to the upper part of the larynx.

CASE 6. *Stricture of the œsophagus opening into the trachea.*—In May, 1863, Dr. Hardinge, of Grafton Street, asked me to examine Mrs. B—, the wife of a farm bailiff in Surrey, with the laryngoscope, at the Great Northern Hospital. She had stricture of the œsophagus about seven months, and after a while she expectorated about a quart in the twenty-four hours. This was really her fluid nourishment, which escaped into the trachea through a fistulous opening in the œsophagus, and was coughed up. The irritation of the throat was so great that no instrument could be borne, and no examination was made. She died finally of supposed cancer of the part, a disease hereditary in her family. No autopsy was permitted.

A similar case to this was brought before the Pathological Society by my colleague, Mr. Heath, and published in vol. x of their 'Transactions,' wherein the œsophageal stricture opened into the trachea. The preparation is preserved in the

museum of the Westminster Hospital. Two similar preparations exist in the museum of St. Thomas's Hospital; in one, the communication between the two was close to the bifurcation of the trachea. (W, Nos. 45 and 46.)

On the 8th February I examined a female, æt. 41, with aphonia and dysphagia, sent to me by Dr. Watkins, of the Euston Road. I found the larynx normal, but there was stricture of the commencement of the œsophagus and swelling of the pharyngeal surface of the larynx, which had produced palsy of the true cords.

SECTION VIII.—DYSPHAGIA—DIFFICULTY IN SWALLOWING—
HOW PRODUCED.

Although the circumstance of a difficulty experienced in swallowing is considered to be merely a symptom, its importance is such that its causes should be understood, leaving out for the present a consideration of some of the special diseases of the œsophageal tube which, among other causes, give rise to this distressing symptom.

In its course downwards to the stomach, the œsophagus, after leaving a little below the apple of the neck, and entering the chest behind the windpipe, passes behind the arch of the aorta and along the posterior mediastinum, lying in front of the thoracic aorta. It then enters the abdomen through the special opening for it in the diaphragm, and terminates at the cardiac orifice of the stomach, opposite the tenth dorsal vertebra. Although this tube is flat and narrow in the neck, cylindrical in the rest of its course, and largest near its lower part, any tumour growing near it, such as an enlarged bronchial or some other gland, or chain of small glands, which might press slightly upon it, would produce the dysphagia. The same effect, or sensation, would also arise from aneurismal tumours existing throughout any part of its course, but par-

ticularly springing from the arch of the aorta, and occupying the root of the neck or upper part of the thoracic cavity, as described when speaking of dyspnœa. Enlargement of the thyroid gland, and projection of the dorsal vertebræ will also give rise to dysphagia. Mr. Brodhurst, whose experience upon any subject connected with deformities is of the first character, informed me, in August, 1859, that dysphagia was a prominent symptom in a female under his care, thirty-three years old, with lateral curvature of the spine. It had been present for twelve months, and was partly due to irritation, and partly to hysteria.

Another cause is ossification of the cartilages in advanced life, when dysphagia is complained of as a more or less constant and never-ceasing symptom, leading to the suspicion of an actual stricture, when nothing of the kind is present. I can call to mind several cases which came under my own observation—one of them was brought before the Pathological Society, in April, 1859, and is briefly noticed in the chapter on ossification of the cartilages. The dysphagia may commence at the very top of the tube, if there is much thickening of the arytenoid and cricoid cartilages, besides their transformation into calcareous material, as in a case of the kind related by Mr. Travers in the seventh volume of the 'Med.-Chir. Trans.,' and quoted by Ryland.

Acute inflammation of the trachea, often coincident with acute laryngitis, gives rise to dysphagia, independently of any spasm of the œsophagus. Abnormal distribution of the subclavian artery, between the trachea and œsophagus, produces dysphagia, as stated by Demme.

In hysterical females, this symptom is one of the vagaries which presents itself, as has been already noticed in Chapter VII.

A very common cause of inability to swallow is a slight contraction of the upper part of the canal, arising from colds, engendered by sitting in draughts between windows and doors,

or in an omnibus, with a direct draught blowing upon the neck. If the general health is good, and there is no predisposition to inflammatory action, the dysphagia disappears of itself, or may be dispersed in a day or two by drinking warm liquids, and adopting moderate care. It should not be allowed to become chronic, and is readily amenable to treatment.

A person subject to dysphagia should be made aware of what it depends upon ; for if it is irremediable, his attention ought to be diverted from it. Sudden attacks of dysphagia, temporary in their nature, no doubt arise from a spasm of the gullet, consequent upon increased or deranged sensibility, and are often witnessed in nervous and hysterical people. This subject has been already illustrated in the previous section.

Two other causes of dysphagia I have noticed now on numerous occasions, and they are any affection of the thyro-hyoid articulation and ligament, and pendency of the epiglottis, as revealed by the laryngoscope and physical examination. Several instances of the former, occurring in patients under my care at the West London Hospital, I have recorded in the 'British Medical Journal' for May, 1863.

Many painful affections of the larynx, such as supra-glottic œdema affecting the false vocal cords and epiglottis, and ulcerations about the epiglottis or the aryteno-epiglottic folds, give rise to dysphagia. And also it occurs in a very painful form sometimes, in the destruction of the free portion of the epiglottis, and likewise in ulcerative exfoliation of the arytenoid cartilages. With regard to the latter, the pain and agony are so terrible that the unfortunate patient almost prefers starvation to the swallowing of any food that gives rise to attacks of what may be called dysphagic suffocation, a remarkable instance of which is described in Chapter I, page 42.

A curious cause of dysphagia is ossification of the muscles of the neck ; a remarkable case of the kind was shown to me at the Infirmary for Children at Manchester, on the 7th Sep-

tember, 1861, when there, by Mr. Lomas. The subject of it was a lad of fourteen, with general ossification of the muscles of the body, his case having been recorded in the 'Medical Times' of 20th April previous, by Dr. Skinner. He had had sore throat only two weeks when I saw him, and the extension of the ossification to the muscles of the neck had been most rapid. The muscles at the floor of the mouth, the deep muscles of the larynx, sterno-hyoid, possibly the thyro-hyoid, and many others, were in this condition. The larynx could scarcely be felt, it was drawn so much upwards and backwards. Deglutition was painful, but the voice was perfect. He could barely open the mouth half an inch, for the temporal muscles were ossified.

SECTION IX.—THE INFLUENCE OF THE BEARD ON THE THROAT.

So much has been written in favour of the beard, that it would be waste of time and space to say another word upon the subject, unless in its bearings as a prophylactic against sore throat and affections of the voice. What I have to say, however, is more particularly addressed to the clergy and to those who suffer from similar affections to which they are liable, as described in the first chapter of this work.

In the first place, the assertion is unhesitatingly made that the beard prolongs life and adds immensely to the general health and comfort of the individual. This assertion is not lightly made, but is the result of many years' close observation and experience of all classes of mankind. Many of those who live the longest possess their beards, a maxim which is not weakened by the fact that many, too, live long without the beard.

On carefully searching amongst the records of the older medical writers, with some exceptions, there is a noticeable absence of diseases of the throat, as we see them at the present

day, and why is this? Had not the presence of the beard something to do with it?

Of the great majority of cases of disease of the throat in the male sex that come before me there is an absence of the beard, and this is a predisposing cause of affections of the throat and air-passages. Let any one who possesses a luxurious beard shave it off in winter or in summer, and he will have a sore throat, mild or severe, according to the season at which he dispensed with his hirsute appendage, and, as not unfrequently happens, he will become subject to it.

Sore throat, in the ordinary sense of the term, must have been nearly unknown amongst the ancients, because they were not shavers. To take an example admitting of the fullest proof, a visit to the British Museum and an inspection of the Nineveh sculptures will show that that enterprising people the Assyrians, together with their enemies, wore beards. The Israelites, the ancient Egyptians, the early Christians, and the various orders of the Roman Catholic priesthood up to a century or two back, wore fine long beards. Reference is frequently made in the Old Testament to the beard. As a physiologist, my mind is as clearly satisfied that God gave us beards for a special purpose in the economy, as that our auricles were intended as collectors and modifiers of sound. Face-ache, coryza, some forms of ophthalmia, cutaneous maladies, and certain affections of the voice and throat, are prevented by the presence of the beard. In this age, when science has done so much for mankind, and the incurable has been converted into the curable amongst a large class of diseases, the common sense of the intelligent will in time overcome any foolish obstacles to the wearing the beard and even the moustaches, when it becomes generally known that they form a safeguard to the keystone to health, namely, the throat and entrance to the windpipe.

“That a defence of the beard should be necessary, is a melancholy sign of the times, showing a culpable ignorance of

physiology, to which may be attributed a very large proportion, if not all, the evils, physical and moral, to which we are so notoriously subject.”*

It has been a rule with me, after curing an obstinate example of long-standing follicular disease, or clergyman's sore throat, to recommend the beard to be grown, and, under certain circumstances, the moustaches as well, but I am content with the former. The good results of this practice can be proved by a large number of gentlemen now preaching in different parts of the country, for their cure has remained permanent and lasting; their liability to take cold in perhaps a large and airy church has been to some extent guarded against, and their general health has been excellent. It would not add to the force of my arguments to give the particulars of a considerable number of cases (which could readily be done, were it necessary), showing the most undoubted value and importance of the beard in throat-affections, especially after cure. The matter is so clear that an appeal to almost any member of our profession must be answered in the affirmative.

As showing the effect of removing a portion of the whiskers, the following may be mentioned:—A gentleman with a fine pair of whiskers and beard—and who at one time was the subject of pains about his face and throat before he wore these appendages—one day cut off that part of the whiskers in front of the ears running up towards the head. The hair there was about three fourths of an inch long, and formed a sort of protection to the parts. The result was that he instantly felt cold in his ears and the skin in front, and a severe neuralgia was the result, confined to the parts mentioned, which did not wholly disappear for some months—until, in fact, his hair had grown and attained a respectable length.

A very good instance illustrating the value of the moustache in chronic throat-disease, in the person of a medical man, is

* Lecture on the ‘Uses of the Beard,’ by Arthur Fisher, M.D.

recorded in the 'Medical Times' for 8th February, 1862 (p. 149). The sufferings of this gentleman were so great that he was on the point of giving up practice, until he allowed his moustache to grow, when his old complaint vanished.

CHAPTER IX.

THE VARIOUS AFFECTIONS OF THE TRACHEA.

THE literature of diseases of the trachea is so barren that, with the exception of croup, which is not a disease of this tube especially, scarcely anything is to be found that would help in writing an article on the subject unassisted by a large experience. In this latter view I hope to be borne out by other observers. Our museums furnish valuable evidence of some structural lesions, which I have availed myself of, although they are by no means common. In considering then affections of this important tube, they may be subdivided into the following sections :

1. Inflammation, acute and chronic.
2. Ulceration, hyper-secretion, and dryness.
3. Growths and tumours.
4. Alteration in form, dimensions, and structure, giving rise to obstruction.

SECTION I.—INFLAMMATION, ACUTE AND CHRONIC.

This is rarely to be witnessed in an acute form, unless associated with catarrhal or some of the other forms of laryngitis, when I have seen the lining membrane of the trachea in

the laryngeal mirror of an intense scarlet redness. Under such circumstances, it appeared to me that the dyspnœa was much increased. In the erysipelatous form of laryngitis, the trachea is more often involved than in any other, and such cases have come under my notice in the hospital practice of London. Ryland found the trachea and bronchi intensely inflamed in one instance, and he quotes an observation of Dr. Gibson (who described an epidemic of erysipelas at Montrose in 1828, p. 75), to the effect that "sometimes the internal fauces were attacked, and if it spread to the trachea it proved fatal."

It is occasionally associated with follicular disease of the throat, especially during the exacerbation of the symptoms, and pain is generally complained of down the front of the neck, associated with some dysphagia; minute red points are seen projecting from the inflamed surface, which presents more or less a shiny appearance, and at times minute florid vessels can be distinguished with the laryngoscope. The red points are the follicles of the mucous membrane, which become considerably enlarged if the case proceeds to a fatal termination, and are the source of the thick ropy mucus, sometimes purulent, which is coughed up, as in bronchitis. Generally the entire membrane is covered with a large number of minute florid vessels, closely packed together.

In some rare cases of so called croup in the adult, the entire tube has been found lined with a false membrane, as in the same disease in the child; this tracheal affection was generally concurrent with typhus fever, phthisis, pleurisy, or other disease.

Chronic inflammation the laryngoscope has demonstrated in my hands to be a common disease, much more so than could have been anticipated. In many cases of follicular disease the trachea was thus involved as far as could be seen, as described in some of the examples given in the first chapter. There is this peculiarity associated with this form of inflamma-

tion, it steals insidiously on and is not preceded by any symptoms of the acute stage. Many cases have been under my care wherein the throat symptoms have been found to depend upon chronic tracheitis, extending from the subglottis downwards, the vocal cords forming a sort of limiting boundary to its progress upwards. Occasionally, though it may be said rarely, this form of inflammation involves the larger bronchial tubes, as evidenced by unmistakeable physical signs. I have no doubt that in some examples of acute bronchitis, asthma and catarrh, tracheitis in a subacute or chronic form is frequently present.

In the laryngeal mirror the redness is sometimes vivid, but more usually it is of a dark red, and the vessels, if distinctly seen, possess a dark colour, simulating venous congestion. After death, these last have been discovered more or less varicose.

In an elderly lady who consulted me in October, 1862, with a capacious larynx, and who was subject to attacks of chronic bronchitis and dyspnoea, I found the trachea of a dark red colour as far down as the bifurcation, whilst the larynx above was normal. In a clergyman, aged thirty-three, from the West Indies, brought to me by Dr. Ogle, of Upper Brook Street, in May, 1863, for a throat affection, the trachea was observed to be extremely congested for as far as could be seen in the laryngeal mirror, terminating upwards in the subglottis; this gentleman suffered from pain at the root of the neck, with much dysphagia and dyspnoea at first, and some old bronchitis. A major in the army consulted me in July, 1863, for a peculiar smarting sensation in the throat, of a year's duration, for which no other lesion was found to explain, excepting a chronic inflammatory redness of the entire trachea, associated with some pulpy thickening, beautifully reflected by the laryngoscope.

These cases, with numerous others, were cured by showers of a solution of the nitrate of silver at first, and afterwards of

some other metallic solution, applied by means of the following beautiful instrument, which I have called a *laryngeal fluid pulveriser*, made for me by Weiss and Son, of the Strand. It consists of a curved tube of silver, with an India-rubber receptacle at one end, and a platinum capsule at the other, so finely perforated that the holes are invisible to the naked eye, yet permitting of the injection of a fine spray into the trachea throughout its entire length. I possess this invaluable instru-

FIG. 95.



ment in gold as well as in silver, for the use of solutions that are too corrosive on the latter. Its use in my hands does not produce any cough, and indeed most rarely even a spasm. I give the preference to the application of fluid agents with this instrument to the insufflation of powders.

I may here mention also, that I have had a graduated glass syringe constructed by Messrs. Whicker and Blaise, for dropping into the larynx or trachea any given quantity of a particular fluid, from half a drop to several drops. It is sometimes highly important not to exceed a certain quantity of highly concentrated or extremely active vegetable preparation, strychnine for example, or the Calabar bean.

In chronic tracheitis it will be found useful to combine some general supporting treatment with the local, as more likely to render the cure permanent. The cure is rarely obstinate when the local remedy is well applied, but I experienced some obstinacy in accomplishing it in a lady with the calcareo-atheromatous expression, close upon fifty-five, the wife of a well known practitioner in the City, who had been ably cured of a faucial affection by another medical gentleman. Her malady

now was shown by the laryngoscope to be chronic inflammation of the trachea and subglottis, associated with great irritability and spasm of all the muscles of the larynx; the vocal cords were quite natural. Persistent showers completely cured the tracheal malady, but there was a strong disposition to its recurrence, depending upon some constitutional predisposition. The voice and appearance of this lady pointed to extensive calcification of the laryngeal and tracheal cartilages, may be associated with coronary ossification. In swallowing, she had pain at the root of the neck and top of the sternum, with, as she stated, an invariable feeling of suffocation at night, as if she was going to be choked.

In July, 1863, an unmarried lady, *æt.* 56, consulted me, recommended by Dr. Surrage, of Wincanton, Somerset, for a throat malady which commenced with bronchitis. She was very nervous, because she had lost a sister from cancer; the mere act or motion of swallowing produced pain, but this was not so in eating. There was no dyspnœa, but a sort of tightness at the root of the neck; the voice was hoarse and weak in the evenings. Laryngoscopy showed a fine larynx, with feeble action of the vocal cords. The trachea was intensely congested on the right side only, and extending very far down. This I believed the cause of the sensations experienced, as the interval of a week's treatment fully verified.

In obscure and doubtful cases of throat disease, if no well-marked cause can be discovered to explain the symptoms, the trachea must be carefully examined, and this is generally easy, for this class of malady is commonly observed in elderly persons, who possess a large and capacious larynx, readily permitting of an extended view beyond the glottis.

SECTION II.—ULCERATION, HYPERSECRETION AND DRYNESS.

In long standing and unrecognised chronic inflammation, the lining membrane becomes thickened and indurated from submucous deposit, and is occasionally ulcerated. A frequent form of ulceration is in chronic follicular disease, when the follicles (previously enlarged) have ulcerated, and frequently extend over the entire membrane. These ulcers are very frequent in consumption, and a reference to page 81 will show that Louis found the trachea ulcerated seventy-six times in one hundred and ninety subjects, twenty-one in females and fifty-five in males. They are said to be more frequent in the lower half, sides and back, than elsewhere, which may partly depend upon the position occupied by the patient. I have seen instances, indeed some are preserved in the London museums, where the ulcers are so numerous, that they give to the membrane a sort of sieve-like aspect, as mentioned by Gross. In the museum of St. Thomas's Hospital is a striking illustration of phthisical ulceration of the larynx and trachea; in the latter, the membrane from top to bottom posteriorly is studded with numerous wart-like elevations; on the lateral and anterior surfaces the membrane is extensively ulcerated, laterally it extends in the form of two narrow bands as far as the bifurcation. The ulceration has exposed some of the tracheal rings, many of which hang loosely into the trachea, being attached only by one extremity. (W. 34.) This preparation is a pathological curiosity, but well shows the extent to which ulceration may proceed before destroying life.

The ulcers vary in shape, being mostly circular or oval, and seem excavated or scooped out; and in size they vary from a pin's head to that of a marble, but they are generally small in tuberculosis. When large and deep they are liable to lay bare the rings, as in the example just referred to; occasionally large portions of the membrane are destroyed, which is replaced by a thick indurated tissue. (See Section IV.)

Differing from the tuberculous, the syphilitic ulcer is generally isolated, large, and often very destructive from its sloughing tendency. A good example is preserved in the museum of St. Mary's Hospital (F. a. 8) of one large sloughing ulcer in the right subglottis, and another just above the bifurcation of the trachea, each the size of a shilling, the latter perforating the tube and laying bare the rings. The patient died of tertiary syphilis.

In the first chapter are several cases of the tuberculous ulcer extending into the trachea, and as a rule they are readily healed by topical treatment elsewhere referred to; whereas the specific ulcer requires constitutional measures in addition. If the ulceration has been extensive, and heals notwithstanding, it is liable to produce contraction of the tube, as described further on.

Hypersecretion and dryness are two conditions which I have occasionally observed as a result of chronic tracheitis, often associated with some thoracic affection; they require general treatment, and local measures according to the special indication. In the first of these matico has proved very serviceable, in the form of syrup or tincture, combined with other remedies, such as the tincture of sanguinaria or of senega; whereas, in the second, bromide of sodium, with antimony, tincture of veratrum viride, and glycerine, will readily afford relief, associated with a nightly pill of small doses of leptandrin and podophyllin.

SECTION III.—GROWTHS AND TUMOURS.

