Lectures on the physical examination of the mouth and throat with an appendix of cases / by G.V. Poore.

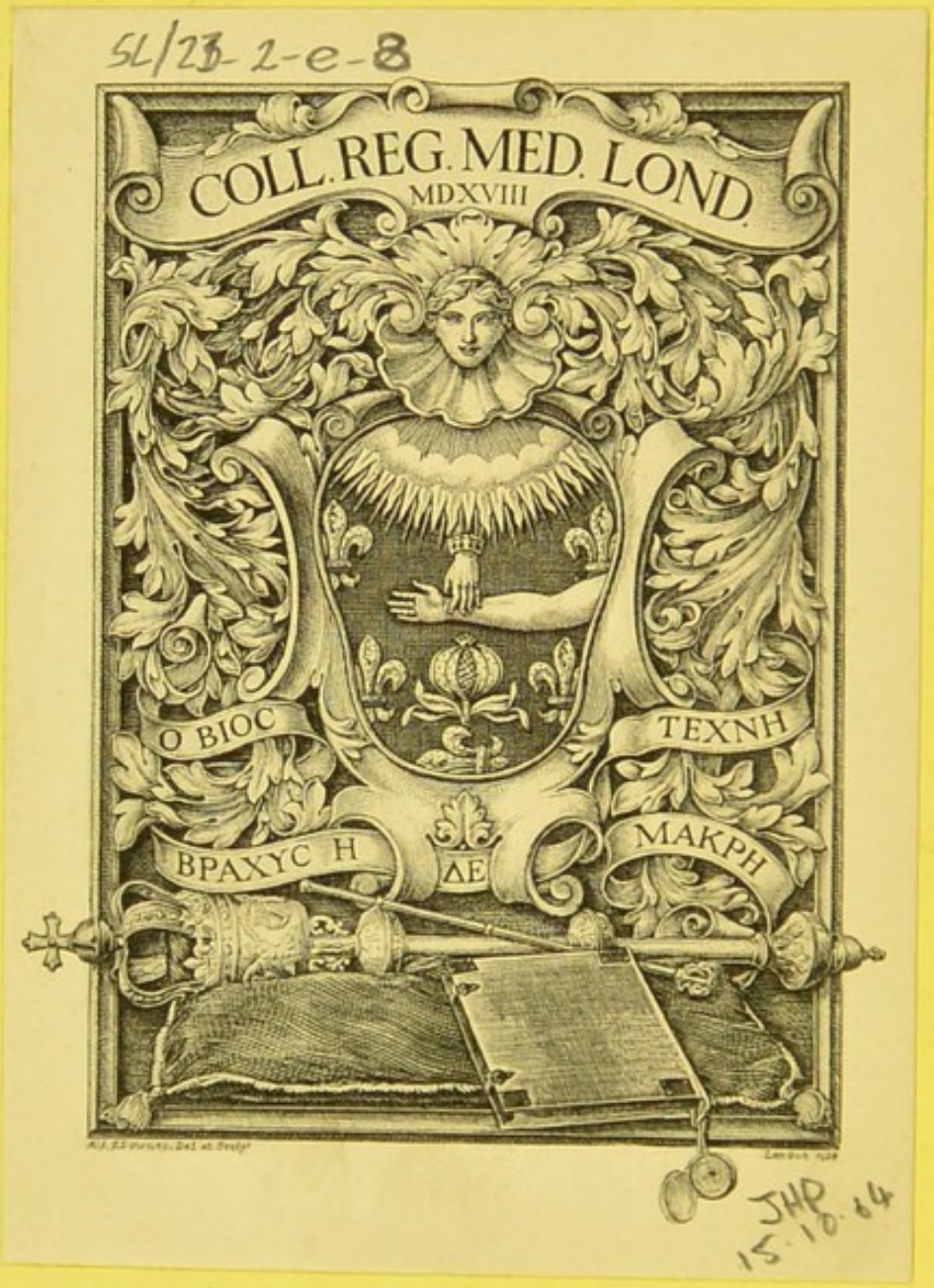
ON THE

PHYSICAL EXAMINATION

OF THE

MOUTH AND THROAT.

G. V. POORE, M.D.



LECTURES

ON THE

PHYSICAL EXAMINATION OF THE MOUTH AND THROAT.

WITH AN

APPENDIX OF CASES.

BY

G. V. POORE, M.D., F.R.C.P.,

PROFESSOR OF MEDICAL JURISPRUDENCE, UNIVERSITY COLLEGE; LATE ASSISTANT PROFESSOR OF CLINICAL MEDICINE; ASSISTANT PHYSICIAN AND PHYSICIAN IN CHARGE OF THE THROAT DEPARTMENT OF UNIVERSITY COLLEGE HOSPITAL; SENIOR PHYSICIAN TO THE ROYAL HOSPITAL FOR CHILDREN AND WOMEN, ETC.

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PREFACE.

THE following Lectures were originally written for the benefit of students attending the Junior Class of Clinical Medicine at University College. They were published in the 'Lancet' in the course of 1880; they were thence in part copied into the 'British Journal of Dental Science' and the 'Missouri Dental Journal.' The author has, therefore, been led to think that possibly they fulfil a want, and that students and practitioners may be glad to have them in a separate form.

30, WIMPOLE STREET, W.;
July 12th, 1881.

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LECTURES

ON THE

PHYSICAL EXAMINATION OF THE MOUTH AND THROAT.*

Lecture I.—The Physical Signs derivable from the Breath, Lips, Teeth, and Mouth.

Gentlemen,—It is my duty to bring to your notice the various physical signs of disease which are to be obtained from an examination of the throat and windpipe; but inasmuch as it is impossible to properly examine the throat without at the same time examining the mouth and nose, I think I shall be best fulfilling my duty by dealing methodically not only with the throat, but also with the oral and nasal cavities which lie above it.

The physical signs met with in these regions of the body appeal not only to the sight, touch, and hearing, but occasionally to the sense of smell as well; and the first thing which forces itself on our attention is often the odour of the breath.

The *smell of the breath* is a valuable physical sign, and in many diseases is so characteristic as to enable the man of experience to form a diagnosis from it alone with almost absolute certainty. It is impossible to describe the various odours of the breath; experience alone will enable you to distinguish one from the other, and I shall merely content myself with cataloguing some of the most distinctive of them. The smell of drink is the most common of all, and in cases of insensibility is often a valuable indication of the cause. It may give a valuable hint as to the habits of the patient; and I would here remind you that over-indulgence in alco-

* Delivered to the Junior Class of Clinical Medicine, University College.

holic liquors is one of the most common causes of congestion and catarrh both of the pharynx and larynx. You must not run too quickly to the conclusion that because a man's breath smells of drink he is necessarily a drunkard, for a single glass of wine or beer is sufficient to impart an odour to the breath for some time after it has been taken. When directing your attention to the alcoholic smell of the breath in the presence of the patient, I am in the habit of speaking of it as *oinosmia* (from οἶνος, wine, ὀσμή, an aroma), since patients naturally resent having attention bluntly called to the fact that they smell of drink.

The presence of carious teeth imparts an odour to the breath which is quite characteristic, and which, according to Mr. Salter, resembles no other odour except that given off by the genus of neuropterous insects called Chrysopa. Want of attention to the mouth, and allowing food to lie between the teeth and decompose, or the presence of decomposing matters in the crypts of the tonsils, imparts a foul odour to the breath. A disordered stomach also causes the breath to be fetid.

A peculiarly disgusting and perfectly characteristic odour of the breath is present in those cases of chronic inflammation of the nasal and pharyngeal cavities, which are known from this fact as ozæna, and which are most often due to caries or necrosis of the nasal bones, which is generally of syphilitic origin. The smell, however, may be present without any disease of the bones in cases of chronic inflammation of the cavities occurring in scrofulous subjects.

In cases of dilatation of the bronchial tubes accompanied by ulceration and copious purulent discharge, the smell of the breath is peculiar and almost diagnostic of the condition, and in gangrene of the lung the odour of the breath reaches a degree of foulness which once smelt can never be forgotten.

In cases of fever, with high temperature, a dry mouth, and the accumulation of sordes on the teeth and gums, the smell of the breath is peculiar. In pyæmia and in diabetes the breath has a sweet odour, but the odour in each of these diseases is perfectly distinguishable.

With inflamed gums the breath is apt to smell. This is peculiarly the case in patients under the influence of mercury, and the term mercurial odour of the breath is one in common use. In scurvy the breath is apt to be very foul. It is needless to say that certain articles of diet, as garlic and onions, and certain drugs, as turpentine, copaiba, and some of the essential oils, are detectable in the breath.

The *inspection of the lips* is capable of furnishing many

facts which are of great service in forming a diagnosis. The *form* of the lips is characteristic in different races; thus, the thick lips of the African negroes and the thin lips of most European races are well known. In conditions of general plethora the lips look swollen and big. A few cases have been recorded of great hypertrophy of the lips and neighbouring parts, a notable example being given by Mr. Barwell in the eighth volume of the Clinical Society's 'Transactions.'

The *colour* of the lips is a matter of great importance. After great loss of blood the lips may appear of a waxy whiteness, and such an appearance should at once lead to questions likely to elucidate this point. A recent confinement attended by hæmorrhage is the most common cause of this appearance in women. Anæmia and leucocythæmia, arising from no matter what cause, produce a pallor of the lips, and in investigating cases of anæmia, we invariably look to the mucous surfaces of these parts. It is right to remind you, however, that undoubted evidence of hydræmia may be present without any very obvious alteration of the tint of the lips.

The lips are often unduly red in cases of general plethora and in the early stages of many febrile conditions. A cyanotic tint of the lips may be due to extreme cold, to those malformations of the heart which give rise to the condition known as cyanosis, and to a mal-aëration of the blood arising from no matter what cause, atmospheric, pulmonary, or cardiac. A patch of herpes on the lips (herpes labialis) is very commonly seen. It is a common accompaniment of an ordinary cold, and it is well to bear in mind that such an appearance may be indicative of more serious trouble, such as pneumonia. It is sufficiently often an accompaniment of pneumonia to make it incumbent upon us always to investigate this point when we are confronted with a patch of herpes on the lips.

In febrile conditions the lips get dry and cracked, and sordes accumulate upon them. Sordes are collections of dried mucus, evaporated saliva, and food particles, which cannot be removed, owing to the general dryness of the mouth and the paucity of the salivary secretions. This condition of the lips is seen in the most extreme degree in the state known as the typhoid condition, in which also the lips are often brown or almost black.

Round the margins of the lips are occasionally seen cracks, white lines, and little pits, the latter reminding one of the appearance known as the lineæ albicantes which occurs on

the abdomen after pregnancy. These appearances occurring on the lips are sufficient to raise a suspicion of congenital syphilis. The other indication of syphilis which we may find upon the lips are— (1) a true infecting sore or hard chancre, which is happily rare; and (2) mucous tubercles, which may be present in cases of congenital or acquired syphilis. These mucous tubercles have the same appearance when seen here as when seen elsewhere—flat, slightly elevated patches, with a dirty-whitish surface, surrounded by a congested areola. Epithelioma is among the more rare diseases of the lips, concerning which one should be on one's guard.

The *movement* of the lips is a matter of great diagnostic importance. The muscular power of the lips may be impaired or abolished in several distinct conditions, such as hemiplegia, facial palsy, bulbar or labio-glosso-laryngeal paralysis, and general paralysis of the insane.

In hemiplegia the lip palsy is often slight, and in very slight cases which have partially recovered, a trifling drooping of the prolabium of the upper lip on one side, just sufficient to destroy the symmetry of the "Cupid's bow," is all that we can detect. The observation of this slight drooping and want of symmetry should always lead to an investigation into the history of the patient, and to questions likely to elucidate the diagnosis of hemiplegia. In marked cases of hemiplegia, and in cases of facial palsy from disease or injury to the trunk of the facial nerve, the paralysis of one half of the lips is easily demonstrated, and on asking the patient to show the teeth it will be observed that the teeth are imperfectly exposed on the paralysed side, and the angle of the mouth is drawn over to the sound side. Facial palsy may be double, and then this want of symmetry is not observed, but the face is expressionless, and the teeth and gums cannot be exposed.

In bulbar paralysis the condition is usually bilateral, and the patient is quite unable to move the lips. In the later stages of this disease the lips waste, and the under lip droops so as to expose the gums and allow the saliva to run out of the mouth.

In general paralysis of the insane there is a paretic condition of the lips, and when they move they do so in a hesitating jerky manner, which is very characteristic.

In alcoholism the movement of the lips is also often tremulous. In chorea the lips are liable to those uncertain jerky movements which are so characteristic of this condition. In "muscular tic" one side of the mouth may be the seat

of spasmodic movement. Lastly, in tetanus and spinal meningitis there occurs that condition which is called the risus sardonicus, which is caused by a spasmodic retraction of the angles of the mouth.

Dribbling of saliva is a symptom which is due to many causes. It may be due to an excessive secretion of saliva, a condition seen in cases of mercurial poisoning and in some other states. It is present in cases where there is deficient movement of the lip and tongue, as in bulbar paralysis, or in cases where movement of the tongue is rendered impossible or painful by the presence of sores and ulcers. In patients also with whom the act of swallowing is impaired or painful, as in cases of paralysis or stricture of the pharynx, or inflammation of the tonsils or throat, dribbling of the saliva is apt to occur. In children dribbling is a physiological condition, owing to a want of vigour and purpose in the movements of their lips and tongues, and in idiots this infantile condition would seem to be permanent. Old writers considered the dribbling of saliva to be characteristic of idiots and madmen.

An *inspection of the gums* occasionally affords important evidence of disease. Their *colour*, like the colour of the lips, may be pale or red or livid, and is an indication of anæmia or plethora or those conditions mentioned in connection with the lips which give rise to a cyanotic tint. The gums are sometimes spongy and congested, and liable to bleed at slight causes. This is often the case in depressed conditions of health, arising from whatever cause. It is present in a marked degree in persons who are under the influence of mercury, and to a less extent in those who are taking iodide of potassium. In leucocythæmia and in Hodgkin's disease the gums are often swollen and pale, and occasionally they are stated to become gangrenous. In purpura, hæmorrhage from the gums is a common occurrence. In *scurvy* the gums are very greatly and remarkably affected. They become sore and apt to bleed at the slightest touch, and get swollen, spongy, and livid. The lividity is stated to be most marked at the free edges. The swelling of the gums is so great as occasionally to obscure the teeth, and in extreme cases they protrude between the lips. They get livid and almost black, and undergo sloughing and ulceration, which causes the breath to be peculiarly offensive. The sloughing may leave the fangs of the teeth exposed, and in such cases the teeth commonly fall out. Dr. Buzzard states that this condition of the gums is by no means invariably present in scurvy, and that all the other symptoms

of the disease may be present in a marked degree, while the gums are not noticeably affected. Indeed, the gums in scurvy may occasionally be paler than natural and contracted.

A *blue line* upon the gum may, in the vast majority of cases, be taken as certain evidence that the patient is suffering to a greater or less extent from lead-poisoning. This "blue line" is due to a deposit of lead sulphide in the tissues of the gum. Dr. Hilton Fagge has made sections of the margin of a gum affected with a lead line, and by the aid of the lower powers of the microscope was able to see that the discolouration was not uniform, but was distributed in the form of rounded loops. The pigmentation was seen to be due to minute granules, and these granules were situated sometimes in the interior of the smaller blood-vessels, and sometimes outside them in the tissue immediately adjacent. The deposit is in reality black, its blue appearance being due to the fact that it is seen through a thin translucent layer of gum. Care must be taken not to mistake the purple congested edge of the gum of persons who do not clean their teeth for the deep blue line which is caused by lead. The blue line is produced by the action of hydrogen sulphide upon the lead which is presumably circulating in the blood. The hydrogen sulphide is produced by the decomposition of food particles lodging between the teeth, and adhering to the tartar. Persons who are careful to keep the teeth clean, and in whom no decomposition of the food particles takes place, may be suffering from lead-poisoning and yet have no lead-line upon the gums. The lead-line once formed, and being due to the deposit of an insoluble salt, may remain for months after the system has been freed from lead. Persons who have been exposed to the action of lead may exhibit no line upon the gums until after the administration of iodide of potassium. This is difficult of explanation, but the fact admits of little doubt. The blue or black discolouration caused by lead is not always limited to the margin of the gums, but may occasionally form black patches on the inside of the lips or cheeks.

Occasionally among the ill-fed and dirtily-kept children of the poor, and especially during the first dentition, the gums become swollen and the edges ulcerate, the ulcerated surface being covered with a dirty-grey secretion. This condition is known as gingivitis, accompanied by offensive breath, and some increase in the flow of saliva.

