The Royal College of Surgeons from the Author

DISEASES

OF THE

THROAT, EPIGLOTTIS,

AND

WINDPIPE.

BY THE SAME AUTHOR,

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ON

DISEASES

OF THE

THROAT, EPIGLOTTIS,

AND

WINDPIPE;

INCLUDING

DIPHTHERIA, NERVOUS SORE-THROAT, DISPLACEMENTS OF THE CARTILAGES, WEAKNESS OF THE VOICE AND CHEST:

THEIR SYMPTOMS, PROGRESS, AND TREATMENT.

BY

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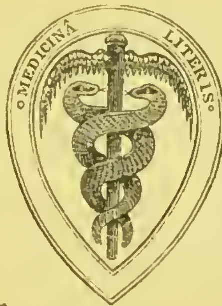

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TO

ROBERT BENTLEY TODD, M.D., F.R.S.,

PHYSICIAN TO KING'S COLLEGE HOSPITAL,
AND LATE PROFESSOR OF PHYSIOLOGY IN KING'S COLLEGE,
&c., &c., &c.

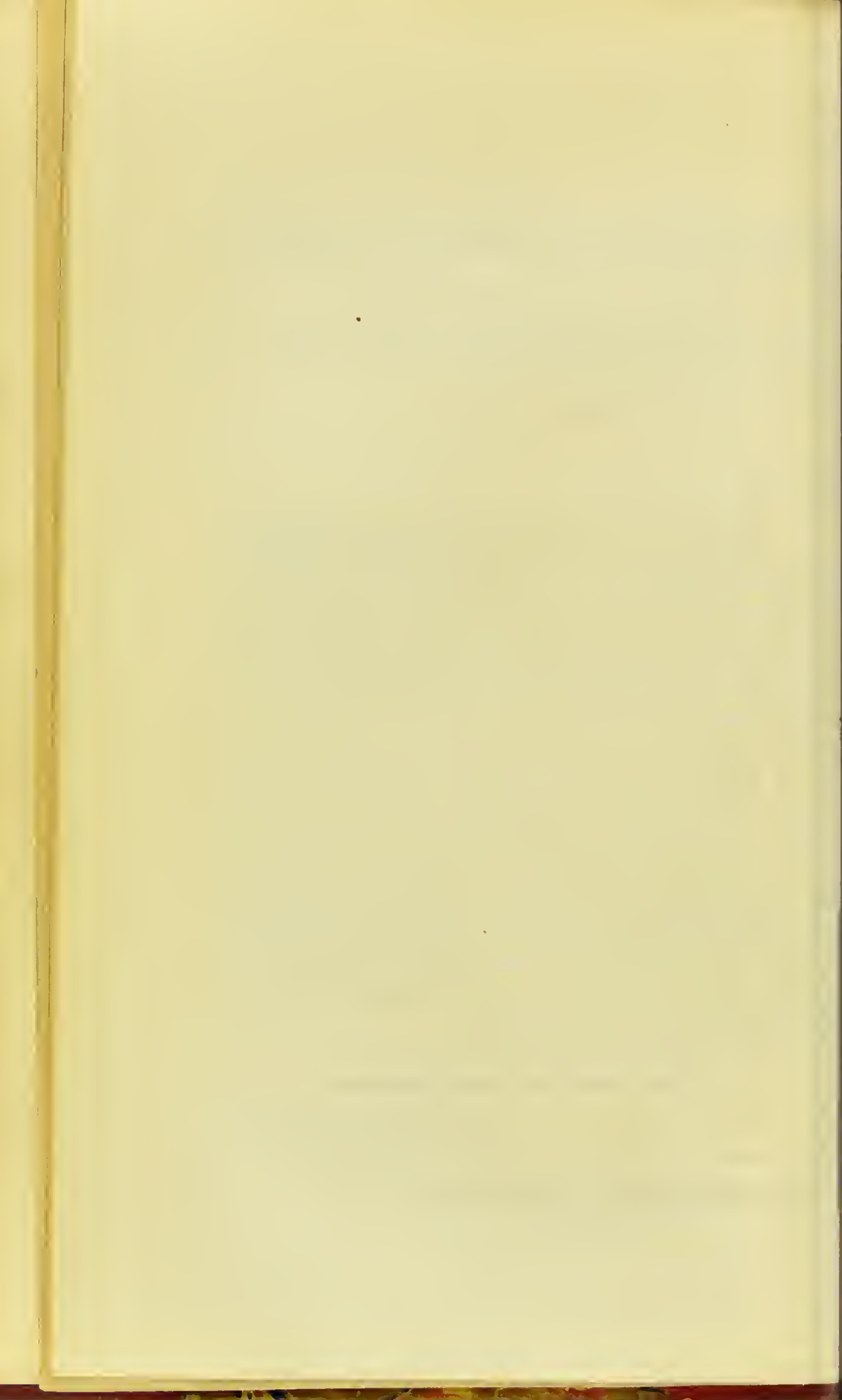
MY DEAR DR. TODD,

It is now many years since I first experienced the great pleasure of your acquaintance, through my late lamented friend, Dr. James Crawford, and during that time have learned to admire and respect you for your profound knowledge and experience as a physician, and for the high position which you so justly occupy among the great ones of our profession. It is with feelings of gratitude for many acts of personal kindness that I humbly inscribe these pages to you, upon a subject that comes home to us all, and one for some knowledge of which I am indebted to your teachings and writings. That you may long continue in the enjoyment of health to permit our profession to possess you as an example and an ornament, is the sincere wish of

Your obliged and faithful friend,

GEORGE D. GIBB.

22, PORTMAN STREET, PORTMAN SQUARE;
1*st December*, 1859.



PREFACE.

Having devoted considerable attention to Diseases of the Throat and Windpipe for many years, I have frequently experienced the want of a work, specially devoted to such a subject, without the necessity of being obliged to refer to the larger and more elementary works on disease; for, with the exception of Ryland, on the 'Larynx and Trachea,' (long out of print) there was no smaller manual that would furnish much information in a small compass. The present work is intended to supply that deficiency; and it is to be hoped, that any of its short-comings will be considered as the result of my desire to confine it within reasonable limits, without being encumbered with an excessive mass of details. This explains why some of the subjects treated have necessarily been brief, more so than could have been wished; and, again, why some have been necessarily excluded, although their importance was by no means underrated: I allude to foreign bodies in the windpipe, injuries to the throat by hot and corro-

sive fluids, the influence of various medicinal agents upon the throat, malformations, and, perhaps, a few others. These, together with any existing imperfections, it is my intention to supply on another occasion, should my present efforts meet with approval.

Nor is the work a mere manual, on the special subjects upon which it treats, for there is much new matter hitherto unpublished, which will be apparent to the intelligent reader in going through these pages. Some new methods of treatment are submitted in chronic laryngeal disease and other affections, but more particularly in croup: in the last, as a substitute for the almost invariably fatal operation of tracheotomy.

In the arrangement of the subjects, no particular classification has been adopted; but they have been considered in the ratio of their importance, and perhaps their frequency; and my endeavours have been rather to simplify and render clear, than to complicate by giving a multitude of minute subdivisions of disease. At the same time, to render the work as useful as possible, as one of reference, short chapters are given on Dyspnœa and Dysphagia, in their connection with the throat; and the condition of the throat in the exanthemata has been brought under notice. The hitherto undescribed displacement of the Tongue-bone, is for the first time considered, and in a separate chapter.

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ON

DISEASES OF THE THROAT,

&c.

CHAPTER I.

FOLLICULAR DISEASE OF THE THROAT AND AIR-PASSAGES.

By far the most frequent and not the least 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.

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 embedded 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

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

solitary glands, excepting in the mass of follicles entering into the 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. 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 chapter, 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 which are 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. 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, which is shown particularly in the hoarseness, pain, and soreness, with extreme debility and languor, which accompany them. According to the position of the disease within the larynx 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, which causes spasm, and vents itself in that way, 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, but a cough may steal on from 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.

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, causing great inconvenience, the tonsils enlarged, and often conceal the state of the pharynx behind. 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.

* 'On Diseases of the Air-Passages.'.

† This is described in Chapter V.

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 chapter.

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 exercise of the vocal organs, whether in speaking or singing.

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. If seen at an early period (which is seldom the case), the treatment, both general and local, soon cures the disease. Without relating any

cases of throat-disease—which the scope of the present work will not permit—I may refer to one of a well-known Canadian merchant, who 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 were 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. This was one of the first cases that came under my care at this *early* stage, although the disease was chronic, and I had little difficulty in recognising it. The employment of topical measures, attention to the general health and regulating the diet especially, conjoined with suitable constitutional treatment, presently to be noticed, effected a perfect recovery in the course of three months.

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, through a glass tube, or are directly applied, in a liquid form, through the aid of a small, round piece of sponge, usually attached to a rod of whalebone, of which the end is curved.

Of substances recommended for insufflation by MM. 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.

Next in importance to these were inhalations of various substances, in the form of the vapour of hot water impregnated with them. Some of the essential oils, iodine, chlorine, the sedative plants, and others, were thus employed.

