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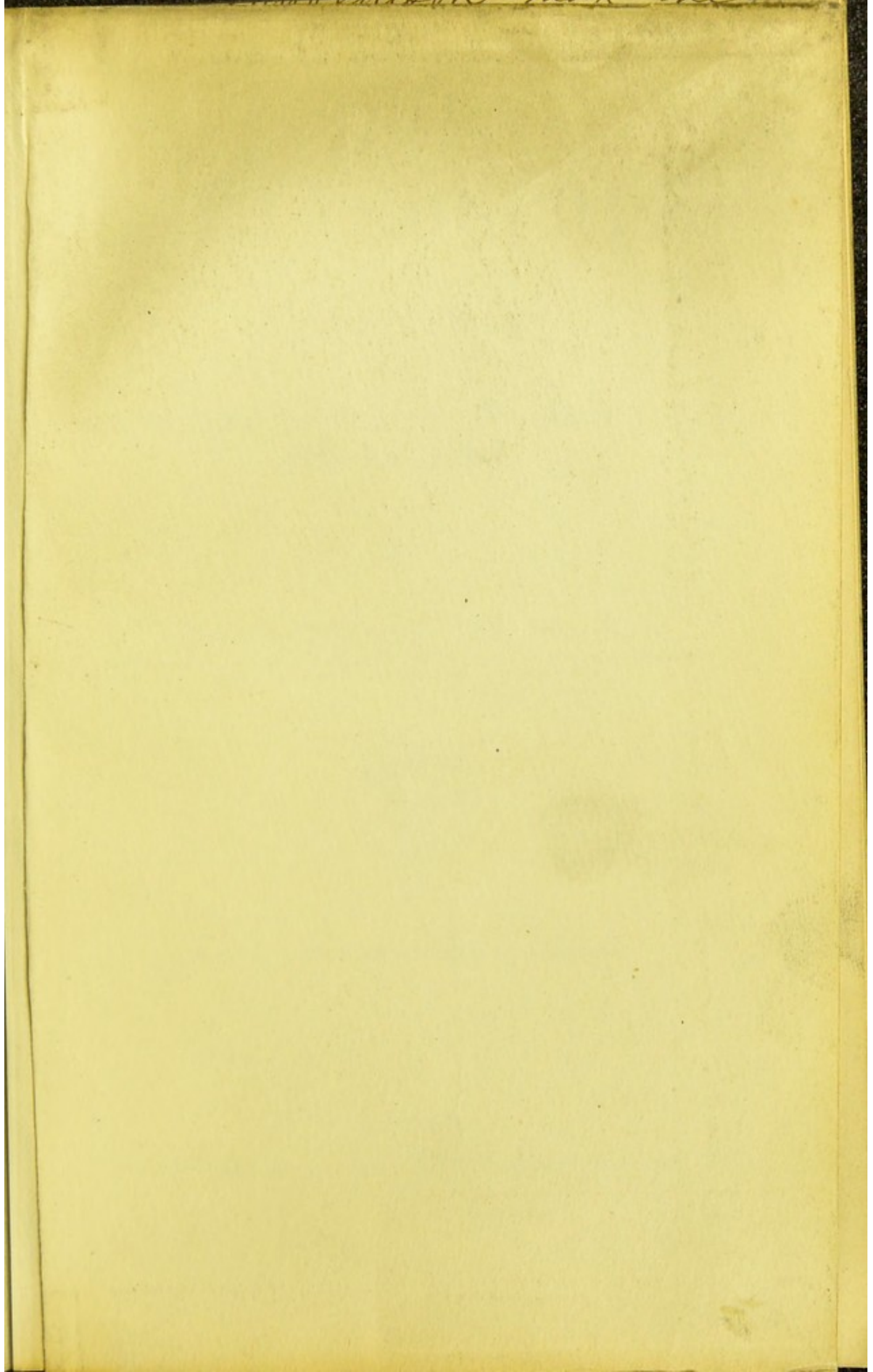
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Author's kind regards.

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THE
LARYNGOSCOPE:

ILLUSTRATIONS

OF

ITS PRACTICAL APPLICATION, AND DESCRIPTION OF
ITS MECHANISM.

BY

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

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LONDON:

JOHN CHURCHILL & SONS, NEW BURLINGTON STREET.

1863.

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TO MY OLD AND VALUED FRIEND AND

FORMER COLLEAGUE,

GEORGE EDGEWORTH FENWICK, M.D.,

OF MONTREAL, CANADA,

THIS ESSAY IS INSCRIBED

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PREFACE.

THE present Essay formed the subject of a paper read before the *Medical Society of London*, in December, 1862, and is submitted to the Profession with the view of illustrating some of the applications of one of the most important inventions of modern times.

The cases which are set forth are simple in detail and brief; a number, including those of tumours or growths, I had the pleasure of showing to many of my professional brethren, to whom I take this opportunity of gratefully tendering my warmest acknowledgments in their sending me for inspection many obscure and difficult cases of laryngeal disease.

In the following pages some of the more important only of my cases (public and private) have been selected, as particularly illustrative of the practical value of the laryngoscope, and of the different structures and localities which it presents to our observation.

For a general description of all the diseases of the throat, larynx, and trachea, perseveringly and carefully worked out with the laryngoscope since its re-introduction into this country by my distinguished friend, Professor Czermak, the reader is referred to the forthcoming *second* edition of my work on the subject, shortly to be published by Messrs. John Churchill and Sons.

G. D. G.

19A, PORTMAN STREET, PORTMAN SQUARE,
1st October, 1863.

ADVERTISEMENT.

For an announcement of the Author's other works, with Notices of the Press, the reader is referred to the end of this Essay.

ILLUSTRATIONS

OF THE

PRACTICAL APPLICATION OF THE LARYNGOSCOPE.

So much interest has been excited amongst the Profession in a desire not only to know more about the Laryngoscope, since it was brought prominently forward in 1860, but also to see examples wherein its practical value could be demonstrated, that I have been persuaded to submit the following instances, wherein the diagnosis was readily made out, after years of suffering, and the treatment in consequence rendered comparatively easy. It has fallen to my lot to see cases of laryngeal disease—great hoarseness, for example, with varying aphonia—that have existed for ten or twenty years, and submitted to every variety of treatment, without the slightest benefit, at the hands of some of the foremost amongst us, wherein the symptoms have depended upon a little growth attached to one or both vocal cords, which was recognised in as many seconds as the complaint had existed years. The nature of the malady thus being made out, the plan of treatment to be pursued became obvious.

There can be no doubt that the use of the laryngoscope would have remained dormant most probably for some years longer, had it not been for the perseverance and energy of Czermak; and although he was not the discoverer, yet, in common fairness, he is entitled to all the credit of having been the resuscitator or revivor of the instrument. For many useful applications in connection with it we are indebted to him; these will become apparent to any one who will read his work on the subject, which I had the agreeable task of translating for the New Sydenham Society. He had mirrors made of various forms, and sizes, and of different materials, and contrived hooks and other instruments for examining the nostrils, known as rhinoscopy. Professor Czermak, therefore, for what he has done, may be looked upon as the *Father of Laryngoscopy*, for we are not only indebted to him for its perfection, but for its having come into general use, as he succeeded, more than any other person, in obtaining for it a universal public recognition. (See my Paper in the *Lancet*, 17th of January, 1863, p. 65). It remains for his disciples and followers to see that it shall become one of the indispensable requisites in the hands of every practitioner, who has the welfare of his profession at heart.

Whilst thus giving the meed of praise to my distinguished friend, I must not neglect an act of justice to another observer, who was the first

to place upon record something positive regarding the use of the laryngoscope, and who *was the first* undoubtedly, to practise autolaryngoscopy. Professor Manuel Garcia is the gentleman alluded to, the well-known brother of the celebrated Madame Malibran. When Czermak published his first Essay in 1858, the title of it was, "Physiological Researches with the Laryngeal Mirror of Garcia," thus showing the importance he attached to the experiments and researches of the latter, in thus giving his name to the mirror. Indeed, I take this opportunity of declaring that these experiments are some of the most important that have ever been made, and reflect the highest credit upon the sagacity and genius of their originator; they are so beautiful and so interesting physiologically in relation to the voice, and help us so much to appreciate the pathology of vocalism, that we cannot be too grateful for them, as they appear in the Proceedings of our Royal Society, vol. vii., p. 399 (read May 24th, 1855), under the title of "Observations on the Human Voice." In my late lecture, delivered 11th of March, before one of the most critical bodies in the kingdom—the Musical Society of London—"On the Influence of Musical and other sounds upon the Larynx, as seen by the aid of the Laryngoscope," illustrated by a large number of coloured diagrams, I took the opportunity of acknowledging how much we owed to Garcia, and stated that his researches had formed the basis of experiment for all subsequent observers, and some, it was to be regretted, had actually pirated his views without acknowledgment.

I shall not here enter into the question of the priority of discovery of the laryngoscope,—that I did in another place; on a future occasion it may be more fully considered. My present purpose is to deal with pathology. At the latter part of this essay, the reader will find some observations relating to the use and construction of the instrument.

In examining the throat, the larynx, or the nose, the reader must remember all the various special parts and structures which are to be found in these situations, and he should make himself acquainted with their shape, position, colour, and movements in health, before he can venture to understand them when diseased. In regard to the movements of the vocal apparatus in the production of sounds, this is most essential. Having become familiar with all these, he will be prepared to inspect and to recognise diseased conditions. For convenience of illustration, the throat and its connections may be divided into different regions, which may be wholly or partially examined, according to the structure involved, or the seat of any particular lesion.

Thus we may take—

1st. Varying states of congestion of the mucous membrane of the pharynx, larynx, and trachea.—This may proceed to inflammation of an acute or chronic character, and involve some of the numerous follicles; or the follicles may become generally diseased, no part of the mucous membrane that is exposed to the influence of the air (including the pharyngo-nasal recess) remaining unaffected, and not unfrequently proceeding to ulceration. This constitutes the follicular disease of the throat, and is tolerably frequent.

2nd. Different affections of the tonsils, uvula, and soft palate, which materially, more or less, affect phonetic intonation. The soft structures modify the voice, although perfect phonation cannot be carried on without the integrity of the vocal cords.

3rd. Diseases of the epiglottis, such as congestion, inflammation, ulceration, relaxation, or contraction of its folds and ligaments, congenital and acquired, resulting in pendency, attenuation, thickening, displacement, malformation, tumours, &c.

4th. Diseases of the arytenoid cartilages and aryteno-epiglottidean folds of mucous membrane, in themselves forming a distinct, numerous, and highly important class of affections. Invasion of the integrity of these little cartilages particularly, causes more misery, suffering, and wretchedness than from disease of any other part of the throat. The most horrible feelings of suffocation are produced when they are undergoing ulcerative exfoliation, and if the patient does not succumb from hectic and exhaustion, he is an object for life. The diseases and alterations in the cartilages of Wrisberg and Santorini must be included in the 4th series.

5th. Affections of the vocal apparatus, namely, the superior or false, and the inferior or true vocal cords or ligaments, and their immediately contiguous parts. They are Legion, and comprise ulceration, loss of substance, thinning, thickening from hypertrophy, or interstitial deposit, and loss of nervous power, varying to complete paralysis of one or both sides; vascularity, either streaked or punctiform, partial or general redness, and acute inflammation; warty, pedunculated, or follicular growths of varying character and consistence, from the fibro-plastic and fibro-cellular to epithelial; œdema, sub- and supra-glottic; and many other conditions besides the foregoing, variously influencing phonation, and producing partial or complete aphonia, whether functional or organic, dysphonia, hoarseness, &c.

6th. Affections of the trachea and bronchial tubes, as ulceration from tuberculosis or otherwise, exposing the rings; follicular enlargement; hypersecretion and dryness; tumours and growths of various kinds and consistence; puckering of the mucous folds, especially immediately below the origin of the true vocal cords; and flattening, straitening, or bulging inwards of the tube by the pressure of tumours externally, or other causes.

7th. Diseases of the nose in conjunction with the throat, more particularly at its posterior part, where the pharyngo-nasal cavity, and the recesses of the nostrils show various forms of lesion, chiefly ulceration and tumours. The membrane covering the posterior part of the turbinated bones and the floor of the nostrils is very often diseased.