The *teeth* often afford valuable evidence of constitutional conditions. *Delayed dentition* is apt to occur in children that are debilitated from any cause, but more particularly is

this the case in rickets. Finding the dentition delayed, we should always search for other evidence of rickets. The milk teeth should begin to appear at the seventh month, and should be all "cut" by the end of the second year. The teeth appear in the following order—central incisors, lateral incisors, anterior molars, canines, and posterior molars; and each of these five groups appears by the seventh, ninth, twelfth, eighteenth, and twenty-fourth month; the number of teeth which a child should have at the end of the months named being four, eight, twelve, sixteen, twenty. It may be some help to the memory to call attention to the fact that when a child is twelve months old there should be twelve teeth in the mouth. These numbers are liable to great deviation even in health. Some healthy children are precocious, while others are backward in the matter of dentition. The teeth may be wholly or in part deficient as the result of congenital defect. *Caries* or decay of the teeth is so common in this country that very few escape from it. It is more common in women than men, and is predisposed to by pregnancy and by the scrofulous and tuberculous constitutions. It is said to be caused by the generation of acid from the fermentation of food particles lodged between the teeth. There is a condition known as "*rocky*" *enamel*, in which the enamel of the teeth is grooved and pitted and honeycombed. This condition is brought about by rickets, or by any depressing illness occurring during dentition. Occasionally the teeth get excessively worn, so that they appear truncated, and the dental arch presents the appearance of a flat level border, the exposed dentine presenting a yellowish appearance. This condition, of which a very good example was lately attending in my out-patient room, is rare, and is said to be predisposed to by syphilis, and to be favoured by the use of gritty food. Mr. Jonathan Hutchinson has pointed out that a peculiar condition of the permanent teeth often exists in patients who are the subjects of *inherited syphilis*. The incisors and canine teeth are small, peg-like in shape, narrow at the free edge, and either excavated by a crescentic notch at the margin or marked by a crescentic groove. The conical condition is most marked, according to Salter, in the lower, and the crescentic notch is most conspicuous in the upper incisors. When the teeth are lost very early in life, inquiry should always be made as to whether the patient has taken much mercury, and, if so, for what reason.

The *mucous membrane of the mouth* is sometimes swollen and red as part of a general catarrh. It may be swollen in

consequence of gastric irritation, brought about by errors in diet. In children who are ill fed, and especially during dentition, small, circular, painful ulcers called aphthæ very frequently appear upon the gums and the internal surface of the cheeks. They are almost always an indication of gastric disturbance from injudicious feeding. When we get the mucous membrane of the mouth inflamed, and upon the inflamed surface a parasitic fungus (the oidium albicans) growing, we have the well-known disease called thrush. The mouth, tongue, and palate and pharynx may be covered with white patches, and we may be in doubt whether these patches are due to curdled milk or diphtheria, but if a small quantity be placed under the microscope with a drop of caustic potash, the well-known mycelium and spores of the oidium albicans are easily seen, and serve to clear up all doubts. Whether the fungus is the cause of the inflamed condition, or whether the inflamed patches form a fitting nidus for the growth of the fungus, is an open question. Thrush never occurs in well nursed children, and if a young child is fed upon good milk and nothing else, thrush seldom appears. When, however, mothers give farinaceous matter to very young children, often combined with milk which is slightly sour, this sticky mixture adheres to the inside of the mouth, and if the mouth be not very carefully cleansed out after every meal, the decomposing food particles irritate the mouth, cause it to inflame, and form a soil upon which the oidium grows luxuriantly.

Thrush is liable to occur in adults towards the termination of chronic illnesses, when they are too weak to cleanse their mouths by vigorous movements of the tongue. I have seen patches of thrush also occurring in a patient the subject of labio-glosso-laryngeal paralysis, because the movements of the mouth were too feeble for the purpose of properly cleansing it. The lesson to be learnt from these facts is that in feeble persons the mouth needs to be artificially cleansed after feeding by being sponged out with some antiseptic, such as a solution of borax, or, perhaps, there is nothing better than peppermint water, which to many persons is agreeable and refreshing.

Lecture II.—The Physical Signs derivable from the Tongue.

Gentlemen,—No organ in the body is appealed to so often to afford evidence of disease as *the tongue*. This is not to be wondered at, as it is the only internal organ which can be conveniently and instantaneously exposed. In inspecting the tongue, we have regard to its *size, form, colour, density, movement,* and to any *adventitious* appearances due to fur, sores, or morbid growths.

The *size* of the tongue differs in different people. It may be congenitally wanting, and at least one well-authenticated case of this deformity is upon record. Some persons have naturally small tongues. A tongue may be apparently, but not really, small, owing to an inability to protrude it properly. Atrophy of the tongue occurs in cases of damage to the trunk or origin of the ninth nerves. Such atrophy is generally unilateral, or, if bilateral (as in cases of bulbar or labio-glosso-laryngeal paralysis), it is generally better marked upon one side than on the other. In cases of creeping palsy, or Cruveilhier's atrophy, the tongue is occasionally affected, and wastes, as do the other muscles of the body.

We have now attending in the out-patient room a little girl of twelve years of age, who has atrophy of the right half of the tongue. This supervened upon an attack of right hemiplegia, which occurred a couple of years ago after scarlet fever. The paralysis of the right arm and leg is now almost perfectly well, but the atrophy of the right side of the tongue remains well marked. There is no evidence of any implication of the right ninth nerve in its course, and we are driven to the conclusion that the atrophy is caused by a degenerative change descending from the seat of the cerebral lesion along the course of the right ninth nerve.

Big tongues occur as congenital defects, and a certain number of children with "tongues too big for their mouths" are recorded. This congenital hypertrophy is sometimes so great that the tongue hangs from the mouth over the chin. In some few instances the hypertrophy has commenced after birth, but in such cases the enlargement has usually followed some inflammatory condition of the organ, and it is doubtful if it

be due to simple hypertrophy of the lingual muscles. The tongue may be enlarged and swollen from inflammation (*glossitis*), brought about by mercurialisation or errors in diet. In tertiary syphilis the tongue is sometimes the seat of a uniform infiltration, and undergoes enlargement in consequence. We have had one such case attending in the Throat Department in which the tongue was enormously increased in size. A tongue which is the seat of syphilitic gummata or cancerous tumours, is necessarily bigger than ordinary. The size of the tongue apparently differs also according to its state of muscular tonicity, appearing smaller when the tone of the intrinsic muscles is great, and large when the muscles lack tone, and in some anæmic and depressed conditions.

The *form* of the tongue is a matter of secondary importance. It is remarkable how this differs in different individuals. Sometimes it is broad and flat, and at other times it is long and pointed. These variations depend presumably upon differences of muscular tone. The broad flat tongue is often seen in atonic conditions, and the long pointed tongue in conditions of irritative dyspepsia. This rule, however, if rule it can be called, is liable to many exceptions. In cases of unilateral atrophy the tongue loses its symmetry. The symmetry of the tongue is also interfered with by tumours and ulcers, the cicatrisation of which causes contraction of one side. When the tongue is large and flat the edges of it are liable to be marked by the teeth, and present a characteristic crenulated appearance. In cases of glossitis from any cause the teeth-markings appear, and they are also very often seen in the broad flat tongues of anæmic persons suffering from atonic dyspepsia. These teeth-markings in the absence of any inflammatory condition of the tongue are important evidence of want of tone.

The *colour* of the tongue, apart from the presence of fur, of which we shall speak presently, varies from an extreme degree of pallor in patients who are the subjects of anæmia to an extreme degree of redness in scarlet fever. It is necessary not only to look to the colour of the organ itself, but of the papillæ, and especially the fungiform papillæ, which are situated round the tips and edges. These papillæ are apt to get enlarged and very red in conditions of irritative dyspepsia. They also enlarge very much in scarlet fever, and the enlarged papillæ standing out in bold relief against the white fur with which the organ is covered have given rise to the expression "strawberry tongue," on account of its bearing some resemblance to that fruit. The condition of

these papillæ affords important evidence of stomach condition. Any irritation of the stomach will cause an hyperæmia of the tongue and pharynx, and it is surprising how quickly the presence of any obnoxious body in the stomach causes the characteristic appearance in the tongue. The irritation of the terminal branches of a centripetal (sensory) nerve causes, as you know, a dilatation of the vessels in the area supplied by that nerve. Irritation of the stomach causes, presumably, impressions upon the terminal branches of the vagus, which travel to the vaso-motor centre in the medulla, and produce by reflex action a dilatation of the vessels. This reflex effect produced by irritation of the vagus spreads beyond the area of the nerve irritated, and a dilatation of the vessels of the pharynx and soft palate (which are supplied with fibres of the vagus), as well as of the papillæ of the tongue (to which vagal fibres have, I believe, been traced with the branches of the hypoglossal) occurs. The reflex impressions producing variations in the blood-supply of the mouth and tongue, and variations in the amount of mucus and salivary secretion of those parts may be merely psychical. The watering of the mouth produced by appetising thoughts, and the dryness of the same which may be brought about by fear, are two familiar examples.

The colour of the tongue is changed by any cause producing jaundice, when it assumes with the other tissues of the body the icteric tint. The tongue becomes cyanotic whenever the aeration of the blood is impeded from any cause. It may be well to remind you that it is turned brown by chewing tobacco, and is often black in patients who are taking preparations of iron.

The degree of moisture or dryness of the tongue is a point to be observed. A very moist tongue is seen in cases of ordinary catarrh. A dry tongue may be due to mental impressions, to increased evaporation from the surface, brought about by keeping the mouth persistently open, to the febrile state in which the secretion of the buccal mucous membrane is in abeyance, and the evaporation from the surface largely increased by the high temperature of the body. One of the dryest tongues I have ever seen was in a patient with a cleft palate and was caused by the constant evaporation from that part of the tongue which was exposed to the air passing through the nostrils. A very dry tongue in cases of fever is always a sign of considerable gravity. In cases of long-continued fever patients get into a low condition, known as the typhoid state, and then not only is the tongue almost absolutely dry, but almost black upon the surface.

This dry black tongue occurring in cases of fever is a very unfavorable sign.

One may mention here that occasionally the circumvallate papillæ which form a chevron at the base of the tongue, undergo a very great hypertrophy, so as to look like large warts standing on the surface. We had one such case lately attending in my out-patient room. The filiform papillæ are also occasionally hypertrophied and give a hairy appearance to the tongue.

The *density* of the tongue—*i.e.* its hardness or softness to the touch—is a point which is often of value, as affording confirmatory evidence. The tongue is soft in all anæmic conditions and in conditions of atrophy, and feels hard when it is in the long pointed state which I mentioned as sometimes accompanying gastric irritation. The tongue feels hard whenever it is the seat of simple, cancerous, or syphilitic infiltration. Many of you may have seen the case of tertiary syphilis attending my out-patients, which I have previously mentioned, in which the tongue, without being in any way distorted in shape, was enormously enlarged and uniformly infiltrated, so that it felt, when gently squeezed between the fingers, as hard as a board.

Most important to observe are the *movements* of the tongue. Some patients, when asked to put out the tongue, do so with difficulty, and only just protrude the tip. This may arise from tightness of the frænum linguæ—the condition known as tongue-tie. It may be well to remark here that tongue-tie is not at all common, and that of the numerous babies who are brought to us by their mothers and said to be tongue-tied, a very small proportion only need any surgical interference. Occasionally a difficulty in protruding the tongue is an evidence that the patient wears false teeth, a circumstance of which it is convenient to have a knowledge. The tongue of a healthy person is protruded in the middle line, and any deviation to the right or left is evidence of disease. An imperfection in the line of the lower teeth will often cause a deviation of the tongue, and if there be a gap in the teeth on one side or the other of the middle line the tongue will be pushed out through this gap. In cases of paralysis which implicates the ninth nerve on one side the tongue is protruded obliquely from the mouth, and is pushed over *towards the paralysed side.* Thus in ordinary cases of hemiplegia we find the arm and leg paralysed, let us say, upon the right side. The muscles of the mouth are paralysed upon the same side, and consequently in all movements of the mouth it is dragged a little towards

the left, but the tongue, owing to the failure of the right genio-hyo-glossus, is pushed over to the right by the healthy left muscle. Whenever we see the tongue deviate from the middle line we should always make diligent search for evidence of a past or present hemiplegia. The tongue may be paralysed by a lesion limited to the ninth nerve, and then we shall have deviation of the tongue without other signs of paralysis. If the muscles on one side of the tongue only be attacked with Cruveilhier's atrophy, the tongue will deviate towards the side of the atrophied and weakened muscles. In some cases of paralysis of the facial nerve—*i.e.* in cases where the paralysing lesion is on the central side of the junction of the chorda tympani—there is a slight deviation of the tongue towards the paralysed side. In cases of bulbar paralysis—*i.e.* the paralysis due to a lesion of the medulla implicating the origin of the seventh, eighth, and ninth nerves—the movements of the tongue are more or less impaired. It cannot be protruded, and swallowing and mastication are effected with great difficulty. In general paralysis of the insane the movements of the tongue are impaired so that speech becomes altered. Movement of the tongue may be impaired also by local causes, such as sores or ulcers, which cause movement to be painful, and cancerous, syphilitic, or simple inflammatory infiltrations, which offer mechanical hindrances to free movement.

The movements of the tongue may be irregular rather than deficient. In chorea the tongue is protruded in a jerky, irregular, and highly characteristic manner. Tremor of the tongue is very often seen. In weak "nervous" girls, and in hysterical women and men, the tongue trembles so that it is scarcely ever quiet. Tremor is present in delirium tremens and in chronic alcoholism. In all febrile conditions accompanied by great prostration we get a tremor of the tongue. In general paralysis of the insane the tongue trembles as it is protruded; and in Cruveilhier's atrophy affecting the tongue, the side which is attacked is often the seat of the fibrillary tremor which is characteristic of that disease. Tremor of the tongue sometimes exists in typhoid fever to a degree which is out of all proportion to the other symptoms. It is accompanied usually by general tremor; and I would remind you that we have the authority of Sir William Jenner for regarding such tremor as an indication of *deep* destruction of the intestine. "A small *deep* slough will be accompanied by great tremor; a large extent or superficial ulceration may be unattended by symptoms."

We may now proceed to the consideration of the *adventi-*

tious appearances of the tongue. The most common and the most important of these is what is known as "fur." The fur upon the tongue is mainly composed of epithelium. Epithelium here, as elsewhere, is constantly being formed and cast off: and whatever causes an excessive production of epithelium, or whatever tends to foster an accumulation of the epithelium which is formed, will produce a fur upon the tongue. In addition to epithelium, we also find among the constituents of fur, mucus, saliva, and occasionally confervoid growths (such as oidium and leptothrix), food particles, and perhaps a little blood from the mouth or gums. Seeing that epithelium, the chief constituent of fur, is formed in quantity proportional to the blood-supply, we may say that whatever tends to produce hyperæmia of the tongue tends to produce fur. Local conditions of the tongue and mouth may produce fur, such as ulcers on the tongue itself or on the oral mucous membrane, carious teeth, swollen or inflamed tonsils, or inflammation of the tongue. Among local causes one must mention excessive tobacco-smoking which, in some persons, is capable of producing a considerable fur.

Furs due to local causes in the mouth are often limited in extent to the neighbourhood of the exciting cause. Thus, if one tonsil only be inflamed the fur may be most marked on the side of the inflamed tonsil. Again, a carious tooth may produce a unilateral fur. Mr. Hilton in his work on 'Rest and Pain,' pointed out that unilateral fur might be produced by causes acting directly or in a reflex manner through the second or third divisions of the fifth nerve. The fur caused by carious teeth is due to a reflex action, and Mr. Hilton demonstrated that in these cases the fur is limited to that part of the tongue to which the fifth nerve is supplied—viz. the anterior two thirds, and does not occur on the posterior third, which is supplied by the glosso-pharyngeal nerve. Mr. Hilton also mentions a case in which a unilateral fur was caused by a scrofulous deposit within the cranium pressing upon the convex edge of the Gasserian ganglion; and another case in which a unilateral fur followed a laceration of the foramen rotundum. There has lately been attending in my out-patient room a man with a unilateral fur upon the tongue depending upon a cause very different from the foregoing. His fur was limited to the right side of the tongue and on examining the mouth we found a tumour projecting from the roof of the mouth on the left side nearly as big as a walnut, and this had the effect of wiping off whatever fur accumulated upon the left side of the tongue, which, therefore, appeared clean in contrast to the right side.

Fur may be due merely to accumulation of normal epithelium. People who sleep with their mouths open and thus allow the dorsum of the tongue to become dry by evaporation have habitually a fur on waking in the morning. Always remember that some persons have a thicker coating of epithelium upon their tongues than others, and that a furred tongue is the normal condition of a certain proportion of perfectly healthy individuals.