Although such applications have fallen into disuse, nevertheless at times, and in particular cases, some one may be found a useful auxiliary in the general treatment. At the present day, however, common consent and experience have given the preference to liquid medications, from the readiness and certainty of their application, of the decided effects they produce, and, at the same time, with an 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 these 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, by means of the sponge and whalebone, to the interior of the larynx, or at its upper opening, 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 this 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.

The mode of application of this solution to the interior of the larynx is now so familiar to the profession that it is unnecessary to detail the steps of that process, but I am in the habit of following out the plan of Dr. Green, of not intruding the sponge directly into the larynx through the aperture of the glottis on the first occasion, but of rather educating the parts for some days, by touching the membrane in the fauces and pharynx, then around the epiglottis, and finally the interior of the larynx itself. This completely overcomes the primary irritation and exquisite sensibility which belongs to the lips of the

glottis.* Yet it must be remembered that this operation is one not always of easy performance, depending upon some amount 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. Glycerine he has found equally efficacious in suitable cases, and mucilage occasionally. Glycerine and borax in my hands have proved very beneficial in healing up the ulcers, but not at the commencement.‡

Constitutional treatment.—In the follicular disease

* Dr. Green, op. cit.

† 'The Medication of the Larynx and Trachea.'

‡ When the ulcers are chronic, the following gargle, first recommended to me by my friend, Mr. Coulson, has proved most serviceable in this and some other forms of throat disease: it consists of 6 grains (4 for a lady) of bichloride of mercury, 20 drops of dilute hydrochloric acid, 7 drachms of syrup, and 7 ounces of water. To be used two or three times a day.

of the throat whieh presents the granulated appearanee from hypertrophy, the most useful preparations will be found those of iodine. They will eure when other substanees have been tried in vain. My favorite remedy is the ioduretted iodide of potassium, or a weak Lugol's solution, eombined with some earminative and tonie, of whieh the *hydrastin*, the aetive prineiple of the Hydrastis eanadensis, is one of the best. The merehant whose ease I have referred to was eompletely eured after a three months' trial of this medieine. Although the aetion of iodine on the system is now pretty well known, in its eausing the disappearanee of glandular and other enlargements, yet it exerts a speeifie influenee on the throat, for after it has been taken for some time it eauses a heat and dryness of the mueous membrane of the fauees and pharynx. When iodine and iodide of potassium are eombined, the dose to produee the desired effeet need not be large, unless there is some other indieation besides the throat-affeetion for its inereased employment. Oeeasionally the bromide of potassium has replaeed the iodide in my hands with evident advantage.

In giving these remedies attention should be paid to the seeretions by the use of mereurials in alterative doses, or the use of aloes, or regulated doses of the *podophyllin*, the aetive prineiple of the Podophyllum peltatum, or some other purgatives. The funetions 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 treatment will urge themselves upon the mind of the enlightened practitioner, which it is unnecessary for me longer to dwell upon.

CHAPTER 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 chapter, 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 by the obstructed or interrupted free admission of a sufficiency of air for

the purposes of breathing—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 of the voice and dryness of the throat at first, 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, which produces 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 sufficient 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. 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.

Among the changes which are produced by the malady we are considering, besides the ulceration, is

a general induration and thiekening of the tissues in the larynx from interstitial deposits, ehiefly of lymph or albumen (of serum in aeute laryngitis); this has been more partieularly notieed in the pharynx, and eonstitutes a true hypertrophy of the mueous membrane. On the other hand, when absorption has beeome inereased from the long eessation of the natural funetions of the part, an atrophic eontraetion of the pharynx has resulted with the formation of those "enlarged or eavernous throats" which oecasionally are presented to our notiee.

Usually there is no pain nor diffieulty in swallowing in ehronie uleer of the larynx, but it is otherwise if the anterior or lingual surfaee of the epiglottis is uleerated. Again, if the uleer is situated at the junction of the voeal eords, both speaking and coughing produee uneasiness and soreness. This helps us in the diagnosis. It is important to go into the patient's history to aseertain if the disease in the larynx owes its origin to syphilis—a rather frequent eause of uleeration,—or, to the exeessive use of mereury. Then again, the lungs should invariably be examined; this is indeed a matter of vital importanee in the prognosis and treatment. When the lungs are sound, the uleeration is usually present at the boundaries of the upper aperture of thc larynx, namely, above or below, or at the margins of the glottis. On the other hand, when the stethoseope assists us to learn the presenee of pulmonary disease, the voeal eords are notieed to be the most affeeted,

with the reentrant angle of the thyroid cartilage. Although the state of the lungs will thus assist us sometimes to form a tolerably correct opinion as to the exact seat of the ulceration, 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 *treatment* which has been recommended by many writers of authority for chronic disease of the windpipe in this country, although it has the semblance of rationalism, is such, that after being pursued for a time, causes 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 is 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, 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 scruples to the ounce of water*) must be applied at once to any abnormal appearance in the fauces and pharynx, and after a few days the whalebone and sponge is to be introduced daily into the larynx, and all its parts are to be thus freely cauterized down to the inferior vocal ligaments. This practice will most probably 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 at once be brought back. 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.

After the ulcerations have healed under this treat-

* The strength will vary from two to four scruples,

ment, and if any thiekening remains of the lips of the glottis, whieh may be known by an oeeasional difficulty of breathing during exereise, or undue exertion, the internal use of small doses of the biehloride of mereury and iodide of potassium, or either with any suitable eombination, will be found effeetual in causing absorption of the interstitial deposit, and affording eomplete relief.

Whilst the uleeration is undergoing treatment, quiet and rest are neeessary, and the use of the voiee is strietly to be prohibited. Should there be a tendeney to spasm of the museles of the glottis towards night, some mild anodyne may be administered. Aeeording, however, to the indieations present, so shall sueh general remedies of a tonie nature be ordered, eombined with an unstimulating and yet most nourishing diet.

Notwithstanding all that has just been reeommended, if it ean be elearly foreseen that the improvement is likely to prove only transitory, and some of the more serious complieations are likely to arise as mentioned in the sueeeeding ehapter, and if, moreover, we should feel satisfied, from the frequency of attaeks of spasm, of the likelihood of the oeeurrenee of some sudden suffoeative seizure, then it is here most strongly reeommended to make a fistulous opening into the traehea, and eonstantly to keep it patulous. This proeeeding will give the voeal organs sueh 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 any partial obliteration of the larynx, as has been supposed, 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 is at once restored. 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 had been wounded in the throat by a splinter, which perforated the larynx; it healed up afterwards, leaving this opening. When it was exposed, his voice could not be heard; but the finger placed over it at once restored speech. The same phenomenon is noticed with a silver tube 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 chapter. 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 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.

CHAPTER III.

DISPLACEMENT OF THE CARTILAGES.—ULCERATION, DESTRUCTION, AND ULTIMATE EXFOLIATION.

When the general symptoms of chronic disease of the windpipe, described in the previous chapter, 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 is likely to ensue. 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; in the mean time their destruction goes on, ending in a state of necrosis or death, and finally they are thrown off and expelled. 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 most probably been 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.*

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. 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; 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.

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.

The *epiglottis* has been almost wholly destroyed by ulceration, and yet its mucous covering may remain thickened and ulcerated (see chapter 4).

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 abs-

cess in front, as mentioned by Ryland. The upper rings of the traehea have mortified and been expelled. Usually, eolleetions of matter are assoeiated with death of the eartilages, and as they are destroyed by expeetoration, so are we made aware of what is going on by the fearful odour whieh is imparted to it.

Besides ehronie disease giving rise to the displaeement of the cartilages, the use of large quantities of mereury in broken-down eonstitutions has been notieed by Drs. Graves and Stokes to terminate in ulceration of the eartilages. They frequently slough in typhus fever, and the tertiary forms of syphilis are a fertile souree of misehief.

It is extremely rare to meet with this stage of throat disease in ehildren, 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 eommonly seen.

If unrelieved, the displaeement and diseases of the eartilages terminate fatally by slow wasting away and final exhaustion, if suffoeation has not already ensued from the irritation set up by the mortified eartilage—generally the arytenoid—and the elosure of the glottis by œdema or spasm.

Treatment.—When the uleerative process is known to be spreading, and extending to the eartilages,

with the presence of hectic fever, night sweats, and emaciation; and when all constitutional 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 eases to heal up and get well. This is rational and good practice, because loeal 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 espeeially when the larger cartilages are affected, for they have been known to aet 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 overeome 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 laying bare and loose. If the disease is then checked by the internal applieation 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 eartilages, when partially necrosed, and the pieces detached eannot be 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 am 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?

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 combined by myself in 1845, and one of considerable value. 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.

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

CHAPTER IV.

LESIONS OF THE EPIGLOTTIS.

The oval shaped cartilage, which is situated at the base of the tongue, immediately above the entrance into the windpipe, is composed of a very elastic tissue, which permits it to bend backwards 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. It is subject to inflammation and ulceration, as in other parts of the throat, and when serum is poured out in its submucous tissues, it is rendered œdematous and permanently erect, thus offering a most serious obstruction to the passage of food, because, from loss of power, it fails to cover and protect the opening into the windpipe. If it does do so, deglutition is painful, more especially if the anterior surface of this cartilage is ulcerated as well. The importance of the different lesions to which it is therefore subject, renders it necessary that it should be specially considered, independently of other affec-

tions. Now the chief of these 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 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 depressing the back of the tongue in a forward direction, they may not be noticed, but the general symptoms help much to guide us 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, is, 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.