8th. Diseases of the hyoid or tongue-bone, or its articulations with the cornua of the thyroid cartilage. These I have shown, in a special monograph, to be numerous, important, scarcely understood or at all recognised, and yet they explain many anomalous symptoms which have been erroneously referred to other parts.

9th. Necrosis, calcification, and other diseases of the true or larger

cartilages of the larynx, namely, the cricoid and thyroid, with their occasional expulsion. Or again, premature calcareous and atheromatous conversions, giving the voice a cranky, aged, feeble, or shaky-brassy sound, which can sometimes be made out beforehand by the *atheromatous*, or a mixture of the *atheromatous* and *calcareous expressions* of the countenance. It is in this class of cases, but especially where the *atheromatous expression* exists in its typical form, that we meet with what I have elsewhere described as the "saccharine throat."

10th. Foreign bodies in the larynx and trachea.

This general classification shows the extent and importance of the diseases which the laryngoscope helps us to understand and to treat. The list might be much extended, but sufficient is mentioned in the present Essay to show the student and practitioner the scope and range of vision which are submitted to the laryngeal mirror.

In the forthcoming second edition of my work on "Diseases of the Throat and Larynx, as seen with the Laryngoscope," the classification becomes more minute and distinct, and refers to special and particular affections, which are not mentioned here unless in a general manner.

These various diseases require a special study, and lengthened experience to become thoroughly familiar with. Each subdivision could alone occupy much of our time and space, but my object will be gained by submitting a few examples of each, wherein the diagnosis was made out or confirmed by laryngoscopic inspection. As the cases are given, such observations are made as seemed to be proper, in the course of their narration, but necessarily brief.

Follicular disease of the throat; incomplete dislocation of the right thyro-hyoid articulation; thinning, flattening, marginal ulceration, and depression of the epiglottis backwards.

Mrs. P., æt. 32, married nine years, one child, was sent to me by Dr. Tilbury Fox on the 29th of August, 1862. Subject to sore-throat ever since a child; but her present illness commenced about eleven months ago with a feeling of choking, and since then she has had a constant hemming as if there was something present at the back of the throat; this is worse in damp weather. Gets hoarse and very nervous at times. Has tenderness and occasional pricking at the right thyro-hyoid articulation often after eating, and grating can be felt there with the finger. General health bad. Mucous membrane of the pharynx is relaxed, secreting mucus, with some redness and streaks the result of follicular enlargement. The laryngoscope showed the epiglottis very thin and dry, ulcerated at its left and upper margin, flattened out laterally, and much depressed backwards, so that the interior of the larynx could hardly be seen by forcible inspiration or sudden expiration; it was much congested. She was subject to spasmodic fits of dyspnoea, and often felt as though she should be suffocated. This patient had been seen by many practitioners and hospital men; some pooh-poohed her complaint, and told her it was imaginary; yet on examination I diagnosed follicular disease

of the mucous membrane, with general congestion and irritation, incomplete dislocation of the right thyro-hyoid articulation; and more important still, depression, thinning and flattening of the epiglottis. Under treatment she was perfectly cured in two months, to my own surprise, and it has remained permanent, for the natural position of the epiglottis was restored.

Congestion and depression of the epiglottis backwards, giving rise to fits of dyspnœa and threatened suffocation at night, with great suffering.

Mrs. B., a lady without family, had been seriously ill two years when she consulted me, in June, 1862, for her throat. She had had a mild form of follicular disease six years before. She had been under the care of almost every body of note, and the throat, she told me, had been burnt with all sorts of things, swabbed innumerable times—in fact each one, she said, did something. Besides various other symptoms, she felt in swallowing as if a lump was present at the back of the throat, and she was in the habit of introducing her finger, and feeling it. This proved to be the epiglottis, which the laryngoscope showed to be much depressed, and presenting what I shall denominate a care-worn appearance, for it had undergone much suffering. The left side of the cartilage was in complete contact with its proper fold, and a small aperture existed on the right through which respiration was carried on; it was much congested. At night she had various distressing sensations of dyspnœa and threatened suffocation, and her life was most miserable and wretched. Under treatment her health improved, the condition of the throat was better, but the epiglottis could be only partially raised. She finally left London to pass the winter in a distant climate; although the lungs were quite sound. She was at all times very desponding, and this chiefly arose from the sense of suffocation she experienced for many hours, after swabbing had been done by others, and she would put the question to me, "Could such practice be really useful in the cure of throat diseases, when it caused her such agony?" Her sufferings were so extreme, that her friends always saluted her with the inquiry, "How is your poor throat?" which appeared to me to be peculiarly applicable to others at the time, for garotting was then rather prevalent.

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

In some of the severest forms of throat disease which have come under my observation, this unhappy state has existed, and the patients were impressed with the idea that they must ultimately become suffocated.

The remedy for this is in the hands of the profession, and should be applied early: it consists in the examination of children with the laryngoscope from the age of four or six to ten years, to determine the position of the epiglottis, and if it is erect the parents need not be anxious whilst the child is going through the usual diseases; but if it be oblique and very much pendant, which it is in eleven per cent. of mankind, then it should be specially noted as a precautionary measure. In many persons this peculiarity is congenital, for I have discovered it in the mother and her child. In some I can almost predicate it beforehand, from the influence which it exerts on phonation. If there is disease of the larynx or trachea, of the bronchial tubes or proper tissue of the lungs, it forms a serious obstacle to treatment, independently of the impediment it offers to breathing, until the adoption of such means as shall wholly or partially draw up and restore the cartilage to a more suitable position.

As I have elsewhere gone more fully into the subject of the position of the epiglottis, I shall not enter farther into it here.* I may observe, however, that cases are remarkably frequent where this pendant position is associated with throat disease, numerous examples of which might be adduced, but I shall content myself in simply narrating two of my latest.

Aphonia, severe irritation and burning in the throat, constant raking of mucus, associated with a pendant epiglottis.

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

In a fourth case of

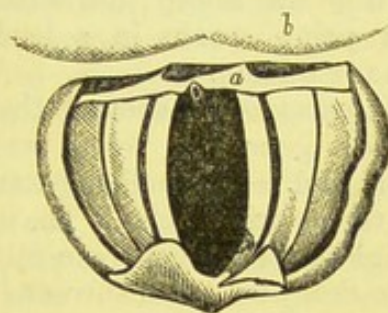
Flattening and pendancy of the epiglottis from old laryngeal disease
of five years' duration, the sufferings of the patient were not great when

* See *Tran. Brit. Assoc. for Advancement of Science*, Cambridge Meeting, 1862, and Newcastle Meeting, 1863; also *Archives of Medicine* for 1863.

he came under my care in June last at the Westminster Hospital. The uvula and other parts of the throat were destroyed, there was ulceration leading up to the pharyngo-nasal arch, as shown by the rhinoscope; and the epiglottis completely covered up the larynx, so that it was utterly impossible with all the devices at my command to see the interior of the latter. This patient had been subject to fearful tertiary ravages, under the care of my colleagues Mr. Holt and Dr. Fincham, and was comparatively well, but liable at any moment to attacks of serious laryngeal disease, and pulmonary mischief from the position of the epiglottis.

It has fallen to my lot to encounter six instances of destruction of the free portion of the epiglottis; three of them occurred in 1862, and were brought before the Pathological Society; a fourth was lately sent to me by Mr. Brace, of Bath, and Dr. Guthrie of Brechin. A fifth I lately examined for Mr. Nunn, and Mr. J. W. Mason; and a sixth was recently under the care of my colleague, Mr. Holt, at the Westminster Hospital, wherein I diagnosed this condition. The symptoms in all were very distressing and painful to witness, in one there was ulceration of the left arytenoid cartilage, and the poor patient's sufferings were described as actually horrible. The annexed sketch affords a view of the parts laryngoscopically; the root of the epiglottis seems as if it had been cut off by three incisions; my belief is that it was detached by three separate lacerations. The particulars appear in the fourteenth volume of the "Pathological Transactions." Two of the other cases are as follows, the appearances they presented were such as to excite the deepest commiseration in my mind for the unfortunate sufferers. The first was truly a case of laryngeal phthisis, for the patient underwent all the suffering and symptoms as if he was in the third stage of the pulmonary disease. I showed the subject of it to the Fellows of the Medical Society of London, and pointed it out as an example of laryngeal consumption, in which the lungs remain comparatively sound, and yet the structures at the upper larynx were wholly chaotic, or to use a geological expression, had undergone a cataclysm, wherein they had been swept away without leaving scarcely a trace behind.

Fig. 1.



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

Destruction of the epiglottis, aryteno-epiglottidean folds, arytenoid cartilages and vocal cords; incurable aphonia.

A. Stoneham, æt. 24, called on me the 7th of November, 1862, with a

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

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

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

Laryngoscopy showed the most fearful ravages. The uvula was almost gone, the velum was adherent posteriorly to the pharyngeal wall, and left a shallow passage towards the right side passing upwards to the nostrils behind. The epiglottis was wholly gone, and the aryteno-epiglottidean folds were mostly destroyed, their remains being transformed into fleshy tubercles surrounding the crescentic glottis, as represented in the woodcut. The arytenoid cartilages were gone. There were no vocal cords, but a sort of glottis remained, formed by folds or edges of

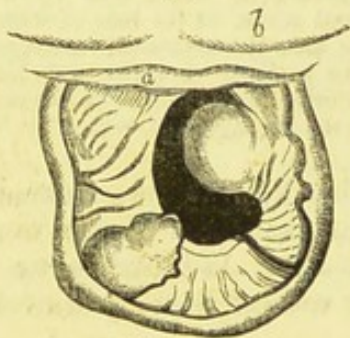
the cicatrices of the destroyed mucous membrane, and expanding to a small degree with some slight movement during forcible inspiration. Everywhere great ravages were visible, and for fearful destruction of the parts it was one of the most terrible cases that has come under my notice.

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

Treatment was of course palliative, and he so improved that a more healthy state of the membrane of the larynx was brought about; heretofore it had been of a drab

colour, it now changed to a pink. The breathing continued very noisy,

Fig. 2.



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

and he had to expectorate frequently. In December, 1862, I exhibited him, with others, before the Medical Society of London, and then lost sight of him. In February last, Dr. Masters wrote me to say that A. S. was carried off by an attack of bronchitis, such as he had, to his knowledge, frequently been subject to. No *post-mortem* examination was made. Thus ended the unfortunate case, which might have been attended with much more comfort to the patient had his constitution been better, and the laryngeal consumption less extensive than it was.

Total loss of the epiglottis, with aphonia from ulceration of the larynx and pharynx.

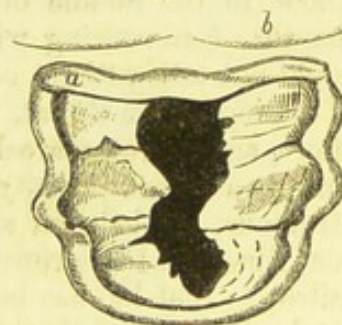
In October, 1862, a lady consulted me from one of the Western counties, accompanied by her son and daughter. She was *æt.* 56, the mother of ten children, and of delicate health. She was very well from June to November, 1861, when she had a relaxed sore-throat. A solution of caustic was applied in April,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

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

Laryngoscopy and inspection.—So irritable was the throat that my examination the first day was unsatisfactory, but both on it and the second day (17th and 18th) I contrived thoroughly to see all the parts. The mucous membrane of the fauces was bathed in a profuse secretion, especially the first day, the membrane was sensitive and extremely congested. A large, deep, and irregular ulcer occupied the middle of the back of the pharynx, and could be seen only by depressing the tongue with a depressor. Another was present in the right side of the pharynx, laterally, seen with the laryngeal mirror—this one gave rise to the pricking pain. Several other smaller ulcers were scattered here and there.

The epiglottis was wholly destroyed down to its root, leaving the

Fig. 3.



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

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

The effect of an astringent and soothing gargle the first day was a diminution of the secretion, and subsidence of the irritability, producing a more healthy pink colour of the membrane generally; but this was partly due to a solution of the iodide of silver, freely applied the first day. On the second day I carefully applied a solution of nitrate of silver to the interior of the larynx, and to all the ulcers, especially that in the middle of the pharynx, by means of a soft brush. Suitable constitutional and local measures were prescribed, the diet regulated, and a hopeful prognosis was given. In two months she had greatly improved, her throat was comfortable, and it seemed cured. One month after she saw me she wrote (on the 16th of December), "The expectoration was much lessened, the general health greatly improved, appetite doubled, meat acceptable, which she had not touched for months. Voice returning; she does not whisper, yet the sound is croaky. Ulcers all healed up." The vocal cords were subsequently seen by her son; and her recovery has been complete, with full power of swallowing, although the epiglottis is irrecoverably gone, and I heard her speak in a good, clear voice, at her own residence, on 8th August last.