The most common cause of fur upon the tongue is irritation in the stomach, and from what I have already said concerning the production of hyperæmia of the tongue by irritation of the stomach, and concerning the production of fur by hyperæmia of the tongue, you will readily understand how this comes about. The fur upon the tongue in these cases is generally in proportion to the amount of gastric disturbance. A copious fur, with enlargement and reddening of the papillæ at the tip and edges, is characteristic of acute gastric catarrh. A pale flabby tongue with a thin coating of fur is characteristic of the chronic dyspepsia of anæmic women. It is astonishing how quickly these furs, which are symptomatic of stomach conditions, will appear and disappear. The drunkard, whose stomach has been filled over night with spirits, awakes in the morning with all the symptoms of gastric catarrh—nausea, vomiting, and a tongue thickly coated. The tongue condition is often gone by midday, and does not reappear until the recurrence of the cause Again, when giving arsenic to patients, one is often struck by the rapidity with which the furred tongue characteristic of gastric irritation makes its appearance, to disappear as quickly on the discontinuance of the drug.

In almost all febrile states we get a fur more or less thick upon the tongue. This fur is primarily an indication of the state of the stomach ; and you will bear in mind how in most febrile conditions we have symptoms which are referable to the stomach, such as loss of appetite, vomiting, or nausea. In addition to the stomach conditions which are present in fevers, we have also very often a hyperæmia of the tongue itself, which tends to produce an excess of epithelium, and the patient by lying with the mouth open allows this epithelium to become dry and to accumulate.

The fur upon the tongue varies very much in colour. It is often yellowish, which is due probably to a fatty degeneration of the epithelium. Sometimes it is brown or black, which is caused either by an admixture of blood with the epithelium, or by some pigmentary change which is less well understood.

In long-continued fevers, especially when the temperature is high, the epithelium, which is formed in excessive quantities upon the tongue in the early stages, ceases to be produced, and that already produced cracks off, leaving the tongue red and raw. This kind of tongue is often seen in cases of phthisis with high temperature. It must be borne in mind that, just as a fur upon the tongue may arise from local causes without any derangement of the stomach whatever, so there may be an extreme degree of local disease of the stomach without any fur upon the tongue. In many cases, for example, of ulcer and cancer of the stomach, the tongue may remain throughout perfectly healthy and normal in appearance..

In many diseased states the tongue presents an appearance which is sufficiently characteristic to afford us material assistance in forming a diagnosis. For example, in *scarlet fever* the tongue is covered with a white fur, except at the tip and edges, where the enlarged papillæ show through, producing what is known as the "strawberry tongue." Many students seem to think that the "strawberry tongue" (a term which easily dwells in the memory) is diagnostic of scarlet fever. It may be well to say emphatically that this form of tongue is often present, especially in children, without scarlet fever, and that many cases of scarlet fever are not accompanied by a "strawberry tongue." All we can say of a "strawberry tongue" is this—that, *taken with other symptoms*, it is of a certain diagnostic value.

In rheumatism the tongue is covered with a thick creamy fur. In many cases of tonsilitis the fur upon the tongue is very like that which is seen in rheumatism. Before and during a paroxysm of gout the tongue is often covered with a thick white fur, which to the practised eye is characteristic. In typhoid fever the tongue is covered with a thick fur, except at the tip and edges, where the tongue is red and the papillæ big. As the fever advances the fur becomes yellower and cracks, and Sir William Jenner used to compare the appearance of the tongue to that produced by yelk of egg smeared over a white plate, and allowed to dry. In malarial conditions the tongue is said to have a distinct lateral margin of a faint bluish tinge, which is broader or narrower according to the state of the patient. There is also an appearance of indentation transversely. In diabetes mellitus the tongue is dry, fissured, red, smooth, and clean.

We may now pass on to the consideration of *ulcers* upon the tongue. Small aphthous ulcers arise upon the tongue as upon other parts of the buccal mucous membrane. They

are small, circular, and sharply defined. They occur very often on the linguæ, and at the tip of the tongue. They are painful, and depend generally upon errors in diet. Ulcerations of other kinds are liable to arise from local causes, and it is a rule that whenever a patient comes to us with an ulcer upon the tongue *we must examine the teeth to see whether such ulcer has not been caused by a sharp projecting piece of a broken tooth, or some other similar cause.* Always remember, however, that ulcers seldom occur upon the tongue, even when local causes be present, if the patient be healthy.

The most common cause of ulceration of the tongue is probably syphilis, and an adult patient who complains of a liability to soreness of the tongue must always be examined carefully for any signs of constitutional taint. The syphilitic ulcers occur usually at the sides of the tongue, and a little towards the under-surface. They are commonly small and superficial, and are generally in old cases surrounded by cicatricial tissue, the seat of former ulcerations. The appearances presented by the ordinary syphilitic tongue other than those which are due to ulceration may, for convenience, be here mentioned. The tongue which is characteristic of syphilis is usually enlarged, and often there are teeth marks at the side. Its surface looks white and shiny, the epithelium is thick and patchy, lines of cicatricial tissue are visible on the surface, sometimes there are genuine puckerings due to the contraction of cicatrices, and generally upon the dorsum there are visible fissures and cracks which are very characteristic. These appearances, combined with superficial ulcerations at the sides, are among the most certain evidence of constitutional syphilis which we possess. These appearances occur during the secondary stage. Other manifestations of syphilis occur on the tongue. Mucous tubercles—raised patches of mucous membrane surrounded by a congested ring—are not uncommon on the tongue in the early stage. The primary chancre may occur on the tongue as a rare phenomenon. Tertiary manifestations of syphilis are common in the tongue in the form of gummata or of uniform infiltrations. The gummy tumours are often to be felt, rather than seen, as dense masses the size of a pea or larger, buried in the substance of the tongue. These gummata are said to occur towards the middle line rather than the edge; but this is by no means always the case. I have already mentioned a case of uniform infiltration of the tongue, due to tertiary syphilis, attending in the out-patient room. The tongue was nearly twice its natural size, and

very hard to the touch, but soon resumed its natural condition under treatment.

I mentioned that fissures and cracks upon the tongue were common, as a result of syphilis. These must not be mistaken for mere furrows in a healthy tongue. The one condition may be distinguished from the other by taking the tongue between the fingers and gently stretching it, when mere rugæ will disappear, but actual cracks will remain.

There are certain other conditions of the tongue of which it may be well to say a few words. Epithelioma of the tongue in its early stages is often indistinguishable from syphilis. It may begin with a little localised thickening, a blister, or an hypertrophy of the papillæ. It is most common after middle life, and is said to occur towards the side rather than the centre of the tongue. It begins to ulcerate early, and very soon it forms an ulcer with ragged edges and a foul secretion surrounded by infiltrated tissue. It is exquisitely painful, and interferes with all the functions of the tongue. The glands under the jaw are enlarged.

Simple inflammation of the tongue may produce a superficial glossitis causing a thickening of the epithelium and a shiny appearance. In extreme cases the tongue may become distinctly scaly, and this condition is then spoken of as psoriasis or ichthyosis, according to its degree. It is important to bear in mind that ichthyosis linguæ is generally the precursor of cancer. A kind of urticaria may occur in the tongue, causing it to swell immensely. Inflammation of the tongue may produce abscess, which may occur at any point. The tongue may be the seat both of vegetable and animal parasites; thus the oidium albicans and the leptothrix buccalis may grow upon the tongue, and among the animal parasites are the echinococcus, the cysticercus, the guinea-worm, and the trichina spiralis.

Lecture III.—The Physical Signs derivable from the Pharynx and Fauces.

Gentlemen,—We next have to consider the indications of disease which we may derive from an inspection of the fauces and pharynx—*i.e.* so much of those parts as can be seen without the aid of instruments, other than a tongue-depressor. It may be well to remind you that a considerable part of the pharyngeal cavity, which extends upwards to the basilar portion of the occipital bone and downwards to the level of the fifth cervical vertebra and the cricoid cartilage, cannot be seen except by the aid of mirrors. If a patient be asked to turn towards the light, open the mouth widely and inspire deeply, the tongue is usually depressed on the floor of the mouth, and we get a good view of the fauces and pharynx. We may often get a much better view without than with the aid of a tongue-depressor, the presence of the instrument seeming with many to excite the tongue, as it were, to uncontrollable movements which obscure the view. If it is necessary to use a tongue-depressor, it is well to choose one with a long wooden handle, and with a blade having a gentle curve which will fit to the natural curve of the tongue. The blade should be broad, and should be passed right over the dorsum of the tongue beyond the circumvallate papillæ. The patient should then be asked to inspire deeply, and a slight amount of downward pressure should be exerted with the instrument. We then get a view of (1, 2) the hard and soft palates, (3, 4) the anterior and (5, 6) the posterior pillars of the fauces, (7) the uvula, (8, 9) the tonsils on either side, (10) the posterior wall of the pharynx, and (11) the tip of the epiglottis. In looking into the mouth in this way there are therefore eleven distinct points which demand your attention. I have catalogued them thus because I know by experience that many students look into the mouth without any definite notion of what they are going to look for.

It is well to remember that the parts seen are formed of a highly glandular mucous membrane, the glands being largest in the posterior wall of the pharynx. The mucous membrane of the pillars of the fauces and soft palate covers a stratum of voluntary muscular fibres. Ordinary and

special sensation (taste) is afforded by branches of the glosso-pharyngeal and vagus inextricably commingled, and the muscles of the soft palate are supplied by the glosso-pharyngeal, and the motor fibres of the vagus obtained through the spinal-accessory nerve.

It is scarcely necessary to mention how easily reflex contraction of the fauces and pharynx, and even vomiting, is produced by irritation of the mucous membrane.

On inspecting these parts we notice that the appearance of the mucous membrane of the mouth alters close to the margin of the anterior pillars of the fauces. In front of this line it is rosy in hue, and behind it has a more dusky and congested appearance. This, it should be remembered, is a normal condition, and is not indicative of any disease.

The common diseased appearances of this region are *hyperæmia, pallor, swelling, excess of secretion, ulceration, cicatrisation,* and *adventitious* appearances.

Hyperæmia arises here, as elsewhere, from direct or reflex irritation. Hyperæmia without swelling, in which we see the enlarged blood-vessels coursing on the pharynx and fauces, is most often due to stomach irritation, caused by abuse of strong drinks and highly-seasoned food. Once established, it is maintained by cold, tobacco-smoke, excessive use of the parts, and foul atmospheres. Hyperæmia is hardly even seen alone, but is usually combined with swelling.

Redness and swelling of the throat are common in: 1. Simple catarrh, due to ordinary cold. 2. Acute tonsillitis. 3. Scarlet fever, in which occasionally the redness is excessive. 4. Diphtheria. 5. Erysipelas (not very common), and measles. 6. The early stage of syphilis. In all these conditions it may happen that the throat is merely swollen, but usually there are some points which enable us to distinguish one kind of swollen pharynx from another. The degree of swelling and the seat thereof vary much. The uvula may be enormously enlarged and clubbed at the end, owing to a dropsy brought on by gravitation. The soft palate and anterior pillars of the fauces are sometimes the seat of particular swelling and œdema, especially in hospital sore-throat; the tonsils may be swollen out of all proportion to the neighbouring parts, and may threaten suffocation by meeting in the middle line; the posterior wall of the pharynx may be swollen by matter forming behind it, or the epiglottis may be in a state of extreme œdema, threatening life. When the swelling of these parts is due to one of the acute specific diseases, the concomitant symptoms will afford

means for diagnosis—the rash in scarlet fever or measles, the patches of false membrane in diphtheria, the facial eruption in erysipelas. The swelling due to ordinary catarrh is usually not very great, and the whole region very often steams with moisture.

In acute tonsillitis, quinsy, or hospital sore-throat, the throat condition is the main trouble. The constitutional disturbance is always severe. There is headache, malaise, loss of appetite, and a look of extreme prostration. The temperature is always raised, and may reach 104° F.; the pulse is quick, the tongue often coated with a thick, creamy, rheumatic fur, with large papillæ. The patient swallows, speaks, and even breathes with difficulty, owing to the faucial obstruction. The bowels are confined, and the breath is foul, owing to the accumulation of catarrhal products in the fauces. The parts look red and œdematous, and are occasionally so swollen as to be past recognition. The swelling may be general, or it is limited to the tonsils, or to one tonsil rather than the other. Often one sees a bulging forward of one anterior pillar and the adjoining part of the soft palate, and on palpation fluctuation may be obtained, showing that suppuration has taken place. The parts may be covered with a yellow, slimy muco-pus, and the enlarged tonsils may have patches of white secretion about the orifices of the crypts; but it may be well to bear in mind that although abscesses often form beneath the mucous membrane or in the tonsil, superficial ulceration of the mucous membrane is not common. This is the ordinary form of hospital sore throat, with which some of you possibly have only a too practical acquaintance. Occasionally acute septicæmia is ushered in in this way, and the case goes rapidly on to a fatal termination. Here one may well direct your attention to the cause of this sore throat, viz. foul air. It was more common in the days of septic surgery than now, but it is still common enough in hospitals, and will probably remain so. When you see these cases in private, and especially when a throat of this kind runs through a family, always make a diligent search for the cause, which is usually a foul atmosphere combined with draughts. Living in ill-ventilated and crowded rooms, or in rooms to which sewer gas has access, are the most common causes. Butlers, who sleep close to the untrapped pantry sink, and in whom converge the four great causes of pharyngitis—over-eating, over-drinking, want of fresh air and exercise, and sleeping in an atmosphere laden with sewer gas—are very prone to this trouble.

On the subsidence of the inflammation the tonsils are often left enlarged, and in patients of a strumous habit this enlargement is very obstinate. It occasionally happens in strumous children that the tonsils undergo a slow progressive enlargement without any acute attack. The tonsils in these cases are large, pale, smooth, and hard-looking, and often meet in the middle line, while the rest of the pharyngeal mucous membrane remains healthy. The cause of the enlargement is either a general hypertrophy of the part, or is due to inflammatory products or occasionally to a lardaceous change. The openings of the crypts on the surface of the tonsil may give the idea of ulceration. If the tonsils meet and rub against each other, a superficial erosion of the surface is not uncommon. These enlarged tonsils may inflame and swell up when the patient "catches cold."

There is a form of hyperæmia and swelling of the posterior wall of the pharynx which must be mentioned. In this the vessels ramifying in the mucous membrane are distinctly enlarged, and the mucous follicles are swollen, giving a coarsely granular appearance. Hence the name of "granular pharyngitis" has been given to it. The mucous secretion of the part is increased, and strings of mucus may be generally seen adhering to the membrane. This form of pharyngeal disease is common among gourmands and steady drinkers. It seems, according to Rühle, to be very common in the Rhineland, and the cause of it is said to be found in the convivial nature of the inhabitants and the seductiveness of the famous wines, which leads to a large amount of drinking and singing in close, ill-ventilated taverns. Combined with a certain amount of laryngeal congestion, it constitutes one form of the so-called "clergyman's sore throat"—a form of sore throat which demands a strict dietetic regimen for its relief. It is very common in gouty subjects.

Pallor of the fauces and pharynx is present in anæmia and leucocythæmia. Occasionally the pallor of this part is out of proportion to that of the rest of the body. There may be extreme pallor combined with a great amount of chronic enlargement of the tonsils.

Ulceration of the pharynx and fauces may take the form of aphthous ulcers, like those which occur on the tongue and mouth.

The most common causes, however, of ulceration of this region is syphilis. Syphilis may attack the pharynx in its early or late stages, and the manifestations may be either "secondary" or "tertiary." The pharyngeal condition which

occurs during the secondary stage, *i.e.* during the time of general glandular enlargement, and the symmetrical rashes, is in its typical form, pathognomonic of syphilis, and once recognised can scarcely ever be mistaken. Looking at the throat we see the tonsils slightly enlarged, and upon the surface of them deep ulcerations. It is characteristic of this form of disease *that the ulceration is not limited to the tonsil, but involves the anterior pillars of the fauces, the margin of the soft palate, and the uvula.* We see this region dotted with mucous patches and superficial ulceration, giving to it a gray mottled appearance, which is so characteristic as to be absolutely diagnostic of syphilis. Should the ulceration be limited to the tonsil, we may be in doubt as to its cause, but should it spread from the tonsil and involve the parts which I have enumerated, and in the manner I have stated, we may be certain of our diagnosis and of the satisfactory result of treatment. Occasionally the mucous patches and ulcerations are very limited in extent, and may be so situated (just at the junction of the anterior pillar with the tongue, for example) as to elude detection unless they are looked for with very great care.