Another form of ulceration, which has not come under my own 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 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

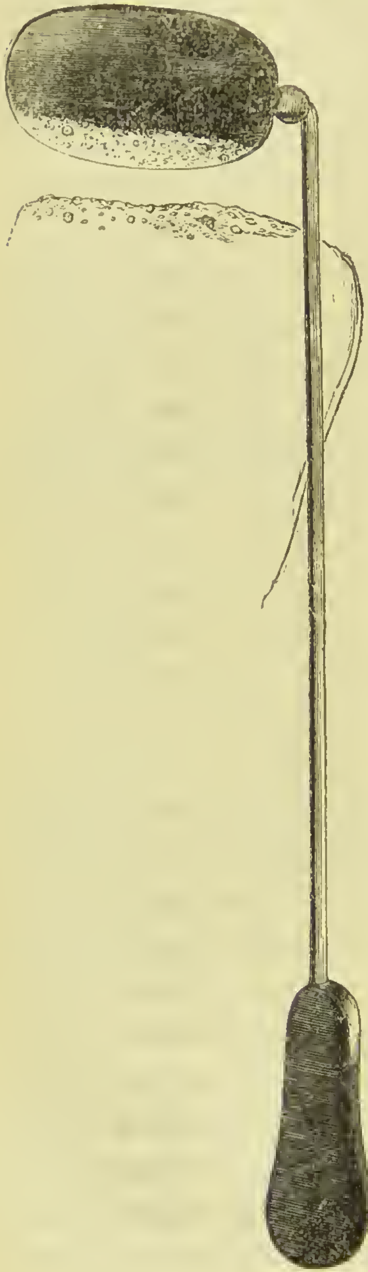
also present in œdema of the glottis, but the former can be distinguished from the latter. When its anterior surface is ulcerated, there is always painful deglutition from the food rubbing over the ulcerated surfaces, and if any portion of the cartilage is destroyed, fluids cannot be swallowed. Consumption and syphilis exert a most baneful effect in many instances upon this fibro-cartilage, as stated in the chapters upon those complications. A considerable portion of the epiglottis may actually be destroyed by ulceration ; yet, if the remains of it be sufficient 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. *Œdema*, 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 altera-

tions 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 favourite seat, but next in frequency is the centre, and more rarely the right border. These 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.



Before taking leave of the epiglottis, I must refer to an instrument recently brought into notice by my friend, Mr. Price,* for examining the posterior surface of this cartilage, and more particularly the deep fossæ on either side of it, at the root of the tongue. The annexed wood cut shows its application, and reflection of the base of the tongue in the steel mirror. It is this latter that is the essentially useful part,

* 'The Lancet', December 24th, 1859.

and it forms a small disc of hard and very highly polished steel, attached to a slender rod, and is moveable through a ball and socket joint, thus permitting it to be placed at any angle at the back of the mouth. Its temperature must be raised above that of the breath by dipping it into hot water. I have found it exceedingly useful and convenient, for examining the parts of the throat named, and more particularly for getting a view of the laryngeal surface of the epiglottis; in fact, it is an indispensable requisite in diagnosis, and is obtained from Mr. Mathews, in Portugal Street.

CHAPTER 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 at once be observed, is effected by topical applications, either of the nitrate of silver, or of the argento-nitrate of mercury, and the ulcerations are 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 consumption, 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. 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 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. My friend Dr. Cotton remarks, in his truly philosophical and well-written 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 in 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,

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

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 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

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

larynx may be invaded, as shown by experience, and 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 it is destroyed. 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 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 in the excellent work of my friend Dr. Edward Smith 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 do much towards their alleviation, and will

permit 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, 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 of certain soothing medicated substances in addition (with an inhaler of my own contrivance, permitting the patient to use it in the recumbent posture), have given a greater amount of ease and comfort than could at first sight have been expected. In confirmed and apparently hopeless cases, the topical treatment already mentioned will have the effect, if applied in a reasonable time, of quieting the laryngeal disease, and may even 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 hitherto he was a stranger. I do not overlook 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. What has already been said in 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 my friend, 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. Cod liver oil, and a mixture of glycerine and borax, I have myself found useful. The sponge probang slips into the larynx with great facility when loaded with any oily fluid, 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 tonsils most probably will be enlarged and ulcerated, and the uvula elongated. Besides topical treatment to the throat, iodine will here be found of much service internally, and blood-root with tincture of

opium, or of lobelia, will give great relief to the bronchial irritation.

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 gives rise to symptoms which simulate chest maladies, and I have actually known a most unfavourable 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.

CHAPTER VI.

SUPPRESSION AND LOSS OF THE VOICE—APHONIA.

The observation was made, now many years ago, by Dr. Stokes, in his able and 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." Of later years, notwithstanding the rapid advances made in pathology, and, perhaps, more especially minute morbid anatomy, we have had, so far, very little additional evidence furnished on the subject of the voice, which is altered, decreased, or even extinguished by disease. To some extent, therefore, Dr. Stokes' remark is applicable to the present time. At this moment, I am engaged in some important researches and experiments in relation to this subject, which shall be brought before the profession when completed, but am not prepared to enter into it now, as my observations are not sufficiently advanced. For the present, I must content myself with a consideration of the influence of certain diseased conditions in the windpipe itself, upon the action of the voice, and the modifications it undergoes. By understanding these, we shall be better able to apply

suitable treatment, and to give an opinion with some amount of confidenee as to the ultimate result. This subjeet naturally divides itself into three subdivisions, to eaeh of whieh a brief spaee is allotted in separate ehapters, in the following order: viz.—

Suppression and loss of the voiee—aphonia;
The sore throat from oratory, publie speaking, and singing; and
Weakness of the voiee and ehest.

In relation to the first of these—the loss of voiee—it is well known that it may oecur most completely, either as the result of disease in the larynx itself, or from some funetional eause, temporary in its nature, with which the nervous system has a great deal to do. The reader will have been prepared for the modifications and utter extinetion of the voice, as the result of ulecrative mischief around the glottis and neighbouring parts, from what has been already stated in preceding chapters. Our knowledge of the physiology of the larynx tells us that all the minute ligaments and museles in their healthy eombination are necessary towards the perfect development of the voiee. The injury of any of these, or of distant nerves whose branehes are supplied to them, or the pressure by tumours upon the main trunks of nerves themselves, neeessarily impairs the produetion of sound.

The morbid lesions which pathology has shown to influenee the voiee, are the various affections to which the mueous membrane of these parts is liable,

whether it be inflammation, induration, thickening, atrophy, purulent or other secretions, œdema and ulceration. The last is the agent which tells with the greatest severity, for in all the others hoarseness is the chief alteration observed, modified or increased according to the condition of narrowing which the lips of the glottis may present, or the tension and induration of the vocal cords themselves, from the accompanying spasmodic irritation.

The presence of ulcers, then, are 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 such ligaments as the thyro-arytenoid, 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 thyro-arytenoid ligaments, "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."*

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, and

* Ryland 'On the Larynx and Trachea.'

in this I cannot wholly agree. They have been found in every part of the larynx, and the voice is almost invariably modified by their presence; hoarseness is 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. If they extend to the thyro-arytenoid muscles, Andral mentions the result as a most deleterious effect on the voice. Sometimes the ligaments, such as the thyro-arytenoid, may be laid bare by the ulceration, and the voice, although rough and hoarse, is not extinguished. Anything tending to diminish the calibre of the larynx affects the voice; for example, if the cricoid cavity becomes nearly filled up by sub-mucous indurated tissue, the voice will be hissing or whispering, and utterly gone if the vocal cords and ventricles are affected; as in an instance related by Cruveilhier. The effect of induration on the vocal cords is to narrow their aperture.

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. Œdema 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 cartilages.*

* Dr. Green's paper on 'Aphonia,' before the Medical Society of

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; and if too much mischief has not occurred, and the parts are not destroyed which are so essentially important to correct phonation, such as the vocal cords or thyro-arytenoid ligaments and muscles, there is a prospect of the recovery of the voice by the topical use of the strong argental solution (two scruples to the ounce of water), the mode of applying which has already been commented upon. Ulceration of the vocal ligaments, if confined to the mucous membrane, is susceptible of complete cure. In the diagnosis of this special lesion, there is some difficulty in passing the sponge probang through the glottis at first, and a sensation of roughness may be felt by an experienced hand. After sponging the fauces and pharynx the first two days, and then the interior of the glottis, and continuing it, the pain at first felt in the latter from this proceeding will entirely disappear.

Females are subject to loss of voice, which in many instances has been looked upon as the result

London, at the reading of which was present. The 'Lancet,' vol. i, 1854 (p. 516).

of nervous exhaustion of the vocal organs, and treated accordingly without any good results. The reason of this is, that it depends upon a thickening of the membrane surrounding the vocal organs, as pointed out by Dr. Green,* who states it is more common in females than in males, and is usually a result of the follicular inflammation described in the first chapter of this book. The same plan of topical medication is absolutely necessary to perfect a cure, with suitable constitutional measures, and it is quite possible that a voice that shall have been impaired or lost for three or four years, may be recovered in as many weeks.