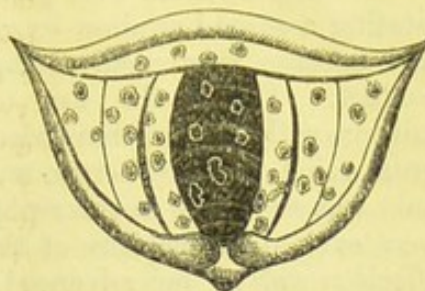
Aphonia and dysphonia from tuberculous ulceration of the follicles of the epiglottis, larynx and trachea, in the first stage of phthisis pulmonalis.

A. M., a young gentleman, æt. 17, was sent to me by Dr. John Hall Davis in the middle of December, 1862. He had been ill sixteen months, commencing with pain in the chest. Twelve months back, could not talk without coughing. The cough now originates in a sort of itching of the throat, with a squeaking attending it. His breath is short, and he can scarcely ascend a flight of stairs. Coughs and expectorates a large quantity of phlegm, especially at night. Is a delicate, strumous, tall lad, fair and pale complexion; always healthy before present illness. Has grown much last twelve months, and his appetite has failed, so that he has become a shadow. All his brothers and sisters are healthy, and father and mother are living. Deglutition is very painful, the first mouthful is quite agonizing. Voice is a laryngeal whisper, it gets better and worse; has not had his proper voice for sixteen months. He is in the first stage of phthisis.

Laryngoscopy.—Redness and congestion of the mucous membrane, with very fine tuberculous ulcers on the true and false vocal cords, and

also in the trachea and on the epiglottis. (Fig. 4). There is much secretion of mucus in the upper trachea. Applied a solution of nitrate of silver on two occasions to the trachea with my laryngeal fluid pulverizer, and to the other parts with a brush, and these were sufficient to heal up all the ulcers, and improve the voice.

Fig. 4.



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

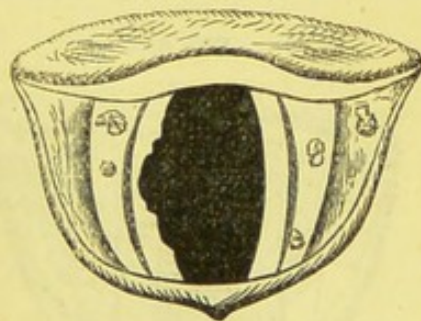
Tuberculous ulceration of the larynx, especially involving the right vocal cord in a phthisical patient.

In the following case the ulceration of the affected vocal cord was completely arrested, and the other little ulcers healed up by topical applications. Constitutional measures alone cannot be relied upon in such cases; something must be done locally as well.

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

Laryngoscopy, 28th of July.—Throat raw and very irritable, but she bore the laryngeal mirror three times. General redness of the entire laryngeal mucous membrane was noticed, with extensive ulceration of the inner or free margin of the right vocal cord, which had penetrated somewhat extensively, as shown in the sketch. The left vocal cord was quite healthy. In several other places small points of ulceration were visible. The large ulcer was touched with the aid of the laryngoscope, with a solution of nitrate of silver, by means of a suitably curved, large-bellied camel's-hair brush, causing comparatively slight spasm.

Fig. 5.



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

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

bility of action. The left vocal cord vibrated like a relaxed string.

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

Aphonia following phthisis and pneumonia, tuberculous ulceration of the larynx and disease of the vocal cords.

Mrs. C., a handsome, but pale, young married lady, accompanied by her husband and Mr. F. B. Pearse, of the Maldon Road, her medical attendant, consulted me in the latter part of January, 1863.

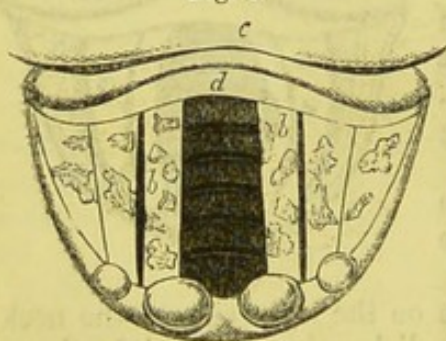
She was pregnant four months with her first child. Two years ago she had an attack of pneumonia at Bristol, and remained delicate after it. In December, 1861, her voice began to fail and went gradually away, so that for the last twelve months she has spoken only in a whisper. Has a severe cough and expectoration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

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

ulcers were tuberculous (see Fig. 6). Beyond the glottis I could not see, but so delicate was the patient that she fainted away during the examination. The aphonia was due to the ulceration of the larynx, and thickening of the vocal cords.

I prescribed a course of treatment which Mr. Pearse approved of, including topical measures, with the view of healing the ulcers and restoring the voice, at the same time not overlooking the general health.

Fig. 6.



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

Deformity of the larynx, and alteration of speech, from small-pox.

The subject of this was a female, æt. 43, sent me by Dr. Wright, of Somerset Street, 15th of December, 1862, to examine on account of deficient phonation.

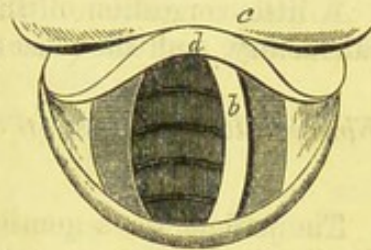
When four years of age she had small-pox; a fit occurred, and after it the upper part of the neck became much swollen; she remained speechless for six months. She was very weak and nervous up to the age of fifteen. She married and had three children. Her speech remained indistinct until she grew up, when it became a little clearer, although still imperfect. All her other faculties are good; she was operated upon for strabismus by Mr. Ure, at 21. Never could sing. The laryngoscope showed the right vocal cord to be destroyed, no doubt by the small-pox; the left was normal. Her language is that of a child in pronunciation, *e. g.*, calling

good — dood	silly — chilly
clever — chever	thin — chin
stout — tout	stopped — topped.

and so on.

The woodcut shows the view obtained, but in phonation the left cord moved freely across to the right side.

Fig. 7.

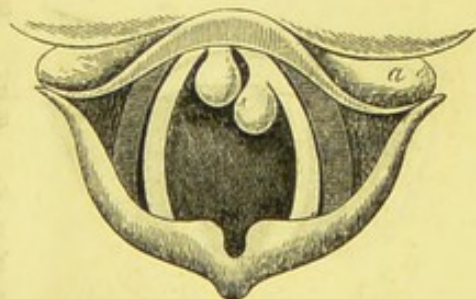


b, The left and only vocal cord.
c, The back of the tongue.
d, The epiglottis.

Polypoid growths removed from within the larynx, by means of the laryngeal écraseur.

The patient was a gentleman, æt. 37, who had been the subject of hoarseness and varying aphonia for twelve years, which supervened upon an attack of yellow fever in the West Indies. In recovering from this, he was profusely salivated, and permanent hoarseness set in. In the open air, he spoke only in a whisper; in-doors the voice was stronger, and possessed a rough laryngeal sound. He had been under every variety of treatment for many years without any benefit, as the true nature of his malady was never made out until examined by myself with the laryngoscope for the first time in November, 1862. Two distinct, fleshy, pedunculated, polypi were seen attached to the vocal cords; they were nearly as large as peas. One was situated between the two cords anteriorly, whilst the other was attached to the anterior free border

Fig. 8.



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

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

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

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

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

Fibrocellular polypus of the larynx, the size of a pea, successfully removed.

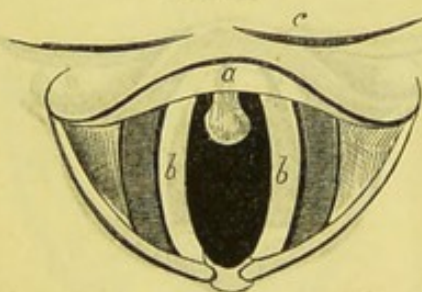
The patient was a gentleman, æt. 42, the subject of hoarseness and dysphonia for ten years. He had rubeola at twenty-four years of age, pertussis at thirty, and variola at forty. The voice possessed a sort of hoarse whisper, and was constrained as if the trachea was tied. He had undergone every variety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

action. The drawing accurately represents the condition of the larynx as sketched at the time (Fig. 9).

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

Anæsthesia of the fauces was produced by the internal use of the bromide of ammonium; yet on attempting to introduce the laryngeal écraseur* (of which the annexed woodcut (Fig. 10) is a representation), the reflex action, through contact with the epiglottis, frustrated attempts at removal, not-

Fig. 9.

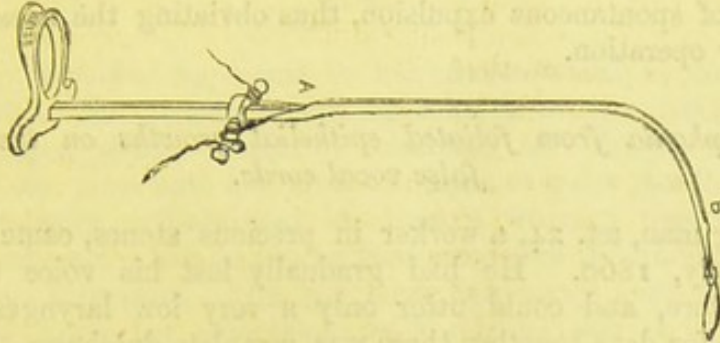


a, The epiglottis. *bb*, The vocal cords, between which is seen the polypus.
c, Back of the tongue.

* It is described in the *Lancet* of May 20th, 1862, p. 520.

withstanding the celerity of my movements. On the 10th December,

Fig. 10.



1862, aided by Mr. Alex. Ure, Dr. Richardson (who admirably gave chloroform), Dr. Logan, and Dr. Fisher, I very readily succeeded in catching the pedicle in the wire noose of the écraseur, and the tumour was detached. The merest trace of blood was visible.

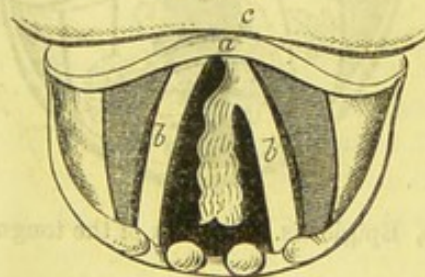
The result of the operation was marvellous. The voice instantaneously became altered and sonorous, the chest filled with air, and the patient felt as if suddenly possessed of increased bodily power and energy. Nothing untoward followed, and a good recovery ensued.

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

Spontaneous expulsion of an elongated polypus from the left vocal cord.

The subject of this was a young lady, whose voice had been affected for ten years, but not lost, after singing the higher notes. In March, 1861, the glottis was pear-shaped, from imperfect action of the anterior part of the vocal cords. This condition, due probably to paralysis, disappeared, and the glottis became oval. In May, 1862, she was seen, with me, by Professor Czermak, when a number of little tubercular bodies were observed on the edge of both cords like a row of small beads; these disappeared under treatment, and in June the glottis opened widely, and the voice was stronger. In August three small spiculæ were noticed, two on the right and one on the left vocal cord, producing no inconvenience. In the beginning of February, 1863, the appearance was presented, as seen in the drawing, of an elongated growth, originating from the anterior part of the left vocal cord, and about two-thirds of its length running parallel to both cords from before backwards. It did not hang downwards into

Fig. 11.



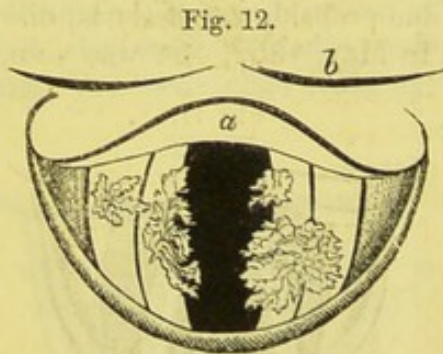
a, The epiglottis. *bb*, The vocal cords; the left gives origin to an elongated polypus. *c*, The tongue.

the trachea, and when the glottis was closed it lay over the fissure. It had formed in five months. In the first week of March the pedicle of attachment, which was small, became strangulated one evening, and permitted of spontaneous expulsion, thus obviating the necessity of its removal by operation.