Whilst growths or polypi are comparatively frequent in the larynx, they are rare in the trachea; when they do occur, their general seat is upon the posterior, soft, unresisting wall. They originate usually in disease of the œsophagus, mostly of a malignant nature, and give rise to symptoms, which strongly simulate the laryngeal stridor of the pressure of an aneurism

upon the lower end of the trachea. If a diagnosis cannot be effected with the tracheoscope, we must trust to other signs to help us. The voice may not necessarily be lost, nor will there be paralysis of the vocal cords, although hoarseness will be a characteristic symptom. Even should aphonia be present, and both cords are seen to act fairly and evenly, yet without vibration, if the other co-ordinate evidence is clear, the probability is that there is a tracheal tumour. If, on the other hand, there is hoarseness, laryngeal stridor, or aphonia, and one cord is alone acting, and the other either wholly paralysed or sluggish in its action, the probability is that there is an aneurism, if to some extent corroborated by physical signs. The fact must not be forgotten, that the simulation of laryngeal disease, as evidenced by stridor, and hoarseness of a peculiar and striking tone, is oftener witnessed from aneurism than any other form of tumour.

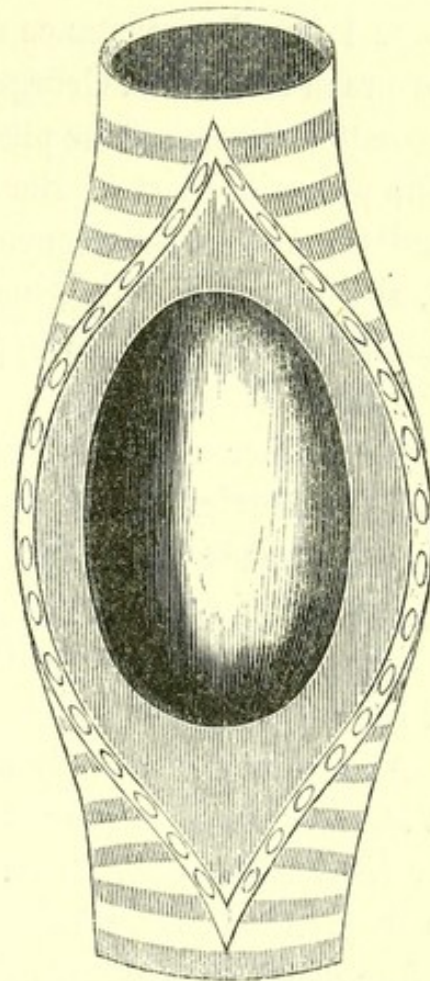
If circumstances are favorable, and the larynx is capacious and wide, it is quite possible to see in the tracheoscope the entire extent of the trachea, as has occurred several times to myself, wherein the diagnosis was doubtful until thus cleared up. But this is not always practicable, and the view is limited to the subglottis and anterior part of three or four of the tracheal rings. A case of the kind was sent to me on November 6th, 1860. The patient was a married woman, *æ*t. 53, the mother of eight children. About twelve months before she had slight dysphagia and dyspnœa, at first so slight as to pass unnoticed, till the month of June, 1860, when the dysphagia became severe, and every mouthful swallowed seemed to stick half way down; she had lived upon slops since June, and was much emaciated. The voice, previously hoarse, was now whispering; she breathed with a loud noise, and had much dyspnœa and orthopnœa. She had pain between the shoulders, and swallowed only a teaspoonful of fluid at a time, and very slowly, for it took some time to go down with a gurgling sensation. The left pupil was dilated

but this was present since she was eighteen years of age, and noticed by her friends. There was a diffused swelling at the lower part of the neck in front, and an enlarged gland behind and above the right clavicle. I examined her with the laryngoscope, and found nothing wrong with the larynx as far as the second or third tracheal ring; further I could not see, nor could I trace any cause for the dyspnœa, unless pressure upon the trachea, by the probably swollen and strictured œsophagus.

I persuaded her to enter a hospital, and at my recommendation she was admitted into University College Hospital, under the care of Dr. Jenner, on the 12th November.

Her case formed one of extreme clinical interest from the difficulty in diagnosis and the strong simulation of the symptoms to those of an aneurism pressing upon the trachea and œsophagus. She improved, could swallow better, and could lay down, but became much thinner. A very highly florid complexion remained constantly present. She left the hospital at her own request, January 15th, 1861, and died on the 1st February, and at the autopsy the œsophagus was found adherent to the vertebral column below the cricoid cartilage, where also the tube was much thickened and greatly constricted for about two inches. The upper half of

FIG. 96.



Tumour growing from the posterior wall of the trachea. The anterior wall is cut open to show its position and natural size.

the trachea was occupied by an oval tumour one and a quarter inch long, which almost wholly blocked up the tube, growing from its posterior wall, but encroaching on the centre and left side. It was blended with the œsophageal disease which proved to be infiltrated scirrhus. It is shown in the wood-cut of the preparation which is in my possession.

It would have been a great triumph to have diagnosed the tracheal tumour with the laryngoscope; its rarity, however, is such that it was not suspected. In all the museums that I have examined in this country, and elsewhere, in one only have I found an instance corresponding to the foregoing. It occurs in that of St. George's Hospital, and is labelled—"Carcinomatous disease of the pharynx, œsophagus and thyroid body." The posterior part of the trachea is perforated by the disease, and there projects a cancerous tumour resembling the figure 8, about an inch long, but it is flat and does not fill up the calibre of the tube; its upper end is on a level with the cricoid cartilage.

One other case of tracheal tumour has come under my notice, wherein a small cyst projected from the anterior wall of the trachea of a woman, which subsequently burst. She had dysphagia and aphonia. I have not seen her for some months, and therefore shall refrain from going into the details of her history.

A curious case of polypus of the trachea is recorded by Dr. W. C. B. Fifiield, in the 'Boston Medical and Surgical Journal' for November 14th, 1861. The patient was a female, subject to frequent attacks of dyspnœa during life, and for four days before death she sat with her forehead on the back of a chair. The left bronchus was found perfectly covered by a firm rosy polypus the size of a small grape; the pedicle was attached to the trachea, at the mouth of the bronchus, it had acted as a ball-valve, allowing expiration, but forbidding inspiration. No other polypi were seen, nor disease of the lungs.

The points to be borne in mind in the diagnosis of a

tracheal tumour are the strong simulation of the symptoms to aneurismal pressure, which sometimes again so strongly imitate those of laryngeal obstruction that tracheotomy has actually been performed to afford relief. This I have known to be done. If the diagnosis can be made out, the only possible mode of getting rid of the growth is to lay open the trachea, and after its removal, the base, if large, must be freely cauterized with the solid nitrate of silver, and the wound in the neck closed with silver sutures, to prevent suppuration.

SECTION IV.—ALTERATION IN FORM, DIMENSIONS, AND STRUCTURE, GIVING RISE TO OBSTRUCTION.

Alteration in the size and form of the trachea is mostly due to the influence of compression exercised from without, as for instance when a large bronchocele occupies one or both sides of the neck, and so surrounds the tube as to compress it laterally and leave a longitudinal fissure for the purposes of breathing. Many such instances I have seen during life, and examined the parts involved after death; they are by no means rare in the London museums.

Aneurisms of the arch of the aorta when of large size, or of its three great branches, compress the lower end of the tube and give rise to stridor. Enlargement of the cervical or other glands in leucocythemia lymphatica, I have known to encroach upon the tracheal walls. Deep seated disease of the neck, infiltrated or otherwise, and involving some of the special parts, such as the œsophagus, associated with tumefaction, the result of tumours, abscesses, or malignant disease, will compress the trachea from behind forwards. Parotid tumours displace and compress the trachea. I have seen with the laryngoscope the tube bulged inwards by pressure of a bronchocele, and have given a drawing of such a case in another part of this book. There can be no difficulty in the diagnosis when the presence

of the tumour or other cause is distinct. Under all these conditions the calibre of the tube is not only diminished sometimes almost to obliteration, but its form is necessarily altered.

Tracheostenosis.—The *dimensions* of the trachea, again, are much impaired, as the result of ulcerative disease or submucous thickening within the tube, when a *stricture* forms of varying length, but mostly short, yet nevertheless serious and inconvenient. The variety of ulcer which is most generally followed by a cicatrix is the syphilitic and tuberculous. The former is that commonly seen, for in the latter the patient generally succumbs from the lung disease before the ulcer has had time to heal up. If the ulcer is circular, *i. e.*, encircles the calibre of the tube, in healing it will form a circular cicatrix, but if on one side, the cicatrix is confined to it, and the contraction is irregular.

In the 9th volume of the 'Guy's Hospital Reports,' published in 1863, is a plate showing contraction of the trachea by means of a fibrous band from syphilitic ulceration. There is another plate in the same volume showing circular contraction of one of the larger bronchi from the same cause, illustrating a paper on syphilitic affections of internal organs, by Dr. Wilks. Both preparations have been examined by me. In the museum of the College of Surgeons is a preparation of contraction of the trachea from induration and old disease, which, I believe, must have been syphilitic, for the patient had worn a tube for years. Mr. Porter describes a case of contraction of the larynx and trachea for an inch and a half below the left ventricle of a poor woman, by means of a longitudinal syphilitic scar. Examples of syphilitic contraction are not scarce, but they are few in the London museums. The scrofulous contraction is much less common, and instances are extremely rare; one that I have examined exists in the museum of St. Mary's Hospital. The stricture is an inch and a half above the bifurcation, nearly an inch long, and is circular;

the tube is dilated above and below it, but it will barely allow the passage of a No. 8 bougie through it.

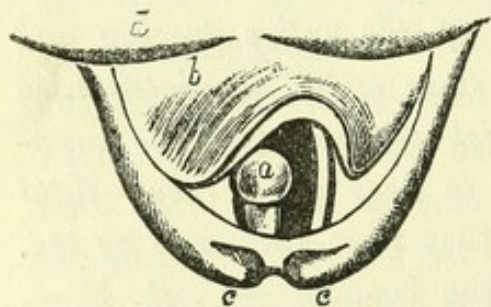
The sloughing ulcer of typhus, and ulcers following croup, are asserted to produce constriction if they heal up; an instance of the latter is at present under my care, where the upper end of the tube and lower part of the larynx are, for the present, obliterated from the consequences of croup, whether ulceration or otherwise I am not prepared to state.

The last and rarest cause of contraction is infiltration of the walls of the trachea at the expense of its calibre. In such a condition the entire tube may become involved, and undergo irregular contraction from top to bottom, and perhaps involve the larger bronchial tubes by continuity. The dimensions of the body of the tube will remain natural, but the walls are extensively hypertrophied, sometimes to the extent of half an inch, and the diameter of the tube, in some places, will not exceed a quarter of an inch. The following case is an example which occurred to me quite recently, wherein the tracheal disease was associated with the presence of smooth warty growths in the larynx, of the same nature as the deposit in the walls of the trachea.

CASE. Remarkable constriction of the entire trachea and larger bronchi, with thickening of their walls, associated with fibrinous growths in the larynx, which were seen with the laryngoscope; tracheotomy; inability to keep in a tube; fatal result.—The notes are given as they were furnished by Mr. W. Gandy, house-physician to the hospital:—C. R. M—, æt. 20, was admitted into Burdett ward of the Westminster Hospital, on the 22nd December, 1863, under the care of Dr. Gibb. He had been previously a patient at the Hospital for Diseases of the Chest, Victoria Park, under the care of Dr. Thorowgood, who, recognising the presence of serious laryngeal mischief, sent him to Dr. Gibb. A difficulty of breathing and a stridulous noise had existed for twelve months, with cough

and expectoration. He had lost his voice several times for weeks together, which he attributed to colds. On admission, there was severe dyspnoea, with a stridor or roughness on inspiration, some pain and severe constriction about the larynx, and a feeling of oppression at the upper third of the sternum, where he frequently placed his hand. His aspect was pale and wan; the features were drawn up with an anxious and careworn expression; he looked not more than sixteen, although twenty years old; was much emaciated; and his hands were long and thin, with clubbed fingers. He had a hard cough, with expectoration of a thick viscid mucus tinged with blood; the breathing was laboured, causing a peculiar croaking sound with each inspiration; at every paroxysm of coughing he had much pain in the lower part of the trachea, and great difficulty in expelling each pellet of mucus. There was harsh breathing in the apices of both lungs, and the breath-sounds generally were remarkably feeble, as if the free entrance of air was somewhat obstructed. The laryngoscope revealed a partially pendent and lopsided epiglottis, with the presence of growths on the right side of the larynx above the true vocal cord. When the larynx was expanded, both of the

FIG. 97.



- a.* The growths occupying the position of the right false vocal cord. The left true vocal cord is seen on the opposite side. *b.* The lopsided epiglottis. *c, c.* The arytenoid cartilages. *d.* The back of the tongue.

true cords could be seen, and the voice, although feeble and somewhat hoarse, was quite audible. During forcible expiration these growths were prominent, and appeared to occupy the position of the right false vocal cord, extending forwards to the root of the epiglottis. They were seen by Mr. Gandy (the house-physician), Mr. Holt-house, Mr. Firth, and several

of the pupils on various occasions; and the annexed woodcut

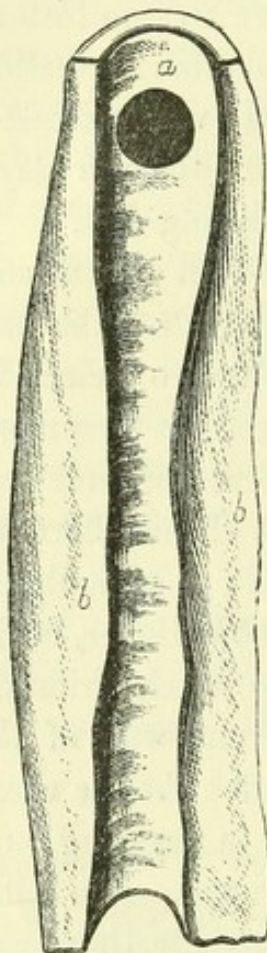
gives the appearance they presented. He was also examined at the hospital two days before his admission. No growths were seen below the cords, and the symptoms were believed to depend chiefly upon those present in the larynx, but they did not explain the feebleness of the breath-sounds. The dyspnœa was so great at times as to oblige him always to remain in the erect position. He had no dysphagia. There was no history of syphilis, although the disease was suspected from ulceration and purulent secretion of the left nostril. He was ordered a mild pectoral mixture, and iodide of potassium thrice a day; a solution of tannin to the larynx; and nourishing diet.

He improved a little, but the dyspnœa was still urgent and the cough became distressing. New-year's day Dr. Gibb had appointed for removing the growths, but about two o'clock in the morning he was suddenly seized with extreme dyspnœa; so urgent, indeed, that Mr. Holthouse was sent for, and tracheotomy was performed at four o'clock; but all his efforts to regularly introduce and keep in a tube failed. A gum-elastic tube some inches long, and the size of a No. 10 catheter, could be introduced; but it caused the patient so much irritation that it was withdrawn. A portion of the front wall of the trachea was removed, and the patient was left. At the usual hour of the visit, fresh attempts failed to get in anything, and it was clear that the trachea was much constricted. Dr. Gibb observed that the air scarcely entered, and the breathing was quite inaudible over the bifurcation of the trachea and larger bronchi. The patient died at a quarter-past nine in the evening, chiefly from asphyxia.

Autopsy, seventeen hours after death.—The lungs were engorged with blood, with a few scattered miliary tubercles here and there quite recently deposited; the liver had one or two small white nodules on the surface; the genital organs appeared natural, as well as the other viscera. The tongue, larynx, trachea, and bronchi were removed for careful examination. The œsophagus was healthy. The epiglottis, from its root to

half way upwards on either side, was occupied by a number of flattish, fibrinous bodies, which partook of the character of warts; two or three, the size of small peas, smooth and round, were present on the right side of the larynx, involving the false vocal cord, and were those seen during life. The ven-

FIG. 98.



The trachea laid open from behind. *a*. The opening of the operation. *b, b*. The walls greatly thickened, and drawn of the natural size.

tricles of the larynx were unobliterated, and the larynx was unobstructed below the vocal cords; the mucous folds everywhere, but especially the aryteno-epiglottic, were very loose. The trachea was greatly thickened, and its tubal diameter much contracted; the anterior walls about its middle were half an inch thick, thinning upwards, but less so downwards. This thickening involved the right bronchus, and slightly the left. About half an inch from its commencement the contraction began, and below the wound its diameter was a quarter of an inch, and this continued nearly all the way to the bifurcation, where even the walls were two lines thick. The diameter of the left bronchus at its commencement was about two lines, and its lining membrane was intensely inflamed, with several ulcerated patches. The rings of the trachea could not be distinguished from within, for the whole of its interior was irregular and

uneven from fibrinous deposit. Dr. Wilks kindly confirmed this with the microscope, for he found a tough simple, fibrous tissue presenting the ordinary characters of such material, with small nuclei amongst it. The entire disease was similar in composition.

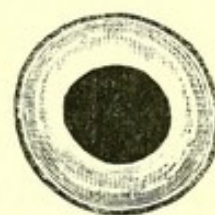
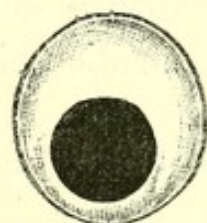
Since the foregoing was written, Mr. Meldola, of Victoria Park, has informed me, that the lad was under his care eighteen months before he went to the Victoria Hospital for the chest. He had contracted the poison of glanders from a glandered horse, and had a purulent discharge from the nose, which extended to the throat. Repeated attacks of laryngitis ensued, with deposits of lymph, and finally ending in permanent dyspnœa.

The foregoing truly remarkable case was published in the "Hospital Mirror" of the 'Lancet,' and was characterised as unique in the annals of medicine. Although the dyspnœa was chiefly tracheal, yet there were three causes giving rise to it, namely, the laryngeal growths, constriction of the entire trachea, and both larger bronchi. These peculiarities will long render it not only a very instructive case, but one of the most remarkable that has ever been placed upon record.

Dilatation of the trachea is liable to occur under two varieties of form, according to Gross. In the first and most common, the walls are atrophied and its calibre increased in diameter, sometimes a fourth or even a third beyond the normal state. It seldom involves the whole tube, is common in old subjects, and usually associated with marasmus and pulmonary emphysema. This I have often witnessed, as well as in asthma, phthisis, old bronchitis, &c.

In the second form the dilatation is *saccular*, confined to the posterior wall of the tube, and consists in an extrusion of the mucous membrane across the muscular fibres, which are usually florid and hypertrophied, while the yellow elastic tissue behind them is wasted and hardly perceptible. The mucous lining is itself thickened, and sprinkled with enlarged

FIG. 99.



Horizontal sections of the trachea in different parts of its course.

follicles. The number of sacs varies, in some places from one to three, at others they extend the whole course of the tube, even into the bronchial tubes. In shape they are round or oval, and in size rarely exceed a cherry or filbert. This form of dilatation is generally produced under the influence of chronic inflammation of the mucous membrane.

CHAPTER X.

EXTRANEOUS SUBSTANCES IN THE THROAT.

SECTION I.—WORMS IN THE AIR PASSAGES.

THE nose and frontal sinuses, the pharynx, the larynx, the trachea, and the bronchial tubes have been occupied by some of the varieties of animal parasites, and as their existence should not be overlooked, a brief notice is accorded to them in these pages.

In 1610, Fulvius Angelianus and Vincentius Alsarius observed some parasites expelled from the nose of a patient by sneezing, which Leuckhart and others regard as a species of *Linguatula*.* This is the sole instance on record of these animals being found free in the air passages of the human subject, although existing in other parts of the body.

Various species in a matured state live in the frontal sinuses, larynx, trachea, and lungs of mammalia, or in the lungs of various lizards and snakes. They are said to be common in Brazil.

In 1845, an army surgeon named Jortsits found *Strongyli* in the substance of the lungs of a boy six years old; and in 1790 Treutter found them an inch long in the enlarged bronchial glands of a man aged twenty-eight.

* Kuchenmeister 'Manual of Parasites,' Sydenham Society, vol. ii, p. 8.

In 1854 Dr. Bristowe exhibited before the Pathological Society some specimens of minute worm-like entozoa forwarded by Mr. Rainey. They were met with in the larynx and trachea of a female who had died from an injury to her lower extremities.

When recently taken from the larynx with some of the epithelium coating its mucous membrane, and placed between two pieces of glass, these animals were seen by the microscope to be in vigorous motion, the larger end always moving before the smaller one, and therefore, Mr. Rainey wrote, leaving no doubt as to which was the anterior and which the posterior extremity.

After being left in this state for some time, their motion became more slow and feeble, and at last they were quiescent, some of them remaining coiled up, and looking very much like a small trichina when in its cyst, others being much less coiled or nearly straight.