Occasionally the ulceration of this part, from syphilis, is much more severe; the uvula may slough away and the whole margin of the palate may be so implicated as to produce an adhesion between it and the posterior pharyngeal wall, thus shutting off the nasal from the oral cavity. This kind of extensive ulceration has been met with in children, as the result, *probably*, of congenital syphilis. In appearance the throat does not differ from that which is due to acquired syphilis. I have seen one or two of these cases myself. There was lately in the hospital a boy whose throat had all the appearances of extreme ulceration which I have just described, together with adhesion of the palate to the pharyngeal wall. The appearances were syphilitic, but mercury and iodides made him worse. The boy was a wretched strumous foundling out of a suburban workhouse, and good diet, the administration of sulphides, and a visit to Eastbourne completely cured him, and he was able to leave the workhouse and take a situation. Of course the adhesions remained. This case was possibly one of scrofulous ulceration, and a similar case is mentioned by Wilks in his work on pathology.

In the *tertiary* stage of syphilis the pharynx, fauces, and hard palate are liable to the growth of gummata, which first form hard congestive patches, and then soften and slough, leaving deep clean-cut wounds, or clean-cut, "punched-out"

perforations of the soft and hard palate. Whether we detect the early hard swelling or the subsequent foul circular slough, or the final perforation, we may be sure that we have to deal with a case of tertiary syphilis. Sometimes in tertiary syphilis we are confronted, not with distinct gummata, but with a uniform infiltration of the parts, which causes them to be extensively thickened and sensibly indurated. This infiltration is often followed by ulceration and sloughing, which leads to great loss of substance, to adhesion of neighbouring parts, to contraction by cicatrisation, and great deformity. The throat which has been the seat of extensive tertiary syphilitic disease looks hard and glazy; the scars of cicatrices are seen scattered more or less all over it; there may be perforations either of the hard or soft palates; there may be great loss of substance (very commonly of the uvula and tonsils); the posterior pillars of the fauces, or the soft palate may be wholly or in part adherent to the posterior wall of the pharynx; and the throat may be generally so contracted and distorted, that the patient can neither speak, swallow, nor breathe with comfort.

There is a form of chronic inflammatory disease of the pharynx to which I would direct especial attention. In scrofulous and syphilitic subjects the nasal cavity and the pharynx are liable to an inflammatory swelling of the mucous membrane, accompanied by hyperæmia, a catarrh of sticky adherent mucus, and occasionally superficial sloughing of the mucous membranes. Either as a cause or a consequence of this chronic inflammatory state, we may have caries of the bones of the nasal cavity. On looking into the throat of a patient with this trouble, which is often called *ozæna* from the stinking of the rotting mucus or sloughing membrane, we may see a granular hyperæmic appearance of the posterior wall of the pharynx; and on asking the patient to breathe deeply, and thus elevate the soft palate, we may see very often the tail end, as it were, of a lump of glairy or black tenacious-looking mucus descending from the pharynx. In cases of old standing, in which the posterior wall of the pharynx has been the seat of chronic inflammation, the soft mucous, granular, glandular appearance of the pharynx gives way to a smooth, glazy, cicatricial dry-looking surface, which is very characteristic. This condition has been called pharyngitis sicca. Whenever we see sloughs coming from behind the soft palate, or this glazy appearance of the pharynx, we should always search for the causes and symptoms of ozæna, and subject the naso-pharyngeal cavities to

a thorough examination, of which I shall have more to say hereafter.

Both tubercular and typhoid ulcerations are said to occur in the pharynx. They are excessively rare, and I need only remind you of them by mentioning the fact.

With regard to the *adventitious appearances* of these parts, the most common are the white patches which are due to the growth of oidium albicans upon aphthous ulcers. These may appear all over the fauces and pharynx, and their nature is easily decided by the microscope. In diphtheria we are confronted with a whitish or yellowish membranous exudation, which may spread all over the fauces, pharynx, and tonsils. The consistence of the membrane varies from that of cream to that of wet wash leather.

True diphtheria has to be distinguished from the patches of oidium just mentioned, and from the patches of white secretion which are often seen sticking about the orifices of the tonsillar crypts. The dotted patchy appearance and the discovery of the oidium will serve to distinguish the first, and the latter appearance is limited to the tonsils, and the patches are seldom large. The diphtheritic membrane generally grows from one point, and soon presents a considerable area. But this is not always the case, and the membrane may begin to grow from several points at once. When the false membrane of diphtheria is removed the mucous surface beneath is left raw and bleeding.

It is not necessary to do more than mention the various tumours—adenomata, papillomata, carcinomata—which may grow from the hard and soft palate. Occasionally a papilloma has been seen growing from the end of the uvula. Polypi growing from the nasal or upper pharyngeal cavities may be seen hanging behind the soft palate.

The condition known as post-pharyngeal abscess is due to a collection of pus forming in the bed of areolar tissue, which unites the pharyngeal mucous membrane to the bodies of the cervical vertebræ, and it is usually due to caries of the bodies of these vertebræ. The abscess forms a smooth, globular projection, in which fluctuation may be detected, and which often endangers life by its interference with respiration and deglutition.

A few words remain to be said about the neuroses of the mouth and fauces. Of paralysis and motor troubles affecting the tongue I have already spoken. The common sensibility of the mouth and tongue is derived from the fifth nerve, and in cases of paralysis of that nerve common sensibility is lost, so that the patient is unconscious of the

presence of food or irritating particles upon the side of the paralysis. In cases of paralysis of the third division of the fifth there is very commonly observed a swelling and congestion of the mucous membrane of the mouth, and occasionally ulceration. Whether this ulceration is produced directly by the nerve lesions, or indirectly by the irritation of foreign particles, I will not stop to consider, although I may say that my own opinion is strongly in favour of the former theory. When common sensation of the tongue and mouth is lost, it may seem as though the sense of taste is lost also, because the patient is unable to appreciate irritants, such as strong acids and alkalies (like ammonia), which in reality appeal rather to common than to special sensibility.

The special sense of taste is conferred upon the anterior two-thirds of the tongue by the fibres of the chorda tympani, and on the posterior third and the pillars of the fauces by the glosso-pharyngeal. Taste is most commonly impaired in cases where a disease of the temporal bone has injured the facial nerve at a point above the junction with it of the chorda tympani. In testing the power of taste much care is needed. Erb* gives the following directions:—"It is expedient that the patient should put the tongue out, with the mouth widely opened, and that he should keep the eyes closed while the sapid substance is being applied to the particular part the sensibility of which is to be investigated, with a glass rod, or a small brush, and in very small quantity. As soon as a taste is perceived, a sign is made, and then only is the tongue to be withdrawn and the conclusion arrived at stated." It is very difficult to prevent the sapid substance from diffusing itself over the tongue, and thus touching a portion in which the gustatory faculty is perfect. On this account I think it is better not to allow the patient to speak while the trial is going on, but to make him keep his tongue exposed, and express his sensations in writing, using the initial letters of sweet, bitter, acid, as symbols. The tongue must be carefully cleaned between each trial. It must be remembered that bitter tastes are best appreciated at the root, and sweet tastes at the tip of the tongue. Acids are appreciated by the edges principally. Solutions of quinine or quassia, syrups, and vinegar are employed in these investigations. Subjective phenomena of taste are occasionally complained of, such as the sour, bitter, and putrid tastes in dyspepsia.

In paralysis of the facial, from injury or disease in the

* 'Ziemssen's Encyclopædia,' vol. xi.

temporal bone, there is a want of power in the levator palati and the azygos uvulæ on the paralysed side.

Paralysis of the palate is liable to occur from other causes. In these cases the palate is seen to hang loose and flaccid in the mouth, and to remain stationary during deep inspiration, swallowing, and speaking, and not to move when tickled or otherwise irritated. In cases of this paralysis food is very liable to return through the nose, because the naso-pharynx cannot be shut off during swallowing, and in speaking all sounds have a nasal twang.

Paralysis of the palate is particularly liable to occur after diphtheria, and it is generally the precursor of the other post-diphtherial paralytic phenomena. This paralysis may occur after other febrile conditions, and may form a part of labio-glosso-laryngeal paralysis. We have had a girl attending in the out-patient room with absolute paralysis of the palate, which was followed by well-marked symptoms of locomotor ataxy.

Lecture IV.—The Larynx and the Use of the Laryngoscope.

Gentlemen,—We have now discussed all those objective phenomena of the mouth and fauces which are appreciable to our unaided senses. It is always my custom to advise you to trust as much as possible to your unaided senses and always to make a point of learning as much as possible about a patient without having recourse to those various "scopes" which students are very prone to regard not merely as valuable accessory aids to our senses, but as absolutely indispensable for the acquisition of any knowledge at all.

Yon will find that it is quite possible to learn a great deal about the larynx without looking at it at all, and that alterations in voice, respiration, and swallowing, combined with palpation, may teach us a great deal. For convenience sake, however, we will depart from our rule of considering all simple means of investigation before the instrumental means, and proceed at once to speak of the laryngoscope.

The laryngoscope, an instrument for obtaining a view of the larynx, is a modern invention. Mirrors for illuminating the throat had been used in an unmethodical manner for

many years, when Signor Garcia, a singing master, presented a paper to the Royal Society in 1854, on the "Physiology of the Vocal Cords," based upon an examination of his own vocal apparatus by means of a laryngoscope. In 1857, Türck of Vienna, and Czermak of Pesth—especially the latter—succeeded in bringing the laryngoscope to the general notice of the profession.

I shall not detain you many minutes with directions for using the instruments; that is a practical matter, and a very little practice will make you a proficient in the art. To use the laryngoscope aright is a far easier thing to learn than to use the stethoscope or opthalmoscope. The laryngoscope consists of a mirror worn by the observer, by means of which a strong light is reflected to the back of the pharynx, and there again reflected downwards to the larynx by means of a second and a smaller mirror, upon which an image of the larynx becomes visible. A few words may be added in amplification of this.

1. As to the source of light. The best of all is the sun; and whenever you can get the chance of doing so, place your patient in a chair, with his back to a window, and reflect the rays of the sun directly into his throat. Failing the sun an Argand gas-burner, or, better still, a mineral-oil lamp, with either a flat or a circular flame (I prefer the latter), form excellent sources of light for this purpose; and as the one or the other exists in every house, you should accustom yourselves to use them. An ordinary gas-flame, or even a candle, will answer the purpose. No lenses or condensers are necessary, and you may have observed that I never use either the one or the other. I strongly advise you not to get in the habit of using cumbrous and expensive apparatus, which you may not be able to obtain when most needed, and which really hinder that training of the senses, after which we should all strive. Some persons prefer a direct illumination of the pharynx, but you will find it generally most convenient to place your source of light a little behind and to one side of the patient, and then to reflect the light into the throat, exactly as a schoolboy uses a bit of looking-glass for the purpose of throwing a light into some one's face.

2. The reflector may be mounted on an india-rubber band or a spectacle frame, it must be perforated in the centre, and be movable in all directions upon a ball-and-socket joint. The reflector is best worn over one eye, the operator using the central perforation for the purposes of vision.

3. The laryngeal mirrors vary in size from a sixpence to a florin, and are mounted on slender handles. The handle and

the mirror should form an angle of about 120°, and the handle should be sufficiently pliable to admit of this angle being varied at the pleasure of the observer.

A few words as to the method of using the instrument. Let the patient sit facing you, with the knees together, on an ordinary chair, and with the illuminating lamp upon a table, or otherwise suitably supported, just behind and to one side of him, the flame being about on a level with his ear. Sit immediately opposite the patient, and ask him to sit quite upright, with the head a little thrown back. Tell him to open the mouth, and then adjust the reflector, so that the light is thrown upon the pharyngeal wall, the uvula, and the arches of the palate. Ask him to protrude the tongue fully, and then *gently* and neatly wrapping the end of it in a smooth fold of a soft small napkin, take the tip *gently* between the thumb and forefinger of the left hand, and retain the tongue in its protruded position with the least possible amount of pressure, and absolutely without anything like forcible traction. If the second finger of the left hand be passed beneath the patient's chin, any unintentional wandering of the hand is prevented.

Be sure and use all gentleness in these manipulations. Anything like force leads to struggling on the part of the patient's tongue and to spasms of the pharynx, and is fatal to your object. Next, take a laryngeal mirror of suitable size and hold it lightly, like a pen, in the right hand. Many students hold the mirror too tightly, and with the end of the handle touching the palm of the hand. Held in this position it is impossible to alter the direction of the mirror without moving the entire hand and wrist. If it be held like a pen, the mirror can be moved freely in all directions simply by the movements of the tips of the thumb and first two fingers.

The mirror must be warmed before being introduced into the mouth to prevent the condensation of moisture upon its surface. This end may be attained also by smearing the surface of the mirror with glycerine and water, but heating is a better plan, as, being cleaner and simpler, and likely to lessen instead of increase the risk of any carriage of infecting particles from one patient to another. In passing the mirror to the back of the mouth follow the natural curves of the mouth, and pass the mirror over the dorsum of the tongue without touching it. If skilfully passed the mirror should touch nothing until the edge of the soft palate is reached, when the uvula should be gently pushed upwards upon the back of the mirror. Then if the patient be asked to take a deep breath a complete image of the larynx is obtained.

In a favorable case there is really no difficulty whatever in doing what I have described. You will find, however, many patients who are very intolerant of any manipulation of the mouth or throat, and the mere *idea* of the examination is enough to make them double up their tongues, contract the pharynx, retch, and even vomit. In such cases you must be doubly careful not to touch the tongue, and particularly to avoid irritating the posterior pharyngeal wall. It is a good plan to keep such patients occupied and to make them inspire and expire deeply and frequently during the whole period of examination, and to utter sounds, such as "Ah" or "Eh." When asked to "take a deep breath" many of the irritable patients do nothing of the kind, but merely contract the pharynx and hold the breath. It is often necessary to teach them what is wanted to be done. The irritability of the throat may be lessened by sucking ice. The bromide of potassium administered for a few days in doses of ten or fifteen grains will diminish the irritability in a very remarkable manner. Great irritability of the throat is natural to some people, but in the great majority it is indicative of gastric hyperæmia, and is especially observable in people who indulge in alcoholic stimulants. In such cases the combination of Epsom salts with the bromide is very useful.

But now let us suppose that the laryngeal mirror is successfully placed *in sitû*. What do you see reflected in the mirror?

At the top of the mirror is seen the epiglottis; at the bottom are seen the two prominences caused by the tips of the arytenoid cartilages, or rather by the cartilages of Santorini which surmount them. Between the edges of the epiglottis and the cartilages of Santorini are two folds of mucous membrane called the aryteno-epiglottic folds, and during deep inspiration a fold of mucous membrane is observed stretching between the arytenoid cartilages and forming the posterior wall of the larynx. The parts I have named form a frame, as it were, and in it are seen the pearly white vocal cords, stretching like an inverted ∧ from the epiglottis (apparently), where is the apex of the triangle, to the arytenoid cartilages, where is the base. Between the vocal cords and below them may be seen a transverse striation caused by the rings on the anterior wall of the trachea, and in very favorable cases a glimpse may be caught of the division of the trachea into right and left bronchus. Between the aryteno-epiglottic fold and the vocal cord on either side is seen the red mucous surface of the ventricular band or false vocal cord.

These appearances differ at different times. During deep inspiration the arytenoid cartilages are separated by a third of an inch or more, the inter-arytenoid membrane is well seen, and the triangle formed by the separated vocal cords is very evident. During phonation, however, when the patient is made to say "Ah" the arytenoid cartilages and the vocal cords are brought close together, and the rima glottidis is almost completely shut.

It may be well to mention that healthy larynges differ considerably in appearance, and the shape of the epiglottis is as varied as is the shape of the ear or nose in different individuals. It may be well to mention also that in a certain very small percentage of cases the epiglottis is so pendulous as completely to obscure the larynx.

I must remind you that the image which you see in the laryngeal mirror is a reflected one; and just as in an ordinary looking-glass the right hand of the spectator becomes the apparent left of the image, so the parts of the image of the larynx which are to the observer's right hand are in reality those which are on the left side of the patient's larynx. Remember also that the upper part of the image, the epiglottis and the apex of the triangle formed by the vocal cords —the parts which seem furthest off—are those which form the anterior wall of the larynx, while the bottom part of the image is formed by the posterior laryngeal wall. It is very important to remember this when you come to make applications to the larynx.

I may mention that the laryngeal mirror is useful as enabling one to get a good view, not only of the larynx, but of the base of the tongue—the papillæ circumvallatæ and the parts beyond, and the glosso-epiglottic fossa. It enables us also better to explore the pharynx and the arches of the teeth.

The diseased appearances of the larynx are in kind similar to those which are seen in the pharynx.

Hyperæmia is very easily produced by any irritant. In the rapidity with which hyperæmia may be brought about the larynx resembles the conjunctiva, and a particle of food or dust will cause a general distension of the vessels, and a swelling of the mucous membrane almost instantaneously. If the irritant be a powerful one, such as boiling water, the hyperæmia may cause œdema, and the swelling may be so great as to produce suffocation and death in a very short time.