Organic aphonia from foliated epithelial growths on the true and false vocal cords.

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

It was not, however, until October, 1860, that I examined him in the regular way with the laryngoscope, and made out the nature of his complaint. Warty growths of a foliaceous form were discovered above the true and false vocal cords. One, large and broad, nearly covered the posterior third of the left true and false vocal cords, overlapping the free border of the true, whilst a smaller was situated more anteriorly on the free border of the true cord. The free border and part of the surface of the right true vocal cord was in connection with a long growth, and a smaller one occupied the anterior part of the right false vocal cord. These are shown in the figure. (Fig. 12.)



a, Epiglottis. b, Back of the tongue.

The glottis could not close, and therefore voice was extinguished. The treatment consisted in the topical application of solutions of nitrate of silver and argento-nitrate of mercury on many occasions. Small doses of bichloride of mercury and iodide of ammonium were given internally. The growths gradually shrivelled up and were wholly absorbed, and the mucous membrane assumed its natural condition, as well as both true vocal cords. The whisper in the meantime became gradually louder and louder, until the voice returned in about five months, and in two months later he was perfectly cured.

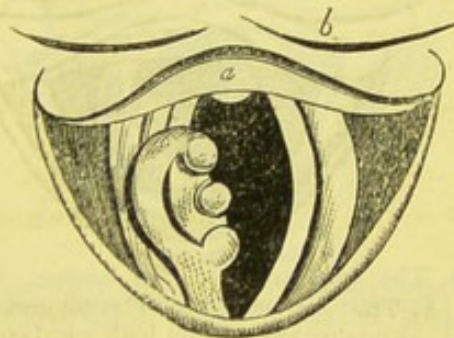
The growths, I believe, were solely confined to, or originated upon, the mucous membrane, and were specific in their nature, although not necessarily so.

Organic aphonia for five years, from a tumour on the right vocal cord.

A young lady, æt. 29, came to me, accompanied by her aunt, in August, 1860. Her general health was good in every respect, excepting that she had a violent attack of cold with sore-throat, followed by hoarseness, six years ago, and after the lapse of a few months the voice became gradually extinguished, so that a whisper was reduced to absolute dumbness. Yet on two or three occasions the whisper returned, but again to disappear. She had consulted many men of eminence, who looked upon her complaint as hysterical, and she was treated accordingly, without any or the slightest benefit. At times dyspnoea was distressing and her health suffered, but the aphonia had existed for five whole years. Local and general treatment produced some slight benefit only. On the 24th October, 1860, she was submitted to laryngoscopy, when the cause of the aphonia was at once revealed: for a large, nodulated, and somewhat oval tumour occupied nearly the whole of the right vocal cord, encroaching upon the false cord, and protruding across the glottis (*see Woodcut*). It was red and fleshy, and quite immoveable, whilst the left vocal cord was white and slightly moveable, and bent outwards. Nothing else was noticed beyond general congestion of the throat and trachea. Of the nature of the tumour it was then impossible to say, but as it had existed for some years, in a comparatively young person, it was not malignant.

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

Fig. 13.



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

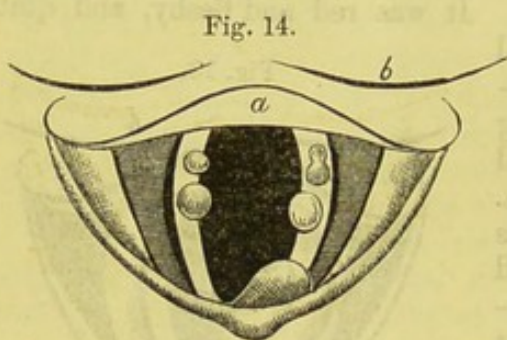
an agglomeration of several enlarged follicles, for the reason that the natural condition of the cord was preserved.

Organic aphonia for three years, from tumours on both vocal cords.

H. B., æt. 22, resided in Essex, came to London, and was treated for consumption at one of the Hospitals. She had lost her voice for three years, and was given cod-liver oil, steel, and the neck and chest were blistered numberless times. She had a slight cough, but she said her throat caused it. She spoke in a low whisper, and its laryngeal softness and tone at times gave the belief that she was suffering from ulceration of the follicles of the larynx, especially as there was some follicular disease of the pharynx. The catamenia were regular. General health middling, but she did not look phthisical. The most careful examination failed to detect any pulmonary disease. The laryngoscope was used on the 27th October, 1860, and several tumours were found on the surfaces of both vocal cords, two on the anterior half of the right, both slightly overlapping the edge of the cord; and four on the left, the largest situated at its posterior part close to the

arytenoid cartilage; another smaller was on the middle of the cord; these two, especially the former, overlapped the edge of the cord; whilst two very much smaller lay on the surface, on the anterior third of the cord. All these are seen in the drawing. (Fig. 14.)

These growths were regularly touched with various applications, and one by one gradually disappeared; in the interim the voice was slowly returning, but it was



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

not until nine months after laryngoscopy was first practised that the remains of the last and largest growth had completely disappeared, when the voice assumed its full and natural compass and power.

Varying aphonia from two small congested growths on the surface of the left vocal cord.

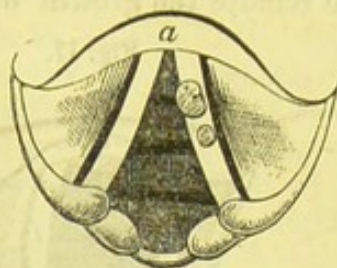
The subject of this was a young lady æt. 20, supposed to be phthisical, who came to me on the 2nd of November, 1860. Her voice was weak, at times reduced to a whisper, for the period of eighteen months. General health good.

Laryngoscopy showed two swellings or tumours of a deep crimson colour upon the surface of the left vocal cord; one was situated near its anterior third and projected over the free edge of the cord. Although these did not interfere with its action, they nevertheless impaired phonation. The drawing (Fig. 15) gives an accurate view of them.

She was treated for three months by the local application of various solutions, and the internal use of the iodide of ammonium, when the growths disappeared, the voice being restored to its usual power and strength without any further attacks of weakness or aphonia. I have no doubt that these took their origin in two of the follicles of the mucous membrane.

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

Fig. 15.

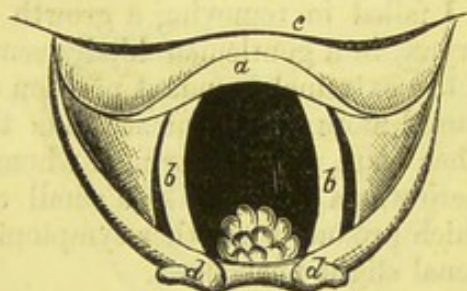


a, The epiglottis. The two tumours are seen on the left vocal cord.

Constrained hoarseness for eighteen months, depending upon a warty growth, removed with the laryngeal écraseur.

Mr. Henry D., æt. 51, had had hoarseness for eighteen months, of a peculiar laryngeal character, indicating obstruction, which I suspected beforehand to be due to a warty growth. This was verified by the laryngoscope, which revealed a tumour as large as a pea springing from the posterior part of the larynx, between the vocal cords and arytenoid cartilages, as shown in the woodcut. (Fig. 16.) He had been under various persons, without any relief, and was still a great sufferer. By local treatment the growth shrank a little, but it was mostly removed with the laryngeal écraseur, on the 22nd of February, 1863, at which operation I was ably assisted by Mr. W. F. Teevan. His voice and general health greatly improved, but the tendency towards a laryngeal tone in the former for some time remained.

Fig. 16.



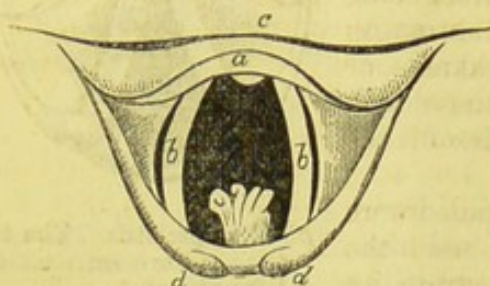
a, The epiglottis. bb, The vocal cords, between which is seen the growth. c, Back of the tongue. dd, The arytenoid cartilages.

Loss of voice, with an occasional hoarse whisper for fifteen months, from a warty growth at the back of the larynx, which was successfully removed.

This patient was a young lady, æt. 25, placed under my care by Dr. Routh. She had lost her voice from a cold in December, 1861, and never regularly recovered it, and the whisper was at times rough and hoarse. Health very good. The laryngoscope revealed a fissured wart (Fig. 17) at the posterior part of the larynx, in the same situation as in the foregoing instance. On Sunday, 29th March, 1863, she was given a few whiffs of chloroform, by Dr. Routh, with an inhaler of his own con-

trivance, and sensation was removed from the larynx. I then proceeded to remove the growth with the laryngeal écraseur, which was accom-

Fig. 17.



a, The epiglottis. bb, The vocal cords, between which is seen the growth. c, Back of the tongue. dd, The arytenoid cartilages.

plished with the greatest ease and with no bleeding. The voice immediately improved and became strong, but she subsequently lost it two or three times, from attacks of cold, to which she was exceedingly liable. She had a strong tendency to pulmonary tuberculosis, and her vital capacity was weak.

I have been successful in removing little growths in several other cases, which limited space

prevents me giving here, but it may be observed that in one a flattish tumour sprang from the right ventricle of the larynx, and was easily torn from its bed of attachment with marvellous results.

In a girl of 16, Lydia C., occasional aphonia and a constant unconscious catch of the breath were cured on 31st March, 1863, by the removal of a cluster of small growths situated at the posterior part of the subglottis, with the laryngeal écraseur.

I failed in removing a growth situated at the posterior part of the larynx, in a gentleman kindly sent to me by Mr. Gay, in consequence of the extremely pendant position of the epiglottis; this latter condition caused more inconvenience than the presence of the tumour. On the other hand, in a young man whom I examined for Mr. Walter Coulson, there was a growth like a small comb also at the back of the larynx, which produced no other symptom than a catch of the breath and occasional slight hoarseness.

Portions of necrosed cricoid cartilage expelled in coughing from a peculiarly-shaped tumour of the right false vocal cord; aphonia and dyspnœa.

S. P., æt. 47, was sent to me on the 10th of January, 1863, by Mr. Corner of Poplar, for admission, under my care, at the West London Hospital.

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

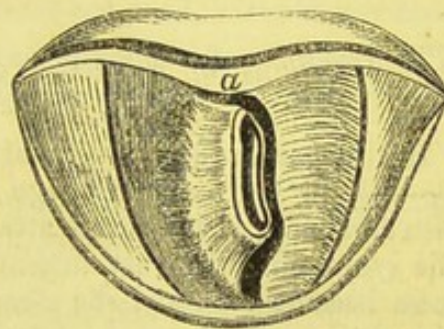
He now feels choked up, and "cannot get clear of the phlegm."

Has no pain, but cannot swallow fluids without choking, some passes through the nose, and some is swallowed, about one half returns. No dysphagia with solids, but they seem to stop in his throat. He feels as though he could eat and drink well, but cannot do it, and is very thirsty at times. He whispers, but cannot talk, his breathing is noisy and stridulous, very much like Stoneham's case.* Cough of a brassy, laryngeal sound, as if there is obstruction. Expectoates about two pints of a yellowish catarrhal sputum in the twenty-four hours. Has no night-sweats, but little sleep, being "choked up with the phlegm." Is thin, pale, and wan, pulse feeble and small. The lungs are sound, but the dyspnoea is considerable, and respiration laboured. In forty-eight hours tracheotomy would have been necessary. Laryngoscopy was difficult at first, from the irritation and general secretion. The fauces and pharynx were much relaxed and quite white; the uvula elongated. Epiglottis was sound, but much inflamed, and not covering the glottis completely in deglutition. The glottis was difficult to make out at first, but, after a while, it was seen to be nearly closed by a tumour in form like a miniature volcano, arising from a broad base on the right false vocal cord, projecting inwards towards the left side, its apex or summit being hollowed out by ulceration, and resembling a miniature volcanic crater. (see Fig. 18). The left false vocal cord was swollen and extended across to the right side to meet this, thus leaving a very narrow fissure to constitute the temporary glottis. The true vocal cords were completely concealed.