The worms measured $\frac{1}{50}$ th of an inch in length, and about $\frac{1}{500}$ th of an inch in thickness, and a specimen is figured in the 6th volume of 'Pathological Transactions,' to which I would refer the reader for a fuller description.

Hydatids have found their way into the larynx and trachea through perforation of one of the bronchi; but they are extremely rare.

Dr. Edwards Crisp, a high authority on the subject, believes that Mr. Rainey's worms may have been the embryos of some nematoid worm. If his view is correct, then their increase in size, had life continued, would have given rise to distressing symptoms, which the laryngeal mirror alone could clear up. In his essay on the 'Lamb Disease of which Parasites in the Lungs are generally the cause or consequence,'* he mentions that Mr. G. Patterson (one of the Russian Commissioners at the International Exhibition of 1862) informed him that this lamb

* The 'Prize Essay of the Bath and West of England Agricultural Society,' pp. 15 and 37.

disease is well known in Polessye, or the boggy woodlands of the western provinces of Russia; and moreover, that a disease in the human subject, supposed formerly to depend upon laryngitis, is occasioned by the presence of these parasites. Neither Dr. Crisp nor myself have been able, however, to meet with an account of it in any of the foreign journals. Its interest and importance is such that it is well worthy of careful investigation.

In Dr. Crisp's essay, he mentions the existence of *strongyli* in the windpipe and lungs of lambs and sheep, as sometimes very numerous; the smaller tubes are crammed with them, and they exist generally in masses, some spots being preferred to others. In the substance of the lungs, tubercle-like masses exist, chiefly at the lower parts, containing thousands of the young worms.

In old sheep he has found the exclusion and destruction of masses of these parasites by the formation of a bony and calcareous wall around them, the dead worms possessing a dark colour. This phenomenon he has figured.

The bronchial tubes of the porpoise are often crowded with nematoid worms: in those of one dissected by Dr. Crisp, a vast number of *eustrongyli* were found, about eight inches long.

Strongyli exist in the lungs of the calf, the pig, and in the windpipe of chickens, pheasants, partridges, and grouse. Dr. Crisp gives the magnified sketch of the trachea of a young pheasant filled with thousands of these monsters, which, besides depriving the part of its natural secretion, obstruct the passage of the air, and ultimately occasion suffocation.

I am thus particular in mentioning these, in the event of their being discovered in the air passages of children or adults. It would seem, however, that they must be remarkably rare, and any observations upon their treatment would be superfluous. In animals, inhalations of sulphurous acid gas, chlorine, the vapour of turpentine, and tobacco smoke are prac-

tised ; and in birds, Dr. Crisp has injected a small quantity of salt and water into the windpipe ; and he has introduced into the windpipe a *very small* silver canula, having a stilette with a piece of sponge at the end. The canula is passed to the bottom of the trachea, the sponge is pushed out of the canula by means of the stilette ; the canula is withdrawn, and the sponge is pulled up, bringing the worms before it. The open and uncovered state of the glottis in birds, renders this plan easy of accomplishment.

A tricocephalus was discovered in a dead soldier at the Military Hospital, at Fort Pitt, Chatham, and was embedded in the left tonsil enlarged and in a gangrenous condition.*

The consideration of vegetable parasites in the air passages is for the present postponed.

SECTION II.—FOREIGN BODIES IN THE PHARYNX.

Various bodies become lodged in the pharynx and upper part of the œsophagus, and if not too far down they can be seen in the laryngeal mirror, and then removed. Large lumps of food, pieces of money, fish bones, pins and needles, artificial teeth, and numerous other substances have been impacted. The fossæ at the root of the tongue, on either side of the frænum of the epiglottis, is a favourite site for small objects which give rise to much irritation. Even larger bodies have become lodged in the same situation between the tongue and epiglottis ; Mr. Paget lately recorded an instance wherein a gold palate-plate with nine artificial teeth was impacted in that situation in a gentleman aged sixty, for the long period of three months, and had actually lain out of sight for that period of time.† The patient referred to the parts about the cricoid cartilage as the place of obstruction in swallowing.

* Dr. Abbotts Smith on 'Human Entozoa.'

† 'Med. Times,' January 16th, 1862 (with a plate).

A somewhat similar case occurred to a policeman who was running to catch an omnibus, and fell down dead as he reached it. He was taken to St. George's Hospital, and, quite accidentally, three false teeth with a metal frame were found lodged in the same situation as in Mr. Paget's patient.*

On either side of the larynx is a groove or fissure, readily seen in the laryngeal mirror, which is a favourite locality for fragments of food, raisin stalks, and other substances. They can be seen usually in the mirror, and if not they can be felt with the finger. The fissure has the pharyngeal wall on the outer side, and the fold of the epiglottis on its inner, and generally the horn of the hyoid bone can be felt at the bottom. From this situation, on the right side, I removed a pin from a gentleman, *æt.* 72, with the aid of the laryngoscope in 1861, who was drinking some water out of a tumbler; he kept quiet, ate no breakfast, and came at once to my house. This case is noticed in Mr. Durham's article on the laryngoscope in the third volume of 'Holmes' System of Surgery,' p. 257.

In May, 1861, I discovered, with the laryngoscope, the opening of entrance of a pin, at the anterior extremity of this groove on the right side, in a married woman *æt.* 31, sent to me by Mr. Critchett. There was induration on the right side of the neck, at the part corresponding to the seat of pain in the upper part of the right half of the hyoid bone. The last time I saw her was on the 13th July, 1863, and believe that the pin is still lodged in the base of the tongue.

On the 9th January I examined a woman for Mr. James Lane, who had swallowed a pin a few days before. It could be felt in the left side of the neck, close to the thyro-hyoid ligament, and the laryngoscope revealed to us both the opening of entrance in the sulcus to the left side of the epiglottis. The larynx was quite normal.

A fourth pin case is given in the next section wherein it was lodged in the larynx.

* 'Lancet,' November 20th, 1862, p. 591.

Behind the tonsils when enlarged is another spot where substances lodge. The tonsils themselves are often perforated by sharp bones, bristles, &c. On the 23rd June, 1863, a gentleman was brought to me with severe sore throat, and pain in his left ear, forehead, and down left side of the neck, from the lodgment of a tooth-brush bristle in the left tonsil. Its point could be felt with the finger, and with the aid of the pharyngoscope and a powerful light this could be barely seen, yet it was laid hold of and extracted with fine forceps; the previously alarming symptoms immediately subsiding.

There are sometimes two or three loose folds running from the root of the tongue to the epiglottis, and when such is the case, they commonly secrete particles of food, and fish-bones often perforate them. I have had two cases of halfpennies in children; both were lodged in the œsophagus, and were then swallowed. One was subsequently passed per anum, and had lost more than half of its weight by the acids of the stomach. The other child, æt. 6, who swallowed the coin on the 12th September last, has not yet ejected it.

In January, 1863, a young lady was brought to me by Mr. W. Hodson Rugg, with symptoms of laryngeal obstruction, which were found to depend upon probably laceration of the coats of the œsophagus from swallowing some meat-pie crust. The larynx was unobstructed. She afterwards had a sharp attack of pharyngitis.

The value of the laryngeal mirror is incontestable in these cases, for it reveals the foreign body if present, and renders its seizure and extraction an easy proceeding, with simple curved forceps.

In the 'British Medical Journal' for 22nd March, 1862, are the details of an interesting instance of removal of a copper penny from the œsophagus, by Professor Syme, who performed the operation (very rare now a days) of œsophagotomy, with most complete success, after a lodgment of three months. The coin had produced no ulceration.

SECTION III.—FOREIGN BODIES IN THE LARYNX AND TRACHEA.

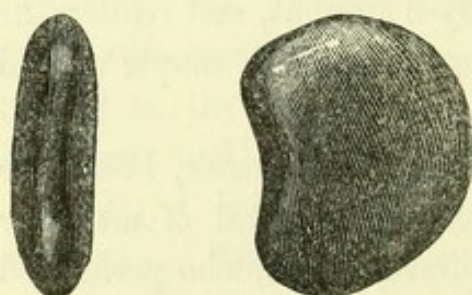
Mr. Erichsen has most pertinently observed that foreign bodies are not introduced into the air passages by any effect of deglutition, for no substance can be *swallowed* through the glottis, but they are *inhaled*. This is certainly true, and if any substance is held in the mouth, a sudden inspiration will draw the body into the larynx.

The exception to this observation of Mr. Erichsen is swallowing foreign bodies sometimes through the glottis, when its protector, the epiglottis has been destroyed, or where a fistula exists between the œsophagus and trachea.

In talking whilst eating, the glottis is necessarily open, and there is the risk of sudden inhalation of bodies, especially if laughing occurs. The variety of substances found in the larynx is much greater than is seen in the pharynx, and a bare enumeration would occupy pages. In the museum of St. Thomas's Hospital there are preparations of a muscle shell, quartz pebble, and trachea tube, lodged in the larynx.* In St. Bartholomew's is one of a pill beneath a child's vocal cords. Nut-shells, cherry-stones, pebbles, buttons, fish bones and pins, are perhaps the most frequently lodged. My colleague, Mr. Power, successfully removed a large stone from

the trachea of a robust Irish labourer, æt. 45, on the 23rd of July, 1863, who on the same day suddenly inspired it whilst in a stooping position. He was in the habit of sucking it when at work, and applied at the Westminster Hospital the same day to have it cut out, although breathing

FIG. 100.



Pebble removed from the trachea.

* Preparations 8, 9, 10.

quietly. It was removed from its position near the bifurcation by placing the man on his belly, causing him to inspire deeply, then to cough, slapping him smartly on the back at the same time. This process was successful, and the stone ejected was of the size and shape represented in the woodcut.*

The practical value of the laryngoscope is well shown in the two following cases, in the first of which I saw a piece of nut-shell in the larynx and in the second a pin. In the latter I removed the foreign body myself, with results that show how we may in many cases wholly dispense with the operation of opening the trachea.

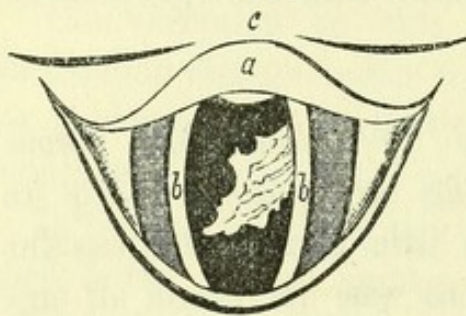
CASE. *Impaction of a piece of walnut-shell below the glottis, seen by the aid of the laryngoscope.*—Up to the time of my examination of the little patient who was the subject of the following case, there was no record of any instance of the lodgment of a foreign body in the larynx being verified by the laryngoscope, and therefore proved by actual visual evidence. It is fair to assume, therefore, that it is the first instance wherein this new appliance was made use of for the diagnosis of an impacted substance.

Through the kindness of Mr. J. W. Turner, of Lower Phillimore Place, Kensington, I was requested to examine with the laryngoscope, a lad of 13, the son of Captain C., on the 19th of November, 1862. Some months before, when at dinner with the family, a piece of walnut-shell became lodged in his larynx, and after six weeks of occasional paroxysms of cough, he had a severe attack of laryngitis, necessitating the operation of tracheotomy, which was skilfully performed by Mr. Paget. This at once relieved the urgency of the symptoms, yet did not effect the removal of the offending cause, which Mr. Turner believed must be still lodged in the sacculus of the larynx. I employed the laryngoscope with the patient sitting up in a chair near the fire, and had a good view of the parts, the

* See the 'Lancet,' September 5th, 1863.

mirror being very well borne against the uvula. At first there was spasm and resistance, but this wore off and the larynx was found to be clear of obstruction above the vocal cords, which were mostly approximated. A curved canula passed through the tracheal wound from below upwards readily felt a foreign body, manifest both to Mr. Turner and myself. Its position was shifted, and another view was taken of the larynx, and this time one end of the walnut-shell could be distinctly seen

FIG. 101.



a. The epiglottis. *b.* The vocal cords, with the piece of nutshell between, projecting across the glottis from left to right. *c.* The back of the tongue.

below the vocal cords, projecting in the middle, across the rima from left to right, as represented in the engraving drawn at the time. Several efforts were made to dislodge it from below without success, but its position must have again become changed, for it could not be seen from above, chiefly owing, however, to closure of the glottis. It was apparently jambed in the sub-glottic space, and could not

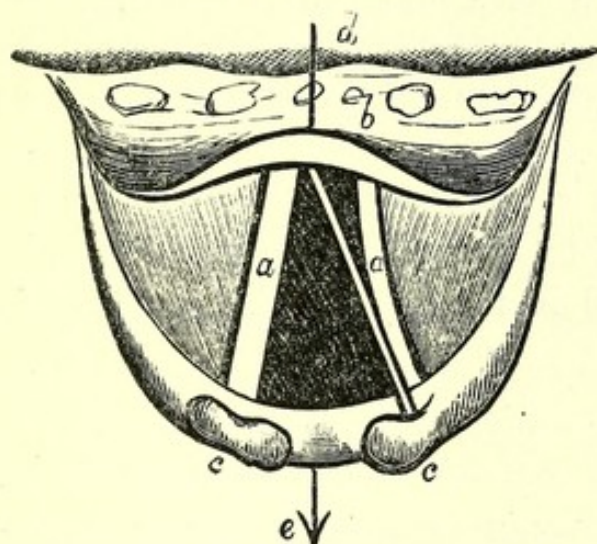
be detached, even although the patient was under the influence of chloroform. We thought it prudent not to interfere further. The ashy-grey appearance of the foreign body, bathed in secretion, was very striking.

On a subsequent occasion Mr. Paget enlarged the wound upwards, and passed his finger through the glottis from below and also from above, and felt no body then remaining. In conversing with him about the case in the middle of January, he coincided with me in the opinion that it had been coughed up before the second operation, and probably swallowed.

I subsequently learnt that the wound had perfectly healed, and the young gentleman was never in better health in his whole life.

CASE. *Lodgment of a pin across the larynx transfixing the left arytenoid cartilage, seen with the laryngoscope and removed by the aid of the same instrument.*—A gentleman, æt. 64, was brought to me in July last, about 5 o'clock, p.m. About two hours before he drank a glass of water which contained a pin, and in endeavouring to eject it from the mouth it slipped into the larynx, where it became lodged. The most violent fits of suffocating spasm ensued at first, and recurred every few minutes. Inspection with the laryngoscope was difficult, but with firmness and perseverance it was effected, although the tongue was much swollen. The pin was seen running from before backwards, one end transfixing the left arytenoid carti-

FIG. 102.



a, a. The true vocal cords, on the outer side of each of which are seen the false cords with commencing swelling. *b.* The epiglottis. *c, c.* The arytenoid cartilages, the left is pierced by the pin seen running from before backwards. *d.* Back of the tongue. *e.* An arrow running through the centre of the larynx, to show the deformity caused by the pin on the left side.

lage, and the other lodged at the root of the epiglottis between the origin of the two vocal cords. The entire larynx was intensely congested, of a bright scarlet redness, and œdema was about commencing; the true vocal cords were purple, the right only acting spasmodically, whilst the left was loose and

flaccid, giving an irregular outline to the disposition of the parts as shown in the drawing. An arrow indicates the median line. With the assistance of two friends of the patient, who held both him and his tongue, and with the aid of the laryngeal mirror and a pair of reliable forceps made by Luer, of Paris, the pin was fortunately seized the first time the instrument was introduced, and extracted. The recovery of the patient was like magic, and nothing untoward happened.

I may observe that I felt beforehand everything depended upon the firmness of hold with which the forceps would retain the pin if caught, else it might not be readily extracted. In certain cases the wire of my laryngeal ecraseur would be convenient to lay hold of a projecting foreign body. Usually if a body is retained, suppuration ensues, although cases are recorded where a ducat continued two years in the larynx,* and a piece of nut-shell as large as a finger nail, was lodged for seven years.

In the Guy's museum are pieces of tape and apple-core removed from the larynx, and a preparation with a sharp piece of bone lodged in the larynx which could not be removed by tracheotomy.

SECTION IV.—THE OPERATION OF TRACHEOTOMY FOR DISEASE, &c.

In comparing the operations of tracheotomy and laryngotomy, surgeons have almost invariably given the preference to the latter for various reasons, and amongst others, because the air-tube is always opened below the seat of obstruction, and there can be no necessity to make an aperture further from the seat of disease. Granting that this is so, the laryngoscope has revealed the fact that disease confined within the cavity of the

* Hochstetter and Tulpius, quoted in 'Meckel.'

larynx does not heal so kindly nor so speedily as when the trachea is laid open; in some cases this is remarkably evident and seriously impairs the action of all the vocal ligaments and muscles. However powerful the arguments in favour of laryngotomy (and none can be more so than those given in the valuable paper of Mr. Prescott Hewett, in the 'London Journal of Medicine,' for 1849), they are essentially weakened from the revelations made by the aid of the laryngeal mirror when the cases can be watched in their progress after the larynx has been laid open. Cases in illustration are scattered throughout this work. In no class of cases is tracheotomy more demanded, in preference to the other mode, than in syphilitic laryngitis, for not unfrequently the cavity of the cricoid cartilage becomes partly filled up by fibrinous material.

The obstacles sometimes to tracheotomy are considerable, at others trivial, and occasionally it can be completed within a single minute, as I have seen practised in the hands of some surgeons, without a drop of bleeding. But for the future in cases of severe laryngeal disease, if the trachea can be opened *immediately below the cricoid cartilage*, providing there are no dangerous obstacles present, it should be done in preference to laying open the crico-thyroid space.

It will be remembered how frequent is tracheotomy in the child, and it is a far more difficult and dangerous operation than in the adult. It is in the adult that it is required for laryngeal disease, often chronic, and therefore it should be performed upon the principle of giving as much rest to the affected parts as possible, and this cannot be always, indeed I should say never, obtained in laryngotomy. Before very long this principle will become generally recognised, and its adoption general.

It is foreign to my purpose to enter into the mode of doing the operation, but from what I have seen, the hook is invaluable. Langenbeck's double hook, an instrument well known to the profession, is one of the most convenient and simple

that could be used, and every physician as well as surgeon should possess one in case of any dangerous emergency.

Canulæ are sometimes worn for months or years, and when made of silver they require to be periodically removed and cleansed, else they oxidise and are liable to break off in the trachea; this I nearly saw happen in 1861, at Guy's Hospital, to a woman, aged forty-five, who presented herself to Mr. Bryant. In the 'Dublin Medical Press,' for October 21, 1863, is published a case of asphyxia, which resulted from the fall of a canula into the air-passages.

In very young children, tracheotomy is a very fatal operation. Trousseau has observed that he has seen three children only recover after the operation for croup under two years of age. According to M. Roger, ('Arch. Générales,' April, 1862), 20 per cent. of the children operated upon at the Hospital for Sick Children in Paris, recover. When the disease extends below the bifurcation it is a hopeless remedy, although it should be tried. A larger proportion of older children die in England than in France, which Dr. Jenner attributes to the greater frequency of rickets in England, and consequently in the greater flexibility of the chest-walls in proportion to the age of the children.

Dr. Webster recently stated before the Medical Society of London, (October 19, 1863,) that in 1200 cases of tracheotomy throughout Europe, the result proved more favorable in girls than in boys, 22 per cent. of the latter and 25 per cent. of the former recovered. But much depended upon the age and season of the year; it was fatal under two and over seven, and favorable between three and six. I believe the operation would be less fatal in the young, if it could be done without the necessity of wearing a tube, which to my mind causes so much reflex irritation as to be the main cause of the fatal result.

In adults, when consulted as to the advisability of an operation, when necessary I have invariably recommended tracheotomy in preference to any other, for the reasons previously stated.

CHAPTER XI.

DISEASES AND INJURIES OF THE HYOID OR TONGUE-BONE.

A. DISEASES.

SECTION I.—INFLAMMATION AND ITS CONSEQUENCES, SUCH AS NECROSIS AND EXPULSION.