In all these cases there is a direct lesion of the structures in the windpipe, which is made known to us by the patient's history, symptoms, and progress from the beginning. The aphonia is usually gradual and not sudden, and never speedily disappears; this is reversed in nervous loss of the voice, for it sometimes suddenly vanishes in hysteria, and as quickly returns. I have heard the late Mr. Pilcher relate the case of a lady under his care, who lost her voice for twelve months, from mere lesion of sensibility: upon one occasion she spoke in her natural voice for two or three minutes, but the aphonia returned. In such cases, there is an absence of all the signs of organic lesion, and nervous symptoms predominate, perhaps following upon weakness

* The volume of the 'Lancet' just quoted.

and general debility. In many well-known cases of this kind, in 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.

Violent and sudden strong mental emotion, such as joy, sorrow, anger, or fright, will produce an attack of aphonia. There is no doubt that the influence of the mind upon the laryngeal nerves is the cause of it 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. 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 most instructive lectures on the diseases of the nervous system.* The presence of aneurisms or other tumours pressing upon the windpipe or its nerves—the par vagum and recurrent—affect the voice, and I have seen complete suppression from their influence. The

* 'Clinical Lectures on Paralysis, Disease of the Brain, and other Affections of the Nervous System.' By R. B. Todd, M.D., F.R.S. (p. 169).

voice varies from hoarseness to a shrill whisper, and the breathing is stridulous; the simulation of laryngeal disease is more often witnessed from aneurisms than any other form of tumour, for reasons that will suggest themselves to the mind of the reader. The alternate exposure to heat and cold, or the quick change from a warm to a very cold air, have induced aphonia, and it is thus often met with in those who live in damp kitchens.

The treatment of all these, will of course depend upon the various causes which produce the partial or complete aphonia: in the nervous and hysterical forms, the shower-bath, electro-galvanism, tonics, chalybeates, good food and exercise, will prove successful. Where the cause is removable or but temporary, its disappearance may be looked for, without any special recommendation here.

I have not referred, in this place, to the influence of various medicinal substances in producing suppression of the voice. These are lead, some of the powerful narcotics, and others, which are noticed in most works on Materia Medica and Therapeutics.

CHAPTER VII.

THE SORE-THROAT, FROM ORATORY, PUBLIC SPEAKING, AND SINGING.

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 of them 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 into the system, and allowed to proceed, often gives rise to great inconvenience and mischief. Among the causes which may be mentioned, 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 wind blowing upon the speaker or singer, whose digestive organs perhaps, may not be in their normal condition, or who may already have general relaxation of their mucous membranes. The membranes around the upper part of the windpipe, from the long-continued tension of the vocal cords in speaking or singing, are perhaps in a state of congestion. 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 probably ending in a chronic thickening of the parts. Besides these causes, long-protracted speaking and singing sometimes overstrains the muscles of the windpipe, and a debility is produced, which is followed by some amount of actual loss of the voice; or the voice becomes 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. In the class of persons referred to, the vocal organs are naturally in a state of capillary injection, and are extremely sensitive, being

very liable to take on ehanges from often the slightest cold or draught of air. A simple congestion of the vocal cords will thus produee aphonia, and many of our public singers are not unfrequently obliged to give up their avocation until this condition has been removed. Loud talking out of doors is another eause of the same thing, only that besides eongestion, a thickened state of the vocal cords is present, whieh is very liable to end in dangerous spasm.

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

When seen early, that is to say, when active eongestion alone is present, the application topieally of a weak argentine solution, or of the argento-nitrate

of mercury, immediately corrects this state of the membrane, without the slightest mischief or inconvenience, and if aphonia is present it will yield. 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. A thickening of the vocal cords will require a stronger solution of the nitrate to produce a decided effect; and with this, small doses of iodine and iodide of potassium in a bitter tonic, may be given to produce absorption of the submucous deposits. The use of the voice should be nearly dispensed with until a cure is performed. For the condition of the fauces, such measures will 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 its natural and healthy sound.

The importance of the subject discussed in the present chapter is such, that its consideration might very well have been more extended, but enough is stated to render it clear, and at the same time prove a useful guide to this form of throat-disease when encountered.

CHAPTER VIII.

WEAKNESS OF THE VOICE AND CHEST.

As a corollary to the two previous chapters, 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, 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 disorganization 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.

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 ehief signs mentioned. They are the result of the depressed nervous influenee on the lungs and voeal apparatus, more espeeially the ageney of the pneumogastrie and laryngeal nerves. The formation of the ehest is usually regular, although I have seen this form of weakness in females with lateral eurvature of the spine. The ehest does not seem to expand to its full extent, possibly from diminished nervous power in its museular apparatus, depending upon the eauses mentioned. The urine is often loaded with lithates, sometimes mixed with erystals of the oxalate of lime under the mieroseope, and it is not seanty in quantity. In many persons with this form of weakness, the skin is dull, but there is sometimes eonsiderable 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 diffieulty in making out this affeetion when onee it is studied.

In the treatment to be pursued, two objeets are to be held in view; the first, and most important, is, eareful regulation of the digestive organs; and the next is the administration of some of the milder tonies, assoeiated with diffusible stimuli. I have found it oeeasionally neeessary to give small and repeated doses of mereurials to eonquer the obstinaey of the liver, and have followed that up by the internal use of the eitrate of iron with quinine, with deeided advantage; or a very benefieial result may be obtained, by the use of the *hydrastin* eombined

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. 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.

CHAPTER IX.

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. In old age the changes observed in the larynx may properly be called ossification, because the phosphate of lime enters largely into their structure, 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.

The *ossification* of old age is then a natural process, in which the cartilages become converted into the elements of true bone, and assume a more or less solid yet spongy form, never compact. Dr. Gross, however, states he has seen them quite hard and firm, like the most perfect bone.* The voice in these cases is harsh and constrained, or it is cracked 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

* 'Elements of Pathological Anatomy.' 3rd Edition. Philadelphia, 1857.

ossification in an old person who sustained a wound of his throat, which was followed by the exfoliation of the thyroid eartilage in an ossified eondition, with an aetual eure in the course of several weeks.

If any disease should arise in the voeal apparatus of old people, the ossified eartilages are quite liable to undergo any of the ehanges of ordinary bone, sueh as earies, neerosis, and exfoliation. A very striking ease of the kind is related by Ryland,* in the person of an old man, aged seventy-five, who died of chronie bronehitis. He had soreness at the upper part of the traehea, and a feeble, veiled voiee. The rings of the traehea were found osseous, earious, absorbed, and some of them denuded.

In April, 1859, I exhibited before the Pathological Soeiety of London some speeimens of eomplete ossifieation of the thyroid and erieoid eartilages, taken from an old soldier, seventy years of age, who died from senile eatarrh. His voiee possessed a peeuliar but harsh sound, and his neek was unusually skinny from emaeiation. Some of the rings of the traehea were likewise similarly affected. In November last, my friend, Mr. T. Holmes, kindly showed me a preparation, in the museum of St. George's Hospital, of "ossifieation and ealeifieation" of all the eartilages of the larynx, as well as the thyrohyoid membrane, all the rings of the traehea, and some of the bronehi; no history of the ease exists.

* Op. cit.

In cases related by Dr. Travers,* and by Ryland, the arytenoid cartilages were found, after death, to be ossified and carious. I have seen the same thing on two occasions, but never met with that condition in the epiglottis. On the other hand, atheromatous thickening of the epiglottis is not a rare occurrence in calcification of the larynx.

Calcification of the laryngeal cartilages may be suspected in the class of persons who are subject to the saccharine throat, described in the next chapter. 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,

* 'Med.-Chir. Trans.' Vol. vii.

† 'Trans. Path. Soc.' Vol. x.

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, and not unfrequently there is a great noisy, barking cough, associated with this form of degenerated larynx. 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 the minute arteries in the brain is not only imminent, but likely to prove fatal in such bad constitutions.

CHAPTER X.

SACCHARINE THROAT.

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. It is one of considerable importance, and therefore worthy of notice. It may here be stated, however, that in another place a paper will shortly appear from my pen upon "the atheromatous expression," a remarkable yet very striking feature characterised by indication in the countenance of certain changes going on in the system generally, but especially of the conversion of the saccharine element (now called hepatine 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 was 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. The face has a greasy aspect, the nose and both upper and under lips seem as if slightly swelled, the eyes are bright and watery, there may be an arcus 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

* I use this term, proposed by Mr. Dixon, in his work on the Eye, as more appropriate for persons who are not aged, confining the *arcus senilis* of my friend Mr. Canton to the really old.

necessary accompaniment. The patient will consult his adviser for a cold which seems to hang about him, and on examining his throat the conditions mentioned will be noticed. If the irritation about the epiglottis has been rather annoying, with some cough, redness of the mucous membrane will be visible. There is no necessary connexion 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.

Now, cases of this kind often prove very troublesome, 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 neutralizing 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 half drachm doses of the dilute nitric acid of the London Pharmacopœia, combined with the nitrate of potass, and some stomachic; carefully regulating the bowels. Sometimes I substitute the aromatic sulphuric acid, with sulphates of potass and iron. The diet should consist of meat once a day, and that mutton; it should be light, yet nutritious, 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.