Hyperæmia is not only brought about by direct irritation of solid particles, but by over-use of the larynx in talking or

by incessant coughing, exposure to cold, and atmospheres laden with solid particles either in workshops or in London fogs, by the too frequent use of strong drinks, and by gastric irritation, however induced. It is seen also in certain constitutional states, such as syphilis, gout, and consumption. The hyperæmia may affect any part. When it affects the vocal cords they lose their pearly-white shining appearance, and look very often as if a very thin layer of treacle were smeared over them, or possibly tiny vessels may be actually visible upon their white surface.

Anæmia of the larynx is present as a part of general anæmia. Occasionally the anæmia of the larynx is greater than that of other parts, and I have seen cases where the pallor of the larynx has been very great, while no very obvious signs of anæmia existed elsewhere. Such anæmia of the larynx is generally accompanied by some impairment of function, and is said to be a precursor of laryngeal phthisis. I can call to mind four cases, at least, in which the anæmia of the larynx was a very marked feature. One was in a girl, who had signs of locomotor ataxia combined with paralysis of the palate; another was in a medical student with a sluggish follicular ulceration of the larynx, and in whose family there was a well-marked tendency to phthisis; a third was in a boy who had been seized with aphonia during convalescence from measles, and a fourth was in another boy, who was recovering from an attack of whooping-cough.

In *inflammation in the larynx* there are the usual objective signs of inflammation—viz. redness and swelling. In acute laryngitis the swelling may be enormous. The epiglottis may be two or three times its natural size, and the arytenoepiglottic folds may be distended to such an extent as to obscure the false cords and the glottic chink. The parts may be dry on the surface, and of a fiery redness, or, as is more often the case, they are bathed in muco-pus. In such a condition the patient is in imminent danger of his life, and presents all the symptoms of one who is in fear of immediate suffocation. Between these extreme appearances of inflammation and a mere thickening and slight discoloration of the cords there is, of course, every degree of redness and of swelling. Acute laryngitis is liable to occur from exposure to cold, or from direct injury to the part. In children it is known as catarrhal croup, and in adults it is liable to come on after the acute specifics, or during an attack of erysipelas. If there be any disease of the kidneys, the œdema in these cases is apt to be alarmingly great.

As a result of acute laryngitis abscesses may form in the

submucous tissue, and then, when the general redness and swelling is subsiding, a smooth globular elastic swelling is left at one spot. A great cause of laryngeal abscess is necrosis of the laryngeal cartilages, which is liable to occur as a result of laryngitis, and especially after typhus and other exhausting fevers, and in tubercular and syphilitic disease. The arytenoid cartilages are most often affected, and then we find a globular elastic swelling at the posterior part of one or other of the aryteno-epiglottic folds. Next to the arytenoids the cricoid is most prone to suffer, and the resulting abscess may either form a projection into the larynx beneath the vocal cords, or it may project backwards into the œsophagus, and in doing so interfere with swallowing and with the function of the muscles which cover the posterior surface of the cricoid. The thyroid is occasionally, but not often, the seat of necrosis and resulting abscess.

Chronic laryngitis presents symptoms the same in kind as are seen in acute laryngitis, but usually more localised; and we find that the epiglottis, the aryteno-epiglottic folds, the false cords, or the true cords themselves, are mainly affected.

We may find that the only sign of laryngitis is a very slight thickening and redness of the vocal cords just at the point where the elastic cord joins the processus vocalis of the arytenoid cartilage, and this is a point to which the practical man will specially direct his attention. During phonation, when the arytenoid cartilages rotate inwards, the tips of the processus vocales impinge against each other, and this constantly-recurring shock is enough to determine the inflammatory action to this spot.

There are three great constitutional causes which determine the chronicity of a laryngitis or laryngeal catarrh. These are syphilis, phthisis, and alcoholism. Two of these causes are often combined, and occasionally all three. Now, it is important to consider whether, *from the appearance of the larynx alone,* one call tell which of these causes is present. There may be simple diffused redness of the larynx, and then it is quite impossible to say to what cause it is due, and your opinion will be formed entirely by the concomitant symptoms.

Syphilis will cause swelling of the mucous membrane, accompanied by mucous patches and superficial ulceration, exactly similar to the appearances which I have described as occurring in the pharynx, and seeing these the practised eye will recognise their cause at once. Gummata may grow in the mucous membrane here, and that uniform syphilitic infiltration which we have noticed as occurring in the tongue

and pharynx may also take place in the larynx, causing great swelling of the epiglottis, false cords, and the aryteno-epiglottic folds, and occasionally swelling also of the parts beneath the true cords. As a general rule, it may be said that in the syphilitic conditions the mucous membrane is not of a very deep tint, and the parts look harder. I am in the habit of saying that, when the appearance of the swollen mucous membrane reminds me of a "white-heart" cherry, I suspect syphilis, but when I am reminded of a ripe strawberry I suspect some other cause (often phthisis) for the catarrhal condition. The infiltration of syphilis may produce complete occlusion of the glottis. Sloughing and contraction of the parts may occur, and so much distortion as to render them scarcely recognisable. The epiglottis may be completely destroyed, or may appear notched and crumpled, and unequally thickened.

With regard to "laryngeal phthisis," as it has been called, Von Ziemssen says, "Neither the catarrh nor the ulceration of phthisical subjects presents any characteristic signs by which it could be recognised as such." This is perfectly true, and my experience enables me to endorse this assertion. It may be said, however, that in laryngeal catarrh of phthisical origin the mucous membrane looks red and soft, like an over-ripe strawberry, and often the glandules of the part, being swollen, increase the resemblance to the texture of the strawberry. There are especially two parts which are very liable to be attacked in phthisis, viz. the epiglottis and the posterior parts of the aryteno-epiglottic folds. When we see the epiglottis fiery red, puffy, and granular, and bathed in muco-pus; and when we see the so-called pyriform swelling over the arytenoid cartilages, with the big ends of the pear-shaped masses touching behind and the thin ends stretching towards the sides of the epiglottis; when these pear-shaped masses look red and granular, and when we see muco-pus welling up between them, we have very strong grounds for suspecting phthisis as a cause of the condition. Many of you, however, may have seen a patient whose condition was to the eye most suggestive of phthisis, but whose recovery was only brought about by active mercurialisation, and the occurrence of such cases should make one careful not to jump to conclusions. I have also seen cases of laryngeal phthisis in which there has been literally a consumption of the parts by ulceration without any swelling or much redness.

Alcoholic laryngitis has nothing very characteristic about it, although I fancy that the epiglottis is the part most generally attacked.

In all cases of chronic laryngeal catarrh your conclusions as to the cause must be largely drawn from the concomitant symptoms. The laryngeal appearances may or may not be highly suggestive; but an alcoholic smell in the breath, combined with a bloated countenance; or the characteristic anæmic condition seen in syphilis combined with pharyngeal syphilis; or emaciation, rapid breathing, a hectic flush, and a flattened chest, will generally serve to confirm or correct the opinion which an inspection of the larynx has led you to take.

Ulceration of the larynx is commonly present in two conditions, viz. syphilis and phthisis. In both it may be very extensive, and may occur at any part—on the epiglottis, the false or true cords, the aryteno-epiglottic folds, or the inter-arytenoid space. The ulceration is very similar in both conditions. In phthisis the seat of the ulceration is very apt to be the tip of the processus vocalis, or the part of the laryngeal wall between the arytenoid cartilages, or the surface of the swollen and reddened mucous membrane covering the arytenoid cartilages. In laryngeal phthisis the swollen and ulcerated condition of the posterior part of the aryteno-epiglottic folds often occasions very great difficulty in swallowing.

Adventitious growths.—In croup and diphtheria a false membrane grows upon the laryngeal mucous membrane, similar to that which is seen on the pharyngeal. "Thrush" may affect this part, and we may find patches of oidium albicans. Occasionally cancer, usually of the epithelial type, attacks the larynx, and when it does so it is almost always by spreading from the œsophagus. The appearances are the same as those caused by epithelioma elsewhere—thickening and infiltration of the part, with ulceration and a foul unhealthy surface. Here there is no attempt, as in syphilis, at cicatrisation and repair, and the act of destruction is continuous. In the late stages diagnosis is easy, but in the early stages it is difficult. The concomitant symptoms and the microscopic appearance of expectorated matter are great aids in forming a diagnosis.

New growths of a simple character in the larynx, forming tumours upon the laryngeal mucous membrane, are not uncommon. In all cases of prolonged laryngeal catarrh the mucous membrane is apt to become thickened and nodular, and may project into the laryngeal cavity. Such mucous projections, although they may prove tempting objects of attack to aspirants for fame, are in no sense new growths, and do not often call for any surgical interference. We have recently seen in the throat department a good example

of a simple laryngeal tumour, viz. a globular round-celled sarcoma, as big as a hazel-nut, growing by a broad base from the anterior part of the left ventricular band or false cord. The most common among these formations are papillomata, or warts and fibromata or polypi. These tumours seem to have their origin in hyperæmia of the mucous membrane, however brought about. Occasionally there is a syphilitic history. They may grow from any part of the laryngeal mucous membrane, true or false cords, the arytenoepiglottic folds, or the inter-arytenoid space, and the laryngoscope enables us to see their exact position and their naked-eye appearance, whether warty or polypoid. The diagnosis of these conditions is impossible without the aid of the laryngoscope.

Lecture V.—Laryngeal Paralyses: Alterations in Phonation and Articulation.

Gentlemen,—The larynx is the seat of many forms of paralysis, and we often see an impairment in the movements of the vocal cords owing to failure of one or more of the muscles which move them.

It may be well to recall your minds for a few moments to the muscles of the larynx. One may begin by saying that the mucous membrane of the larynx, except at the margins of the true vocal cords, everywhere immediately covers muscular fibres, which fibres have been grouped and named by anatomists. The best marked of these groups are—

1. The *posterior crico-arytenoid* muscles, which arise from the impressions on the posterior surface of the cricoid cartilages, and are inserted into the outer angle of the base of the arytenoid cartilages. These muscles rotate the arytenoid cartilages *outwards,* and thus cause the processus vocales to diverge. They cause the vocal cords to separate widely, or, in other words, they *abduct* them. These are the only muscles which separate the cords.

2. The *crico-thyroid,* a triangular muscle passing obliquely upwards and outwards from the front of the cricoid cartilage to the lower border of the thyroid cartilage, causes the thyroid to move downwards and forwards over the cricoid, and thus produces tension of the vocal cords.

3. The *arytenoid* muscle passes from one arytenoid cartilage to another, and causes them to approximate, and hence helps to close the glottis.

4. The *lateral crico-arytenoids* pass from the upper margin

of the cricoid to the outer angle of the arytenoids, and cause the arytenoid cartilages to rotate inwards. These muscles are *adductors,* antagonists of the posterior crico-arytenoids, and help to close the glottis.

5. The *thyro-arytenoid* muscles run parallel to the vocal cords from the thyroid to the arytenoid cartilages, and tend to relax the vocal cords.

6. The muscular fibres covered by the aryteno-epiglottic folds of mucous membrane help to close the glottis and depress the epiglottis, and the thyro-epiglottic muscle also tends to depress the epiglottis.

These muscles are all supplied by branches of the vagus, the crico-thyroid by the superior laryngeal, and all the others by the recurrent laryngeal. Now, since the great cause of paralysis is a lesion involving the origin or trunk of a nerve supplying a muscle, it is necessary in considering the paralyses of the larynx to bear in mind the origin and course of the vagus and its laryngeal branches.

The vagi having their deep origins in a grey nucleus at the lower part of the floor of the fourth ventricle, start from the lateral tract of the medulla, and, being joined by fibres from the glosso-pharyngeal and spinal accessory, pass through the jugular foramen, and down the neck within the sheath of the carotid vessels lying between the internal jugular vein and the internal and common carotid arteries as far as the root of the neck. The right nerve crosses the subclavian artery between it and the subclavian vein, while the left, lying between the left carotid and subclavian arteries and behind the left innominate vein, crosses in front of the arch of the aorta. The right recurrent laryngeal nerve arises in front of the subclavian artery, winds from before back around the subclavian, and ascends obliquely to the side of the trachea behind the common carotid and inferior thyroid arteries. The left recurrent laryngeal nerve arises in front of the arch of the aorta, and winds from before back around the aorta, close to the junction of the transverse and descending portions of the arch, and just beyond the junction with it of the obliterated ductus arteriosus, and then ascends to the side of the trachea. Both nerves ascend in the groove between the trachea and œsophagus, and enter the larynx behind the articulation of the inferior cornu of the thyroid cartilage with the cricoid. It is a matter of great clinical importance to bear in mind how the course of the vagi in the neighbourhood of the origin of the recurrent laryngeal nerve differs on the two sides. The left recurrent has its origin, so to say, much

deeper in the thoracic cavity than the right, and encircles the aorta just beyond the main branches of the arch. This part of the aorta lying deeply is not, as it were, very accessible to direct clinical observation; but by the fact that disease of this part often causes injury to the left recurrent laryngeal nerve we are often enabled from the impaired functions of this nerve to infer disease in the neighbourhood of the junction of the transverse and descending parts of the arch of the aorta. Once more reminding you that disease, injury, or pressure upon the recurrent branches of the vagus, or of the trunk of the nerve superior to their origins, will cause paralysis of the laryngeal muscles, we will consider the appearances produced by these paralyses.

In a normal larynx the vocal cords are of a pearly whiteness, and appear of an equal width on either side (about one eighth of an inch). The chink between them runs directly in the middle line. During deep inspiration the cords separate widely, the tips of the arytenoid cartilages recede from each other, and the aperture of the glottis assumes a somewhat lozenge-shape, like an ace of diamonds truncated at its lower end.

During phonation (as when we ask the patient to say "Ah") the cords approach each other, and almost meet in the middle line, and the tips of the arytenoid cartilages approach each other so as to be almost in contact. If we ask a patient alternately to take a deep breath and say "Ah," we see how vigorous the movement of the vocal cords is in health. If the patient can sing, and we ask him to ascend the scale, we see, as the note gets higher, the chink between the cords get narrower, but in a degree which is scarcely perceptible. During the utterance of very high falsetto notes the processus vocales of the cords are seen to touch each other, and the chink between the anterior part of the cords gets wider.

I will here remind you that failure of movement of the cords may be produced by causes other than nerve injury, such as—(1) Mere muscular weakness, as in anæmic conditions and emotional states; (2) functional nerve troubles, as in hysteria and some forms of stammering; (3) direct injury to the muscles by inflammation above or beneath them, and consequent impairment of their nutrition; (4) disease of the crico-arytenoid articulations; (5) mechanical impediments to free movements, such as swelling of the mucous membrane, or the presence of polypi or warts, or, as I have actually seen, one cord may be glued in one position by the tenacious muco-pus covering the mucous membrane.

The cords on either side may be unequally exposed. This may be due to a swelling of one false cord preventing a full view of the true cord beneath, or it may be caused by a loss of the power to adduct the cord which is least exposed, or to abduct the cord which is most exposed. When the cords are unequally exposed, and the glottic chink runs obliquely instead of directly in the middle line, we may be sure there is failure of movement on one side or the other. On asking the patient to say "Ah," we may notice that there is a *failure more or less complete to approximate the cords*. They may remain motionless, with the glottic aperture open nearly to the full, or the cords may make an attempt to approach in a tremulous, hesitating manner. This is due to muscular weakness in the adductor muscles, and is almost always brought about by anæmia. It is very common in hysterical women, but also occurs in males. The most marked case I have seen was in a boy after one of the acute specifics, whose larynx showed an extreme degree of anæmia. Cure the anæmia and the trouble gets well.

One vocal cord may be seen to move vigorously while the other remains stationary. This is the most common and the most important of the laryngeal palsies, because it indicates, in the majority of cases, disease or injury of the recurrent laryngeal nerve on the side of the immovable cord. It often happens that phonation is normal in these cases, because the healthy cord when adducted overpasses the middle line, and comes into nearly perfect contact with its fellow. This palsy is far commoner on the left side than the right, and is then generally due to an aneurism of the transverse part of the arch of the aorta. So often is this the case that it should be a rule of practice, whenever the palsy is seen, to make diligent search for aortic aneurism. In every case of obscure chest symptoms, with deep-seated, shooting pains, &c., the larynx should always be examined, to ascertain if there be any failure of action of one cord. This should be a matter of routine never to be departed from, for the inaction of the cord may precede every other symptom, and may occur without there being either hoarseness or cough to direct attention to the larynx. If I were asked to name the chief service which the laryngoscope had rendered to medicine, I should unhesitatingly reply that it was the facility it had given us for the diagnosis of the early stages of aortic aneurism. I need not say that pressure upon the vagus or its recurrent branch by tumours of any kind or by disease of the nerve will cause the paralysis. Aneurism, however, remains *the* cause *par excellence*.