LIKE other bones of the body, the tongue-bone is subject to inflammation of its substance and its periosteal covering. This is perhaps one of the most general affections of this little bone, and gives rise to symptoms that are referred to the larynx. It may arise in the progress of syphilis, of scrofula, and of tuberculosis, and sometimes idiopathically without any constitutional taint. In the first-named disease, the primary inflammation is periosteal, which, according to its progress and extent, cuts off the supply of arterial blood to the body of the bone, which then dies; and if the patient be not suffocated, he fortunately escapes by the expulsion of the necrosed bone, sometimes in its entirety, at others, one half of it only. In the latter, the necrosis is limited to one half of the bone. The following are illustrations:—

No. 1. Necrosis and exfoliation of the left half of the hyoid bone.—In the museum of the College of Surgeons is “the left horn of an os hyoides, expectorated after necrosis and exfoliation,” from a woman *æt.* 28, who suffered from dyspnœa for two weeks, for which tracheotomy was performed. On the thirteenth day she coughed up this piece of the bone, and recovered well.

It is a good example of necrosis, and is quite porous in some parts; the figure shows its size and shape. It belonged to Robert Liston.

FIG. 103.

Necrosis of the
hyoid bone.

No. 2. Spontaneous expulsion of the hyoid bone.—This was the expulsion of the whole of the bone, from the description given of it by M. Rozart, of Bordeaux, before the Academy of Medicine, at Paris, in 1844. The patient was a lady, æt. 36, of scrofulous habit, and ill five years, until she coughed up the necrosed bone. She immediately recovered.

No. 3. Necrosis of the os hyoides, with ulceration of the pharynx.—This was in a girl, æt. 22, in Guy's Hospital, under Mr. Bryant, whose case is recorded in the 11th volume of 'Pathological Transactions.' She died, and the whole bone was found loose and detached.

In none of the foregoing was the disease syphilitic.

No. 4. Necrosis of the entire hyoid bone.—A case described by Mr. Spry some years ago in the 'Medical Gazette,' with extensive ulceration of the throat, in which the hyoid bone was expectorated entire. The patient died some weeks afterwards.

No. 5. Extensive ulceration of the fauces, exposing the left cornu of the os hyoides from syphilis.—The specimen is preserved in the museum of St. George's Hospital, and was removed from a patient who died of secondary syphilis.

No. 6. Illustration of how syphilitic or other disease may extend to the os hyoides.—This also is in the museum of the College of Surgeons; and the preparation seems to show the healing process after the bone was involved.

No. 7. Necrosis of the right horn and half of the body of the os hyoides from syphilitic ulceration of the tongue. Preserved in the museum of St. Thomas's Hospital.

No. 8. Necrosis of the hyoid bone from syphilis.—In a male patient in University College Hospital, in 1855. This was diagnosed during life, and laryngotomy was performed, with recovery. The man was a painter.

For fuller details of the foregoing cases the reader is referred to my monograph on the hyoid bone.*

* On the 'Diseases and Injuries of the Hyoid or Tongue Bone.' 8vo, pp. 48, 1862. John Churchill.

No. 9. Necrosis and expulsion of the right horn of the hyoid bone.—A lady, æt. 33, consulted me in June, 1863, who had had strumous disease of the lower jaw when a little girl, with caries of portions of it, which extended to the os hyoides, the right horn of which was destroyed. This had produced a tilting of the larynx to the left side, and a pressure of the tongue upwards. The larynx was normal.

A 10th case of necrosis with expulsion of one horn, occurred in the practice of Dr. Murchison, at the Middlesex Hospital, the particulars of which have not as yet been published.

CASE. Hyoid periostitis with suppuration.—In January, 1863, a gentleman, æt. 26, consulted me, recommended by Mr. Baker Brown. He had various anomalous symptoms about the throat and neck, with dysphagia; his food appearing to him to pass down only on the left side of the neck. He felt a something on the right side of the neck, which, on pressure, caused matter to flow out of his mouth, and he was easy. This was determined to be sub-periosteal suppuration over the right horn of the hyoid bone, as was confirmed by the laryngoscope, which revealed a fistulous opening at the back of the tongue, close to the right side of the larynx. He died of phthisis.

CASE. Periostitis of the right horn of the hyoid bone was present in a married lady, æt. 32, sent to me by Mr. F. M. Corner, of Poplar, December 7th, 1863. It occurred from straining of the muscles, from the lodgment of the bristle of a tooth brush in the pharynx. The symptoms were pain and tenderness on the right side, with enlargement of the affected horn quite manifest to the touch; there was dysphagia with fluids. The symptoms had been present six months, and quickly yielded to judicious treatment.

SECTION II.—SUB-HYOID ABSCESS.

The neck is subject to various and deeply situated abscesses in the areolar structures, the result of inflammatory and other causes; occasionally they occur in the vicinity of the hyoid bone, and by extension involve both it and the larynx. The symptoms are of the most urgent and distressing character, and frequently prove fatal. The most interesting example with which I am acquainted is preserved in the museum of University College, and well illustrates the ravages of an abscess in the neck. It has laid bare the thyroid cartilage and the hyoid bone, both in a state of necrosis.

In chronic abscess of the neck, matter may exist on either side of the larynx, extending from the hyoid region downwards towards the entrance of the chest. Now and then an abscess is met with immediately beneath the body of the hyoid bone, called by Jamain, *sub-hyoid*. It assumes an importance according to the depth at which it is situated, and should be punctured as soon as fluctuation is discovered.

SECTION III.—THYRO-HYOID INFLAMMATION AND ABSCESS.

Inflammation and abscess of the thyro-hyoid region have been particularly described by Sestier and Vidal. The precise seat of origin, according to both, is a mass of cellular tissue occupying a space behind the thyro-hyoid membrane, close to the base of the epiglottis. The suppurative inflammation of this part of the throat may be either idiopathic, or symptomatic, of an affection of the tongue, of the epiglottis, or of the thyroid cartilage, and leads to an œdematous infiltration into the neighbouring parts, the sub-epiglottic areolar tissue, and in that of the aryteno-epiglottic ligaments, and forces the epiglottis upon the superior orifice of the larynx. The importance of this form of abscess will be seen in the next section.

A thyro-hyoid abscess may be known by the presence of aphonia, difficulty of inspiration, turgescence of the face, intense dyspnœa, acute pain in the thyro-hyoid region, and by the distress experienced in swallowing and speaking. It extends towards the mouth, and its projection can sometimes be felt in the fossa between the base of the tongue and epiglottis, as well as seen with the laryngoscope, especially when it has pointed in that situation. M. Vidal recommends its puncture through the thyro-hyoid membrane. Leeches and mercurial frictions will be found useful at the commencement of the attack.

Such cases have come under my notice after the abscess has burst into the mouth at the base of the tongue, when I have seen deep and ragged openings on one side or other of the base of the tongue, secreting a good deal of pus.

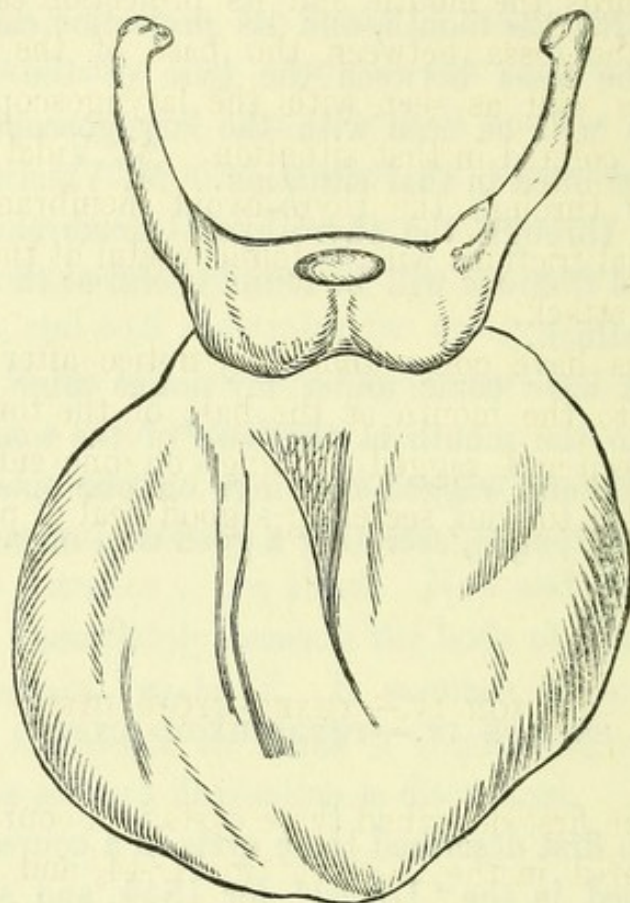
SECTION IV.—THYRO-HYOID CYSTS.

Mr. Liston first described these cysts in a course of lectures which appeared in the 'Lancet' for 1844, and subsequently they were noticed by Nelaton, under the name of *sub-hyoidean ranula*. Liston says they depend upon an enlargement of the bursa between the thyroid cartilage and the os hyoides. An old fellow-pupil of his, Mr. Mackenzie, used to suffer from this affection, and first drew his attention to the subject.

There is a curious specimen of this cyst in the museum of the College of Surgeons, of which I have made the following sketch; it is described in the first volume of 'Pathological Catalogue,' p. 64. The diameter of the cyst is over two inches, and it springs from the hollow at the posterior part of the body of the hyoid bone; it was loosely connected to the surrounding parts and filled with a thick grumous fluid, full of cholesterine, and was taken from the body of an old sailor,

who had had it as long as he could remember. This specimen is the one to which Liston has referred in his writings.

FIG. 104.



Cyst springing from the body of the hyoid bone and forming a tumour in the neck.

There is another preparation in the College Museum of enlargement of the thyro-hyoid bursa, also from Liston's museum (No. 1861), in which the cyst is as big as a small marble. And a third exists in the museum of the Charing Cross Hospital.

The treatment of these cysts consists of puncture and injection with iodine, the same as for hydroceles of the neck. Excision is not to be thought of.

SECTION V.—OSSEOUS TUMOURS OF THE HYOID BONE.

The only known case on record of hyoid exostosis is one described by Dr. John C. Warren in his 'Surgical Observations on Tumours,' in the following words :—

"A man came to my late father with an exostosis of the right cornu of the os hyoides, of a sugar-loaf form, about three inches in height. My father dissected the tumour to the os hyoides, exposed the bone, sawed it off near its base, and thus succeeded in curing the patient speedily and effectually."

SECTION VI.—TUMOURS ORIGINATING IN THE HYOID PERIOSTEUM.

The periosteum is a well-known source for the origin of tumours in various parts of the body, and that covering the hyoid bone is no exception to the general rule. It is to be feared, however, that the great majority are malignant. The examples which I have examined, as affording strong presumptive evidence of their having originated from the hyoid periosteum consist of two of medullary cancer and a third of fibrous growth.

In the museum of St. George's Hospital is a tongue affected with cancer, which projects backwards from the body of the bone, and presses the epiglottis flat upon the glottis. In St. Bartholomew's Hospital Museum is a medullary tumour developed within the base of the tongue, pushing the hyoid bone towards the thyroid cartilage; whilst in St. George's again the hollow of the hyoid bone is filled in with a fibrous tumour. All these are fully described in my work previously alluded to.

When more care is adopted in the post-mortem dissections

of this part of the throat, it is not improbable that by-and-bye many such examples as the foregoing may be met with.

SECTION VII.—EBURNATION OF THE HYOID BONE.

This is a rare form of disease (?) of this bone, and the only example of it with which I am acquainted is in the museum of the College of Surgeons. It is numbered 1830, and is described in the 'Pathological Catalogue' as

"The half of an hyoid bone completely ossified."—*Hunterian*.

On close examination, the bone seems to have become converted into a very hard and compact substance, and greatly differs from ordinary specimens. No doubt this attracted the attention of John Hunter, who preserved the specimen. I am at a loss to explain this condition, which resembles a piece of ivory. Could it be called syphilitic or gouty eburnation? Conjecture leans to the former.

SECTION VIII.—DISEASES OF THE THYRO-HYOID ARTICULATION.

A. *Relaxation of the ligaments producing dislocation.*—When we reflect upon the complicated movements of the tongue, and of the part that the tongue-bone plays in their performance, it might seem at first sight, especially to those versed in the minute anatomy of this bone, somewhat novel and surprising that it could by any possibility become dislocated. Nevertheless such is the fact; and a displacement of one or other of the cornua or horns of the bone is, perhaps, of more frequent occurrence than is imagined. This little bone is attached to eleven pairs of muscles, which are its elevators and depressors; it forms the base of attachment to numerous muscles in the neck, and is the principal support to the tongue

itself. The extremities of the greater horns of the bone, and the superior horns of the thyroid cartilage, are connected together by two round cords, which are known as the *thyro-hyoidean ligaments*. Usually they contain cartilaginous or osseous grains, which represent sesamoid bones in other situations, the knee-cap for example. An acquaintance with these facts is essential for the comprehension of the diseases of this articulation. The superior cornua of the thyroid do not possess synovial membranes, nor capsular ligaments, as in the slightly movable arthrodial joints, formed by the articulation of the inferior cornua with the cricoid cartilage, but owing to a natural weakness of the parts, or a general relaxation of the throat-muscles, the greater horns of the hyoid bone are liable to become dislocated, and most materially interfere with the movements of the throat and general comfort of the person so affected. Moderate violence will give rise to the same thing. Instances of each have come under my notice. The consequence of this is the formation of an abnormal pouch, or synovial capsule, around the thyro-hyoid articulation, which is liable to assume the diseased conditions of the natural joints.

In illustration of this, I exhibited a preparation before the Pathological Society of London, in April, 1859, which I had removed myself from the body, and carefully dissected. The case is published in the tenth volume of its 'Transactions,' and has been quoted in several recent works. The following is a brief outline of it :—

CASE. Hydrarthrosis of the left thyro-hyoid articulation, and dislocation of the hyoid bone.—A man, æt. 45, consulted me several times about his throat. He would feel a sudden click in the *left* side of his neck, which produced a sensation as if something was sticking in his throat; on examination, this appeared to me to depend upon a displacement of the left horn of the hyoid bone, and was generally reduced by throwing the head backward towards the *right* side, so as to stretch the muscles of the neck, and then suddenly depressing the lower

jaw, and so putting the depressors of the hyoid bone into operation. He died, some years after, of pulmonary consumption. On examining his throat after death, I found a sort of a pouch which answered the purpose of a synovial capsule, embracing the horns of the thyro-hyoid articulation. It was filled with a clear fluid, had a comparatively large, rhomboid, sesamoid bone, developed in its outer wall, and permitted an extraordinary amount of motion.

I regret now that I did not examine the nature of the fluid contents of the capsule, more particularly in regard to the presence of albumen.

The condition of the parts in the foregoing case readily explained the symptoms present during life, and was the fourth example which had come under my notice in the male sex. I have since met with dislocation in the female sex.

On the 6th of December, of the eventful year 1848, whilst residing in Paris, I was present at a meeting of the Parisian Medical Society, when a short paper was read by my lamented friend, the late Dr. Ripley, of Charleston, South Carolina, upon dislocations of this bone, especially illustrated in his own person, and the manner of reducing them. He described this process very lucidly, which I have seen him perform upon himself several times, when the dislocation was present: it consisted in throwing the head backwards as far as possible, so as to place the muscles of the neck upon the stretch, then relaxing the lower jaw, when the displacement becomes reduced, after a few attempts, with a click, at the same time gently pressing or rubbing over the displaced part.

The following is a well-marked instance in a female, in whom the dislocation was double :—

CASE. *Lateral dislocation of both thyro-hyoid articulations in a female from relaxation.*—Mrs. Sarah N—s, æt. 30, consulted me on the 7th May, 1861. She felt several “lumps” under the jaw, six months before, which caused some incon-

venience; they were diminished in size from the use of an embrocation. These "lumps" were accompanied by a feeling of pressure, with a pricking sensation, more particularly felt on twisting the neck to either side, lying down in bed, or when troubled with wind. Deglutition was affected. I discovered that she had lateral dislocation of both thyro-hyoid articulations; the grating of relaxation could be felt very distinctly on either side, and hence I inferred that the thyro-hyoid ligaments were shortened, and were probably surrounded with capsules.

The treatment to be pursued in this peculiar malady is, to reduce the dislocation in the manner that has been described, and to improve the general health, by the administration of suitable tonics, especially those that will give tone to the muscular fibre, because it is owing not unfrequently to simple relaxation from constitutional causes, that displacement occurs. When it has arisen from violence, such as forcible squeezing of the throat, or by garotting, if the bone is not fractured, and the muscular tissues not lacerated, better prospects of a permanent cure are held out than when it arises from relaxed tissues.

Several cases in addition to those mentioned have since occurred to me. In my essay on the hyoid bone I have given the details of one of displacement of the right inferior cornu of the hyoid bone from fright, in a woman aged sixty-five, kindly furnished me by Dr. Lewis, of Carmarthan. And I have noticed two instances described by Mr. Abercrombie, in his work on 'Diseases of the Stomach.'

B. *Inflammation of the thyro-hyoid ligaments.*—The commonest affection of the articulation under consideration, is inflammation, which is generally the forerunner of some of the other maladies to which it is liable. The inflammation usually commences in the small and delicate cord-like ligament which holds the cornua of the bone and cartilage together. Effusion of fibrine takes place within its sheath, and forms a tender and hard, oval or bean-shaped tumour, readily felt. If this is not

attended to early, the sheath becomes thickened, contracted, shortened, and then surrounds the terminal ends of the cornua like a capsule. The cornua then partially or wholly come into contact, and a tendency to dislocation of the newly-formed joint exists, and a peculiar uncomfortable pricking sensation is felt in the neck. If the inflammation of the ligament is subdued, there is the liability to its recurrence in some persons until the ligament has become obliterated.

In the 'British Medical Journal,' of May 9th and 16th, 1863, I briefly recorded seven cases of disease of the throat or larynx, associated with inflammation of these ligaments, and can here only recapitulate their titles.

1. Secondary syphilitic eruption, with sore-throat and inflammation of the right thyro-hyoid ligament.

2. Tuberculous ulceration of the larynx, in a case of advanced phthisis ; threatened rupture of the right thyro-hyoid ligament.

3. Bronchocele, dislocating the thyroid cartilage to the left side ; formation of a thyro-hyoid joint on that side.

4. Diphtheria supervening on syphilitic angina, with acute inflammation of the left thyro-hyoid ligament.

5. Cynanche tonsillaris ; inflammation of the left thyro-hyoid ligament.

6. Subacute laryngitis and follicular disease of throat ; inflammation of the left thyro-hyoid ligament.

7. Acute sycosis mentagra of three weeks ; inflammation of both thyro-hyoid ligaments.

A large bean or small Barcelona nut is the usual size of the inflamed ligament, which requires some bland or soothing liniment, and generally iodine internally to dispel it.

In a gentleman, aged thirty-one, sent to me by Dr. Wright, of Somerset Street, in September, 1863, the left articulation had been inflamed four months, and a gnawing sensation was complained of. In another male patient, aged forty-one, sent to me by Mr. Ernest Hart, in November, 1862, the left articu-

lation was inflamed co-incident with an attack of pharyngitis. On 15th January, a woman, aged twenty-three, presented herself to me at Westminster Hospital, in whom inflammation of the right ligament commenced the day before.

The indication for treatment will be usually regulated by the nature of the special throat affection associated with the inflammation, and according to its acute or chronic condition.

C. *Hydrarthrosis*.—As already mentioned, a combination of hydrarthrosis and dislocation occasionally occurs. It is a very singular anomaly in the economy, that a capsule should form around two movable extremities for the purpose of keeping them together, and thus constitute a joint, and that the small osseous grains present in the ligament between them should enlarge and perform the part of sesamoid bones.

If the membranous sac thus formed as a morbid product should become greatly distended with fluid and cause discomfort, and if the diagnosis is clear, it should be punctured with a very fine trocar and canula, and the fluid allowed to escape. It is an operation requiring great delicacy of manipulation, and a familiar acquaintance with the structures in this part of the neck.

This condition is present once in a while in phthisis, and may be looked for in long standing cases of chronic bronchitis and emphysema, and in certain forms of asthma.

D. *Anchylosis*.—The thyro-hyoid joints acquired in the manner described, undergo partial anchylosis in certain rare instances, as a process of reparation, and when such is the case, several of the osseous particles or grains will be found enlarged, and partake somewhat in the formation of the anchylosis. True, firm, and solid anchylosis is very rare, on account of the mobility of this part of the throat, and it would be found on one side only. This is a condition that, so far as my experience has extended, has not yet been detected during life, although I have met with three instances wherein I suspected that it was present.