If the transformation of sugar into fat has not progressed too rapidly, and the atheromatous expression is only developing itself, the effect of the nitric or sulphuric acid 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.

Although this form of throat affection has been familiar to me for the last thirteen 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.

CHAPTER XI.

NERVOUS SORE THROAT—NEURALGIA.

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 was 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 fibres; 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. Dr. Wood, of Philadelphia, considers gouty and rheumatic irritation in a constitution of a nervous cha-

racter 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.

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. 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 ounce 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 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 were only 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 neeessity 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.

CHAPTER XII.

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, 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. How frequently do we observe aphonia in young females subject to hysteria, but then the voice has suddenly disappeared, and no previous symptoms were present to denote that it depended upon any other cause. When considering genuine aphonia (Chap. VI), it was mentioned that hysteria was one of its causes; and if sudden loss of voice does arise, it is owing to some *rapid* patho-

logical change that may have occurred, and the voice 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 of it 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 o 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.

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 these 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. 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 and nervous aphonia, and certainly with a cure, in so far that the voice was restored.

CHAPTER XIII.

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, it is followed at last by an inspiration of a loud crowing or whistling sound, to some extent similar to that in hooping-cough and the inspiration of croup, and 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, 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 in-

tervals; 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 swelled 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 oatmeal. 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. 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 has proved the most useful in my hands is that I am in the habit of adopting in hooping-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 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

* See my Treatise on Hooping Cough, p. 246.

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. 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.

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 recom-

mended 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.

CHAPTER XIV.

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 their connexions; 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. 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,*

* Cotton on Consumption.

dyspnœa is oeeasionally a prominent symptom, when a eontinuous ehain of tumours form along the whole length of the spine upon eaeh side of the aorta, sometimes eneireling the areh, no matter what their size may be. Enlarged bronehial or eervieal glands, in the same disease, equally eause dyspnœa. Besides the windpipe, the œsophagus will be pressed upon, and diffieulty of swallowing is eomplained 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 eaneer of the lung or otherwise, upon the sympathetie nerve, as was first pointed out by my friend Dr. Maedonnell, of Montreal.* The displaeement of the traehea will of eourse be mueh greater as the tumour—an aneurism, for instanee—rises higher and higher, and the breathing beeomes stridulous, and thus sueh eases have been mistaken for ehronie laryngitis.† The diagnosis will be easy on observing that the stridor seems to eome from the upper portion of the sternal region. The voiee is hoarse, or lost from pressure on the reeurrent nerve.

I have seen death ensue, under sueh eonditions, from simple exhaustion; the patient has been worn out. In other eases, a fatal result has oeeurred from suffoeation; a striking example of the kind is given by Mr. Lawrenee in the 'Med.-Chir. Trans.,' vol. vi.

* 'Montreal Med. Chron.,' vol. vi, p. 64, and 'Brit. Amer. Med. Jour.,' June, 1850.

† This subject is ably considered in Dr. Stokes's work on the Chest.

In the hands of an experienced physician, a mistake in the diagnosis of such cases could 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 lips of 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.

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 windpipe, 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 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.

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 quite 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.

CHAPTER XV.

DIPHTHERIA.

In modern times, perhaps no disease has attraeted more attention and so mueh oeeupied the publie mind, as that now reeognised as diphtheria. Its ravages were so destruetively fatal in many families, who were wholly eut off by it; so many persons of note beeame vietims, one ehild after another has been snatehed away, notwithstanding the most persevering efforts of our art to prevent it, that the utmost uneasiness eontinued to prevail for a long time regarding it. Almost every affeetion of the throat was looked upon as diphtheria, and the fears of the friends of the patient have influeneed, in some eases, the opinions of his attendant. In the present ehapter, therefore, it is ineumbent upon me to give a eoncise, yet elear aeeount of the disease as presented to us in England sinee the year 1857, avoiding all unneeessary detail, and exeluding its history as known in other eountries. Those who seek for further information in this respeet, are referred to the memoirs on the disease, published by the New Sydenham Soeiety, and to the *brochure* of my friend,

Mr. Ernest Hart.* The latter embodies all that is known upon the disease as it has oceurred in England. The following observations present a faithful mirror, whieh may be relied upon as a guide to the symptoms and treatment of a malady whieh has proved one of the most formidable our profession have had to eneounter.

Diphtheria is both infeetious and contagious, and may hereafter be determined to present the peeuliarity of attaeking persons at least onee in the course of their lives. It oeeurs both sporadieally and as an epidemie, and is remarkably virulent in limited areas which are defieicnt in good sanitary regulations. It is allied in some of its phcnomena to both the searlatinal and malignant sore throat, but is unquestionably a distinet affeetion from searlatina, whieh is proved by its attaeking persons who have had the former disease, even in years gone by. It has oecurred at all periods of the year, but especially in the spring and fall.

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 eommon, I shall dwell on their pathology before describing them individually.

Pathology.—Diphtheria is essentially a blood-disease, and manifests its great peeuliarity in all its

* 'On Diphtheria; its History, Progress, Symptoms, and Treatment,' 1859. See also Dr. Ranking's Lecture in the 'Lancet' for January, 1859.

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. 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.

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 this parasite is an accidental or exceptional circumstance, although it has been 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

* Observations on Diphtheria.

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.

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 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 velum palati, the uvula, 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.

The treatment is simple and clear, and consists of the local application of either a solution of the nitrate of silver, thirty grains to the ounce of water, or of dilute hydrochloric acid; and the administration of the tincture of the sesquichloride of iron, combined with chlorate of potass, every three or four hours; and mild evacuants suited to the age of the patient.

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 obstruetion to the respiration has been the extension of the exudation down the windpipe to the bronehial tubes; this is sometimes eoughed up, and for a little while the breathing is relieved, but it is mostly but temporary, as the same symptoms reeur, with great difficulty of swallowing from extreme pain, espeeially in young ehildren.

The glands of the neek are swollen and enlarged in this form, whieh may be said greatly to resemble eroup, only with the severity of the symptoms greatly magnified, and the prostration of the most rapid eharaeter, preeeded usually by obstinate vomiting. Although it is mostly in ehildren 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 energetie treatment; it is sometimes the result of the first or simple form, if negleeted.

Without enumerating all that has been reeommended in this form, it is suffieient for us to employ what general experienee has found to be the most effieaeious. The same solution of nitrate of silver as in the first form (thirty grains to the ounee), should be most effeetually and thoroughly applied to the whole of the fauees, three or four times in the twenty-four hours, by means of the sponge-probang in the adult, and a large camel-hair brush in the ehild. Or the hydroehlorie aeid 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.

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 potass and 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 in cold water, and so wrung out as not to drip, and covered by a similar dry one, or a handker-

* 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.

chief, will produce effects very much resembling those of the emollient fomentations.

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 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 forty 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.

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 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, slobbing, 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.

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 recom-

* Two Lectures in the 'Lancet,' January 8th and 15th, 1859.

mended 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. 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, 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.

Should convalescence fortunately become established, the following are some of the sequelæ or after-results, 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, incapacity for suction, and the regurgitation of fluids by the nostrils. 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 latter gentleman recommends a collar of soap-plaster, spread upon leather, as affording great relief and comfort when the head falls forward on the chest from paralysis of the spinal accessory nerve and cervical plexus. This paralysis, when general, is from toxication of the blood by the disease, but, otherwise, it is of local origin.

Diagnosis from other throat affections..—Those diseases with which it is liable to be confounded, are croup, scarlatina anginosa, cynanche maligna, and tonsillitis. The distinction between them is best shown in a tabular form :

Diphtheria.	*Croup.*
1. The exudation begins in the fauces, and reaches the windpipe by extension, in a certain number of cases.	1. It commences in the windpipe, and extends to the glottis from below upwards.
2. Uneasiness first referred to parts subservient to deglutition; that is, in the throat.	2. The earliest symptom is stridulous voice and breathing; this in diphtheria is the final development of diseased action.

* 'Lancet,' 6th November, 1858.

3. Fever of adynamic or typhoid type.
4. Pharynx diseased.

3. Fever inflammatory.
4. Pharynx healthy.

Diphtheria.

1. Exudation easily removed, leaving mucous membrane congested, but smooth and entire.
2. Distinct membranous exudation, without loss of substance.

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.

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.

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.

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.

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.

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. It may attack children during their convalescence from scarlatina, measles, and hooping-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 had performed tracheotomy.* 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 same general principles of treatment already described must be adopted.

* 'Lancet,' for March, April and November, 1858.

CHAPTER XVI.

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 of 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 the 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 girl, Cecilia, has had three or four 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.

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. Sometimes it exists in grains or patches occupying different parts, or it may form demicylinders, 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 habit-

ually 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 dyspnœa, with now intense drowsiness. When there are complications of diseases 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. 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 Dr. Badgley, of Albion Street, Hyde Park, is in the habit of using the ethereal tincture of lobelia as a substitute for the antimonial emetic, and he speaks very highly of its efficacy; and I know, from the reputation it has in the United States, that it must be a valuable remedy.