We occasionally see a *paralysis of the abductors* of the vocal cords due to a failure of contraction in the crico-arytenoidei postici muscles. With the laryngoscope we see that when the patient takes a deep breath (or rather attempts to do so, for very full inspirations are not possible in this condition) the vocal cords do not separate as they do in health, although when he expires forcibly the glottic clink may be somewhat widened by the forcible separation of the cords by the outgoing blast. During attempts at phonation the approximation of the cords is perfect, and the voice is normal. If this form of paralysis persist, the adductors not being antagonised, the cords gradually approach each other, so that the patient's life is endangered owing to the difficulty in drawing air through the closed glottis. It is caused by a failure of one group of muscles, and is more often due to local trouble, such as necrosis of the cricoid cartilage, and consequent involvement of the neighbouring muscles in the inflammatory process, than to nerve lesions. It sometimes appears to be "functional," and has also been seen complicating chronic nervous diseases, such as locomotor ataxia.

Besides these common and well-established forms of larngeal paralysis, there are others which are less common. *A paralysis of the crico-thyroid muscle,* the tensor of the cords, has been described; and it is alleged that the border of the cords appears wavy and slack. I have seen a wavy condition of the cords, but have regarded it as being caused by chronic catarrh and impairment of the elasticity of the cord. The crico-thyroid being supplied by the superior laryngeal nerve, the sensory nerve of the larynx, one would look for evidence of impairment of sensation in these cases.

A paralysis of the arytenoideus and a consequent failure of the arytenoid cartilages to approximate during phonation have been described.

Before leaving the subject of laryngeal paralysis, I will enumerate some of the chief causes of the *nerve lesions* to which they are due. These are:—

1. Central lesions, such as: (*a*) Bulbar paralysis, (*b*) locomotor ataxia, (*c*) Cruveilhier's atrophy (?). It is not often that the laryngeal symptoms are very marked in these conditions, and the laryngoscope is generally required to make out the want of activity in the laryngeal muscles. 2. In some rare cases of lead palsy there have been laryngeal paralyses. 3. "Diphtherial" paralysis. 4. Pressure on the trunk of the vagus in the neck by tumours of any kind. 5. Pressure upon or stretching of the recurrent laryngeal nerves (*a*) aneurisms; (*b*) mediastinal tumours; (*c*) pleuritic

thickenings about the apices of the lungs; (*d*) growths involving the œsophagus and implicating the recurrent laryngeal; (*e*) any tumours of the neck.

With regard to spasms of the larynx, these are more a matter of inference than direct observation; and I shall reserve the discussion of them till a later period.

We have now finished the *inspection* of the mouth and larynx, and we may proceed to consider the *auscultation* of these parts. In auscultation the stethoscope is of little or no use, and the facts to which I wish to drawn your attention are the various sounds emitted by the vocal apparatus as they strike our unaided ear.

First, as to derangements of speech. In speech there are two factors—viz. *phonation* and *articulation*: the production of the sound and the moulding of the sound into words. Either or both of these functions may be deranged.

Phonation is the work of the larynx. It is caused by the vibration of the vocal "reeds" (misnamed "cords") set in motion by a blast of air driven past them, just as the "reed" or lamella of a concertina is set vibrating by the bellows. Now for the production of a normal tone with the larynx it is necessary: (1) that the cords should be of their normal texture and thickness so as to vibrate easily; (2) that they should be brought almost into complete contact with each other, so that the merest chink only exists between them; (3) that the normal tension of the cords should be maintained; (4) that the blast of air driven between them should be sufficient to cause a full vibration. Now, if any of these four factors of phonation be at fault, we get a deficiency or an alteration of the normal tone of the voice, and the patient is either *aphonic* or *hoarse*.

In *aphonia* the voice may be reduced to a scarcely audible whisper, and it is caused either by a failure of the vocal cords to approximate, as in hysterical or anæmic aphonia, or by a failure of the proper blast of air, as in conditions of great exhaustion. In hysterical aphonia you will observe that the patient makes no great effort to emit a sound. The lips move, but no sound issues from them. The absence of effort on the part of a patient otherwise in tolerable health is almost sufficient for the diagnosis of the cause of aphonia. Aphonia may be produced by emotional causes, and the phrase "struck dumb with emotion" is common enough in newspapers and works of fiction. Aphonia—*i. e.* absence of phonation without alteration of quality—is a rare condition. *Hoarseness*, on the other hand, is met with every day, and is the commonest of all symptoms of laryngeal disease. It may

arise from very different conditions; whenever it is present the laryngoscope should be used as a matter of routine, and it may be said that the chief use of the laryngoscope is to determine the cause of hoarseness. Hoarseness is of two kinds. It may be complete, as when the voice is reduced to one prolonged stridulous whisper; or the voice may be mainly hoarse, but bursts into tone as it were for short, transient moments. This latter variety I have called *mixed hoarseness*. When present it always indicates that the cause of the hoarseness is such as can be overcome by effort, or is movable.

Alteration in the texture of the cords is a common cause of hoarseness. Mere hyperæmia, or the slight thickening caused by catarrh, or the greater amount of thickening produced by chronic inflammation or syphilitic infiltration, prevents the proper vibration of the cords and produces hoarseness. The accumulation of tenacious mucoid secretion upon the cords and between them prevents this vibration and interferes with the blast of air, produces hoarseness, and adds to the voice other vibrations, which are not vocal. In laryngeal catarrh due to any cause this condition exists, and the hoarseness is often "mixed," as I have called it, because when the mucus is removed either by a cough or a laryngeal brush, the voice becomes normal until the secretion reaccumulates. Brushing out the larynx with various astringent solutions has been commonly practised in chronic laryngitis, whether of a simple, tuberculous, or syphilitic nature. You have often seen patients come into the throat department absolutely hoarse; you have seen me take a brush dipped in an astringent solution, and pass it down to the vocal cords, the brush returns with a lump of mucus adhering to it, and the patient probably has a violent fit of coughing and expectorates another lump. By this means an obstruction to the proper vibration of the cords is removed, and the patient, whose voice becomes normal, or almost normal, conceives a great veneration for laryngeal mirrors and curved brushes, and looks in wonderment at the lump of mucus which has been removed. Of course, in chronic cases the hoarseness returns in a few hours, and possibly the passage of the brush may have rather intensified the causes of the catarrh. There is no doubt that the laryngeal brush has been much overused, and I would here warn you that the over-use of an instrument is liable, especially in private practice, to bring the operator and his art into disrepute.

The cords may fail to approximate from various causes, the chief of which is muscular weakness and paralysis

When the cords fail to meet the patient tries to produce a sound by increasing the force of the blast of air from his lungs, and the result is hoarseness. We lately had a boy in the out-patient room who had been suffering from hoarseness, and whose condition, diagnosed elsewhere as laryngitis, had been treated by the application of counter-irritants and the administration of so-called "antiphlogistics." The laryngoscope showed great anæmia of the larynx, and proved that the cause of his hoarseness was a failure in the power of the abductors. Fresh air, good food, and iron soon removed his trouble.

When one cord alone is paralysed there is generally hoarseness at first, and there is always occasional hoarseness. It is remarkable to find how hoarseness disappears in these cases after a time. The reason, however, is plain. It is, that the healthy cord, which at first fails to come into apposition with its fellow cord, does so easily later on, because in adduction it over-passes the middle line of the larynx and touches its paralysed fellow. It may be also that the tension of the paralysed cord gradually improves, owing to the fact that the crico-thyroid muscle (supplied by the superior laryngeal nerve) is unopposed by its antagonist (supplied by the paralysed recurrent laryngeal nerve).

The proper approximation of the vocal cords may be prevented by growths, whether simple or malignant, arising from them or projecting between them. This is a condition at once made clear by employing the laryngoscope. One often sees an hypertrophied and, perhaps, ulcerated fold of mucous membrane in the inter-arytenoid space projecting between the cords and preventing their free movement. Swelling of the false cords may be so great as to prevent the approximation of the cords.

The normal tension of the cords may not be maintained, or the tension of one cord may not be maintained, and thus we get hoarseness more or less complete. I have seen one instance, and only one, in a case which I saw in consultation with Mr. Tweed, in which the cord presented a wavy edge instead of a straight one during phonation, and the voice had a certain husky, tremulous, bleating quality, which was very characteristic. Whether this want of tension in one cord was produced by want of power in the crico-thyroid or by chronic catarrh I could not determine.

If the voice be very much used, and especially if it be very much used in foul atmospheres, such as are usually found in ill-ventilated theatres, churches, concert-rooms, and drawing-rooms, the muscles which move the cords, and especially the

tensors, become tired, and the musical quality of the voice gives place to hoarseness or huskiness. This is first observable during the emission of high notes, because the proper degree of tension of the cords is not maintained. This form of singer's hoarseness is brought about by fatigue of the vocalising muscles, and it is important to remember that this fatigue is most easily produced in over-heated, foul, enervating atmospheres, and it is not surprising that fine tenor singers shrink from committing vocal suicide in the wretched rooms in which they are often expected to sing.

Failure of the proper blast of air may be caused by obstruction below the cords, as by tumours pressing on the trachea, or cicatricial contraction of the larynx and trachea. In cases of wound of the trachea, in which nearly all the expired air escapes by the wound, the consequent aphonia may be almost absolute. In conditions of great weakness the blast may be deficient in force, and in cases of extreme emphysema there is always an impairment of the quality of the voice.

Phonation may be fairly good, but the patient may be nearly or quite incapable of altering the pitch of his voice. This shows want of muscular power. It is present in cases of labio-glosso-laryngeal paralysis, where both the cords are paretic. It was present also to a marked extent in a patient whose case was recorded by Dr. Yeo and Mr. Lister. This patient's vocal cords were completely removed by the operation of thyrotomy, but, notwithstanding this fact, he managed, after his recovery, to speak fairly well in a low-pitched monotone. By the kindness of Dr. Yeo I examined the patient's larynx, and it was most interesting to observe how phonation was produced by an approximation of the aryteno-epiglottic folds. It is generally taught that the vocal cords are essential for phonation, but this case proved how completely their functions might be assumed by other parts.

I have shown sufficiently how the symptom "hoarseness" may depend upon many different pathological conditions, and I will now pass on to consider alterations in the second factor of vocalisation—viz. "articulation."

Articulation is brought about by muscular movements of the jaws, lips, cheeks, tongue, and soft palate. At the onset of this subject one may remark that articulation may be performed in many ways, and after removal of parts which we might consider essential the patient will accommodate himself to circumstances in a remarkable manner. Thus, it is well established that people can talk almost perfectly without a tongue.

In the same way unilateral paralysis of the muscles of articulation has wonderfully little effect after the lapse of a short time, and the loss of the teeth is soon compensated for. On the whole, defects of articulation are not of such clinical importance as to warrant one in spending much time upon the subject, and I will merely indicate some of the more important points, and refer those who want more information to Dr. Bristowe's excellent lectures on the subject, delivered last year at the College of Physicians.

The vowel sounds (pronounced in the French manner) *a, é, i, o, u,* depend upon the relative size of the oral opening and the oral canal. Thus "a" requires the mouth wide open, while "u" necessitates an extreme contraction of the orbicularis oris. The sound "aw," as in "hawk," necessitates a contraction of the pharynx.

Certain consonants demand a large amount of lip contraction—such as "p" and "b." Others demand vigorous movements of the tongue—such as the vibratile "r," in which the tip of the tongue is set vibrating; "t" and "d," in which the tip of the tongue is brought forcibly against the teeth, and also "ss" and "th," in which the tip is protruded between the teeth. Lastly, the hard "g" and "k" demand a considerable amount of pharyngeal contraction.

A knowledge of these facts enables us to employ test words for the detection and localisation of the seat of defect in articulating power. Thus the words "Pooh! pooh!"—or, better still, "Booby"—will serve to test the lip power, as they involve the utterance of a labial consonant and the labial vowel sound. Such a word as "thrill" will especially test the tongue power, and "hawk," or "gawk," will test the power of pharyngeal contractions.

In no condition is the power of articulation so completely lost as in bulbar or labio-glosso-laryngeal paralysis. Here lips, tongue, palate, and larynx are all affected and the patient is reduced to the utterance of monotonous inarticulate sounds. Unilateral paralyses or atrophies interfere singularly little with articulation. A sore place upon the tongue effectually stops the utterance of such words as "thrill," "tittle, tattle," &c.; but we have lately had a girl attending the out-patient room who could say all these words perfectly, in spite of very marked atrophy of the right side of the tongue. The loss of the front incisor teeth while the lateral remain puts an end to the proper utterance of "F's" and "V's," although the patient soons learns, unconsciously, to compensate for this as for every other defect. When all

the teeth are lost the rim of the gums takes their place, and articulation becomes perfect again.

The presence or absence of nasal resonance is a point worthy of attention, and one capable of affording a considerable amount of valuable information. The nasal cavity, as you are aware, is shut off from the oral cavity by the pressure of the soft palate against the pharynx during the utterance of all sounds, except those of "m," "n," and "ng."

The labial sound "b," as in "bab," the dental sound "d," as in "dad," and the palatal sound "g" (hard), as in "gag," which are all normally produced with the nasal cavity shut off, become altered to the naso-labial sound "mam," the naso-dental sound "nan," and the naso-palatal sound "ngang," when the nasal is not shut off from the oral cavity. Salter gives the following as a sample of this kind of utterance, the words "Both brothers drove in a gig" becoming "Moth mrothers nrove in a nging." Now, whenever we hear this kind of utterance, we may be sure that there is a difficulty in shutting off the nasal cavity, and we shall expect to find: (1) a cleft palate, (2) a perforation of the hard or soft palate, (3) a paralysis of the soft palate, or (4) a mechanical obstacle to the movement of the soft palate.

It is common to find the reverse of what we have been describing, and to hear sounds which should be nasal uttered without their nasal quality. In this case "m" becomes "b," "n" becomes "d," and "ng" becomes (hard) "g," and (again to borrow a sample from Salter) the sentence, "The afternoon was fine, though the morning was rainy," becomes "The afterdood was fide, though the bordig was raidy." This is the well-known pronunciation of the sufferer from a common cold, owing to the swelling of the nasal mucous membrane and the impossibility of driving air through the nasal cavity. Whenever we hear this pronunciation we may be sure that the nose is shut off from the mouth by—(1) a common cold; (2) by the adhesion of the soft palate to the pharynx; (3) by the presence of nasal polypi or other tumours; (4) by post-pharyngeal abscess. The lesson to be learnt from these facts is that whenever we have have excess or deficiency of nasal resonance we should at once search for the cause.

Lecture VI.—Stertor; Hiccough; The Examination of the Outside of the Neck and Naso-pharynx; Dysphagia.

Gentlemen,—There are certain other pseudo-vocal sounds of which a few words may be said as to their value as signs of disease.

The first of these is *stertor*. Stertor is of two kinds—palatal and laryngeal; their import being very different. *Palatal stertor*, or snoring, is caused by a vibration of the soft palate, brought about by the inrushing streams of air through the mouth and nose. It is most easily produced when air is admitted both behind and in front of the soft palate, and is often audible in those who sleep with their mouth open. The deeper the sleep the more easily is snoring produced, owing probably to the complete relaxation of the palatal muscles. It is heard at its maximum in cases of apoplexy, cerebral concussion, and poisoning with alcohol or opium. It can be produced at will, and it seems to me most easily produced when the air is inspired with extra force in order to overcome some slight obstruction at a point above the soft palate. When we wish to imitate it, we partially open the mouth, put the compressor naris into action, and inspire deeply. When the mouth and nose are both wide open stertor is not so easily produced. With the nose completely closed it is possible to produce only a very imperfect stertor. With the mouth completely closed no stertor is produced even during very deep inspiration. In children and adults who have big tonsils excessive snoring is very common, owing to the increased force of the blast of air which has to be drawn through the narrowed faucial aperture. It is worth considering how much extra work is thus imposed upon a child with big tonsils. The causes of palatal stertor are—(1) extreme relaxation of the palate; (2) increased force of inspiration.

Laryngeal stertor is not to be confounded with palatal stertor. It is a non-vibratile stridulous sound, and betokens some obstruction to the passage of air through the larynx. When this laryngeal stertor is permanent it is usually spoken of as stridor. When the larynx is irritated, as by the passage of a brush on to the vocal cords, the glottis is partially closed and the inspiration becomes stridulous. Of course, if the closure of the glottis were perfect no stridor would be produced, because the vocal cords could not be made to vibrate by the ingoing blast. Stridor is produced by forcible inspi-

ration through a partially closed glottis. It is an *inspiratory* sound, be it observed, and not an *expiratory* one. In cases of paralysis of the posterior crico-arytenoid muscles the glottis is only partially opened during inspiration; and if the inspiratory effort be at all quickened, the semi-approximated cords are made to vibrate, and stridor is produced. During expiration the cords are thrust asunder by the outcoming blast, and no stridor occurs. The presence of inspiratory stridor, combined with unimpeded expiration and good vocalising power, would be sufficient ground for the diagnosis of paralysis, or want of power in the posterior crico-arytenoid muscles.