E. *Spontaneous rupture of the ligaments.*—If inflammation of the thyro-hyoid ligament is associated with suppuration or ulceration, which sometimes happens in advanced pulmonary tuberculosis, which perhaps may have invaded the larynx, the ligament (usually one only) is liable to become spontaneously ruptured. This occurrence will be known by the feeling experienced by the patient of something suddenly giving way, followed by the wide separation of the larynx and hyoid bone on the affected side, and the discovery of the horn of the hyoid bone floating loose beneath the skin. It is a lesion unfortunately that cannot be remedied by the resources at our command.

SECTION IX.—GENERAL DISPLACEMENT OF THE ENTIRE
TONGUE BONE.

It seldom happens that tumours of the neck exercise pressure upon the larynx or hyoid bone unless they have attained to a considerable size. Those originating in the submaxillary, sublingual or thyroid regions, more than others involve the upper part of the larynx and base of the tongue. Not only do the larynx, trachea, and hyoid bone become displaced by these tumours, but they become altered in form, compressed, and somewhat flattened. Tumours springing up in the submaxillary region, in the hollow that exists on either side of the neck, between the greater cornu of the hyoid bone and the upper and lateral borders of the thyroid cartilage, are especially dangerous, for as they increase in size they nearly obliterate the aperture of the larynx. A case of this kind occurring to Dr. Wm. Tindal Robertson, of Nottingham, is given in the section on cancer; I examined the specimen, which consisted of a tumour the size of an orange, figured at page 277.

In my essay I have given seven examples occurring in the London museums of displacement of the hyoid bone in various

directions, by different varieties of growths. Prolapsus and protrusion of the tongue, and contraction of the neck from burns, are other causes of displacement.

SECTION X.—DISEASE OF THE HYOID BONE OR ITS COVERING,
BY EXTENSION FROM THE TONGUE AND NEIGHBOURING PARTS.

The disease which generally involves the hyoid bone by extension is cancer of the tongue. When such is the case, although pain is a constant symptom of the cancer, it is especially present on the external surface of the bone, which is very tender to the touch, and the patient seems anxious to avoid anything like digital pressure. Besides this symptom, we now possess the aid of actual inspection of the parts by the assistance of the laryngoscope. In my essay (already referred to) I have given brief notes of some twelve cases wherein the bone was more or less involved by cancer, ulceration, or gangrene of the tongue. Hasse* refers to a case of caries of the hyoid bone, resulting from a neighbouring cancerous affection.

SECTION XI.—HYOID NEURALGIA.

This form of neuralgia is wholly distinct from that described in Chapter VII. A sharp, severe, sometimes very acute pain, is felt at the root of the tongue, which may or may not shoot forward through the organ. The patient can put the point of his finger upon the neck, at the spot where it commences, and this is the body of the hyoid bone. It may be located at the junction of one of the greater cornua with the body of the bone. Sometimes the pain extends upwards on either side of the neck to the ear, and is compared to a needle running into

* 'Path. Anat.,' p. 271, Old Sydenham Society.

the ear, with an associated pain also in the region of the tonsils. Under these circumstances, deglutition is very painful.

The same measures which I have found serviceable in other forms of neuralgia of the throat are equally so here.

B. INJURIES.

These consist of fractures from manual or other forms of violence, wounds of the bones and parts around it and laceration of the soft structures from various causes, injuring the muscles, ligaments, and thyro-hyoid membrane.

SECTION XII.—FRACTURE OF THE HYOID BONE.

When the tongue-bone is fractured, the injury is of a serious nature, from the urgent character of the symptoms, and the extreme danger to which the patient is exposed from suffocation. Direct violence, in some one of its forms, usually produces it. The part fractured is either one or both of the horns at their middle, or close to their junction with the body of the bone. Should the body be broken at its middle, the result would prove more serious. There is generally bleeding from the ruptured mucous membrane which is sometimes most profuse, and blood is coughed up. There is great difficulty and pain in swallowing, and occasionally it is impossible; whilst speech is equally distressing, and the voice is gone. Simple protrusion of the tongue will produce symptoms of suffocation; the organ itself is now and then swollen from the inflammation, which is sure to extend to the throat and pharynx. Mobility of the horns, with distinct crepitation, can be felt with the finger and thumb externally or when the patient swallows, and the finger introduced into the mouth

will feel the displaced and broken bone, if projecting towards the throat.

Fracture of the hyoid bone may be divided into three classes. In one the violence is of a manual kind, that is, the throat has been forcibly grasped and clenched by the hand of another person and the lesion accomplished, a favourite method of the garotters of modern days. In the second class, fracture has taken place through the agency either of sudden contraction of some of the muscles attached to the cornua of the bone; or it has arisen from a fall, or some other accident, in which direct contact of the part with some foreign substance has been the force producing it. In the third class the punishment of hanging has produced it.

A. *Fracture from manual violence.*—I have come across the following cases:—

1. Fracture of the left horn of os hyoides in a marine, æt. 67, whose throat was clenched by an adversary. Recorded by Dr. Lalesque.

2. Fracture of the right horn of the os hyoides by manual seizure, complicated with a cystic tumour of the tongue, in a man of 55. Recorded by M. Auberge.

3. Oblique fracture of both horns of the os hyoides from manual violence, in a girl of 19. Recorded by Dr. Bitkow.

4. Fracture of the left horn of the os hyoides and of both cartilages of the larynx from strangulation in a woman; cutting of the throat after. Mentioned by M. Devergie.

5. Fracture of the right horn of the os hyoides in a female æt. 29, produced by throttling. Occurred to Dr. Murchison.

The details of the foregoing, with their references, are given in my essay; together with a case of

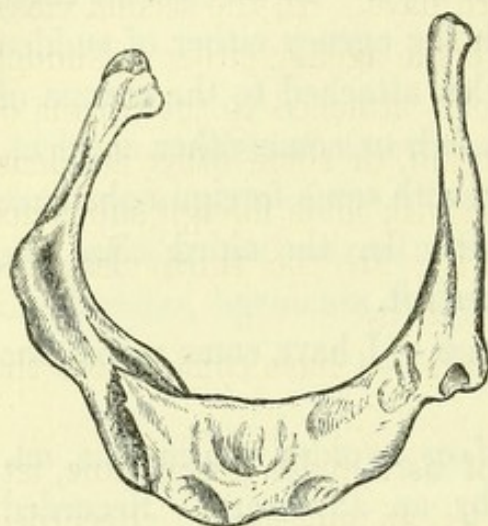
6. Fracture of the right horn of the os hyoides, produced by manual violence upon a man, in a quarrel. A patient at the Royal Free Hospital.

In October 1861, I exhibited before the Pathological Society a —

7. Fracture of the hyoid bone at the junction of the right horn with the body with faulty osseous union.

The specimen was obtained from an adult male subject, about whose history during life nothing was known. The bone had been originally fractured at the junction of the right

FIG. 105.



Fracture of the hyoid bone united in a faulty position.

inferior cornu with its body. It had united in a faulty position, causing the cornu to become shorter than its fellow, and projecting inwards at its terminal end. The proximal end of the fractured horn was overlapped by the body of the bone to the extent of nearly a quarter of an inch. The terminal end of the same cornu gave evidence of its having formed a distinct joint surrounded by a proper capsule. The appearances pre-

sented by the bone are seen in the woodcut. The fracture must have occurred at least two years before death, and originated from manual violence. For this unique specimen I am indebted to the kindness of Mr. Edwin Canton.

8. Fracture of both horns of the os hyoides and thyroid cartilage from throttling. A woman, æt. 66, was found dead in her bed, shortly after being seen alive. Numerous marks of injury existed about the face and neck, and on examination, a fracture of each cornu of the hyoid bone was found. The left side of the thyroid cartilage was also fractured in its entire length, as well as in the transverse directions. Neither blood nor serum was effused beneath the mucous membrane, although slight bloody infiltration was observed amidst the neighbouring soft parts. Both the hyoid bone and larynx were considerably ossified. The cause was the result of throttling. Dr. Helwig

in 'Casper's Vierteljahrschrift,' 1861, No. 2, and 'Med. Times,' 9th August, 1862.

B. *Fracture from accidental causes.*—I am enabled to refer to seven examples of fracture, the result of accident.

1. Fracture of the hyoid bone in a man, æt. 63, attributed to muscular action, in a fall from a waggon on to the face. Recorded by Dr. Grunder.

2. Fracture of the hyoid bone from muscular action. Case recorded by Ollivier d'Angers.

3. Fracture of the left horn of the hyoid bone, with rupture of the thyro-hyoid ligament, from muscular action, in a medical man. The particulars of this case were furnished me by Mr. Oubrè, of Melcombe Place.

4. Fracture of the left horn of the hyoid bone, from a fall down some cellar steps, in a woman æt. 30. Recorded by Dr. G. P. Fore.

5. Fracture of the hyoid and inferior maxillary bones, with fracture and dislocation of the thyroid cartilages, and other injuries, the result of a fall from the height of 45 feet; recovery after tracheotomy. Recorded by Dr. Sawyer.

6. Fracture of the body of the hyoid bone in a girl æt. 6 from a fall against an iron bedstead. The notes of this case were kindly furnished me by Dr. Harley, of University College, in whose practice it occurred.

The details of the foregoing six cases, with their references, are given in my essay already alluded to.

7. Fracture of the hyoid bone from injury. On the 15th February, 1862, Mr. Skey informed me that some years ago he had a case in St. Bartholomew's Hospital of a man who sustained an extensive injury to the neck, with fracture of the hyoid bone. Such was the dyspnœa present, that he had to resort to tracheotomy forthwith.

In the two divisions we have fifteen examples of fracture of the tongue bone, and each one is full of interest.

In the treatment of this form of throat injury, the first

thing to be done is gently to restore the displaced and broken horns to their proper place, by introducing the fore-finger of one hand into the mouth, and holding the hyoid bone with the other externally. This will be only necessary if there is displacement with the fracture. General measures are now to be adopted for the inflammation which is certain to arise, and these consist of bloodletting from the arm, leeches to the throat, cold lotions, nitrate of potass in mucilage, with hyoscyamus and cherry laurel water. The strictest quiet is to be enjoined, efforts at speech are particularly to be avoided, absolute silence is to be maintained; and if swallowing is impossible, or the ends of the broken horns become again displaced in consequence of it, an œsophagus tube must be used to introduce liquid food into the stomach. Sometimes this is equally as injurious as the act of swallowing; when such is the case, recourse must be had to clysters, to nourish the patient. Fluids only are to be taken by the mouth, when circumstances permit it, and in small quantities at a time. If the hæmorrhage after the injury, is profuse, or the inflammation violent, ice may be applied outwardly. Should, unfortunately, the body of the bone be broken, and the symptoms of suffocation become imminent, then the trachea must be opened to afford relief. The head of the patient should be kept rather low, and inclined a little backwards, to keep the neck at rest.

C. *Fracture of the hyoid bone from hanging.*—The hyoid bone is sometimes found fractured in persons who have been hanged, and Mr. South affirms, in his translation of 'Chelius,' that the only examples of fracture of this bone with which he is aware are those of persons executed in this manner, in which he says fracture is almost invariably found. Mr. Mackmurdo, who was surgeon to Newgate for very many years, and had examined the bodies of executed criminals, kindly informed me in October, 1861, that *once* only had he found the body of the hyoid bone broken, and in

three or four cases *one* of the cornua, never the *two*. Orfila saw on one occasion a fracture of the os hyoides as the result of suicidal hanging. From careful investigation of the subject, it may be mentioned as an undoubted fact, that fracture of the hyoid bone occasionally occurs as the result of punishment by hanging, and rarely so in suicidal suspension.

Among the five pirates who were hanged on the 22nd February, the os hyoides was broken in one only, as Mr. J. R. Gibson, surgeon to Newgate, who examined them, kindly informed me the next day. This was explained by the rope being passed *above* the larynx, and therefore compressing the bone; whilst in the other four it passed across the upper part of the larynx, and consequently the compressing force was limited to that part of the neck alone.

SECTION XIII.—LACERATION OF SOFT STRUCTURES ATTACHED TO THE HYOID BONE.

In varying degrees of manual violence, the thyro-hyoid ligaments are sometimes ruptured, or the thyro-hyoid membrane is lacerated and torn. Both are serious injuries and may be recognised by the symptoms already detailed. Laceration of the fibres of the small and delicate muscles attached to the bone is more common, and not so inconvenient. Manual violence is at all times to be dreaded, and the patient is likely to be long a sufferer from the shock to the nervous system.

SECTION XIV.—WOUNDS OF THE HYOID BONE.

Injuries to the bone and separation of its attachments frequently occur in attempts at suicide. Several cases of the kind are recorded in my essay, and demand no more than a passing notice here.

From what has been stated concerning the hyoid bone, a fair estimate can be formed of its importance in connection with the throat, and the necessity for studying its diseases, which are so frequently confounded with laryngeal affections. For very much additional information upon it, the reader is referred to my essay, so frequently alluded to, where many curious and most interesting cases are fully detailed.

CHAPTER XII.

INJURIES OF THE WINDPIPE AND THROAT.

SECTION I.—FRACTURE OF THE CARTILAGES OF THE LARYNX.

SOME of the smaller cartilages of the larynx are liable to dislocation, and even ultimate expulsion by ulcerative disease; this form of throat affection has been considered in a previous part of this work.

Fracture, however, of the thyroid cartilage only, will now be noticed. It is an injury which is the result of direct violence, whether by blows or falls, or forcible squeezing of the throat. According to the violence exerted, and the extent of the injury, so is the liability to a speedy death from suffocation, owing to displacement of the ends of the fracture, as noticed by Chelius; or, very violent symptoms may ensue. In severe injuries to this cartilage, there have been observed difficult breathing with a loud snoring noise, the head and neck being thrown backwards, cough with bloody froth flowing from the mouth, hoarse, inarticulate voice, convulsions in children, and severe pain in the larynx. Many of the symptoms present in a broken tongue-bone are likewise seen, only in a still more severe degree, because of the more important nature of the

part affected; the patient cannot swallow, he seems as if choking, the face is livid, puffy, yellowish white; the eyes are protruding from their sockets; the neck looks swelled, with a visible pulsation in the carotids; blood is poured out, and there may be emphysema in the neck; and actual tetanic symptoms. Fortunately, this melancholy picture is not always realized, and the cartilages may be broken by a blow or a fall without giving rise to even a drop of bleeding. The broken parts can be very readily recognised by an external examination, without inconvenience to the patient, when the nature of the injury is apparent by their mobility and displacement. If the fracture extends through the *pomum* (Adam's apple), there will be neither deformity nor displacement, and a very peculiar indescribable sensation will be complained of. But this form of the injury is extremely rare, only one instance has been placed upon record, and that was by myself in November, 1850;* it has been noticed in the fourth edition of Mr. Fergusson's 'Practical Surgery,' the seventh and eighth editions of 'Druitt's Surgeon's Vade Mecum,' the second volume of 'Holmes' System of Surgery,' and other works. The following is a brief account of it:

CASE. *Fracture of the thyroid cartilage through the pomum Adami.*—On the 1st of September, 1845, I was called upon by a healthy-looking man, æt. 30, for advice about his throat. He stated that two or three days previously, when getting out of a carriage, he fell, and struck one of the steps near the wheel, with the "bone of the neck," and ever since his voice has been impaired, with, at the same time, a strange feeling in the throat. On examination, I found a longitudinal fracture through the pomum Adami of the thyroid cartilage, the two ends of which could be moved upwards and downwards, and in a direction from before, backwards, producing a cartilaginous or soft crepitus, if I may so describe it. The deformity pro-

* 'British Amer. Med. and Physical Journal,' vol. vi, p. 306.

duced during the manipulation was trifling, and when the parts were untouched, the fractured ends were in the proper position. There was no swelling observable, and deglutition was not interfered with, although he had this peculiar indescribable sensation in the throat. There was not even any tenderness on a rough examination, and no appearance whatever of supervening inflammation. When speaking, the voice was slightly rough and hoarse, and now and then whispering. In the treatment, I recommended the neck to be kept quite loose, and free from the use of a tight cravat or kerchief; a fluid diet; to abstain from conversation; and to maintain perfect rest and quiet. Union ultimately ensued.

Curiously enough a second case presented itself to me quite lately, only that it was a—

United fracture of the thyroid cartilage, through the pomum Adami.—John C—, æt. 19, in the third stage of phthisis, presented himself to me at Westminster Hospital, amongst the out-patients on June 10th, 1863. When eight years old he met with an accident, by which the thyroid cartilage was broken at the pomum Adami; this was followed by an abscess, which burst, and the fracture healed. The pomum was now prominent and sharp, the two sides being irregular and narrow, and the larynx had become narrowed, as seen with the laryngoscope and shown to many of the hospital pupils. The voice was sharp and shrill, yet feeble. He was an inmate of the hospital some weeks, under the care of my colleague, Dr. Basham, and was examined from time to time.

Mr. Bryant kindly showed me a little boy in Guy's Hospital, on the 30th November last, aged 8, who had received a blow on the neck with the fist of one of his school-fellows, which was followed by considerable dyspnœa and loss of voice. On examining the larynx,* Mr. Bryant found a fracture of the thyroid cartilage immediately to the right of the median line. When I saw him he was running about,

breathing a little rough, but nothing beyond a little redness was to be seen with the laryngoscope.

This little boy's case may be called a fracture through the pomum, with perfect propriety, and it makes three instances of this remarkably rare injury which I have personally examined.

Two instances of fracture of this cartilage are given by M. Eichmann,* in children. In the first, the child died with the symptoms of suffocation, from œdema of the larynx, laryngotomy having been refused. A double fracture was found,—one producing a detachment of the arytenoid cartilage from the upper edge of the cricoid, and the other penetrating the thyroid, at the point of insertion of the thyro-arytenoid ligaments. Extensive œdema, from sero-purulent infiltration, had very rapidly formed.

The second case occurred in a girl, nine years old, who fell upon the sharp edge of an iron chest. The thyroid cartilage was broken through its middle on one side, and extended somewhat over the other, much displacement was present, and such free bleeding that the superior thyroid artery was tied. After a while, convulsions came on, with violent coughing of frothy blood. Respiration became so difficult that laryngotomy was resorted to with relief, but as the cartilages were so small, two lines of the anterior arched portion of the thyroid were removed, and by means of a bent polypus forceps, the dislocated portion was carefully elevated. The artificial opening was kept open for a fortnight, and the cartilage was quite healed in six weeks, without inconvenience.

The imminent risk to which children are liable, is the impending suffocation from bloody mucus in the trachea, which, if even got rid of, is liable to be followed by acute bronchitis. As showing a marked contrast to the preceding cases, I must here refer to an instance of fracture of the

* 'Brit. and For. Med.-Chir. Review,' N.S., vol. viii, p. 273, 1851.

cricoid cartilage with emphysema, published by Mr. Prescott Hewett, in the first volume of 'Trans. Path. Soc.' (p. 199). A man, æt. 27, fell from a scaffold fifty feet high, and, although his fall was broken, he sustained various injuries, for which he was admitted into St. George's Hospital, under Mr. Cutler's care. Urgent dyspnœa was present, with emphysematous crackling about the root of the neck. The latter spread rapidly in the cellular tissue of the upper part of the body, the tongue was swollen and protruded between the teeth, the emphysema spread to the lower extremities, and he died three days after the accident, never having rallied from the head symptoms. The lungs and ribs were sound, but on examining the trachea and larynx, the right side of the cricoid cartilage was found to be broken in two places on its anterior surface, a portion of the cartilage, two lines in length, being thus separated from the other parts. The angles of this fragment were so sharp, that the superior had penetrated through the mucous membrane, producing a jagged opening, the size of a pea, which communicated freely with the cellular tissue of the neck and gave rise to the emphysema. Ecchymosed spots surrounded the vocal cords, and the brain was found extensively lacerated. The specimen I have seen.

In the treatment of these injuries to the larynx, if the symptoms are not urgent, attempts must be made to replace the ends of the fracture, if displaced, in their proper position. Should this be impossible, and suffocation threatened, as in the second girl, whose case has just been referred to, the coverings of the larynx should at once be cut through, in the median line of the neck, and, if necessary, the larynx must be divided in its whole length, which will thus permit of replacing the cartilages in their proper position. After staunching the bleeding, the edges of the wound are to be closed by adhesive plaster, but this must be left open if the difficulty of breathing continues. Under any circumstances

severe inflammation must be anticipated, and rigid efforts will be requisite to subdue it by leeching ; and, if necessary, venesection must be resorted to. The treatment of acute laryngitis is to be depended upon in such affections as those under consideration, and if great tension is present from serous infiltration of the neck or throat, free incisions must be made to relieve it.