With respect to the operation of tracheotomy for croup, I have only to say, that I have now seen it done in some few dozens of cases, and with a few exceptions all died; therefore I cannot be much im-

pressed 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. The last operation which I witnessed was one by my friend, Mr. P. C. Price, of Green Street, on the 21st Nov., 1859, upon a child twenty-two months old, in the second stage of croup, a patient of Dr. Maurice Davies—and it seemed to be one of the most favorable cases for opening the trachea that I had seen for a long time. Tracheotomy was most skilfully performed by Mr. Price, as is the custom with him in all of his operations; and it was followed by most sensible and marked relief to the child. I was permitted to prescribe from one to two drachms of the decoction of senega (ʒv of the root to ℥xij of water, boiled to ℥vj) with some carbonate of ammonia, administered every ten or fifteen minutes by the rectum, with brandy and wine by the mouth; and the most satisfactory improvement went on for forty hours, the breathing all the time being clear and unimpeded, when the child suddenly expired. After death, some recent false membrane was found below the opening in the trachea, and extensive pneumonia of both lungs, chiefly at their bases, which, no doubt,

produeed the fatal result. There were erude tubereles seattered throughout both lungs.

I am free to admit that the operation *has* saved life in a few instanees, and it must not be diségarded in eroup. Moreover, I will assert that when it has proved unavailing, it has not been due to that proeeeding itself. Notwithstanding all this, however, we are justified in trying the most powerful revulsives, in preferenee to traeheotomy. Emeties of a *very strong decoction* of senega are what I have used in desperate eases, and I found them servieeable in saving life and effeetually expelling the fibro-albuminous exudation. But the senega must be used with an unsparing hand as to the strength of its deeoetion—it ean do no harm whatever; and I generally prepare it myself for administration at the residenee of the ehild, and give it with my own hand. In three instanees that were looked upon as utterly hopel'ess, and too bad almost for traeheotomy, the strong deeoetion of senega saved life, expelled the false membrane, prevented its reformation, and a eure resulted. The way of preparing this deeoetion is as follows: Take two ounees 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 saueepan down to a pint, strain and eool it, and administer it in doses of a dessert-spoonful every ten minutes, until free vomiting takes plaee, with expulsion of the membrane. It may be repeated, if neeessary, but it is only in

such cases that other remcdics fail, that this strong decoction should be employcd. Carbonatc of ammonia may be added somctimes, in the dose of a grain or half a grain, *after* thc emetic influence is produeed, and occasionally the mixture may be given by the rectum ; it is as well to sweeten it, when taken by the stomaeh, with syrup, or bruised liquoriee root, which eovcr both the aerimony and flavour peculiar to it.

An infusion of the senega may be substituted for thc decoction, made in the proportion of two ounccs of the root to a pint of boiling water, and given in the same doses.

CHAPTER XVII.

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 windpipe 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 sub-divisions of acute laryngeal disease, given by some writers on this subject, are puzzling, and likely to mislead in our attempts at diagnosis. My desire is to simplify, and to render the discrimination between them a matter of less difficulty, on taking into account the great variety of pathological appearances which necroscopical inspection has from time to time furnished. With this view, I shall consider acute laryngitis as of two

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

varieties (preferring the division of Cruveilhier, as adopted by Ryland), namely, one form affeeting the mueous membrane alone, and the other implieating the sub-mueous areolar tissue. The seeond variety, under the name of *œdema of the glottis,* is eonsidered quite distinet in the sueeeeding ehapter, although the two often run together. The first variety is ealled *acute catarrhal laryngitis,* to distinguish it from any other affeetion of the larynx, and implieates the proper mueous membrane.

Symptoms.—It may eommenee with the usual symptoms of a sore throat, with general fever, preeeded by shivering; usually, however, the attaek will be sudden. At first, a dull pain is felt at the upper and front part of the throat, attended by a feeling of eonstrietion; the larynx is found to be tender on pressure; there is diffieulty of swallowing, and very soon a diffieulty of breathing; there is a frequent, though slight, irritating, stridulous, harsh or husky eough, unaeeompanied by expeetoration, whieh is very distressing; and the voiee is hoarse, or altogether inaudible, being replaeed by a whisper; the patient points to the pomum Adami as the seat of all his trouble. The fauees are to be seen red and inflamed, whilst the epiglottis, when it ean be observed, is ereet, red, and thickened; it ean be felt in most instanees by introdueing 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."* 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, and requires an unusual muscular effort, 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 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 the 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.

* Porter, op. cit.

Pathology. The mucous membrane of the larynx is 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 mucous membrane, and which does not originate in the sub-mucous tissues, as is the case in œdema of the glottis,* but it generally participates in the disease. The inflammation does not extend into the trachea, but may pass upwards to the epiglottis, which is found to be red, erect, thickened, and swollen, and during life, has been compared to a piece of raw meat. The sub-mucous tissue of the lips of the glottis and 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 found in the structures. 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

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

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 glottidis, and asthma. But such is the peculiar nature of laryngitis, that a mistake is hardly possible; the symptoms clearly point to the true seat of mischief, and when there is doubt, a careful scrutiny will very soon decide.

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. Dr. Stokes has observed, that this form of laryngeal inflammation may occur from erysipelas; diffuse inflammation of the neck; as a result of the lower forms of scarlatina and other exanthemata; as a consequence of parotiditis; from the long existence of

organic tumours in the neck; and after great operations on the neck.*

The *treatment* 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. Our great reliance is now to be placed upon the operation of tracheotomy, which holds out the best chance for recovery; and, indeed, it has proved successful in apparently the most hopeless cases. This is, perhaps, easily explained—for the reason that there is no complication of disease of the trachea and bronchi in the adult, as occurs in the croup of children. Mr. Porter advocates the early resort to 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.*

* 'Diseases of the Chest.'

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

It is left to the diseretion of the physieian whether he shall employ small doses of mercurials, but he will, of eourse, be guided by the after affeets of thc operation itself. I have seen the operation donc in some six or seven eases, when suffoeation was impending, and four out of the number reeovered. Dr. Horaee Green has treated this form of inflammation with sueeess, by using a solution of nitrate of silver (forty grains to the ounee) after having used veneseetion, emeties, and nauseating doses of antimony. The solution inercased thc diffieulty of breathing and eough, for a few minutes only, but much ropy, viscid mueus was diseharged. In half an hour the patient (a female) was better, and made a good reeovery.

CHAPTER XVIII.

ŒDEMA OR DROPSY OF THE GLOTTIS.

In the previous chapter, the essential element of the disease described 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, in so far as depletion is concerned at the commencement. We have here a serious impediment to breathing without any violent inflammation. 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 very reeently observing in two instanees at St. George's Hospital. It would seem to oceur under various eireumstanees and in peeuliar eonditions, and it is notieed by many writers as a eoincident, and not a dangerous eomplieation with other affeetions of the respiratory apparatus. What does its minute anatomy teaeh us?

The *pathology* of the disease shows that the effusion is here poured out in the submueous areolar tissue, as the result of the inflammation eommeneing in that strueture, and not in the mueous membrane; the external surfaee of the latter is free from any inflammatory redness, the swollen parts possessing a pale-yellow eolour. The serous effusion produees an approximation of the sides of the glottis, and offers a meehanieal obstruetion to the passage of the air to the lungs. The epiglottis never exhibits any degree of redness, and seldom any inerease in size. Serous deposition, or dropsy of the submueous areolar tissue, is by no means peeuliar to this affeetion, as it is found in almost every fatal ease of aeute laryngitis, but eombined with symptoms of aetive inflammation and the result of that proeess. When it runs an aetive and fatal eourse, serum alone is observed, as my own disseetions have proved; if it has been somewhat protraeted, and the death a slow one, the serum has beeome eonverted into a sero-purulent fluid, permitting the areolar tissue lying between the mueous membrane in the upper part of the larynx, and the subjaeent eartilages, to be drawn

away in shreds, as has occurred in my own experience. In the majority of instances tumefaction, closure of the rima, and serum alone are noticed.

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. 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. 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 continual 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. M. Thuillier,† has recom-

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

† Quoted by Ryland.

mended the introduction of the finger into the mouth to examine the lips of the glottis; and if they can be reached, and are œdematous, they will present to the finger two tense, smooth and rounded tumours, just behind the epiglottis. This form of disease is often brought on as a consequence of other affections of the larynx.

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, Lisfrane's plan may be tried, of making small punctures in the œdematous swellings, to let out the fluid. It has been found perfectly successful by Mr. Busk, in the Seamen's Hospital Dreadnought, in two instances of sailors thus affected. Numerous minute punctures were made with a sharp-pointed bistoury into the back of the tongue, the uvula and the pharynx, and repeated 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.

Small doses of mercurials have been found useful, in the hands of some practitioners, when all active danger is arrested, and especially in the milder forms, so as gently and decidedly to affect the system.

CHAPTER XIX.

ERYSIPELAS OF THE WINDPIPE.

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 and typhoid character of the inflammation is considered. Some three or four cases have come under my notice in the London hospitals during the last seven years, and all ended in death. 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 edges of the fissure of 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 inflammation 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. Wine, brandy, and other stimulants, should be freely administered, and tracheotomy *must be performed* when suffocation is impending, to afford even a chance of life. Not any lowering nor depleting measures of any kind can be permitted in erysipelatous laryngitis.

CHAPTER XX.

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, were those of intense laryngitis, commingled with general faucial inflammation; the voice was reduced to a whisper, with a considerable amount of dyspnœa depending

upon constriction of the glottis, which is more or less œdematous. 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.*

* 'Practical Remarks on Gout, Rheumatic Fever,' &c. London, 1843.