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

He came to see me several times at my residence, and was examined with the laryngeal mirror; the crater was gone, but on one occasion the right false cord was oedematous, and seriously obstructed breathing; I therefore scarified it with an instrument I had constructed, and let out

Fig. 18.



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

* Already detailed.

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

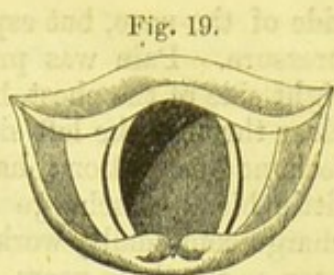
This case was an illustration of the efforts of nature to expel a dead cartilage, and the means she took to accomplish this were exposed by the aid of the laryngoscope; in all probability, it might have had an untoward result had not the treatment been greatly aided by one's vision, which permitted of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

The remains of subglottic œdema, originating in acute laryngitis; disease of the nose.

In January, 1863, I examined a little girl, æt. 14 (Temperance F—), in University College Hospital (for Mr. Erichsen), who had been admitted, with a severe attack of acute laryngitis, three days before. The symptoms were very urgent, but under general treatment the dyspnoea became less, and she escaped tracheotomy. In my examination with the laryngoscope, the interior of the larynx was seen to be much inflamed, the inflammation extending to the vocal cords, the free margins only of which were of a greyish-white colour, thus giving them a narrow outline. They were widely separated, but approximated during the examination—the left cord, however, not very freely. In the subglottic region, below the posterior two-thirds of the left vocal cord, was a red, fleshy swelling, pressing inwards, much encroaching upon the aperture of the glottis, and extending to the posterior part of the subglottic space, thus explaining the peculiar noise in breathing. The mucous membrane around was somewhat tumid, and of a vivid redness, which latter pervaded the trachea as far as could be seen. The case was clearly one of acute laryngitis, with considerable œdematous swelling of the subglottic region, now no doubt somewhat diminished from the treatment pursued. The uvula and central part of the soft palate were destroyed by ulceration, and rhinoscopy was very easy, showing extension of this process to the left nostril. This general examination was made with great ease in the presence of Dr. Ringer, Mr. Rickards (the house

surgeon), and several of the Hospital pupils. The sketch shows the position of the œdematous swelling.

Subsequent inspection showed the gradual subsidence of the swelling, and a good recovery was made. The foregoing is one of several instances of the subglottic form of œdema of the glottis which have come under my notice; in several, tracheotomy had to be performed, but I may just refer to one case that I watched for some time, sent to me by Mr. T. W. Nunn.



The swelling is seen, below the left vocal cord, encroaching upon the glottic aperture.

The patient was a butler, æt. 39, upon whom tracheotomy was performed in August, 1862, and a tube was worn for three months. His illness, however, had existed on and off for eighteen months before the operation, characterized chiefly by attacks of dyspnœa. When he came to me in June, 1863, his voice was tremulous, rough, and a little hoarse, it was not strong enough to permit him to earn his living. In the left subglottic region was a little swelling, which I believed to be the remains of former subglottic œdema, and treated him accordingly, with the result of its absorption and perfect cure. My last inspection of this patient was on 7th of September, on my return from Newcastle-upon-Tyne, he was then able to halloo and shout out loud, without any break or inconvenience to the voice.

The further consideration of supraglottic œdema and subglottic œdema is reserved for another place.

Disease of the turbinated bones and floor of the right nostril, with exudation of fibrine; and disease of the throat.

A married lady, æt. 35, without family, from the county of Worcester, consulted me by letter, in April, 1862. She had had disease of the throat for twelve years, commencing with mumps. The tonsils and uvula became diseased, and the former were removed. It is in the right side of her throat where she suffers great pain, and an ulcer there, she says, "leads up into her head." The pain in the head and throat is at times more than she can bear; it used to be very severe over the frontal sinuses; she has likewise a great discharge from the back of the throat, copper-coloured from the head, and almost black from the lower part of the throat, and it appears to her to gather in the nose and head. The right side of the throat feels raw, there is dryness of the fauces and soreness of the chest. When the frontal pain is present she is a great sufferer. Had been under some eminent men without relief, nearly all of whom had evidently treated her for neuralgia, from the nature of their prescriptions.

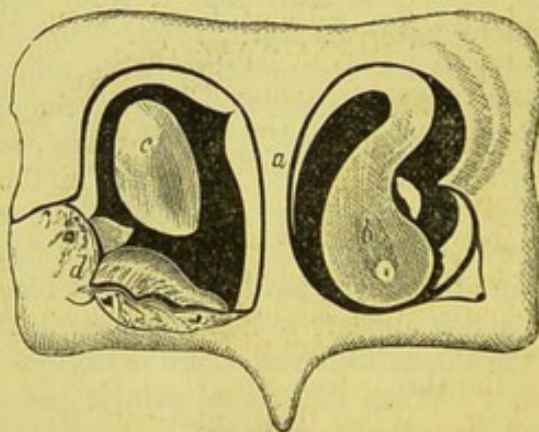
In the latter part of June she came up to London, and I carefully examined her. She seemed in good condition of body, pale, and suffering from neuralgic pain in various parts of the face and head, on either

side of the nose, but especially on the right side, which was tender on pressure. Pain was present behind the lower jaw on each side, in the right side of the chest, between the shoulders, and elsewhere. Breathes clear through the left side of the nose, but not the right, although she feels no obstruction; has always a tightness running up into the head; little bloody discharge from the nostrils, and two pieces of thick discharge come daily, working down from the back of the throat; this has been so for three years, and she gave me a vial full of lumps as big as a pea and upwards, which, on examination proved to be masses of fibrine. A recent specimen was expectorated in my presence. Her breathing is free, but when she is just falling off to sleep at night it is suffocating.

Inspection.—Pharynx covered with a dryish and grey secretion at its back part. Membrane on right side, running up and down, is very red, raw, and ulcerated. Back of tongue is fissured, nodulated, and deeply ulcerated. Base in front of epiglottis not diseased. Epiglottis hangs over the glottis and lies nearly flat, preventing a view into the larynx with the mirror, unless during a sudden inspiration. It is very thin, with small serrated margins, colour altered. The position of this cartilage explained the sense of suffocation at night from extreme relaxation of its proper ligament.

Rhinoscopy.—General bright redness of the membrane at the back of the right nostril was seen, the result of inflammation, with a large ulcerated projecting mass on the floor, and a smaller one to the right of it, covered with secretion of a yellowish and pink colour. The turbinated bone was partially destroyed, and covered with inflamed membrane. The ulceration of the floor of the nostril extended to the velum and right side of the pharyngonasal cavity. The left nostril, although congested, was otherwise normal. The extent of disease can be understood on

Fig. 20.



a, The posterior nasal septum. *b*, The superior turbinated bone of left side. *c*, The remains of the same bone of the right side. *d*, Ulcers and granulations on the floor of the nostril.

comparing the two nostrils in the annexed drawing. The right nostril

is the left in the picture. A red projecting swelling was seen in the right nostril from the front, probably continuous with that behind.

The physical signs pointed to commencing disease of the chest; there were fine mucous râles heard posteriorly between the shoulders, puerile breathing in the left chest, and indistinct in right.

I carefully applied a solution of the argento-nitrate of mercury to the back of the throat and the nose, with most marked benefit, for immediately the pain in the latter was relieved.

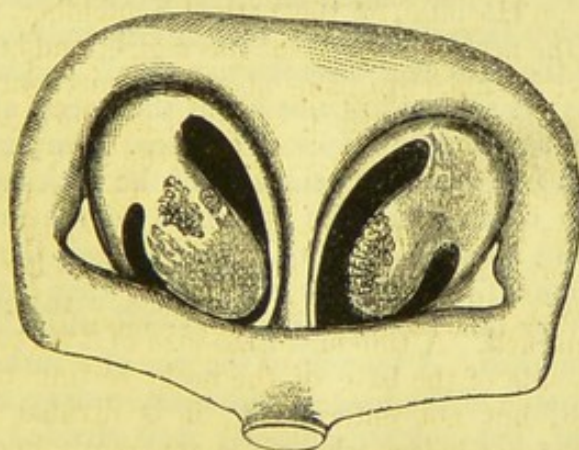
The treatment consisted of remedies internally besides local applications, and her improvement was slow and gradual, and for some time she wonderfully improved, but was very liable to accessions of cold and cough.

Although I have not heard from her now for some weeks, I have every reason to believe that the ulceration of the nose has healed, and the inflammation subsided, and that she is free from the pains to which they gave rise. The case was most satisfactory, in that the diagnosis was clearly made out by the rhinoscope, after a long period of uncertainty as to the nature of the complaint.

Ulceration of the membrane covering the turbinated bones the cause of epistaxis for thirteen years, as seen by the rhinoscope.

J. G., æt. 17, a girl of strumous habit, pale and delicate-looking, admitted under my care at the West London Hospital, on the 8th of November, 1862, for epistaxis. She had had pertussis, rubeola, and scarlatina, when four years old; after the last, she became subject to epistaxis, which remained persistent, occurring daily from both nostrils, but more so from the left than the right. The catamenia had commenced seven months ago. Rhinoscopy was difficult on account of

Fig. 21.



The left turbinated bone is seen to the right of the figure, and the right to the left of the figure, the parts being reversed in the mirror.

the contraction of the velum palati from the scarlatinal angina (no doubt

attended with ulceration, as cicatrices were seen here and there), yet it was performed, and showed very red and vascular ulcers on the posterior surfaces of both inferior turbinated bones, which gave rise to the bleeding which had blanched the patient. These ulcers are shown in the engraving. (Fig. 21.)

With the laryngoscope were seen two deep round hollows, not ulcerated, on either side of the ligament of the epiglottis at the back of the tongue; the cartilage itself was thin and worn, not such as is usually seen in the young. The larynx was normal, and the movements of the vocal cords free; a tubercle the size of a small pea was present on the surface of the right aryteno-epiglottidean fold near its outer border. On looking through the nostrils in front, the mucous membrane covering the turbinated bones appeared very red and swollen.

Topical treatment here, and attention to the general health were the chief means relied upon to bring about a cure.

I might have added several other cases of interest, in which obscure and hidden diseases of the nostrils were revealed by the rhinoscope, but the foregoing will sufficiently answer the purpose of illustrating its value. Cases of perversion of the sense of smell, discharges of various kinds, and uneasy sensations in the nose, are all more or less explained by careful rhinoscopic examination, and their treatment much simplified.

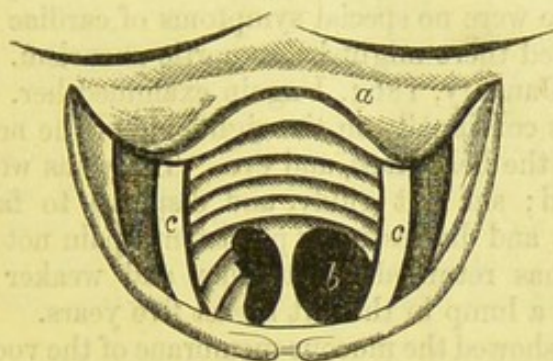
Bronchocele bulging the trachea inwards near to the bifurcation, neuralgic pains of the neck and elsewhere.

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

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

side of, but not in, the tumour. She has follicular disease of the fauces with injection of the membrane, but no ulceration. The laryngoscope showed the epiglottis a little red, the larynx capacious, vocal cords healthy, the passage downwards unobstructed until near the bifurcation of the trachea on the right side, where there was a bulging inwards produced by the adhesion and pressure of the bronchocele since youth. In other respects the bifurcation was well seen, as shown in the Woodcut,

Fig. 22.



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

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

Under the use of general tonics, such as quinine and other remedies, and the use of an embrocation, she improved in health, and the pains diminished. The tumour appeared to become smaller, and she thought she breathed better. In November the cough was rather troublesome; this subsequently got better. When lately seen she was thinner, and could use her arms and hands in needlework, which she could not do when first admitted. The old pains in the limbs had wholly disappeared.

Dyspnœa and aphonia, probably due to an aneurism; the right bronchus only seen.