SECTION II.—INJURIES TO THE TRACHEA.

Leaving out here self-inflicted injuries, the most common lesion, although still very rare, is—

Rupture of the trachea.—A case is recorded by Dr. Atlee, of Philadelphia, as occurring from a fall ('Brit. and For. Med.-Chir. Rev.,' April, 1858). Ryland states that the only case he had met with was one recorded by Dr. O'Brien, in the eighteenth volume of the 'Edin. Med. and Surg. Jour.,' of a woman who had been kicked under the jaw ; she died, and the upper part of the trachea was ruptured as well as the cartilages of the larynx.

Dr. Robertson, of Wiesbaden, records a case in the 'Lancet,' of 6th September, 1856, of displacement of the trachea and its separation from the larynx, in a Prussian bombardier, from the kick of a horse. The laryngeal cartilages were uninjured. Mr. Long, of Liverpool, has published a case in the 'Medical Times,' July 26th, 1856, of rupture of the trachea in a railway labourer, who was caught round the neck by the coupling irons whilst connecting two railway carriages ; this patient actually recovered, and the treatment and management of the case throughout reflects the highest credit upon Mr. Long. In Gross's 'Pathological Anatomy' is a case occurring to Dr. Thomas Marshall, of Virginia, of spontaneous laceration of the trachea, through desperate inspiratory efforts of the patient to relieve the dyspnoea caused by the pressure of a large thoracic aneurism.

An instance is noticed in 'Beck's Medical Jurisprudence,' seventh edition, p. 718, of a boy whose trachea was totally divided by getting his throat jammed against a post in a coal pit.

These are some of the most important examples which I have had the opportunity of looking into, and it is impossible to lay down any special rules for the treatment of such injuries, it must depend upon general principles and circumstances.

SECTION III.—WOUNDS OF THE THROAT.

It is foreign to the scope of this work to enter into a consideration of the various wounds of the throat, windpipe, and gullet; but more especially of the second, as they more properly come within the province of the surgeon. The inconveniences likely to result, if, indeed, life is saved, are loss or impairment of the voice; emphysema of the neck, for which the best remedy is a simple puncture of the skin; hoarseness for some time; a chronic cough, if the larynx has been endangered; and a fistulous opening in the cartilages of the windpipe. This last may close of itself in the course of time. If the chronic cough depends upon any ulceration of the mucous membrane, the local application of a solution of nitrate of silver will prove beneficial.

When the gullet has been wounded or cut across, the swallowing is always difficult from a permanent and incurable constriction of the part.

SECTION IV.—BURNS AND SCALDS.

The inhalation of flame, drinking boiling water, and swallowing the concentrated acids or other irritant fluids, are other injuries of a dangerous character, which, if the patient is fortunate enough to survive, renders him a sufferer in some instances for life. Cases are recorded here and there in the

various journals, and the subject is carefully considered in most standard works. Dr. Marshall Hall was the first to draw attention to the fact of young children occasionally suffering from attempting to drink boiling water from the spout of a tea-kettle, and Mr. Ryland to the injury to the larynx from the inhalation of flame. These particular injuries require careful study, but the agent generally recommended for their cure is calomel, in frequent doses. According to Mr. Porter, when acids are swallowed the inflammation of the larynx never occurs to such an extent as to impede respiration.

CHAPTER XIII.

THE LARYNGOSCOPE AND RHINOSCOPE.

SECTION I.—HISTORY OF THE LARYNGOSCOPE.

THE discoverer of the laryngoscope was Dr. Benjamin Guy Babington, F.R.S., who exhibited his instrument before the Hunterian Society on the 18th of March, 1829, as satisfactorily proved by the following extract, taken from a report of the society's proceedings, published in the 'London Medical Gazette,' for 28th March, 1829 (vol. iii., p. 555).

"Dr. Benjamin Babington submitted to the meeting an ingenious instrument for the examination of parts within the fauces not admitting of inspection by the unaided sight. It consisted of an oblong piece of looking-glass set in silver wire, with a long shank. The reflecting portion is placed against the palate, whilst the tongue is held down by a spatula, when the epiglottis and upper part of the larynx becomes visible in the glass. A strong light is required, and the instrument should be dipped in water so as to have a film of the fluid upon it when used, or the halitus of the breath renders it cloudy. The doctor proposed to call it the *glottiscope*."

The first to conceive the idea of illuminating most of the cavities of the body was Bozzini, of Frankfort-on-the-Maine,

who published a folio pamphlet in 1807 at Weimar.* The glottis was not included; but he described and figured a reflector for examining the posterior nares; it may, therefore, be concluded that he was the first who practised rhinoscopy.

Trousseau and Belloc mention in their treatise on 'Phthisis Laryngea,' published in 1837, that Selligue, an ingenious mechanic affected with this malady, had been cured by his physician by means of a speculum, made by himself, with two tubes, one of which served to throw the light upon the glottis, the other to reflect the image of the glottis upon a mirror placed at the guttural end of the instrument. This occurred some years prior to 1837, and stated by Merkel to have been about 1833.

Beaumès, of Lyons, in 1838, exhibited a speculum for examining the throat, larynx, and back of the nostrils, before the Medical Society of that city. It consisted of a mirror the size of a two-franc piece, attached to a stem of wood or whalebone, and could be used with ease.†

Liston was in the habit of using a glass speculum attached to a long stalk, previously dipped in hot water, introduced with its reflecting surface downwards and carried well into the fauces, for examining an ulcerated glottis, as described in the third edition, p. 417, of his 'Practical Surgery,' published in 1840.

In 1844, Dr. A. Warden invented a prismatic speculum, with which it appears he succeeded in seeing two cases of disease of the glottis.‡ He states that "the epiglottis was immediately seen, but it was only when efforts to swallow were made that the arytenoid cartilages and glottis were raised out of concealment, and brought brilliantly to show their picture in the reflecting face of the prism."

* Mr. Windsor, in 'Brit. and For. Med.-Chir. Review,' January, 1863, p. 209.

† Ibid.

‡ Mr. Windsor, already referred to.

In 1848, Mr. Avery showed me some cases of cleft palate at the Charing Cross Hospital, and at that time he used instruments for looking at the throat, posterior nares, interior of the bladder, and other cavities, with which he had been experimenting since the year 1846.

Professor Manuel Garcia was the first person who employed the laryngoscope to study the mechanism of the human voice, and his researches on this subject were brought before the Royal Society in 1855, and published in their 'Proceedings.' He was not only the *first* to practise autolaryngoscopy, but also the first to employ the laryngeal mirror in an extensive manner physiologically, and the first to perform a series of experiments on a large scale in relation to singing, as might be expected from one who was a master of his art and the brother of the celebrated Madame Malibran. His observations from the first were never disputed.

When Czermak published his first essay in 1858, the title of it was, 'Physiological Researches with the Laryngeal Mirror of Garcia,' thus showing the importance he attached to the experiments and researches of the latter, in thus giving his name to the mirror. Indeed, I take this opportunity of declaring that these experiments are some of the most important that have ever been or likely to be made, and reflect the highest credit upon the sagacity and genius of their originator; they are so beautiful and so interesting physiologically in relation to the voice, and help us so much to appreciate the pathology of vocalism, that we cannot be too grateful for them, as they appear in the 'Proceedings of the Royal Society,' vol. vii., p. 399 (read May 24th, 1855), under the title of "Observations on the Human Voice." In my lecture delivered 11th of March, 1863, before one of the most critical bodies in the kingdom—the Musical Society of London—"On the Influence of Musical and other Sounds upon the Larynx, as seen by the aid of the Laryngoscope," illustrated by a large number of coloured diagrams, I took the opportunity of

acknowledging how much we owed to Garcia, and stated that his researches, which had given the first impulse to the study of laryngoscopy, had formed the basis of experiment for all subsequent observers, some of whom, it was to be regretted, had appropriated his views without acknowledgment.

We may assume that all whose names have been mentioned were independent observers, and intuitively conceived the idea of the laryngoscope. There can be no question about this with regard to the first three and the last named. Garcia's researches appearing in such a prominent place, together with their importance, was the means of spreading the fame of the laryngoscope, and Dr. Turck, chief physician to the General Hospital at Vienna, became acquainted with them, and commenced using the laryngeal mirror for the diagnosis of laryngeal diseases in hospital practice in the summer of 1857. He it was who revived the use of the instrument for medical purposes, and at the end of the same year he lent his mirrors to Professor Czermak, who lost no time in making himself thoroughly master of their use, and published various papers showing their value, in 1858 and 1859.* This led to the rivalry between Turck and Czermak which was the chief means, through the persevering instrumentality of the latter, of disseminating a universal knowledge of the subject, and established for ever the incontestible value of the laryngoscope and rhinoscope for the diagnosis and treatment of disease, and the study of the mechanism of phonation.

Had Dr. Turck not lent his mirrors to Czermak there can be no doubt that he, who already occupied such a prominent position, would have continued his researches, and would have later made them known to the profession. It would be an act of gross injustice, therefore, to ignore Dr. Turck's name in the discussion of this question, and whilst we freely accord to

* See the author's translation of Czermak's 'Essay on the Laryngoscope,' published by the New Sydenham Society, article on "Bibliography."

my friend and teacher, Professor Czermak, all praise in his efforts to secure to himself undying fame, in making laryngoscopy universal, we must not overlook the claims of Dr. Turck. Indeed, the French Academy of Medicine have divided the merit of the resuscitation of the laryngoscope, and its introduction into general practice, between Turck and Czermak and the prize offered by the Academy was, I believe, shared between them. In thus performing an act of the barest justice to Dr. Turck, nothing is detracted from my distinguished friend Czermak, whom I hailed as the *Father of Laryngoscopy*, on December 15th, 1862,* for we were not only indebted to him for the perfection of the laryngoscope, but for its having come into general use, as he succeeded, more than any other person, in obtaining for it a universal public recognition. As the case now stands, Dr. Babington was the discoverer of the laryngoscope, and the first to apply it; Bozzini first practised rhinoscopy, and Garcia autolaryngoscopy.

It was in the summer of 1860 that Czermak first visited London, and, in common with others, I became one of his disciples; the value of the instrument was instantly apparent, in the practice of a branch of the profession long familiar to me, and its use was at once commenced, with results given in the present volume.

For more detailed information respecting the history and general description of "the laryngoscope," the reader is referred to the *second edition* of the author's work upon it, to be published in the course of the present year.

SECTION II.—THE LARYNGEAL MIRROR.

The laryngoscope consists of a little mirror attached to a flexible metallic stem, which is fixed into a handle of wood, ebony, or ivory. (See fig. 106.)

* 'Lancet,' January 17th, 1863, p. 65.

The mirror varies in size from three or four lines to an inch and a half in diameter, and possesses a circular, oval, elliptical, or quadrangular form. I prefer the circular and the quadrangular, the latter with the angles rounded off. The most convenient size for common use, is a mirror with the diameter of an inch. It is made of glass or polished steel, and is attached to the stem at an oblique angle. Steel mirrors have already gone out of use, from the rapidity with which they tarnish; glass are generally preferred.

FIG. 107. FIG. 106.

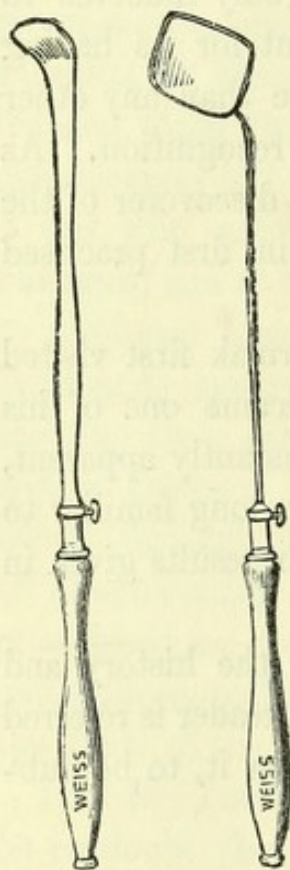


FIG. 106. The laryngeal mirror.

FIG. 107. The palate hook.

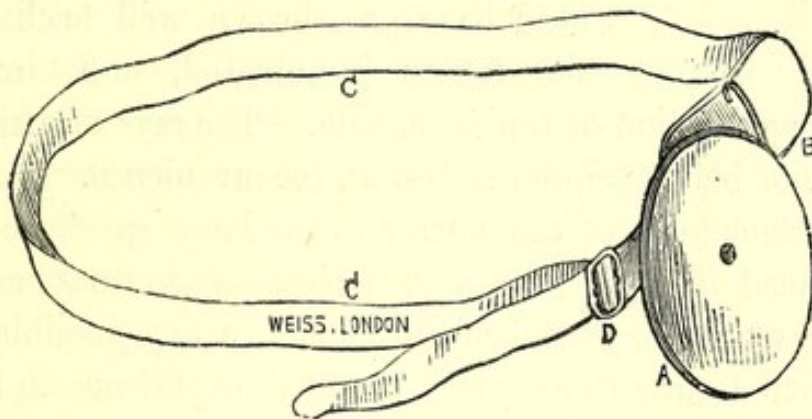
I have had slightly concave metallic mirrors made of a circular form, plated with gold and silver, which offer beautiful and brilliant reflecting surfaces which do not tarnish, and are useful for very minute examination; but for all ordinary purposes the glass mirror is unrivalled.

Before introducing the laryngeal mirror into the mouth it should be gently warmed over the lamp, and the temperature carefully estimated by applying the back of it to the cheek or temple, in preference to the hand. The metallic mirrors (but not those of glass) may be immersed in warm water previous to use; heating them over a lamp, however, will be found the simplest method. When properly warmed, the mirror can be retained sometimes in the mouth for several minutes previous to withdrawal.

SECTION III.—OF THE LIGHT.

Before employing the laryngeal mirror, the throat must be illuminated by means of a light thrown into it from a reflecting surface, and this is accomplished by wearing a large ophthalmoscopic mirror either before the right eye, between the two eyes, or upon the forehead. Each plan has its advocates, but that upon the forehead will perhaps be found the most convenient, and is now pretty generally adopted. The drawing shows the

FIG. 108.



A. The reflecting mirror, attached to an elastic band B, C, C, regulated by the buckle D.

reflecting mirror sold by Weiss and Son, and it is so arranged with an elastic band and buckle, that it can be worn in any position desired, being perforated if the choice should be before the eye. All mirrors ought to be perforated, for this latter reason. Mr. Mason does away with the perforation, and has a ball and socket joint immediately behind where it existed.

I am in the habit of using the mirror before the eye, attached to a large spectacle-frame, as adopted by Semeleder, the handles of which go well round towards the back of the head. I prefer this to all others in examining patients. A small spectacle-frame should be avoided, for it cannot support the weight of the mirror, and is constantly shifting its position.

For minute and delicate operations on the larynx, nothing can be compared (in my mind at least) to the position of the mirror before or in front of the eye.

The rays of light from a forehead reflector, and the rays from the eye, although they may converge to a point in the laryngeal mirror, do not always give a good view of the

FIG. 109.



reflected image, as the annexed figure would help to explain, in which the divergent points represent the forehead and the eye, and the convergent point the image in the mirror. The forehead reflector is so high up, that the patient's head has to be thrown well back to get the fauces illuminated, and interferes

with the application of topical agents. The rays of vision and of light not being parallel is also an inconvenience.

The attachment of the mirror to the large spectacle-frame, the forehead band, or the mouth-piece of Czermak, as made by Weiss and Son, permit of movement in any possible direction, which I state from much personal experience in the use of each. I have had constructed a pocket reflecting mirror, with a mouth-piece and wire stem connected to it by a ball and socket joint, in which the diameter of the former does not exceed two inches, and an oval perforation exists half an inch long, and I have been able to prove with it that there is no inequality in the focal distance of the two eyes in employing a perforated mirror.

In the use of the perforated mirror before the eye, the aperture should be in front of the pupil, so that both eyes may be employed in vision—a matter of easy accomplishment with a little practice. This accuracy of position, however, is not always essential, for a good view is obtainable with the left eye, aided by the co-operation of the right eye. Both eyes should always be kept open, and when the light is thrown into the throat it must be kept steady.

The reflecting mirror was introduced by Czermak, together with artificial light, and his mouth-piece, to those masters of the art who can use it, is exceedingly handy and convenient. In France the practice is common, of wearing the mirror upon the forehead, first introduced by Dr. Moura Bourouillou, and it is not perforated. The objection to the perforation, upon the plea that we get rid of the dark spot in the centre of the luminous disc which is said to exist when the light is reflected from a mirror whose centre is not silvered, is untenable, for it is not seen when the proper focal distance is obtained with a good and strong artificial light. No matter what position the reflector occupies, the eyes are exposed to the influence of some of the rays of light, with all lamps.

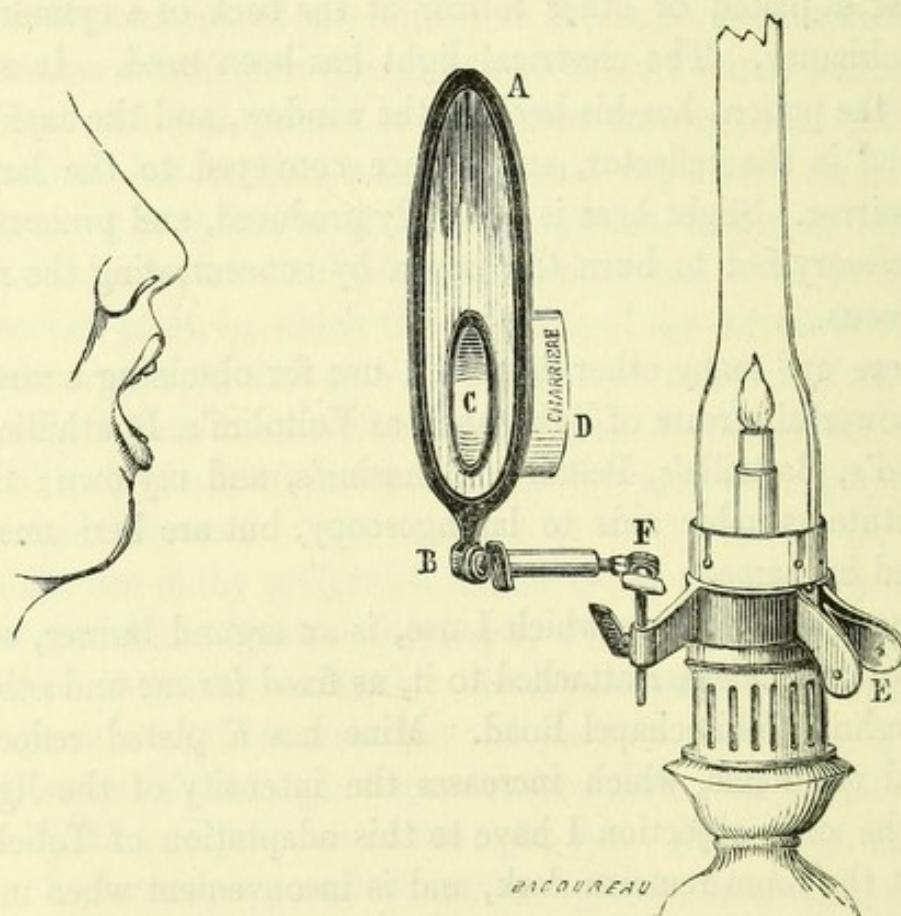
The light to be employed for reflection may be natural or artificial; the former comprises day and sunlight, and the latter a good moderator lamp or an argand gas lamp; both should possess a plated or other mirror at the back of a cylindrical glass chimney. The electrical light has been used. In sunlight, the patient has his back to the window, and the rays are received in the reflector, and thence conveyed to the laryngeal mirror. Slight heat is generally produced, and precaution is necessary not to burn the larynx by concentrating the rays to a focus.

There are many other lamps in use for obtaining a strong and powerful stream of light, such as Voltolini's, Bouthillier's, Tobold's, Battaille's, Peltier's, Bonacina's, and my own; they constitute valuable aids to laryngoscopy, but are here merely noticed by name.