CHAPTER XXI.

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.

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 diph-

theria,* 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, 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

* See Dr. Burrow's able "Essay on Scarlet Fever," in the first volume of the 'Library of Medicine.'

secretion from pharynx and tonsils. Florid redness and considerable swelling of tonsils, uvula and soft palate, extending to posterior fauces. 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 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 *œdema of the glottis* will rapidly form, and quickly destroy life. Enlargement of the submaxillary and parotid glands is sometimes enormous, and produce constriction of the fauces by their pressure; they add 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 circum-

stances 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 that admirable *brochure* on scarlatina, by my friend 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

* 'Principles of Medicine.'

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.

* I have prepared a lengthened essay on the *Sanguinaria,* which is on the eve of publication.

CHAPTER XXII.

RUBEOLAR SORE THROAT.

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 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 constriction 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 and fauces assumes a dusky-red, or livid colour. Œdema of the glottis has occurred in the severer forms, 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.

PUSTULAR THROAT OF SMALLPOX.

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 in 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. Salivation is present in both forms of the disease, but more extensive in the confluent variety. This complication of disease in the throat will sometimes extend to the larynx, and the sufferer perishes by suffocation consequent upon sudden œdema of the glottis.*

* Typhoid disease of the larynx is occasionally noticed in both typhus and typhoid fever; I have seen instances of it, but the attention of the profession has recently been drawn to it by Dr. Wilks, of Guy's Hospital. Dr. Stokes refers to it in his writings.

CHAPTER XXIII.

PERTUSSAL SORE THROAT.

According to the frequency of the paroxysms in hooping-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 (20 grains to the ounce of water) to the larynx, and at once check the tendency to further mischief.

Many of the more dangerous affections of the larynx and trachea are found to be complications in hooping-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 were 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

* See my 'Treatise on Hooping-Cough' (p. 155), 8vo. London, 1854.

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 attention to the throat in hooping-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 hooping-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 hooping-cough," in which he mentions that seventy-five cases (thirty-

* See my 'Treatise on Hooping Cough.'

† Vol. i, 1857, p. 378.

two boys and forty-three girls), in age from two to eight years, in a school of over one thousand 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.

CHAPTER XXIV.

THE 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.

I should wish it to be understood, 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 *a 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

* Op. cit.

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 necessary 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.

* See the 'Lancet,' vol. i, 1855.

CHAPTER XXV.

SYPHILITIC SORE THROAT.

The present form of diseased throat does not specially come within the scope of this work; nevertheless, it requires that a few observations should be made respecting it, so that it may be distinguished from other varieties. From its peculiar nature, it is probably one of the most frequent affections that comes up for treatment. 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. Most usually, there is an extension of the ulceration, by continuity from these parts to the larynx, when there may be present all the symptoms of chronic laryngeal disease, with total loss of voice, or if the patient speaks, it is in a whisper; there is suffocative cough, and expectoration of pus and blood. The vocal cords, and other parts of the larynx are found to be ulcerated at the same time, in common with the rest of the throat, and sometimes including the base of the

tongue. The epiglottis is similarly affected, only that the anterior, or lingual surface, is the most frequently ulcerated, and now and then its tip. My friend, Mr. T. Holmes, showed me a preparation in the museum of 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 larynx itself.

The history and appearance of the patient will plainly indicate the true nature of the larnygitis, which is sometimes so acute, with œdema of the glottis, that suffocation is imminent. There may be secondary eruptions, emaciation, and a look of misery about the patient, whose constitution is at the same time broken down by his disease. The laryngeal mischief is secondary to the other disease, which has probably been noticed for some time.

In the treatment of the ulcerated larynx, it will be necessary to combine local with constitutional means; 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 in every case. 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 œdema of the glottis in syphilitic ulcera-

tion of the larynx; and, terribly bad as most of them were, in nearly all a recovery ensued, by well supporting the paticnt's strcngth after thc operation. In no class of cases, then, docs the operation hold out such a favorable chanee for relief as in the present. As an cxample of its success in a very bad case, I may cite onc whieh I heard Mr. Hilton narrate before the Medieal 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 shc has worn a tube ever since in her windpipc. The voice is cntirely gone. Lately, it was necessary to remove a piecc 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 cxtracted. Now, this is one of those cascs in which a permanent fistulous opening would be preferable to the continued prescnee of a tube, as I have statcd in other parts of this work.

CHAPTER XXVI.

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, laying 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 particularly 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. My friend, 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 two or three 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 osseous 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.

In hysterical females, this symptom is one of the vagaries which presents itself, as has been already noticed in Chapter XII.

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 is further illustrated in Chapter XXIX, on the "Affections of the Gullet."

CHAPTER XXVII.

AFFECTIONS OF THE TONSILS AND UVULA.

As the mucous membrane covering the tonsils and uvula has been already considered in connexion 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 cause 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 may 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 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.

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. Mr. Yearsley* states that the enlargement 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. Without describing the symptoms of an enlarged tonsil, inspection of the throat will readily detect their 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, argento-nitrate of mercury, or the tincture of iodine, combined with internal remedies; of which the prepara-

* '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.'

tions 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 seven years. My testimony, therefore, is of value on this point. Besides the substance just named, guaiacum has been found most useful by my friend, Mr. Harvey, when other remedies have failed. The bromide of potassium will also reduce an enlarged tonsil. If a speedy 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 perform, and whose method I have successfully practised without any inconvenience, cutting downwards and inwards towards the mesial line. The removal is not a painful proceeding, and there is but little bleeding.

In strumous and other children, topical medication, with iodine and iron internally, will cause their diminution to their natural standard; in this way I have succeeded in curing quite a number of cases 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, more especially as he maintains that the enlargement will often disappear spontaneously at the age of puberty, both in boys and girls.

When co-existing with follicular disease of the throat, 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.

Ulcerations are sometimes present on the chronic enlarged tonsil, which will be an additional reason for their removal, as they are probably co-existent with the follicular disease of the pharynx, and it will be impossible to treat the latter whilst they are present. The uvula if also elongated must be truncated.

Calcareous Tonsils. — Mr. 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 a piece of rock coral in its peculiar form.

Cancer of the Tonsils.—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, 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.

Elongated Uvula, occurs from long-continued and repeated attacks of inflammation, and from general relaxation of the fauces; it causes an inclination to cough and to vomit, sometimes difficulty of swallowing, and gives rise to much uneasiness. 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 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 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

* I recorded it in the 'Lancet,' of October, 1859, p. 339.

sometimes the whole of it, as recommended by Mr. 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.

Palsy of the Tonsils, Uvula, and Palate.—This has been observed as a result of diphtheria by Dr. Faure, of Paris; the soft palate dangles like a loose curtain.*

* 'Ed. Med. Jour.,' March, 1859.

CHAPTER XXVIII.

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 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 will perhaps 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 sprung a large fibrous growth, which almost blocked up the pharynx and produced serious dyspnœa. The tumour was not distinctly circumscribed nor moveable, 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 last Mr. Birkett showed me a man, aged thirty-four, 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, and it was 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. If other means are attempted, besides probable failure, there is the risk of ulceration, with constriction and subsequent wretchedness.

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 mis-

taken 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 lately informed me (October 21st) that another example of this form of tumour was just admitted under his care in the Royal Infirmary of Edinburgh, in a man aged forty-two, sent to him by Mr. Dunnet, of Moy.

CHAPTER XXIX.

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 the causes mentioned in the last chapter of this work. Mechanical violence from the introduction of hard or very large bodies down the tube might 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 star-

vation, as I have now seen on two occasions at Guy's Hospital.

Spasm of the œsophagus—which, in its production sometimes of 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. The malformations to which this tube is liable are some of them very remarkable, and necessarily fatal.

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 had treated eight cases of stricture in two years with success, and he attaches no value to mechanical dilatation unless in purely spasmodic cases.

CHAPTER XXX.

POLYPUS AND OTHER TUMOURS OF THE WINDPIPE.

These are very rare in the larynx as compared with their presence in the throat, and are met with in two forms, namely, attached by a distinct pedicle, or growing direct from the mucous membrane in the form of an epithelial, warty, or cauliflower-like tumour. In size, they vary from a pea to a hazel-nut, and necessarily cause great obstruction to the breathing, according to their situation. Their structure is generally fibro-cellular, sometimes fatty or fibro-plastic, or, at times, a prolongation of the mucous membrane only. Their situation is in the ventricles of the larynx, or on the vocal cords,* lips of the glottis, or root of the epiglottis, and are observed in persons over forty-five, who may have suffered from chronic chest disease. They are difficult to make out during life, and our diagnosis

* A child four years old, in Guy's Hospital, under Dr. Wilks, died of diphtheria, and had a papillary polypus growing from one of the vocal cords, which gave rise to the inflammation.—See 'Med. Times and Gazette,' for 1859.

will be assisted chiefly by observing the doubtful character of the general symptoms, as differing from any of the ordinary symptoms of laryngeal disease. There will be variable dyspnœa and, perhaps, dysphagia, with a sensation of the slipping up and down of a body in the larynx, particularly if pedunculated, which is most significant. The voice will be altered, an occasional suffocative or croupy cough is present, and sudden attacks of spasmodic breathing. When very dexterous, we can, in some instances, introduce the tip of the finger into the larynx, and satisfy ourselves as to the presence and form of the tumour.