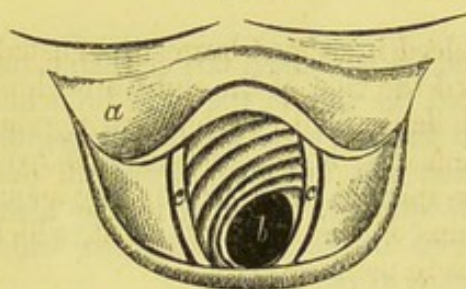
Mrs. E. S., æt. 45, was admitted into the West London Hospital in November, 1862, under my colleague, Dr. Goddard Rogers. The mother of eleven children, six of whom are living. Always healthy up to four weeks ago, when she experienced sudden dyspnœa and pain at the root of the neck in front. The voice then began to fail, dyspnœa came on, and subsequently aphonia. At Dr. Rogers' request I exa-

mined her with the laryngoscope on the 3rd of December, and found the larynx normal. I could see as far as the tenth tracheal ring. The voice was sometimes natural, and at other times reduced to a whisper, with an occasional croupy sound and a cough. There was pain in the right side of the base of the neck and across the upper part of the sternum, with occasional severe dyspnoea at night. Thirsty, mouth very dry, pulse same at both wrists. Is stout, with ruddy complexion and atheromatous expression. Deep strong pulsation is felt on the right side of the neck, but no distinct bruit; sometimes there is pain between the shoulders. There were no special symptoms of cardiac or lung disease, and yet I suspected there might be an aortic aneurism.

On the 1st of January, 1863, I again examined her. There was now pain and soreness continually on the right side of the neck, extending to the right side of the head, face, and eye. The veins were prominent on the right forehead; she felt giddy, and disposed to fall on stooping; cough spasmodic, and distressingly persistent; pain not so uneasy about sternum; voice has returned; is thinner and weaker; orthopnoea at night. Has had a lump in the left breast five years.

Laryngoscopy showed the mucous membrane of the vocal cords relaxed, and a good view was obtained of the right bronchus. This was well seen

Fig. 23.



a, The epiglottis. *b*, The opening of the right bronchus. *c c*, Vocal cords, between which are seen the rings of the right half of the trachea.

three times, but all my efforts, by change of position, reversing the mirror, and other artifices, failed to obtain a view of the left. The aneurismal symptoms seemed to be clearer.

Although she has remained under observation, with improvement in the more distressing of her symptoms, no fresh feature has appeared to call for special note beyond the fact that the evidence afforded by the laryngoscope proved that the symptoms did not de-

pend upon any laryngeal disease. I am inclined to believe that the inability to see the *left* bronchus is due to spasm, in some way influencing the trachea, which is more contracted on the left than the right side.

Paralysis of the larynx after diphtheria, permitting of a view of the bifurcation of the trachea.

The paralysed condition following diphtheria readily permitted of a correct appreciation of the extent of the loss of nervous power, as seen in the present instance, probably for the first time, with the aid of the laryngoscope. The larynx and trachea seemed to form one continuous and expanded tube, which when straightened by position, permitted of a remarkably distinct view of the commencement of the right and left bronchial tubes.

J. W., æt. 33, employed in a fat-melting factory, at Kensington, contracted diphtheria from his three children, one of whom, a girl of five years old, died. One of the girls who recovered had paralysis of the throat, with the usual symptoms. The attack in the father, three weeks after that of his first child, commenced with shivering; the fauces were lined with a thick, yellowish-white, leathery membrane, a piece of which became detached one morning and nearly produced suffocation, until it was removed by the surgeon who attended him. A week before he came under my care at the West London Hospital, his voice became affected, and fluid passed through the nostrils. The voice has a peculiar nasal twang, like a person with cleft palate; his eyesight is likewise affected, he can only read large print held at a distance, and in writing the paper must be placed far from him. The gums are sore and tender, but not from mercury. Has little or no sensation in the fauces. The mucous membrane looks red and raw, with patches of ulceration at the back of the pharynx; the velum is prominent, with a considerable space behind it, and the tonsils are enlarged and ulcerated. He is exceedingly weak and tottering, and the slightest exertion throws him into profuse perspiration.

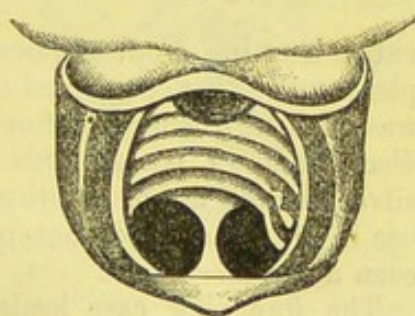
From the insensible state of the throat and the limited mobility of the parts, laryngoscopy was very easy, and a remarkably clear view of the larynx and trachea was at once obtained on the first introduction of the laryngeal mirror. The larynx seemed to be much expanded; the vocal cords lay close against its walls; they were apparently thin, of a greyish-white colour, and possessed no action whatever. The rings of the trachea were readily observed all the way down to the bifurcation, which was remarkably distinct, the patient's neck becoming straight from the head being well thrown backwards. The outer part of the trachea, immediately above the origin of the left bronchus, bulged slightly inwards, resembling a sort of tumour, but in reality not one. This was readily seen several times, and is depicted in the drawing taken at the time (*see* Fig. 24), although it is not represented sufficiently prominent.*

He was treated by the internal use of the citrate of strychnine and iron in infusion of calumba, with the topical use of a solution on one occasion only of the argento-nitrate of mercury, which healed up the ulcers. In two months he was convalescent, the voice was restored, and the paralytic symptoms had mainly disappeared. The bifurcation could be seen only the first few days, so long indeed as the vocal cords remained paralysed.

Although I have now seen the bronchial tubes in many cases of disease, the most favourable to permit of a good view are cases of severe diphtheritic paralysis, when there is not only an almost total absence of sensation in the fauces, but the parts are freely expanded.

* A full report of this case appears in the *Lancet*, Vol. 2, 1862, p. 564.

Fig. 24.



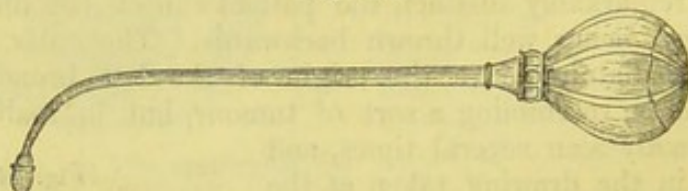
Follicular disease of the throat and chronic tracheitis, inability to sing, speedy cure.

As an example of a form of affection by no means uncommon, I shall cite the following :—

Mr. J. W. L., residing in the county of W., came to me, on the 31st of December, 1862, æt 69. Sore-throat some years on and off, with a cough at night, sometimes most persistent, which seemed to him to come from the throat, and he had to sit up in bed a long time before it ceased. If he begins to sing at church he is sure to cough. Is worse lying down than sitting up. Very hoarse sometimes in talking; no dyspnoea nor dysphagia; health good in other respects, takes five or six glasses of port wine daily for dinner.

Laryngoscopy.—Mucous membrane of fauces relaxed and follicles enlarged, larynx congested, trachea of a dark red colour from chronic inflammation, vocal cords relaxed, but otherwise normal. No obstruction in trachea nor any growths. Approximation of cords in the utterance of sounds pretty fair. He was submitted to general treatment as well as local with the following beautiful instrument, which I have called a *laryngeal fluid pulveriser*, made for me by Weiss and Son, of the Strand. It consists of a curved tube of silver, with an India-rubber receptacle at one end, and a platinum capsule at the other, so finely perforated that the holes are invisible to the naked eye, yet permitting of the injection of a fine spray into the trachea throughout its

Fig. 25.



entire length. Four applications with this instrument effected a complete cure. The cough and other symptoms disappeared, and the patient was enabled to sing in a fine and deep bass voice in church without any discomfort. I possess this invaluable instrument in gold as well as silver, for the use of solutions that are too corrosive on the latter. Its use in my hands does not produce any cough, and indeed most rarely even a spasm.

The foregoing case leads me to say a passing word or two on the subject of singing. I have had many patients under my care, indeed a large number, who had lost the power of control over some of the notes of the diatonic scale, either of the lower, middle or upper, but chiefly of the middle. This loss of power occurs occasionally to some of the most accomplished vocalists of the day, and depends upon causes which impair the equality in the power of tension possessed by both vocal cords. I cannot enter into these here, but will simply observe

that, aided by the kind cooperation of the fair patients themselves, I have been successful in restoring to their full power and compass, without the slightest break or irregularity in the notes, the singing voices of some of the first vocalists of Europe—some of them, too, who were brought expressly over to London to be placed under my care, after being ineffectually treated by Continental physicians of the highest repute.

Deformity of the larynx with a double voice, the result of a wound of the left vocal cord.

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

Laryngoscopy was easy, and showed a fine capacious larynx and trachea. The true and false cords took an oblique direction from before backwards towards the left side. The right vocal cord was natural, but the left was narrowed and contracted near its attachment to the arytenoid cartilage, and did not meet its fellow at this situation during phonation. A very distinct oblique cicatrix could be seen, showing where the cord had been at one time divided. These peculiarities are exemplified in the drawing. (Fig. 26.)

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

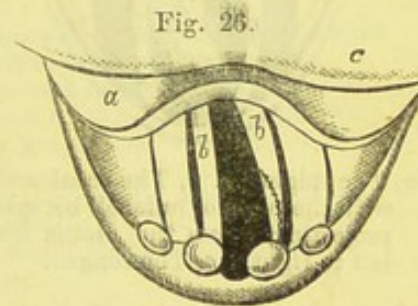


Fig. 26.
a, The epiglottis. b, The two vocal cords; on the left is seen the cicatrix of the wound. c, The tongue.

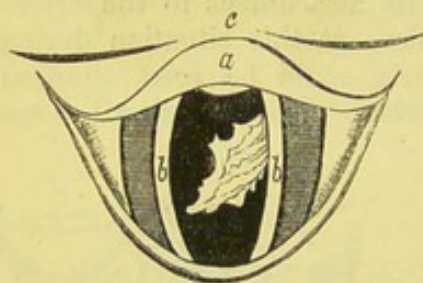
Impaction of a piece of walnut-shell below the glottis, seen by the aid of the laryngoscope.

Up to the time of my examination of the little patient who was the subject of the following case, there was no record of any instance of the lodgment of a foreign body in the larynx being verified by the laryngoscope, and therefore proved by actual visual evidence. It is fair to

assume, therefore, that it is the first instance wherein this new appliance was made use of for the diagnosis of an impacted substance.

Through the kindness of Mr. J. W. Turner, of Lower Phillimore Place, Kensington, I was requested to examine with the laryngoscope, a lad of 13, the son of Captain C., on the 19th of November, 1862. Some months before, when at dinner with the family, a piece of walnut-shell became lodged in his larynx, and after six weeks of occasional paroxysms of cough, he had a severe attack of laryngitis, which necessitated the operation of tracheotomy, which was skilfully performed by Mr. Paget. This at once relieved the urgency of the symptoms, yet did not effect the removal of the offending cause, which Mr. Turner believed must be still lodged in the sacculus of the larynx. I employed the laryngoscope with the patient sitting up in a chair near the fire, and had a good view of the parts, the mirror being very well borne against the uvula. At first there was spasm and resistance, but this wore off, and the larynx was found to be clear of obstruction above the vocal cords, which were mostly approximated. A curved canula passed through the tracheal wound from below upwards readily felt a foreign body, manifest both to Mr. Turner and myself. Its position was shifted, and another view was taken of the larynx, and this time one end of the walnut-shell could be distinctly seen below the vocal cords, projecting in the middle, across the rima from left to right, as represented in the engraving drawn at the time. Several efforts were made to dislodge

Fig. 27.



a, The epiglottis. *b*, The vocal cords, with the piece of nutshell between, projecting across the glottis from left to right. *c*, The tongue.

it from below without success, but its position must have again become changed, for it could not now be seen from above, chiefly owing, however, to closure of the glottis. It was apparently jammed in the subglottic space, and could not be detached, even although the patient was under the influence of chloroform. We thought it prudent not to interfere further. The ashy-grey appearance of the foreign body, bathed in secretion, was very striking.

On a subsequent occasion Mr. Paget enlarged the wound upwards, and passed his finger through the glottis from below and also from above, and felt no body then remaining. In conversing with him about the case in the middle of January, he coincided with me in the opinion that it had been coughed up before the second operation, and probably swallowed.

I subsequently learnt that the wound had perfectly healed, and the young gentleman was never in better health in his whole life.

Congenital deformity and arrest of development of the larynx, in an adult deaf-mute.