I wish to draw your attention to the fact that, in the stridor which occurs in this condition, there is no question whatever of any spasmodic action. It is entirely a paralytic or paretic phenomenon. Now, we have the same kind of stridor—(1) in chloroform narcosis, when it is a sign of imminent danger; (2) in whooping-cough; (3) in laryngismus stridulus. In all these conditions it has been ascribed to spasm, but, as I think, without sufficient cause.

In *chloroform narcosis*, at a time when every other muscle in the body is in a state of complete relaxation, it does not seem reasonable to expect a laryngeal *spasm;* for, be it observed, this stridor only occurs when narcosis is far advanced, and all spasmodic muscular action (which is common enough in the early stages) has passed away. Again, the stridor is removed by a forcible traction on the tongue, which by reflex stimulation brings about a contraction of the posterior crico-arytenoid muscles. Lastly, there is no stridor during expiration, which there should be if the cords were *spasmodically* held in apposition. We have seen that stridor undoubtedly does occur as a purely paralytic phenomenon, and I believe that that which accompanies chloroform narcosis is paralytic also.

In *whooping-cough* the stridor is produced after a prolonged and violent expiratory effort, when the diaphragm descends with force, and air is drawn violently through the glottis. Now, as long as the proper relation exists between the size of the glottic aperture and the rate of movement of the incoming air the respiration is noiseless, but if the chink be not opened wide enough, and the incoming blast be violent, then stridor is produced. Probably, or rather certainly, both these conditions exist in whooping-cough, and the assumption of a glottic *spasm* is beyond the power of proof. In whooping-cough vomiting is a prominent feature, and one can conceive that a catarrhal condition involving the larynx and anterior

and upper part of the œsophagus might well produce vomiting, and at the same time interfere with the proper action of the posterior crico-arytenoid muscles which are close to the summit of the œsophagus.

The remarks which I have made concerning whooping-cough apply also to *laryngismus stridulus*—that sudden arrest of respiration, followed by a crowing inspiration, which is so liable to occur in sickly children, especially the rickety. We know that in rickety children the bones and cartilages are soft, and the muscles flabby and weak. We know also, from an experiment of Marshall Hall's, that if a syringe be tied into the lower end of the trachea of a dead animal, and a very rapid exhaustive movement of the piston be made, the soft parts around the larynx will fall together and prevent the ingress of air to the larynx. In the flabby-tissued rickety child it is highly probable that something of this kind occurs; the aryteno-epiglottic folds probably fall together, and the posterior crico-arytenoids very likely fail to act, and hence the difficulty of getting air into the larynx. It has been assumed that laryngismus stridulus is a true spasm because it is accompanied by the so-called carpo-pedal contractions of the fingers and toes, and spasm in one place has led physicians to infer a spasm in another. These carpo-pedal contractions are probably brought about by the condition of asphyxia induced by the closure of the glottis. Convulsive action very commonly attends carbonic-acid poisoning, especially in children.

Hiccough is a symptom of disease concerning which a few words may be said. It is caused by a sudden spasmodic descent of the diaphragm at a time when the glottis is imperfectly opened, and hence a catching noise is produced by the passage of the air over the vocal cords. The essential part of the trouble is the descent of the diaphragm, which occurs suddenly and irrespective of any respiratory need. Normally, as the diaphragm descends in inspiration, the posterior crico-arytenoid muscles simultaneously contract and the vocal cords separate; but when the diaphragm descends suddenly and irrespective of any respiratory need, the vocal cords do not separate, and hence the noise of hiccough is produced. The cause of hiccough is usually to be found in an over-distended stomach, and it is very common in children in whom convulsive movements are very easily produced. Any irritation of the phrenic nerve on the under surface of the diaphragm, such as peritonitis, will cause hiccough. Irritation of the trunk of the phrenic will produce it also, and occasionally it is of cerebral origin.

Stridor may be inspiratory, expiratory, or both. One

cause of inspiratory stridor is a failure of the glottis to dilate. It may be produced also by warty growths, which are drawn towards the glottis only in inspiration. A pure expiratory stridor may be caused by a growth below the cords being blown upwards into the glottic chink during expiration. A stridor accompanying both sounds is indicative of a narrowing of the glottis of a permanent character. It is very important to listen accurately to the time of any laryngeal noise.

There is one common symptom of throat disease concerning which it may be well to say a few words. This is *dysphagia*, or difficulty of swallowing. Dysphagia may arise from paralysis or spasm of the pharyngeal muscles, from pain or from mechanical obstruction. Each of these four causes is produced by many different conditions, some of which I will enumerate.

Paralytic dysphagia is most common as a sequela of diphtheria, owing to paralysis of the soft palate and the superior constrictor of the pharynx. It occurs also in bulbar paralysis, and when, as generally is the case, sensation as well as motion is in abeyance, food is very liable to find its way into the larynx, to the imminent risk of the patient's life. Not unfrequently also food returns through the nose.

Spasmodic dysphagia occurs in its most marked forms in hydrophobia, and occasionally in spinal meningitis. It is said to occur also in belladonna poisoning, but whether this be due to spasm or to excessive dryness of the mucous membrane is not quite clear. Any source of irritation of the throat, such as a fish-bone, or possibly a small ulcer, may cause a spasmodic contraction of the pharynx. Occasional trifling spasm is not an uncommon occurrence with patients who suffer from irritative dyspepsia. The sensation of a "ball rising in the throat"—the so-called *globus hystericus* which is so common in hysterical subjects—is probably due to a spasm of the œsophagus and pharynx. Globus, you will observe, very rarely occurs with a clean tongue, and the subjects of it not unfrequently bear evidence of subacute gastritis. It is, I believe, very often a reflex phenomenon, caused by gastric irritation, reacting upon a highly nervous, hysterical constitution, and if you want to cure it you must always attend to the state of the digestive organs. A similar spasmodic condition is brought about during emotional states, and causes the well-known sensation of "choking." There is apparently some evidence for admitting that spasmodic contraction of the œsophagus is one of the causes of "stricture" of that organ.

Dysphagia arising from pain is met with very often. It

occurs during all acute inflammatory conditions of the fauces, tonsils, and pharynx. Chronic ulcerations of these parts may also bring about a like result. When inflammation and ulceration attack the posterior part of the larynx, especially when there is great "pyriform swelling" of the posterior part of the aryteno-epiglottic folds, accompanied by ulceration, as very frequently is the case in tubercular laryngitis or laryngeal phthisis, great pain in swallowing, and consequent dysphagia, is very common. Pain in swallowing, accompanied by hoarseness, should always make one suspect laryngeal phthisis, although a certain diagnosis is not to be made without the use of the laryngoscope and a careful examination of the lungs. An enlarged and ulcerated epiglottis, no matter from what cause—tubercular, syphilitic, or cancerous—often produces great pain in swallowing.

Dysphagia from mechanical obstruction in the throat is common, and amongst the causes of this condition I may enumerate—1. Inflammatory swelling of the fauces, tonsils, or pharynx. 2. Organic stricture due to cicatricial contraction following upon ulcerations produced by corrosive substances or syphilis. 3. Neoplasms of the œsophagus or pharynx, whether malignant or benign. 4. Abscesses encroaching upon and narrowing the calibre of the œsophagus. 5. Tumours of the neck, of any kind, pressing upon the œsophagus. 6. Tumours of the mediastinum pressing upon the œsophagus, including aneurisms of the aorta. 7. Among other causes are pericarditis, accompanied by great effusion, exostoses from the vertebræ, fracture of the hyoid bone, and carcinoma of the lungs or pleura.

It now remains to say a few words of the physical signs of the outside of the throat, from the angle and ramus of the jaw to the clavicular arch.

Enlargement of the lymphatic glands is one of the most common signs of disease here. Enlargement of these glands is brought about by any irritation of the region whence the lymphatics come which run into them; and sometimes, when no local cause for their enlargement is detectable, it is ascribed to a scrofulous habit. I would warn you, however, that even in scrofulous subjects there is generally to be found some cause for the enlargement of any special set of glands.

When the glands at the back of the head, behind the ears, and in the occipital region are enlarged, it often indicates some irritation of the hairy scalp, as from eczema or pediculi, and no practical man finding enlarged glands in the regions indicated would fail to suspect pediculi. The glands here

are often hard and shotty in the early stages of syphilitic disease. The glands at the angle of the jaw may be enlarged from inflammatory or other trouble in the pharynx, tonsils, nasal cavity, tongue, ear, and mastoid cells. Enlarged glands beneath the jaw are often caused by decayed teeth. Irritative conditions of the larynx itself cause enlargement of the bronchial glands.

In mumps the parotid glands are swollen, and cause globular swellings on either side of the face. The "socia parotidis"—the little piece of the gland which projects forwards over the ramus of the jaw—is enlarged, and this fact is often of value in arriving at a diagnosis. Occasionally we see the thyroid cartilage of the larynx too prominent. This may be, and generally is, due to the large size of the cartilage. It is well to remember that the larynx may be thrust forward by growths behind it. We have had two cases lately in the Throat Department of epithelioma of the œsophagus, in which the great prominence of the larynx was a notable feature. The thyroid body is often enormously enlarged, giving rise to what is known as bronchocele or goitre. One or both lobes of the thyroid may be affected, and the size of the tumour varies enormously. These tumours—the different varieties of which it is not necessary to discuss at present—may compress the larynx and cause dyspnœa, or they may involve the recurrent laryngeal nerves and cause laryngeal paralysis. Besides their anatomical situation, the main point in their diagnosis is the fact that they follow the movements of the larynx during swallowing. This is not the place to speak of the various tumours of the neck—simple, malignant, aneurismal, &c. That is best left to my surgical colleagues.

Palpation of the laryngeal region is often of use. The larynx may appear too fixed, and the parts to the side and behind it may appear too solid and massive. This is very often the case in malignant disease of the œsophagus. In tuberculous disease of the larynx we may find distinct tenderness on pressure over the superior cornua of the thyroid cartilage. In cases of laryngeal tumour we may occasionally feel a distinct vibratile thrill during inspiration or expiration, or both, by palpation of the thyroid cartilage. *Percussion* of the larynx and trachea is not of much practical value, although capable of informing us of the presence of solid matter in the larynx, or of the occlusion of its orifice. It is instructive to percuss the larynx with the nose and mouth wide open, and to hear the clear resonant note given out under these circumstances. Then close first the mouth and

then the nose, and hear how the percussion note gradually becomes dull and toneless as the superior openings become completely occluded. A similar failure in tone takes place when occlusion is due to pathologic causes.

The examination of the *naso-pharyngeal cavity* can be made partly by means of direct observation through the anterior nares, and partly by employing a reflector and mirror to illuminate that part of the pharynx which extends behind the soft palate upwards to the base of the skull, and into which the posterior nares open. The ordinary reflector is very useful in inspecting the anterior nares, and in order to get a good view, the nares may be dilated by gently pressing upon the tip of the nose with the forefinger, or by inserting the common nasal speculum, or, better still, the bivalve fenestrated speculum introduced by Fraenkel. If the short hairs which grow within the margin of the nostril are found to obstruct the view, they may be removed with a pair of scissors, or smoothed down by the application of a little ordinary soap. (One may here remark that in performing laryngoscopy on persons with heavy moustachios, it is often a great help to plaster down the hair by means of a little soap, and thus make it conform to the line of the lips). The amount which can be seen in this way varies in different individuals, according to the amount of swelling of the parts and their natural configuration. Occasionally one can see the pharyngeal wall through the anterior nares.

The inspection of the posterior nares and adjacent parts by means of the laryngoscope mirror is by no means so easy as the inspection of the larynx. The great obstacle to a good view of these parts is the soft palate, which is very apt to contract, and by impinging against the pharyngeal wall effectually prevent the inspection of the parts above it. The position of the patient, of the light and the reflector, are the same as for laryngoscopy. The tongue must be depressed on the floor of the mouth by means of a rectangular spatula, which may be held either by the patient or the observer, the former being preferable, and in many cases necessary, as the observer often needs both his hands. The mirror, which should form a very obtuse angle with its handle, must be gently passed (the reflecting surface being, of course, turned upwards) to the back of the mouth, care being taken not to touch the pharyngeal wall or the uvula. It is often a good plan to pass the mirror to one side of the uvula in order to avoid it. In very favorable cases we shall be thus enabled to see, by moving the mirror first to one side and then to the other side of the uvula and varying its degree of

obliquity, the whole of the upper pharyngeal cavity and the posterior nares. The parts which we can actually distinguish are (1) the septum narium, (2) the middle and lower turbinated bones in part, (3) the pharyngeal orifice of the Eustachian tube, and (4) the mucous membrane of the upper part of the pharyngeal cavity, rendered uneven by the adenoid tissue beneath it. These parts can only be seen piecemeal, and a great deal of skill and practice is necessary in order to recognise them. The greatest difficulty is generally experienced with the soft palate. The sucking of ice and the administration of potassium bromide may do much to diminish its irritability, and by practice the patient may acquire the habit of allowing his soft palate to be manipulated. Some help may be obtained by making the patient utter a nasal sound during the whole examination, so that the palate is kept free from the pharynx, and if this fails the palate may be drawn forward by means of a thin silvered spatula passed behind it, or a loop of thread passed round the uvula. Palpation is of great use in examining these parts. A probe passed through the anterior nares will often serve to detect pieces of necrosed and carious bone, and a probe or the forefinger passed through the mouth behind the soft palate will often give very valuable information as to the swelling and consistency of the parts examined. One finger may be passed through the mouth into the fauces, while a finger of the other hand is applied externally in the neighbourhood of the angle of the jaw. In this way a very good idea is obtained of any inflammatory exudation or thickening which may exist in the pharyngeal wall or the fauces.

The nasal passage may become occluded from various causes, and when this is the case the following symptoms are presented to us as detailed by Fraenkel:—1. The mouth is kept habitually open for breathing purposes both during the day and the night. The tongue gets dry from exposure, and the patient has a vacant silly look; the breath, owing to one channel being stopped, is drawn in with great violence. It is stated that children suffering from this condition are liable to spasmodic asthmatic attacks, due, it is supposed, to the contact of air, which has not been warmed by passing through the nasal cavity, with the lungs; and it may here be mentioned that adults who have nasal polypi have occasionally suffered from asthma, but whether this is due to obstruction or to some reflex irritation is doubtful. 2. When the occlusion of the nose occurs in infants, they are unable to suck for more than a

few moments at a time, owing to the constant necessity of opening the mouth. 3. The sense of smell is abolished or blunted, owing to the impossibility of effective sniffing. 4. Expiration through the nostrils is impossible, and the flame of a candle cannot be blown out when the mouth is shut, neither can the nose be "blown" so as to expel accumulated mucus, &c. By holding a candle to the nose, and asking the patient to expire through the nose, we can tell which nostril is occluded when only one is thus affected. 5. The voice is altered; all nasal resonance is abolished; the tone is muffled. This mode of speech is often erroneously spoken of as "speaking through the nose."

The chief morbid conditions which may be seen by inspection of the naso-pharynx, and which may, among other symptoms, give rise to occlusion of one or both nostrils are: 1. Catarrhal swelling of the mucous membrane, as is so commonly seen in an ordinary cold. This catarrhal swelling, it must be remembered, occurs also in epidemic influenza, measles, and some other conditions. The secretion of the mucous membrane in this condition, varying as it does from a clear, almost limpid fluid to a thick, tenacious muco-pus, is too well known to need description. Occasionally the nose becomes the seat of a true purulent inflammation. 2. In scrofulous and syphilitic subjects nasal catarrhs are apt to become chronic; the mucous membrane generally becomes thickened and hypertrophied, and ultimately atrophied and shiny, and the secretion is apt to form crusts which stink and hence the name of *ozæna*, by which this condition is often known. 3. Abscesses of the mucous membrane occur occasionally independently of disease of the bones of the nasal cavity. 4. Syphilis very commonly attacks the nose. The presence of mucous tubercles gives rise to the "snuffles," so commonly met with in syphilitic children. Syphilitic ulcerations and infiltrations are met with here as well as elsewhere, and these conditions often lead to destruction of the cartilages, caries and necrosis of the bones, and the consequent establishment of communications between the two nostrils, or between the cavities of the nose and mouth. 5. Among the rarer causes of nasal inflammation we may mention diphtheria, erysipelas, scarlet fever, and glanders. 6. Mucous polypi may grow from any part of the nasal cavity, and vary, as you know, very greatly in size. They are usually diagnosed without difficulty, although it is well to bear in mind that other varieties of tumours, such as carcinomata and sarcomata, are found in the neighbourhood. It is well to remind you also that a hernia cerebri projecting

into the nasal cavity through a congenital fissure in the base of the skull has been mistaken for a polypus. 7. It is only necessary to mention the fact that foreign bodies, such as peas and lumbrici, are occasionally found in the nose.