Among other lamps which I use, is an argand burner, with a Tobold's condenser attached to it, as fixed for me and others by Krohne, Whitechapel Road. Mine has a plated reflector behind the flame, which increases the intensity of the light, and the only objection I have to this adaptation of Tobold's is that the room remains dark, and is inconvenient when more than two persons are present. Ordinarily, however, I seldom

darken my room any further than with the usual linen blinds ; if the day is sunny, the sun unavailable, and the room too light still with the blinds down, the curtains are drawn. For general use nothing is more convenient than a powerful moderator lamp, which is in every one's house, or an argand burner, with silvered reflectors behind the flame. Light reflected into the mouth will be found to be more convenient and useful for manipulation than when thrown direct into it ; it will save much trouble, as experience will amply prove. Weiss now prepares an argand lamp, with a reflector behind, and a glass condenser in front of it, which promises to answer every purpose. Dr. Turck and Dr. Stoerk use large globes of glass, filled with water, for concentration of light, and so does Dr. Walker, of Peterborough. The metal frame adapted to the globe by Dr. Walker, is the most convenient.

FIG. 110.



The Pharyngoscope.

The Pharyngoscope is an invention of Dr. Moura-Bourouillou, of Paris, for examining and illuminating the pharynx. It is represented in Fig. 110, and is seen to consist of a lamp and reflector for illuminating one's own pharynx: A, B, represent the mirror in which we examine ourselves, with a moveable joint at B; C, an opening to permit the passage of the luminous rays concentrated by the lens at D; D, the lens for concentrating the light from the flame of a lamp or a candle, and to throw it upon the face, into the mouth, upon the teeth, the laryngoscope, &c.; E, F, the pharyngoscope holder, a collar of copper, with an arm having two joints, which allows of varied motion and position, as the usage of it may require. The face is seen opposite to the mirror. This is a most ingenious and a very simple instrument, and is described in the work of the inventor. It has already become an indispensable requisite for the toilet.

For medical purposes, in inspecting the fauces and pharynx, the tonsils, velum, and uvula, the reflecting mirror upon the forehead, or before the eye, is most useful, and every minute point can be made out with the greatest facility.

SECTION IV.—MODE OF EXAMINATION.

The person to be examined should be seated on a chair in an erect position, to the right of a table with the lamp near his left elbow. His mouth should be on a level with the nose or eyes of the operator, and the flame of the lamp ought to be on a level with the operator's eyes, or even a little higher.

The position being rendered easy and comfortable, and the mind calm and assured, the patient should take his cambric pocket-handkerchief, and lay hold of his tongue, protruded from the mouth, between his forefinger and thumb, and gently but firmly hold it outwards and downwards, at the same time opening his mouth as wide as possible, and reclining the head

a little upwards. In retraction or resistance of the tongue, Dr. Turck's tongue forceps will be found very convenient. The patient may simply press his protruded tongue against the teeth or lower lip, or he may bury it in the floor of the mouth. Sometimes it will require to be held outwards by the operator.

The proper focal distance being ascertained by movements of the head forwards, the operator now introduces the laryngeal mirror, previously warmed, with his right hand, resting the little finger against the cheek, and gently applies it against the middle of the soft palate and uvula, taking care to avoid coming in contact with the tongue, teeth, lips, and back of the pharynx, keeping the handle of the mirror and the hand to the left side of the mouth out of the light, the patient quietly breathing as usual. The back of the tongue with its large follicles first comes into view; then the hollow space between it and the anterior or glossal surface of the epiglottis; next the apex and laryngeal surface of the epiglottis; and then the interior of the larynx, in which we see an extremely movable antero-posterior fissure, bounded by two brilliant pearly borders, which palpitate with surprising rapidity. This last is the *glottis*, and is formed by the inferior thyro-arytenoid ligaments, or as they are now generally called, the *true vocal cords*, in contradistinction to the false, which are formed by the superior thyro-arytenoid ligaments or muscles, which are above the glottis.

Or to simplify the description: on looking into the throat with the mirror, we see

1. The back of the tongue.
2. The valliculæ or fossæ at its base.
3. The epiglottis.
4. Posterior part of the cricoid cartilage, with its mucous membrane.
5. Pharynx.

6. The arytenoid cartilages with their apices the cartilages of Santorini.
7. The aryteno-epiglottic folds, or ligaments, with the cartilages of Wrisberg in the negro.
8. Vestibule of the glottis.
9. Superior thyro-arytenoid ligaments, or false vocal cords.
10. Ventricles of Morgagni.
11. The true vocal cords, or glottis.

Beyond the glottis the trachea comes into view, the rings of which are distinctly visible far down during deep inspiration. In some persons the bifurcation is readily seen: the reflection of this was first seen by Czermak, in his own person; he has shown it to me a few times, and he has seen mine; I have also seen my own, and have shown it to large parties of persons on numerous occasions. Frequent opportunities have occurred to me of seeing the tracheal bifurcation in both healthy and diseased persons, and on one occasion two patients—a male and female—presented themselves to me, in whom it was most distinctly and clearly seen, one after the other—an unusual and rare circumstance.

The glottis is seen to assume in various persons a lanceolate, lozenge or barrel, elliptic, oblong, or triangular shape, and may possess great activity in motion, or very little. When the mirror, therefore, is introduced into the mouth, the patient should ejaculate, *Ah!* in a prolonged or short, or high falsetto note, which permits of closure of the glottis, and if successively repeated a few times, it is seen opening for inspiration and shutting during utterance of sound. This latter is the test of integrity, and permits of the appreciation of the amount of approximation which the vocal cords undergo.

If anything catches the breath, such as particles of dust, or of food, or if cough is produced, or expectoration, the glottis is suddenly closed, and covered up, very much as occurs during deglutition. This I have verified with the mirror over and over

again. The process will be understood by describing what occurs in deglutition, as may be seen at any time:—

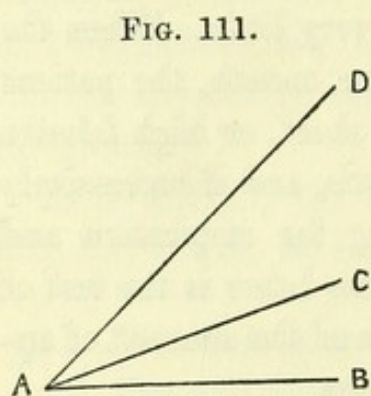
1st. The arytenoid cartilages approach one another the whole length of their internal surfaces, and shut the glottis with great energy.

2nd. Almost simultaneously the superior or false vocal cords approach one another, enter into contact, and completely cover over the glottis, whilst,

3rd. The epiglottis is drawn backwards (by contraction of the aryteno-epiglottic muscular fibres,) and applies its base or cushion, and then its posterior and inferior surface upon the closed vocal cords. At this instant the base of the tongue covers all up, and nothing further is to be seen.

In my lectures, the attachments of the true and false vocal cords, and epiglottic folds of membrane to the arytenoid cartilages, have been compared to three pairs of reins in tandem-driving, which helps to simplify and explain their successive action. Thus, let A B C D represent a longitudinal section of the larynx, of which A is the arytenoid cartilage; A B is the equivalent of the inferior thyro-arytenoid ligaments, or true vocal cords; A C, of the superior thyro-arytenoid ligaments (muscles), or false vocal cords; and A D, of the aryteno-epi-

glottic folds of mucous membrane, in which are contained the muscular fibres running from the arytenoid cartilages to the epiglottis. The action of A D and of A C cannot occur without the action of A B; therefore, the action of A B must precede the action of A C and A D. The consequence is, that A B is first excited to action and closes the true



glottis, forming the first pair of reins; this is instantly followed by the action of A C, the second pair of reins, approximating the false vocal cords; and thirdly, by that of

A D, in drawing down the epiglottis to cover all over, with the third pair of reins.

This proposition is further proved and confirmed by the exercise of voluntary power over the muscles of the larynx (in autolaryngoscopy), when the breathing is suspended for a few seconds; for when the glottis is kept firmly closed, the false cords approximate, and the epiglottis is gradually drawn downwards, as in deglutition. This subject was submitted by me to the physiological section of the British Association for the Advancement of Science, at Newcastle-upon-Tyne, on the 31st of August last, and my views were accepted, the facts and arguments brought forward as correlative evidence fully establishing their correctness.

The influence of musical and other sounds upon the larynx, the manifestation of the chest and falsetto registers, the formation of the voice, and numerous experiments, in relation to all these are described in a lecture which I delivered before the Musical Society of London, a full abstract of which appears in 'The Lancet,' April 25th, 1863, page 476.

After tracheotomy is performed, the under side of the vocal cords and glottis may be sometimes examined from below with the very small mirror of Neudoerfer, introduced into the tracheal opening. I have submitted several persons to inspection in this manner, and the results obtained were not only extremely interesting and curious, but highly important.

For applying remedies, or performing delicate operations, the mirror must be introduced with the left hand, so that the right may be employed as circumstances require. This soon becomes familiar and easy.

If both hands are required, in some most remarkably rare instances, the mirror can be held in the mouth by a *self-holder* in a fixed position. Dr. Turck has figured one of these in his book, attached to a sort of movable arm on a tripod stand. Lewin and Rauchfuss have described others, and so has Mackenzie. That of the last named is the best, and is figured

in the 'Medical Times' of August 8th, 1863. I prefer an assistant to the loss of time in endeavouring to keep the self-holder in the unfortunate resister's mouth.

In irritability of the throat, an astringent and soothing gargle will be necessary for a day or two.

SECTION V.—AUTOLARYNGOSCOPY.

For the practice of *autolaryngoscopy*, or the examination and exhibition of one's own larynx, a different process must be adopted from that just described, and other appliances are necessary.

The method adopted by Garcia, was to turn his back towards the sun, and by means of a small mirror held before the face, to receive the solar rays, and direct them on the laryngeal mirror placed against the uvula, which reflected the image into the other mirror.

Another method is to place the flame of a lamp as close as possible to the mouth, widely open, and to hold a small hand-mirror between the eyes and flame, which will receive the reflection of the image in the laryngeal mirror illuminated by the rays of the lamp.

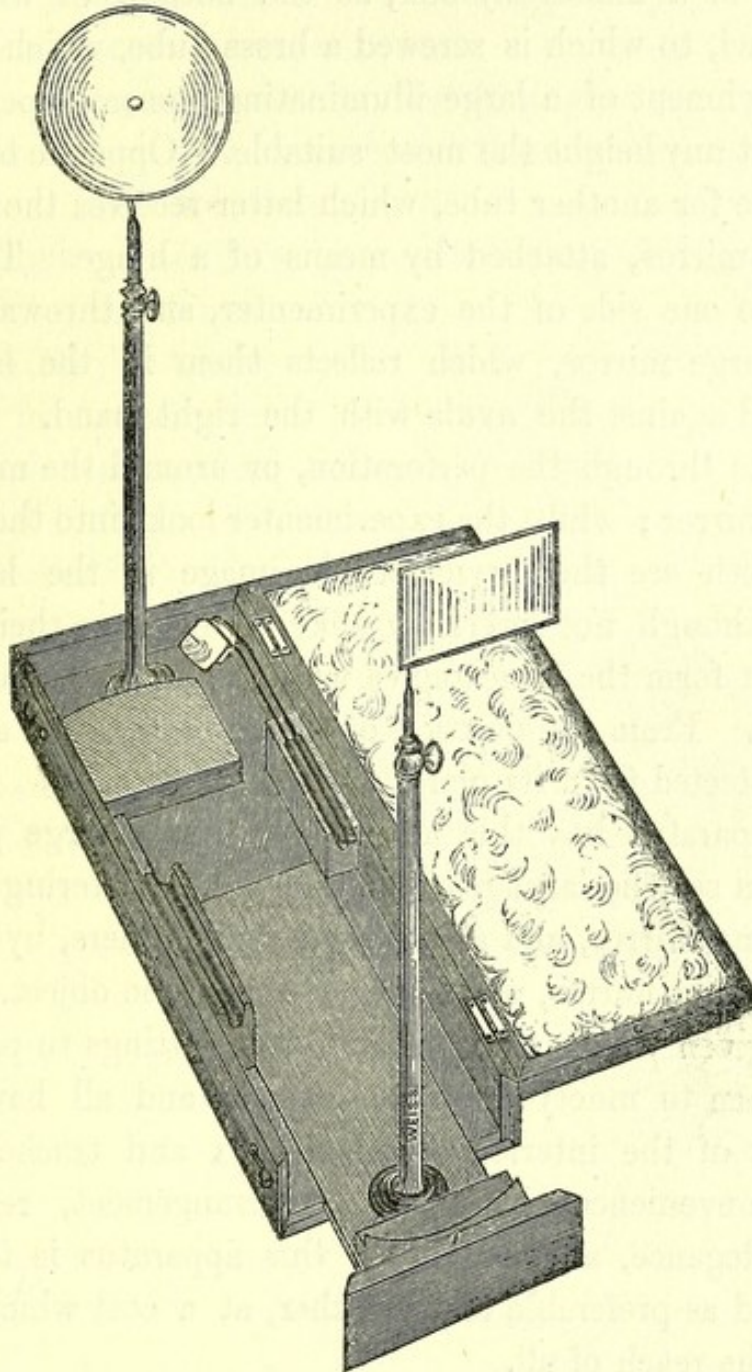
Moura-Bourouillou's pharyngoscope can be used in the same way, with this advantage, that the mirror is perforated, as previously described, to allow the rays of light to pass directly to the pharynx.

A third plan is to sit opposite a small looking-glass, at the side of which is a good lamp, which throws its rays of light into the mirror on the forehead, and which are reflected into the open mouth of the person in the looking-glass, who introduces the laryngeal mirror and sees in it his own larynx, also observable by those looking over his head and shoulders. This is Dr. Johnson's plan.

A fourth plan is to place a lamp on the level of the mouth,

with a globe condensor in front of it. An assistant adjusts the light until the fauces are illuminated. The image in the

FIG. 112.



Professor Czermak's autolaryngoscope.

laryngeal mirror is reflected into a small mirror held with the left hand over the lower part of the globe. This process is Dr. Walker's of Peterborough.

A fifth, and the most convenient method, is by the use of a special apparatus for autolaryngoscopy and demonstration, as contrived by Czermak, modified by Weiss, and shown in fig. 112. It consists of a mahogany-box, at the bottom of which is a sliding panel, to which is screwed a brass tube, which permits of the attachment of a large illuminating, concave, perforated reflector, at any height the most suitable. Opposite to this is a receptacle for another tube, which latter receives the stem of an oblong mirror, attached by means of a hinge. The light is placed to one side of the experimenter, and throws its rays into the large mirror, which reflects them in the laryngeal mirror held against the uvula with the right hand. The observer looks through the perforation, or around the margin of the large mirror; whilst the experimenter looks into the oblong mirror; both see the laryngoscopic image in the laryngeal mirror, although not precisely alike to each, as their visual axes do not form the same angles with the reflecting surface of the mirror. From the position of the lamp the eyes are completely protected from its glare.

This apparatus has this advantage, that a large party of persons can see the laryngoscopic image by clustering around the reflecting mirror, and at the same time others, by looking into the oblong mirror, will see nearly the same object. With it I have given demonstrations at single sittings to parties of from a dozen to ninety or more persons, and all have had a good view of the interior of the larynx and trachea. For general convenience, handiness of arrangement, regulation of light, elegance, and simplicity, this apparatus is to be recommended as preferable to any other, at a cost which places it within the reach of all.

For lecturers on physiology, Czermak's autolaryngoscope is most indispensable, and should have the preference over every other instrument.

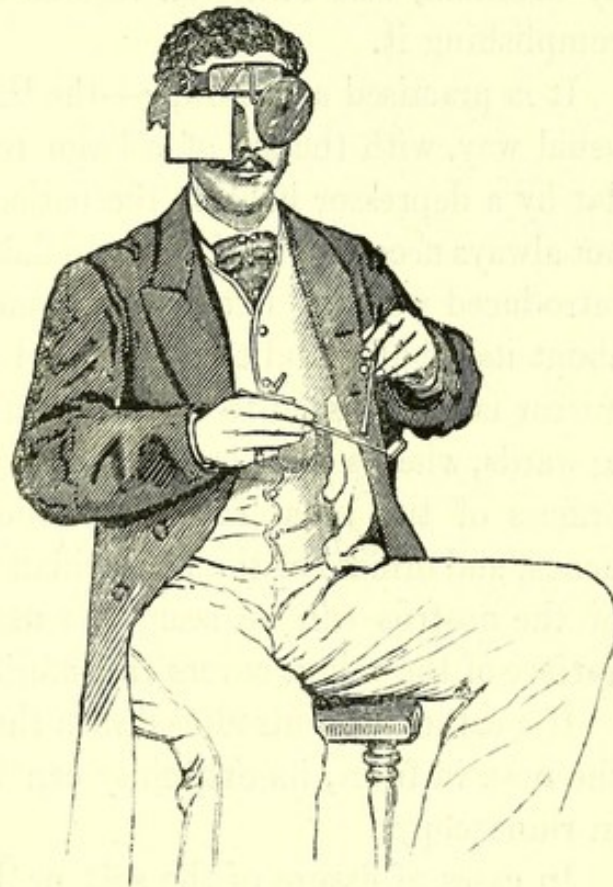
The experimenter must take the precaution of having the illuminating mirror elevated at a higher angle than the mouth,

to throw the rays of light a little downwards ; a fair guide will be to have the upper margin of the mirror in a line with the eye. A great deal, however, will depend upon the management of the person himself, who will soon acquire the minutiae essential to successful experiment.

The laryngeal mirrors for autolaryngoscopy vary in size from three-quarters to an inch and three-quarters in diameter. A medium size will be convenient.

Dr. Smyly, of Dublin, has contrived an apparatus, for demonstrating the larynx shown in Fig. 113. It consists in the addition of a simple square glass mirror, set in brass, like Weiss' concave mirror, which is fastened by means of a second split tube on one of Weiss' frontal bands, to a brass rod bent at an angle of 45° . This rod holds both the square mirror and the reflecting mirror, and when applied as shown in the engraving, the object to be examined is reflected in the square mirror, and can be seen by others.

FIG. 113.



Dr. Smyly's square mirror, for demonstrating the larynx.

SECTION VI.—RHINOSCOPY.

Rhinoscopy is the art of examining the posterior recesses of the nostrils, and of the pharyngo-nasal recess; it is a more difficult proceeding than laryngoscopy, and requires patience and perseverance to accomplish in some persons. It was first practised by Bozzini, in 1807, next by Baumes, in 1838, and thirdly by Avery, in 1846; but its perfection was worked out by Czermak, who contrived various useful instruments for accomplishing it.

It is practised as follows:—the throat is illuminated in the usual way, with the aid of a large reflector; the tongue kept flat by a depressor held by the patient himself, this however is not always necessary; a blunt and flat hook (fig. 107, page 446), introduced with the left hand, is made to catch the soft palate about its middle, and to elevate and draw it forwards; a small mirror is now passed to the back of the pharynx and turned upwards, when a view is afforded of the septum, the posterior orifices of the nasal fossæ, the middle and lower turbinated bones, and orifices of the Eustachian tubes. Sometimes the floor of the nostrils can be seen, but usually the posterior arched surface of the velum covers the inferior part of the nasal cavity.

If a catheter is introduced into the Eustachian tube through the nose in front, its extremity can be seen sometimes readily in rhinoscopy.

In cases of fissure of the soft or hard palate, or loss of the former by ulceration, a good view of the parts can be obtained without much difficulty; and in many persons rhinoscopy is easy enough when the examination is made with delicacy and gentleness, even although there may be sometimes very troublesome obstacles to overcome.

There are instruments combining the palate spatula or hook and the mirror, so that one hand may be free for applying

remedies. Not unfrequently I have dispensed with a palate hook, and have readily seen the right and left nostril, and Eustachian tube, by applying a small mirror on either side of the uvula behind or below the velum. This is desirable when the irritability of the fauces prevents the use of the hook.

Small mirrors are occasionally introduced into the front of the nose, when the nostrils are dilated widely, and a good view is obtained of the nasal cavity and inferior turbinated bone; in some persons with capacious nostrils the nasal orifice of the lachrymal canal can be seen, but more especially in the dead, when a hog's bristle has been introduced.