A man, æt. 54, born deaf and dumb; married three years—no

children. Is very intelligent, and can read and write and converse by means of a slate. Examined with the laryngoscope in October, 1862. The epiglottis was seen low down, about one-half of its usual length, and was concealed or exposed, according to the action of the right aryteno-epiglottidean fold of mucous membrane, which projected across the glottis, encroaching upon the left side; the left aryteno-epiglottidean fold, and no doubt the arytenoid cartilage of the same side, were wanting, but the mucous membrane dipped into the larynx, where it met the right fold, and thus formed the glottis.

The vocal cords were wholly absent, and the movements of the larynx were chiefly, indeed for the most part entirely, confined to the right fold of membrane described, which appeared alone to perform opening and closure, as shown in the woodcuts. The epiglottis was useless for all practical purposes, and constantly maintained the erect position in the situation which it occupied, being uninfluenced by the act of deglutition, with or without food.

The right aryteno-epiglottidean fold, in some views of it, formed an apparent cushion, as seen in Fig. 28 (B).



The parts are reversed in the drawings, as seen with the mirror, for the right side is situated on the left in each.

In Woodcut A the epiglottis is shown at the back of the tongue, with the right epiglottidean fold extending across to the left side, with the malformed glottis open, through which are noticed the rings of the trachea.

In Woodcut B the action of the fold is shown in closing the glottis, but the apex of the epiglottis is left to indicate its position when the glottis is completely closed. The prominent cushion formed by the middle of the fold is noticed in this figure.

The rings of the trachea could be seen on deep inspiration, and they presented nothing unusual. The tongue was large and thick. The throat looked like a confused jumble of the parts, as if the result of disease about the larynx, but it was clear that the deformity was congenital. Externally, the prominence of the pomum Adami was visible rather sharp, but the thyroid cartilage was considerably flattened and spread out laterally; its base, *i.e.* the junction with the cricoid, was as large as its upper part. The interval in front, between the hyoid bone and the thyroid cartilage, was much greater than is natural.

This patient's wife, *æt.* 47, equally educated and intelligent, examined at the same time, was found to possess no vocal cords at all, the opening

and closing of the larynx being performed by the aryteno-epiglottidean folds. This showed a large and wide air-tube, commencing at the upper larynx, thus permitting of an expansive view of the trachea. The husband articulated sounds more distinctly than the wife.

Congenital deformity of the larynx in a deaf and dumb boy.

A boy, æt. $14\frac{1}{2}$ years, was examined by myself in November, 1862, at the Deaf and Dumb Asylum, Old Kent Road, with a large number of others, through the kindness of the Rev. James H. Watson, the Principal.

In this boy, the epiglottis originated low down, as in the previous case, close to the vocal cords, being about one-half of its usual length, and therefore practically useless in deglutition. The glottis was covered by the two usual folds of mucous membrane, originating from the back of the tongue. The vocal cords and other parts were normal. He could utter the vowel sounds.

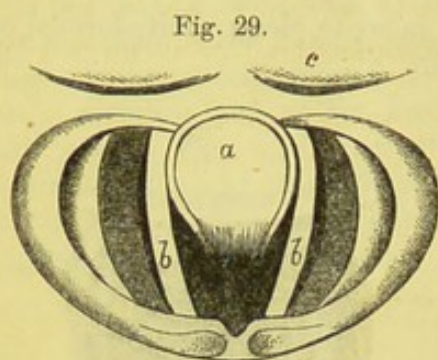


Fig. 29.
a, The epiglottis. b, The vocal cords.
c, Back of the tongue.

In about thirteen per cent. of the cases here examined, the epiglottis was pendant more or less backwards.

The impression seems to be pretty general amongst physiologists, that in deaf dumbness, the organs of speech are not only present, but complete and perfect, and that the dumbness is the result of the congenital deafness, because the hearing of speech is lost.

If this view be correct, then the larynx ought to be healthy, and natural in conformation in those born deaf. It is computed that the number of deaf and dumb persons in Europe is about 250,000. Can it be possible that their ears alone are at fault, and their vocal apparatus not so? I think not, and believe that in a certain number coincident malformation or deformity of the larynx will be found, together with a like condition of the ears. The laryngoscope will add much to our knowledge on this point, if advantage is taken of any opportunities that may present themselves for inspection. I have been the first to draw the attention of the English reader to this subject in the *Medical Times* of the 12th November, 1862.

DESCRIPTION OF THE LARYNGOSCOPE.

The laryngoscope consists of a little mirror attached to a flexible metallic stem, which is fixed into a handle of wood, ebony, or ivory.

The mirror varies in size from three or four lines to an inch in diameter, and possesses a circular, oval, elliptical, or quadrangular form.

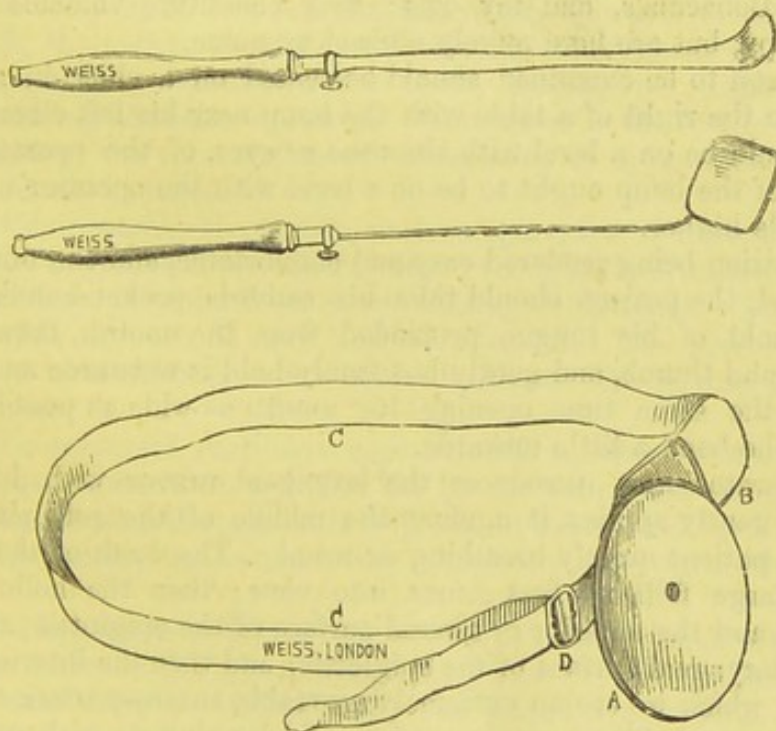
It is made of polished steel or of glass, and is attached to the stem at an oblique angle.

I have recently had slightly concave metallic mirrors made of a circular form, plated with gold and silver, which offer beautiful and brilliant reflecting surfaces, but for all ordinary purposes the glass mirror is unrivalled.

Before introducing the laryngeal mirror into the mouth it should be gently warmed over a lamp, and the temperature estimated by applying the back of it to the cheek or temple, in preference to the hand. The metallic mirrors (but not those of glass) may be immersed in warm water previous to use; heating them over a lamp, however, will be found the simplest method.

Before employing the laryngeal mirror, the throat must be illuminated by means of a light thrown into it from a reflecting surface, and this is accomplished by wearing a large ophthalmoscopic mirror either before the right eye, between the two eyes, or upon the forehead. Each plan has its advocates, but that upon the forehead will perhaps be found the most convenient, and is now pretty generally adopted. The draw-

Fig. 30.



ing shows the reflecting mirror sold by Weiss and Son, and it is so arranged with an elastic band and buckle, that it can be worn in any position desired, being perforated if the choice should be before the eye. All mirrors ought to be perforated for this latter reason.

I am in the habit of using the mirror before the eye, attached to a

large spectacle-frame, the handles of which go well round towards the back of the head. A small spectacle-frame should be avoided, for it cannot support the weight of the mirror, and is constantly shifting its position.

The attachment of the mirror to the large spectacle-frame, the forehead band, or the mouth-piece of Czermak, as made by Weiss and Son, permit of movement in any possible direction, which I state from much personal experience in the use of each. I have recently had constructed a pocket mirror, with a mouth-piece, in which the diameter of the former does not exceed two inches.

In the use of the perforated mirror before the eye, the aperture should be in front of the pupil, so that both eyes may be employed in vision. This accuracy of position, however, is not always essential, for a good view is obtainable with the left eye, aided by the cooperation of the right eye. Both eyes should always be kept open.

The light to be employed for reflection may be natural or artificial; the former comprises day and sunlight, and the latter a good moderator lamp or an argand gas lamp; both should possess a plated or other mirror at the back of a cylindrical glass chimney. The electrical light has been used.

There are many other lamps in use for obtaining a strong and powerful stream of light, such as Voltolini's, Bouthillier's, Tobold's, Battaille's, Peltier's, Bonacina's, and my own; they constitute valuable aids to laryngoscopy, but are here merely noticed by name.

The person to be examined should be seated on a chair in an erect position, to the right of a table with the lamp near his left elbow. His mouth should be on a level with the nose or eyes of the operator, and the flame of the lamp ought to be on a level with the operator's eyes, or even a little higher.

The position being rendered easy and comfortable, and the mind calm and assured, the patient should take his cambric pocket-handkerchief, and lay hold of his tongue protruded from the mouth, between his forefinger and thumb, and gently but firmly hold it outwards and downwards, at the same time opening his mouth as wide as possible, and reclining the head a little upwards.

The operator now introduces the laryngeal mirror with his right hand, and gently applies it against the middle of the soft palate and uvula, the patient quietly breathing as usual. The back of the tongue with its large follicles first comes into view; then the hollow space between it and the anterior or glossal surface of the epiglottis; next the apex and laryngeal surface of the epiglottis; and then the interior of the larynx, in which we see an extremely moveable antero-posterior fissure, bounded by two brilliant pearly borders, which palpitate with surprising rapidity. This last is the *glottis*, and is formed by the inferior thyro-arytenoid ligaments, or as they are now generally called, the *true vocal cords*, in contradistinction to the false, which are formed by the superior thyro-arytenoid ligaments or muscles, which are above the glottis.

Or to simplify the description : on looking into the throat with the mirror, we see

- | | |
|---|--|
| 1. The back of the tongue. | 6. The aryteno-epiglottic folds, or ligaments. |
| 2. The epiglottis. | 7. Vestibule of the glottis. |
| 3. Posterior part of the cricoid cartilage, with its mucous membrane. | 8. Superior thyro-arytenoid ligaments, or false vocal cords. |
| 4. Pharynx. | 9. Ventricles of Morgagni. |
| 5. The arytenoid cartilages. | 10. The true vocal cords, or glottis. |

Beyond the glottis the trachea comes into view, the rings of which are distinctly visible during deep inspiration. In some persons the bifurcation is readily seen : the reflection of this was first seen by Czermak, in his own person ; he has shown it to me a few times, and he has seen mine ; I have also seen my own, and have shown it to large parties of persons on several occasions. Frequent opportunities have occurred to me of seeing the tracheal bifurcation in both healthy and diseased persons, and on one occasion two patients—a male and female—presented themselves to me, in whom it was most distinctly and clearly seen, one after the other—an unusual and rare circumstance.

The glottis is seen to assume in various persons a lanceolate, lozenge or barrel, elliptic or triangular shape, and may possess great activity in motion, or very little. When the mirror, therefore, is introduced into the mouth, the patient should ejaculate, *Ah!* which permits of closure, and if successively repeated a few times, opening for inspiration and shutting during utterance of sound. This latter is the test of integrity, and permits of the appreciation of the amount of approximation which the vocal cords undergo.

If anything catches the breath, such as particles of dust, or of food, or if cough is produced, or expectoration, the glottis is suddenly closed, and covered up, very much as occurs during deglutition. This I have verified with the mirror over and over again. The process will be understood by describing what occurs in deglutition, as may be seen at any time :—

1st. The arytenoid cartilages approach one another the whole length of their internal surfaces, and shut the glottis with great energy.

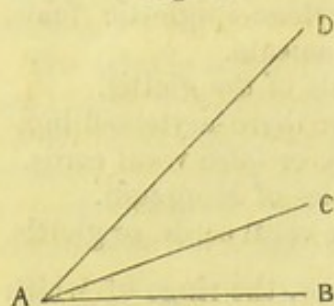
2nd. Almost simultaneously the superior or false vocal cords approach one another, enter into contact, and completely cover over the glottis, whilst,

3rd. The epiglottis is drawn backwards (by contraction of the aryteno-epiglottic muscular fibres), and applies its base or cushion, and then its posterior and inferior surface upon the closed vocal cords. At this instant the base of the tongue covers all up, and nothing further is to be seen.