If clearly made out, and the tumour is known to occupy the larynx, it must be got rid of by opening that cavity, for suffocation is sure to result in the end if it is not done. It is wholly out of the question to expect its removal through the glottis. We have the experience of several accurate observers, to show that the larynx may be freely opened, and such tumours removed with the most perfect safety.

When the polypus is attached to the epiglottis above, its removal by the knife or ligature can be accomplished through the mouth. It must be confessed that tumours and polypi of the throat and larynx offer a wide and complicated field for study.

CHAPTER XXXI.

DISLOCATIONS OF THE TONGUE-BONE.

(Os Hyoides.)

When we refleet upon the eomplieated movements of the tongue, and of the part that the hyoid or tongue-bone plays in their performanee, it might at first sight seem somewhat novel and surprising that this bone eould by any possibility beeome disloeated. Nevertheless, sueh is the faet; and a displaeement of one or other of the eornua or horns of this bone is, perhaps, of more frequent oeeurrenee than is imagined. This little bone is attaehed to eleven pairs of museles, which are its elevators and depressors; it forms the base of attaehment to numerous muscles in the neek, and is the prineipal support to the tongue itself. The extremities of the greater horns of this bone, and the superior horns of the thyroid cartilage, are eonneeted together by two round eords, which are known as the *thyro-hyoidean ligaments.* Usually they eontain eartilaginous or osseous grains, whieh represent sesamoid bones in other situations, the knee-eap for example. Owing to a natural weakness of the parts, or a general relaxation of the

throat-muscles, these superior horns are liable to become dislocated, and most materially interfere with the movements of the throat and general comfort of the person so affected. Violence will also give rise to the same thing. Instances of each have come under my notice; one of the most interesting I brought before the Pathological Society of London in April, 1859, and is published in the tenth volume of its Transactions. The following is a brief account of it:

Hydrarthrosis of the left thyro-hyoid articulation, and dislocation of the hyoid bone.

A man, forty-five years of age, 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 backwards 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.

This condition explained the symptoms present during life, and was the fourth example which had come under my notice in the male 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 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 the forcible squeezing of the throat, or by

garotting, if thc bone is not fraetured, and the muscular tissues not laeerated, better prospeets of a permanent eure are held out than when it arises from relaxed tissues.

FRACTURE OF THE TONGUE-BONE.

(Os Hyoides.)

WHEN the tongue-bone is fraetured, the injury is of a mueh more serious nature than in the preeeding affection, from the urgent eharaeter of the symptoms, and the extreme danger to whieh the patient is exposed from suffoeation. Direet violenee, in some one of its forms, can only produee it. The part fraetured is either one or both of the horns, at their middle, or elose to their junetion 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 mueous membrane whieh is sometimes most profuse, and is eoughed up. There is great diffieulty and pain in swallowing, and oecasionally it is impossible; whilst speeeh is equally distressing, and the voiee is gone. Simple protrusion of the tongue will produee symptoms of suffoeation; the organ itself is now and then swollen from the inflammation, whieh is sure to extend to the throat and pharynx. Mobility of the horns, with distinet ercpitation, can be felt with the finger and thumb externally or when the patient swallows, and the finger introdueed into thc mouth will feel the dis-

placed and broken bone, if projecting towards the throat.

In a case described by *Dr. Lalesque*,* this bone was broken in a marine, aged sixty-seven, who had his throat violently clenched in a quarrel. At the moment there was very acute pain, and the sensation of a solid body breaking. The pain was aggravated by every effort to speak, to swallow, or to move the tongue, and when this organ was pushed backwards. Deglutition was impossible, articulation indistinct, and he was unable to open his mouth without exciting a great deal of pain. The left horn was broken near the body of the bone, and had pierced the mucous membrane, giving rise to bleeding. He was fed by an œsophagus tube for twenty-five days, and ultimately recovered.

In another case, under Dr. P. G. Fore's care,† a female, aged thirty, fell down the cellar-steps, striking the prominent part of the larynx and tongue-bone against a brick, severely injuring the former, and fracturing the left horn close to the body of the bone of the latter, as in the previous case. Profuse bleeding ensued from the fauces, speech was lost, and great difficulty experienced in swallowing. Considerable inflammation and swelling of the throat and pharynx ensued, and continued for some time.

* 'Jour. Hebdomadaire,' March, 1833, and 'Am. Jr. Med. Sciences.' vol. xiii, p. 250. 1833.

† 'Stethoscope,' Richmond, Virginia, U.S., June, 1855.

In four weeks she was able to converse with an impaired voice, and ultimately recovered.

Other examples have been described by Auberge, in the 'Revue Médicale,' for July, 1855; in 'South's Chelius,' and in the eighth volume of the 'Brit. and For. Med.-Chir. Review,' N.S., 1851. In the last of these, the large cornu was broken, and had become firmly imbedded between the epiglottis and rima glottidis; the patient was a man sixty-three years of age, who fell on his face from a waggon, and the fracture was considered by Dr. Grunder as the result of muscular action, which may be doubted from the position of the broken horn. The patient died on the eleventh day, but the fracture was not detected during life, and the hyoid apparatus seemed sound.

Mr. South states that the only examples of fracture of this bone, with which he is aware, are those of persons executed by hanging, in which he says, fracture is almost invariably found. My friend, Mr. F. J. Gant, examined one of the last men hanged in front of Newgate (Adams), and did not find the cornua broken, as he informed me in July last.

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 whieh is eertain to arise, and these eonsist of bloodletting from the arm, leeehes to the throat, eold lotions, nitrate of potass in mueilage, with hyoseyamus and cherry laurel water. The strietest quiet is to be enjoined, efforts at speeeh are partieularly to be avoided, absolute silenee is to be maintained; and if swallowing is impossible, or the ends of the broken horns beeome again displaeed in eonsequenee of it, an œsophagus tube must be used to introduee liquid food into the stomaeh. Sometimes this is equally as injurious as the aet of swallowing; when sueh is the ease, reeourse must be had to elysters, to nourish the patient. Fluids only are to be taken by the mouth, when eireumstanees permit it, and in small quantities at a time. If the hæmorrhage, after the injury, is profuse, or the inflammation violent, iee may be applied outwardly. Should, unfortunately, the body of the bone be broken, and the symptoms of suffoeation beeome imminent, then the traehea must be opened to afford relief. The head of the patient should be kept rather low, and inelined a little baekwards, to keep the neek at rest.

CHAPTER XXXII.

FRACTURE OF THE CARTILAGES OF THE LARYNX.

Some of the smaller cartilages of the larynx are liable to disloeation, and even ultimate expulsion by uleerative disease; this form of throat affeetion is eonsidered in another part of this work.

Fraeture, however, of the thyroid eartilage only, will now be notieed. It is an injury whieh is the result of direet violenee, whether by blows or falls, or forcible squeezing of the throat. Aceording to the violenee exerted, and the extent of the injury, so is the liability to a speedy death from suffocation, owing to displaeement of the ends of the fraeture, as notieed by Chelius; or, very violent symptoms may ensue. In severe injuries to this eartilage, there have been observed diffieult breathing with a loud snoring noise, the head and neek being thrown baekwards, eough with bloody froth flowing from the mouth, hoarse, inartieulate voiee, eonvulsions in ehildren, 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,' and other works. The following is a brief account of it:

"On the 1st of September, 1845, I was called upon by a healthy-looking man, aged thirty, for advice about his throat. He stated that two or three days previously, when getting out of a car-

* 'British Amer. Med. and Physical Journal,' vol. vi, p. 306.

riage, he fell, and struck one of the steps near the wheel, with the " bone of the neck," and ever since his voice has been imperfect, 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 produced 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.

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 glottis, laryngotomy having been

* 'Brit. and For. Med.-Chir. Review,' N.S. Vol. viii, p. 273. 1851.

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 cricoid cartilage with emphysema, published by Mr. Prescott Hewett, in the first volume of 'Trans. Path. Soc.' (p. 199). A

man, twenty-seven years of age, fell from a seaffold, fifty feet high, and, although his fall was broken, he sustained various injuries, for whieh he was admitted into St. George's Hospital, under Mr. Cutler's eare. Urgent dyspnœa was present, with emphysematous eraekling about the root of the neek. The latter spread rapidly in the eellular 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 aeeident, never having rallied from the head symptoms. The lungs and ribs were sound, but on examining the traehea and larynx, the right side of the erieoid eartilage was found to be broken in two plaees on its anterior surfaee, a portion of the eartilage, 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 mueous membrane, produeing a jagged opening, the size of a pea, whieh eommunieated freely with the eellular tissue of the neek and gave rise to the emphysema. Eeehymosed spots surrounded the voeal eords, and the brain was found extensively laeerated.

In the treatment of these injuries to the larynx, if the symptoms are not urgent, attempts must be made to replaee the ends of the fraeture, if displaeed, in their proper position. Should this be impossible, and suffoeation threatened, as in the second girl, whose ease has just been referred to,

the coverings of the larynx should at once be cut through, in the mesial 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 plaister, 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.

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.

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