In examining the larynx or nose, the mirrors should be wiped with a wet sponge immediately on withdrawal, so that they may be kept clean. This is most essential with those made of steel; for if not quickly cleaned, the mucus leaves a permanent stain which renders them useless until reburnished. This does not occur with glass or plated mirrors.

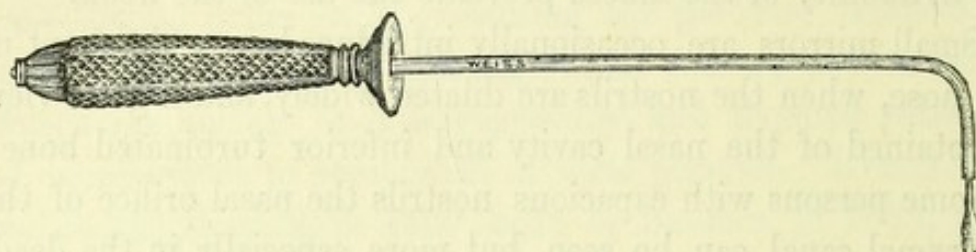
SECTION VII.—APPLICATION OF REMEDIES.

The reader will have become familiar with the application of remedial agents to the larynx and throat from what has been stated throughout this work. It is only necessary, therefore, to remind him of what he will require. Curved brushes like fig. 2, for the larynx, and other shapes for the nose; the caustic holder of Matthews, fig. 3; Weiss' pulverizer of fluids for the lungs and larynx, fig. 1; Matthieu's irrigator, with which Dr. Sieveking cured a case of aphonia of seven months standing by two applications charged with a solution of tannin; and my own small laryngeal fluid pulverizer, described at page 386, fig. 95.

Scarificators for œdema of the larynx, of my own contrivance, fig. 60; curved forceps for the removal of foreign bodies from the throat, or larynx, of which fig. 114, is an illustration, sold by Weiss; they are introduced with the blades open, which

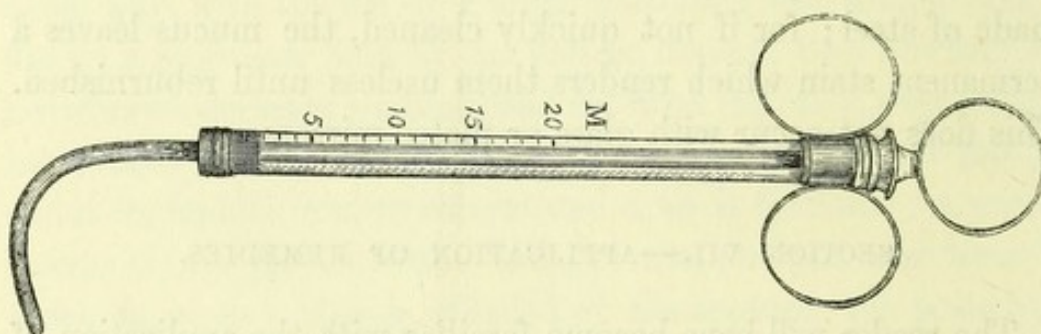
latter can be turned in any direction, and the cup in front of the handle is pushed forwards so that the body is grasped in closing the blades upon it.

FIG. 114.



Small syringes of ivory, glass, silver, and gold, for various purposes. The annexed, fig. 115, represents a carefully gradu-

FIG. 115.



The graduated laryngeal syringe.

ated glass syringe for injecting regulated quantities of fluid, such as solutions of strychnine, &c., one to three or more minims upon the vocal cords, with the aid of the laryngeal mirror; it was carefully made for me by Whicker and Blaize of St. James's Street; the metal mounting is of gold. The same firm sell electro-magnetic machines with the induction coil in a box ready for use, in applying Faradisation to the neck and interior of the larynx; it is the most convenient form of battery in use, is very cheap, and is used at mostly all the hospitals and public services. I can recommend it most strongly, for it seldom or never gets out of order, a great desideratum.

Mackenzie's laryngeal galvanizer to be obtained from Krohné,

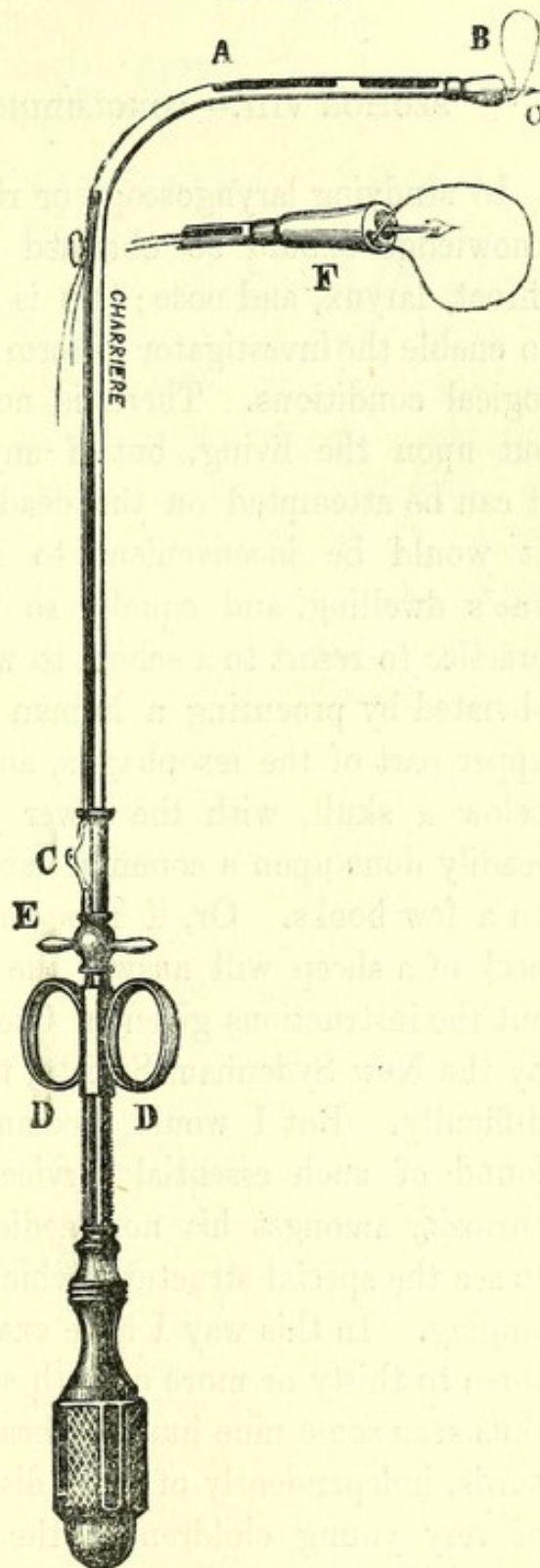
241, Whitechapel Road. Laryngeal ecraseurs and instruments for the removal of polypi and growths from the larynx, of which my own (figs. 34 and 35) are represented at pages 138 and 139. The ecraseur of Dr. Moura-Bourouillou, (fig. 116), is on the same principle as my own, but the growth is pierced by an arrow at the moment of excision, which ensures its immediate withdrawal. It is described in his pamphlet on 'Polypi of the Larynx,' published a few weeks ago.

Curved bougies, for dilating the larynx in œdema, after or without sacrifices, are most essential to have.

Bistouries, straight forceps, and long curved scissors, for excision of the tonsils and uvula. Also Bellocq's canula, and small trocars; œsophagus bougies, and tracheal instruments, particularly Langenbeck's hook.

Tongue depressors, small sponges, linen napkins, a looking-glass on the mantel-piece for ladies, small basins, and various glasses, are necessary requisites.

FIG. 116.



Many other things might be mentioned, but the foregoing are the chief agents necessary in the treatment of the various affections of the throat, larynx, and nose.

SECTION VIII.—CONCLUDING HINTS AND REMARKS.

In studying laryngoscopy or rhinoscopy, a good anatomical knowledge should be obtained of all the parts about the throat, larynx, and nose; this is a matter of some importance to enable the investigator to form a correct diagnosis of pathological conditions. There is no difficulty in following this out upon the living, but if any obstacles are encountered, it can be attempted on the dead without the least resistance. It would be inconvenient to import a dead subject into one's dwelling, and equally so for a medical man in active practice to resort to a school to work upon the dead; both are obviated by procuring a human tongue and larynx with the upper part of the œsophagus, and placing or arranging them below a skull, with the lower jaw attached. This can be readily done upon a common table, the skull being supported on a few books. Or, if this be objectionable, the head and neck of a sheep will answer the same purpose. In following out the instructions given in Czermak's monograph, published by the New Sydenham Society, the student ought to have no difficulty. But I would recommend his doing what I myself found of such essential service, namely, the creation of a curiosity amongst his non-medical friends (male and female), to see the special structures which play so important a part in singing. In this way I have examined parties of persons from three to thirty or more of both sexes and of all ages, and have thus seen some nine hundred healthy throats and pairs of vocal cords, independently of those diseased. I have seen the larynx of very young children at the one examination, and it is astonishing how well they comport themselves under the in-

fluence of example ; it may truly be said that the vocal apparatus in the child is one of the most beautiful objects that can come under the notice of the physiologist.

In these healthy recreations, shall I call them ? some very curious peculiarities often come to light, and a shrewd person will be able to form an opinion in his own mind, as to the capacity for singing or speaking possessed by certain individuals. The student may feel assured that if his interest is once excited, perseverance and patience will overcome all obstacles.

In examining the throat, the larynx, or the nose, the reader must remember all the various special parts and structures which are to be found in these situations, and he should make himself acquainted with their shape, position, colour, and movements in health, before he can venture to understand them when diseased. In regard to the movements of the vocal apparatus in the production of sounds, this is most essential. Having become familiar with all these, he will be prepared to inspect and to recognise diseased conditions.

In health, the epiglottis possesses a pale salmon, buff, or bread colour ; the interior of the larynx above the glottis is of a pale rose colour ; the true vocal cords are of a white colour tinged with a shade of grey ; the subglottis is a pale fawn which shades off into a drab in the trachea, the ring of the cricoid and the rings of the trachea appearing of a lighter and almost white colour through the transparent membrane.

In some persons the arytenoid cartilages are of a yellowish pink, and those of Wrisberg, when present, (but almost always in negroes) have a yellowish tinge like a small abscess.

At the back of the nose, the turbinated bones possess a pale pink and drab colour ; but when congested, the vessels are distinctly seen, and they have a bluish tinge. The septum is generally of a vivid pink, and a prominent object. The oval trumpet orifices of the Eustachian tubes generally possess a pale yellow colour.

GLOSSARY.

ACANTOPHONIA.—An impairment of the singing voice, a term proposed by the author.

APHONIA.—Privation or loss of voice, or the sounds giving rise to it.

CHORDITIS VOCALIS.—Inflammation of the vocal cords ; a term proposed by the author.

CONTENDOPHONIA.—A straining of the voice, in declamation and oratory ; a term proposed by the author.

DIPLOPHONIA.—Double voice, acute and grave sounds ; a term proposed by the author as more expressive than vox convulsiva.

DYSPHAGIA.—Difficulty of swallowing.

DYSPHONIA.—Difficulty of producing or articulating sounds, associated with pain. This term is often erroneously used to indicate hoarseness, and should be solely applied to painful speaking, in a similar sense to dysmenorrhœa, which signifies painful menstruation.

DYSPNŒA.—Difficulty of breathing.

EPIGLOTTIDITIS.—Inflammation of the epiglottis.

EPIGLOTTISATION.—The determination of the position of the epiglottis by examination with the laryngoscope ; a term proposed by the author.

HYDRARTHROSIS.—Effusion of fluid into a joint, as the thyrohyoid.

ISCHOPHONIA.—Restraint, or holding back of the voice, as in stuttering and stammering.

ORTHOPNŒA.—Impossibility of breathing in the horizontal posture.

OXYPHONIA.—A shrill and squalling voice, that in elephantiasis for example.

PARAPHONIA.—A disagreeable character or *timbre* of the voice.

PHLEBECTASIS LARYNGEA.—Varicose condition of the veins of the larynx.

PHONATION.—The utterance of vocal sound, whether in speaking, singing, or otherwise.

PHONOPATHY.—Modifications and alterations of the voice.

PSELLISMUS.—Stuttering.

RAUCITAS.—Hoarseness.

RHINOPHONIA.—Speaking through the nose with a nasal twang.

RHINORRHŒA.—Another name for Ozæna.

SUSURRATION.—Whispering.

TRACHEOSTENOSIS.—Contraction, or narrowing of the trachea.

VOX CONVULSIVA.—Double voice, acute and grave sounds, involuntarily produced in succession.

ERRATA.

Page 20, line 5, *for months, read years.*

„ 288, fig. 79, *reverse the letters a, a, and b, in the text.*

OMISSIONS.

Curved Brushes for Back of the Nose.

Examination of Patients lying down in their Beds.

Proper Chair for examining Patients.

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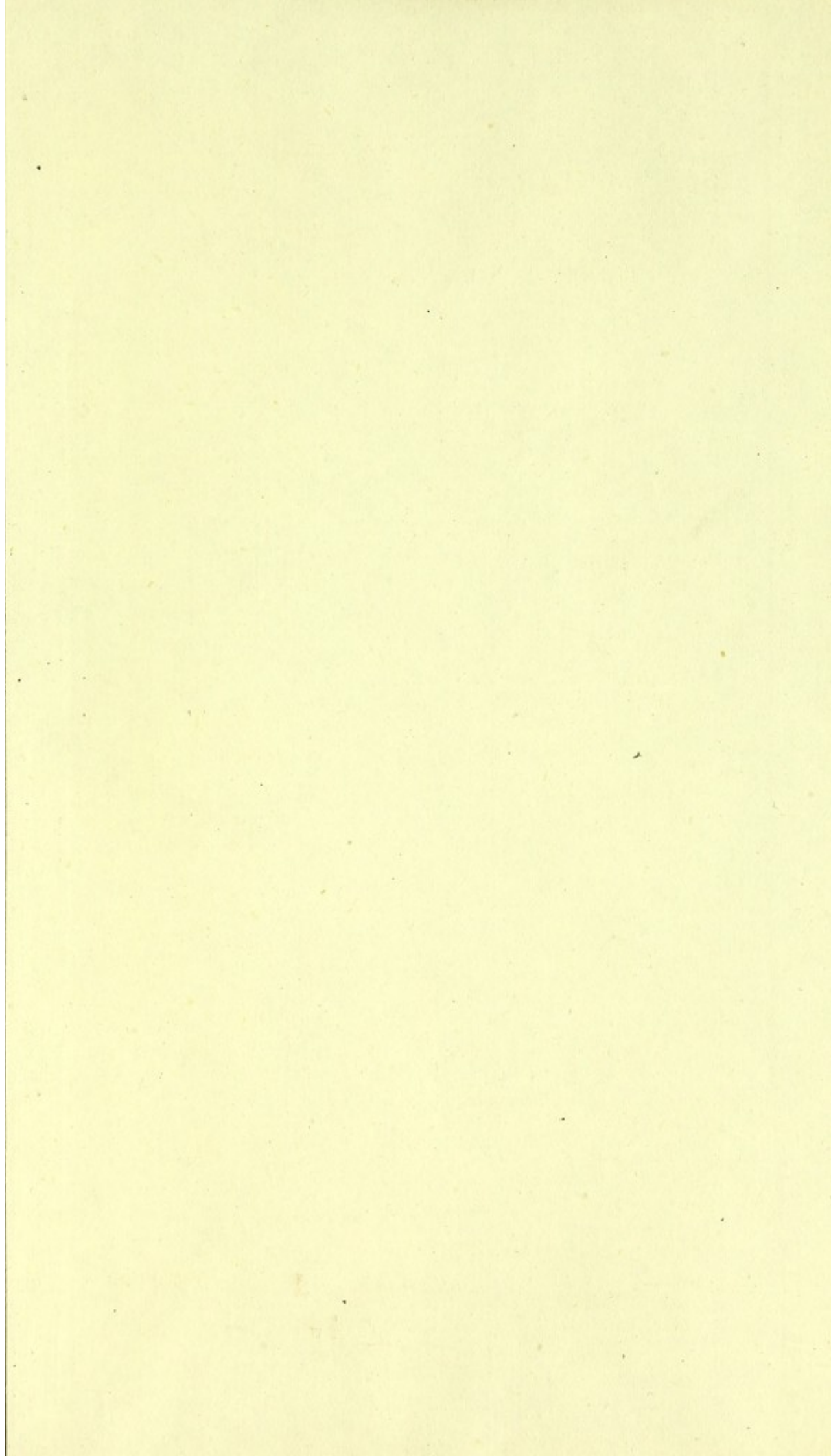
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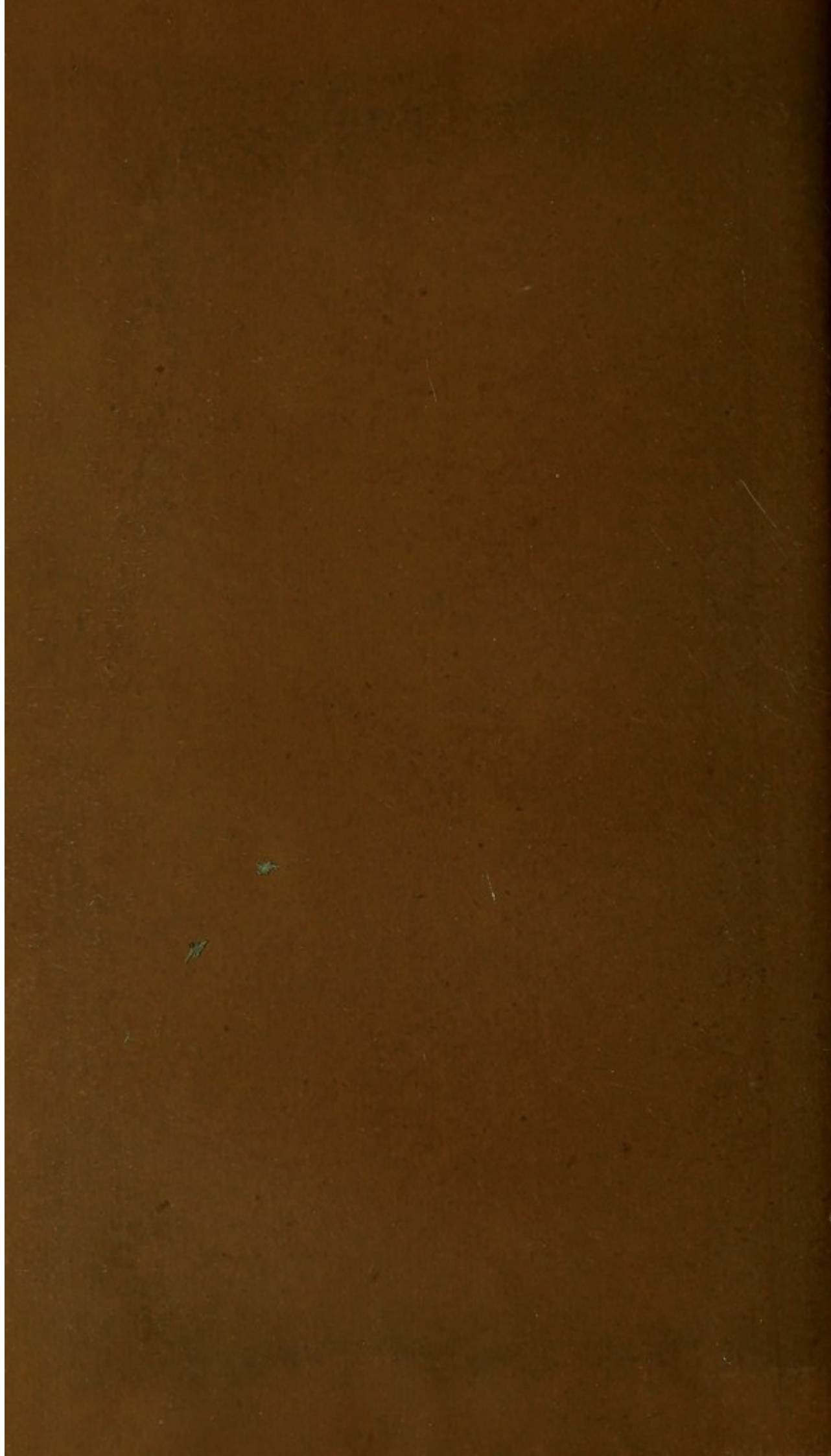
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