In my lectures, the attachments of the true and false vocal cords, and epiglottic folds of membrane to the arytenoid cartilages, have been compared to three pairs of reins in tandem-driving, which helps to simplify and explain their successive action. Thus, let A B C D represent a longi-

tudinal section of the larynx, of which A is the arytenoid cartilage;

Fig. 31.



A B is the equivalent of the inferior thyro-arytenoid ligaments, or true vocal cords; A C, of the superior thyro-arytenoid ligaments (muscles), or false vocal cords; and A D, of the aryteno-epiglottic folds of mucous membrane, in which are contained the muscular fibres running from the arytenoid cartilages to the epiglottis. The action of A D and of A C cannot occur without the action of A B; therefore, the action of A B must precede the action of A C and A D. The

consequence is, that A B is first excited to action and closes the true glottis, forming the first pair of reins; this is instantly followed by the action of A C, the second pair of reins, approximating the false vocal cords; and, thirdly, by that of A D, in drawing down the epiglottis to cover all over, with the third pair of reins.

This proposition is further proved and confirmed by the exertion of voluntary power over the muscles of the larynx (in autolaryngoscopy), when the breathing is suspended for a few seconds; for when the glottis is kept firmly closed, the false cords approximate, and the epiglottis is gradually drawn downwards, as in deglutition. This subject was submitted by me to the physiological section of the *British Association for the Advancement of Science*, at Newcastle-upon-Tyne, on the 31st of August last, and my views were accepted, the facts and arguments brought forward as correlative evidence fully establishing their correctness.

After tracheotomy is performed, the glottis may be sometimes examined from below with a very small mirror introduced into the tracheal opening. I have submitted several persons to inspection in this manner, and the results obtained were extremely interesting and curious in some.

For the practice of *Autolaryngoscopy*, or the examination and exhibition of one's own larynx, a different process must be adopted from that just described, and other appliances are necessary.

The method adopted by Garcia, was to turn his back towards the sun, and by means of a second mirror held before the face, to receive the solar rays, and direct them on the laryngeal mirror placed against the uvula.

Another method is to place the flame of a lamp as close as possible to the mouth, widely open, and to hold a small hand-mirror between the eyes and flame, which will receive the reflection of the image in the laryngeal mirror illuminated by the rays from the lamp.

A third plan is to sit opposite a small looking-glass, at the side of which is a good lamp, which throws its rays of light into the laryngeal mirror at the back of the throat; the image there depicted is readily seen by the experimenter and a number of persons, in the looking-glass placed opposite to the former.

A fourth, and the most convenient method, is by the use of a special apparatus for autolaryngoscopy and demonstration, as contrived by Czermak, and much improved and modified by Weiss and Son. It consists of a mahogany-box, at the bottom of which is a sliding panel, to which is screwed a brass tube, which permits of the attachment of a large illuminating, concave, perforated reflector, at any height the most suitable. Opposite to this is a receptacle for another tube, which latter receives the stem of an oblong square mirror, attached by means of a hinge. The light is placed to one side of the experimenter, and throws its rays into the large mirror, which reflects them in the laryngeal mirror held against the uvula with the right hand. The observer looks through the perforation, or around the margin of the large mirror; whilst the experimenter looks into the square mirror; both see the laryngoscopic image in the laryngeal mirror, although not precisely alike to each, as their visual axes do not form the same angles with the reflecting surface of the mirror.

This apparatus has this advantage, that a large party of persons can see the laryngoscopic image by clustering around the reflecting mirror, and at the same time others, by looking into the square mirror, will see nearly the same object. With it I have given demonstrations at single sittings to parties of from a dozen to ninety or more persons, and all have had a good view of the interior of the larynx and trachea. For general convenience, handiness of arrangement, elegance, and simplicity, this apparatus is to be recommended as preferable to any other, at a cost which places it within the reach of all.

The experimenter must take the precaution of having the illuminating mirror elevated at a higher angle than the mouth, to throw the rays of light a little downwards; a fair guide will be to have the upper margin of the mirror in a line with the eye. A great deal, however, will depend upon the management of the person himself, who will soon acquire the minutiae essential to successful experiment.

The laryngeal mirrors for autolaryngoscopy vary in size from three-quarters to an inch and three-quarters in diameter. A medium size will be convenient.

Rhinoscopy is the art of examining the posterior recesses of the nostrils, and of the pharyngo-nasal recess; it is a more difficult proceeding than laryngoscopy, and requires patience and perseverance to accomplish in some persons.

It is practised as follows:—the throat is illuminated in the usual way, with the aid of a large reflector; the tongue kept flat by a depressor held by the patient himself; a blunt and flat hook (Fig. 30), introduced with the left hand, is made to catch the soft palate about its middle, and to elevate and draw it forwards; a small mirror is now passed to the back of the pharynx and turned upwards, when a view is afforded of the septum, the posterior orifices of the nasal fossæ, the turbinated bones, and orifices of the Eustachian tubes. Sometimes the floor of the nostrils can be seen, but usually the posterior arched surface of the velum covers the inferior part of the nasal cavity.

If a catheter is introduced into the Eustachian tube through the nose in front, its extremity can be seen sometimes readily in rhinoscopy.

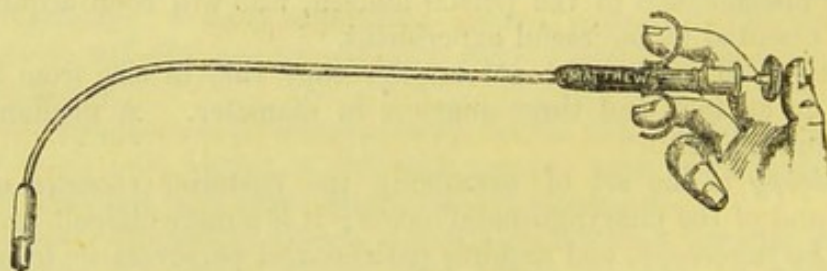
In cases of fissure of the soft or hard palate, or loss of the former by ulceration, a good view of the parts can be obtained without much difficulty; and in many persons rhinoscopy is easy enough when the examination is made with delicacy and gentleness, even although there may be sometimes very troublesome obstacles to overcome.

Small mirrors are occasionally introduced into the front of the nose, when the nostrils are dilated widely, and a good view is obtained of the nasal cavity and inferior turbinated bone; in some persons with capacious nostrils the nasal orifice of the lachrymal canal can be seen, but more especially in the dead when a hog's bristle has been introduced.

In examining the larynx or nose, the mirrors should be wiped with a wet sponge immediately on withdrawal, so that they may be kept clean. This is most essential with those made of steel; for if not quickly cleaned, the mucus leaves a permanent stain which renders them useless until reburnished. This does not occur with glass or plated mirrors.

Application of remedies.—For this purpose whalebone stems bent at an oblique angle, with sponges and brushes attached, are necessary, to apply solutions of various substances. It is seldom that solid caustic is required unless to destroy growths that cannot be otherwise removed; for this purpose an ingenious instrument, manufactured by Mr. Mathews, Portugal-street, Lincoln's Inn, can be recommended. It consists of a curved silver cannula, containing the nitrate within the end of the curve, which can be protruded on pressing the end of the piston-rod, and after touching the diseased part, is allowed to be withdrawn again into its sheath; it is depicted in the woodcut.

Fig. 32.



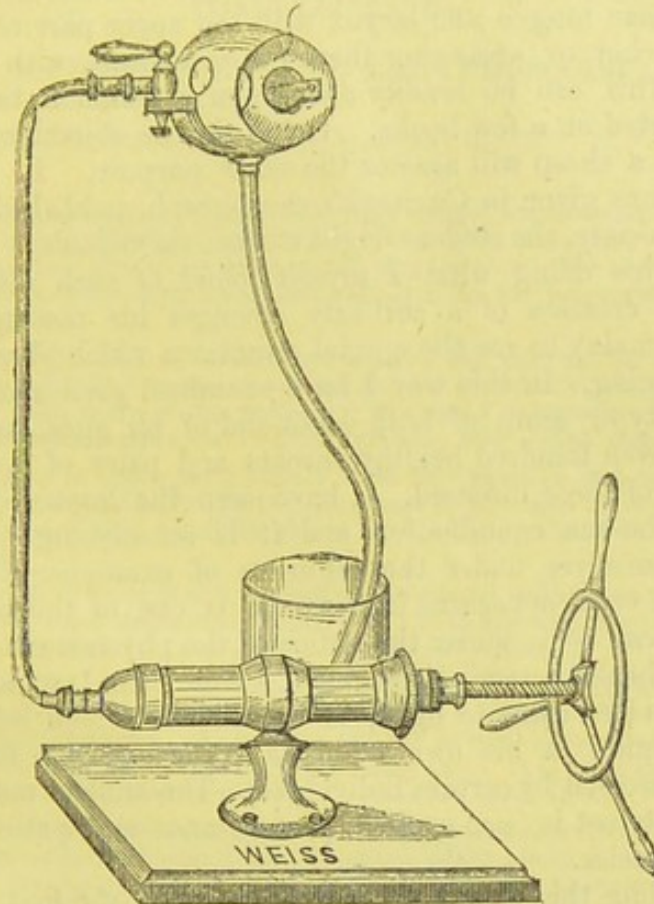
Brushes of various kinds; small syringes of ivory and silver; scarificators for œdema of the glottis, such as I have contrived and used with success, and made by Weiss and Son; curved forceps and laryngeal écraseurs for the removal of polypi and growths; and curved bougies for dilating the larynx, are some of the appliances necessary in the treatment of the various affections of the throat, larynx, and nose.

Mackenzie's Faridiser will be found useful in many cases.

And, lastly, the *hydrostatic treatment* must be mentioned. It consists of an instrument for administering fluids to the larynx, trachea, and bronchial tubes in the form of a vapour or spray. Many will recol-

lect that of Dr. Sales-Girons in the Great Exhibition of last year. The most valuable and convenient for general use is that made by Weiss and Son, of which the annexed woodcut is a representation.

Fig. 33.



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

I have used this instrument in a number of painful and severe cases both of chest and laryngeal disease, and can honestly recommend it. The relief afforded by this mode of treatment is very decided and speedy.

A few useful hints.—In studying laryngoscopy or rhinoscopy, a good anatomical and physiological knowledge should be obtained of all the parts about the throat, larynx, and nose; this is a matter of some im-

portance to enable the investigator to form a correct diagnosis of pathological conditions. There is no difficulty in following this out upon the living, but if any obstacles are encountered, it can be attempted on the dead without the least resistance. It would be inconvenient to import a dead subject into one's dwelling, and equally so for a medical man in active practice to resort to a school to work upon the dead; both are obviated by procuring a human tongue and larynx with the upper part of the œsophagus, and placing or arranging them below a skull, with the lower jaw attached. This can be readily done upon a common table, the skull being supported on a few books. Or, if this be objectionable, the head and neck of a sheep will answer the same purpose. In following out the instructions given in Czermak's monograph, published by the New Sydenham Society, the student ought to have no difficulty. But I would recommend his doing what I myself found of such essential service, namely, the creation of a curiosity amongst his non-medical friends (male and female), to see the special structures which play so important a part in singing. In this way I have examined parties of persons from three to thirty or more of both sexes and of all ages, and have thus seen some seven hundred healthy throats and pairs of vocal cords, independently of those diseased. I have seen the larynx of very young children at the one examination, and it is astonishing how well they comport themselves under the influence of example; it may truly be said that the vocal apparatus in the child is one of the most beautiful objects that can come under the notice of the physiologist.

In these healthy recreations, shall I call them? some very curious peculiarities often come to light, and a shrewd person will be able to form an opinion in his own mind, as to the capacity for singing or speaking possessed by certain individuals. The student may feel assured that if his interest is once excited, perseverance and patience will overcome all obstacles.

In concluding this essay on the laryngoscope—the first that has appeared from an English author—it is hoped that allowances will be made for many imperfections and omissions, which were unavoidable in consequence of the limited space at my disposal; but the main object held in view was to give the practitioner and student a fair general idea of how to use the instruments, and to recognize the diseases when submitted to his notice, in the simplest and easiest manner; how far I have been successful in carrying this out, I leave to the kind consideration of the Profession.

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