A very common symptom of disease of the naso-pharynx is impairment of hearing, owing to the mechanical occlusion of the Eustachian tubes. When a patient complains of being deaf, you should always examine the pharynx.

APPENDIX.

The following cases of throat disease will serve to illustrate some of the points touched upon in the foregoing lectures. All the patients whose cases are given attended at the Throat Department of University College Hospital.

Case 1.—*Syphilitic disease of the larynx and lungs of long standing; great emaciation; rapid improvement under iodide of potassium; remarks.*

A. B—, aged twenty-five, a writing clerk, applied at the throat department of the hospital on May 4th, 1876. His chief symptoms were hoarseness, cough, and complete loss of voice. He stated that his voice, which had been hoarse for some time, had completely failed him since the previous November, and that since then he had been a patient at the Brompton Hospital for Consumption.

The pharyngeal mucous membrane was of normal colour; the tonsils were the seat of old ulcerations; the uvula was half destroyed by old ulcerations; and there were several old scars scattered over the soft palate. With the laryngoscope the epiglottis was seen to be thickened and infiltrated, of a light-red colour, with a large notch out of the left border, much crumpled upon itself, and so pendulous that a view of the glottis could not be obtained. The posterior parts of the aryteno-epiglottidean folds, which were just visible, were swollen and infiltrated. The voice was a hoarse whisper, true phonation being absolutely impossible.

The patient was much emaciated; height 5 ft. $9\frac{1}{4}$ in.; weight 7 st. He stated that fifteen months before his

weight was 8 st. 10 lb. The thorax was long and narrow, much flattened (equally on the two sides) in the antero-posterior diameter. The flattening under the clavicles was not so marked as elsewhere. There was hyper-resonance under the clavicles, and normal resonance elsewhere. On auscultation, the breath sounds everywhere were harsh and blowing. There were no adventitious sounds audible; the condition of the vocal fremitus and vocal resonance could not be obtained, owing to the entire absence of voice; cough was frequent and troublesome; expectoration almost *nil*. There was a big scar beneath the right eye, due to an "abscess," which had lasted eighteen months. There was a small ulcer also on the back of the left forearm.

The patient was not conscious of ever having had syphilis, but the physical appearances left no doubt as to their cause. He was at once accordingly placed upon ten grains of iodide of potassium, subsequently increased to fifteen and twenty grains, three times a day. On the 18th of May there was a marked improvement in general health; cough was much less, the sore on arm was nearly healed; weight 7 st. 3 lb. A week later the weight was 7 st. 5 lb. On June 1st the voice was stronger, and the weight had farther increased to 7 st. 11 lb. On the 8th the weight was 8 st., and in another week it was 8 st. 2 lb. The patient stated that since taking the iodide his appetite had much improved, and was at times ravenous. He had been obliged to have his trousers "let out," owing to his increasing size. On the 22nd the weight was 8 st. 4 lb. The patient had in the interval between the visits suffered from an attack of "erysipelas" above the bridge of the nose. The iodide was omitted and quinine substituted. He was still hoarse. On June 24th the iodide was resumed, but as it apparently caused a return of the "erysipelas," it was discontinued on the following week, and perchloride of iron substituted. On July 13th the iodide was resumed, and was continued, with occasional intermissions. On October 5th the weight was 8 st. 8 lb., and the voice was noted as being stronger. The epiglottis had undergone a slow diminution in size from the first, and on November 9th the posterior part of the right vocal cord was distinctly visible, and presented an appearance of only slight thickening. On November 16th the voice had a true tone, and on the 30th the power of phonation had still further improved. On Dec. 14th the weight was 9 st. 1 lb., and the voice had so far improved that on examining the chest vocal fremitus was found to be normal. The flattening of the chest had undergone a perceptible diminution.

The steady gain in weight, which hitherto had been uniformly continuous, now ceased, and the patient attended at the hospital less regularly. On June 20th, 1877, his weight was found to be 8 st. 10 lb. only, and the patient complained of a return of the "erysipelas." Perchloride of iron was accordingly substituted for the iodide, and a few weeks later cod-liver oil was ordered. The epiglottis, though still crumpled and pendant, was considerably swollen, so that the posterior half of the right cord was only visible. All attempts to raise the epiglottis by means of a fine bent spatula caused violent spasmodic coughing. On Oct. 4th the weight was 9 st. 5 lb.; all improvement in other respects was well maintained. On Jan. 2nd, 1878, the weight was found to be 9 st. 5 lb., and on Feb. 28th it had risen to 9 st. 8 lb. (a gain of 36 lb. since the commencement of his treatment twenty-two months previously). It was thought advisable that he should still continue to take iodide, but he found it necessary to discontinue it occasionally, because of his attacks of "erysipelas," which was never visible during any of his visits to the hospital. On Sept. 13th, 1878, the weight was 9 st. 6 lb., and a fortnight later it was again 9 st. 8 lb. In Nov., 1878, all medicine was discontinued, and on Jan. 8th, 1879, the weight was 9 st. 5 lb., and all the improvement in the larynx and in the power of voice was found to have been maintained. When last seen the voice had a good strong bass tone, and the patient was practically well.

Remarks.—This case presents many points of interest. The absolute hoarseness, the troublesome cough, and the extreme degree of emaciation, gave one so strong an impression of laryngeal phthisis, that had it not been for the laryngoscopic and other signs of tertiary syphilis, which made the diagnosis a certain one, in spite of the patient's ignorance of ever having had the primary disorder, the prognosis would have been absolutely grave. Notwithstanding the great flattening of the chest, and the general harsh blowing respiration, the apices of the lungs appeared to be little affected, a fact which at once placed the case out of the category of ordinary phthisis. The patient was a sensible man, and had no wish to conceal the fact of syphilis, and in a conversation with him not many months ago, it was elicited that the sore or "abscess" under the right eye had followed a scar which had appeared after spending a night in a disreputable house while in a state of intoxication. It seems, therefore, not improbable that the primary sore was situated beneath the right eye, and that the want of proper treatment was the

cause of its long duration. The rapid and continuous gain in weight, and the marked improvement in his general health while taking the iodide, are points of much interest, and the intercurrent attacks of swelling over the bridge of the nose and round the eyes, presumably caused by the administration of the remedy, and which the patient characterised as "erysipelas," are worthy of attention. At no time were there any marked signs of "iodism."

CASE 2.—*Syphilitic disease of tongue and larynx; partial improvement under iodide of potassium; marked improvement under mercury.*

E. R—, aged twenty-five, a barman, came to the hospital on Dec. 11th, 1878, complaining of hoarseness. The patient looked ill, and there was a distinct history of syphilis, with the scars of old ulcerations on the arms and legs. The tongue was enormously enlarged, deeply fissured in the centre, and uniformly indurated. There were no separate swellings visible on the tongue, but the organ seemed to be the seat of a uniform infiltration. Round the margin of the tongue were one or two superficial ulcers. The epiglottis and the laryngeal mucous membrane were slightly congested. He partook rather freely of alcoholic liquors, which his occupation brought in his way. He suffered from irregularity of the bowels and dyspepsia. A mixture containing fifteen grains of iodide of potassium and half a drachm of sulphate of magnesia in each dose was given, and a lotion containing half a grain of perchloride of mercury to the ounce, as a wash for the mouth, was ordered. His improvement was immediate and rapid, and in a few weeks the ulceration of his tongue had disappeared, and it had become soft and natural to the feel, and much diminished in size.

Early in February the patient caught cold, and his laryngeal symptoms suddenly increased. The epiglottis was now seen to be very much swollen and reddened, and the thickened edge was the seat of superficial ulceration. The patient was completely aphonic, was troubled with an incessant cough, and could swallow nothing but the blandest liquid, in consequence of the pain which it caused him. An examination of the lungs showed a slight and doubtful amount of consolidation of the right apex. Emaciation was rapid and extreme, and the condition of the patient at this time seemed to warrant the worst prognosis. Cod-liver oil and syrup of the iodide of iron were ordered, together with

an inhalation of compound tincture of benzoin, and sedative lozenges. The relief thus afforded was slight, but the application of a strong solution of nitrate of silver to the epiglottis notably diminished its sensibility. So much so was this the case that the patient asked to be allowed to apply it for himself, which he readily learnt to do. In March he was sent away to St. Leonards in order to avoid the inclement spring weather. He returned somewhat improved in general health, but with the local condition unaltered. His slight gain in strength soon disappeared, and it was then resolved, in spite of his prostrate condition, to try the effect of mercury. Mercurial ointment was accordingly rubbed into the sides of the chest every night, and with the very best results. The ulcers on the epiglottis quickly healed, the swelling of the mucous membrane subsided, the power of taking nourishment returned, and the patient's general condition rapidly improved. The gums soon became tender, when the inunction of mercury was discontinued, to be resumed after a week's rest. The man's improvement has been continous, and at present he is able the follow his occupation of a barman. An abscess, probably due to the breaking down of a gumma, had appeared in May in the calf of the right leg, but this rapidly got well after being tapped with an aspirator by Mr. Godlee.

Remarks.—The condition of this patient's tongue when he first came under treatment was one of great interest, the enlargement and the induration of the organ being both excessive. Although the tongue rapidly improved under iodide of potassium, it will be noted that the larynx became affected in the manner indicated, while he was still taking large doses of that drug; and it is remarkable and instructive to note that no amelioration of the laryngeal condition took place, in spite of local treatment and favorable hygienic conditions, until the inunction of mercury was resorted to. One naturally felt considerable reluctance to give mercury to a patient in such a miserably shattered condition, but the result proves that any fears one might have had as to the possible ill effects of the drug were groundless.

CASE 3.—*Epithelioma of the upper end of the œsophagus.*

R. S—, a charwoman, aged sixty, first attended on March 1st, 1877. She was much emaciated, and stated that since Christmas she had had a difficulty in swallowing, which had gradually increased. Attempts at swallowing produced fits

of coughing. There was some pain between the shoulders. She had spat blood on two or three occasions. She had miscarried three times, one child alive and delicate, one stillborn. On examination the epithelium of the tongue was patchy, thick in places and thin in others, and the pharynx was slightly congested. There was decided prominence of the larynx, and slight and doubtful enlargement of glands at angle of jaw. The larynx appeared healthy when examined by the laryngoscope, but between the arytenoid cartilages and the pharyngeal wall muco-pus was seen exuding. On passing the finger into the pharynx an obstruction was felt at the upper part of the œsophagus, and a speck of blood was found on the tip of the finger on withdrawal. The examination caused the patient to cough, and she expectorated some blood and a small fleshy particle which, when examined under the microscope, revealed nests of epithelial cells quite characteristic of epithelial cancer. The patient was advised to become an in-patient, but on her declining to do so she was ordered a morphia linctus to ease the discomfort of the throat, carbolic-acid lozenges to counteract the fœtor, and cod-liver oil in large doses. After a time she ceased to attend.

Remarks.—The interest of the case consists in the certainty of the diagnosis at the first visit by means of the microscope. The appearance of the tongue, and the history of the miscarriage rather pointed towards syphilis, but the discovery of the structure of epithelioma in the expectorated particle left no doubt as to the true nature of the case.

Case 4.—*Tumour as big as a hazel-nut, growing from the left ventricular band.*

W. W—, aged forty-eight, a workhouse master, was sent into the hospital on the 18th July, 1878, suffering from hoarseness and dyspnœa. He had been a healthy man, with the exception of an attack of gonorrhœa. His wife had miscarried three times, but there was no direct evidence of syphilis. The patient stated that he had been liable for some time to a relaxed sore throat, that he became hoarse somewhat suddenly about a year ago, and that during the last month his symptoms had very much intensified. On July 25th he was seen by the author, and subjected to a laryngoscopic examination. The dyspnœa was increased when the patient extended his neck for the purpose of laryngoscopy, so that the examination was not easy, and had to be performed with all possible quickness. A tumour was dis-

tinctly visible on the left side of the larynx at its anterior part, and situated, as was thought, below the left vocal cord; the left cord being apparently stretched over it like a shining band. The breathing was stridulous during both inspiration and expiration, and on applying the hand over the thyroid cartilage a distinct vibration could be felt during both respiratory acts, especially on the left side. There was a considerable amount of tenacious glairy sputa. All the extraordinary muscles of inspiration were used, and there was some swelling of the feet. There was no prostration, and no cyanotic tint of face.

He was placed on large doses of iodide of potassium, on the chance that the tumour might be of syphilitic origin; but no improvement having taken place in two days, it was decided that an operation was necessary. In consultation with Mr. Marshall it was decided that no attempt to remove the tumour *per vias naturales* would prove successful. The base appeared to be nearly as thick as the growth itself, and the inability of the patient to submit to more than a momentary laryngoscopic examination, together with the fact that the tumour completely closed the fore part of the glottis, would have rendered the passing of an écraseur over the growth impossible; and any attempt to do so was not thought either desirable or justifiable. It was considered, therefore, that thyrotomy would be the proper operation; and it was resolved that tracheotomy should be first performed, and that the thyrotomy should be done subsequently after the lapse of some days, so as to give the patient time to recover from the shock of the first operation, and to allow of the second operation being performed with greater deliberation.

Tracheotomy was performed with all possible skill by Mr. Bond, the house-surgeon, but the patient never rallied afterwards, and died in a few hours.

On post-mortem examination the mucous membrane of the larynx was found to be considerably injected, especially at the upper and left part. Attached to the left ventricular band at its fore part was a smooth, lobed, hard growth, as big as a hazel-nut, and with a broad base. It was of a pinkish colour, and marked on its upper surface by a white streak. This appearance had led to the idea of its being situated below the cord. A microscopical examination by Mr. Boyd, the surgical registrar, showed the growth to consist principally of blood-vessels with small round nucleated cells between them, and some few spindle-shaped cells.

Case 5.—*A cockle-shell in the trachea.*

T. M—, aged eight, was sent to the throat department for examination by Mr. Godlee, by whom he had been admitted into the hospital, on July 10th, with a view to operation. It appeared that on the 4th of July the boy was playing in the Regent's Park, when a small cockle-shell, which he had picked off the path and placed in his mouth, accidentally slipped into his windpipe. The boy was suffering from some dyspnœa, with slight recession of the thorax during inspiration; both inspiration and expiration were accompanied by bronchitic râles, audible all over the chest. The boy pointed to the trachea as the seat of his trouble, and pressure on a spot about one inch above the sternal notch caused him pain. He was troubled occasionally by fits of spasmodic coughing. He was a timid, fidgety lad, and by no means a good subject for laryngoscopic observation. On July 10th, after much trouble, a momentary glance of the larynx was obtained, and a white body was seen below the vocal cords. On the following morning a further examination was made, and a white body was distinctly visible on the anterior wall of the trachea, about an inch below the vocal cords. While endeavouring to demonstrate the presence of this foreign body to one of the students who was present, the patient was seized with a very violent attack of coughing, and coughed up a small cockle-shell nearly as big as a threepenny piece. The shell was perfect, with sharp edges, and had apparently got fixed in the mucous folds of the trachea. The shell had been in the trachea just a week. After coughing up the shell all symptoms disappeared, and the patient left the hospital on the following day quite well.

Cases of paralysis of the left vocal cord.

Three cases of this form of paralysis have lately been under observation, and since the cause of the paralysis was probably different in each case they form an interesting group.

Case 6.—The first patient, a man aged forty-eight, a cabman, complaining of hoarseness and occasional attacks of dyspnœa, was sent into the surgical wards under the care of Mr. Heath because a laryngoscopic examination made elsewhere had led to the diagnosis of a polypoid growth in the larynx. Mr. Heath sent the patient to the throat department for exami-

nation, and it was then at once determined that no growth existed, but that the left vocal cord was completely paralysed. The erroneous diagnosis of growth had probably arisen from the appearance presented by the oblique distortion of the glottic aperture which is so common in these cases, and from the fact that the left cord was almost completely hidden by the left ventricular band, which was somewhat swollen. Laryngoscopic examination produced on two or three occasions violent attacks of dyspnœa. The cause of the paralysis was not at first very obvious. The neck presented no abnormality. The chest was well formed, and without any abnormal prominence. The expansion of the left side of the thorax when compared with the right was slightly deficient, and on very careful percussion an exceedingly trifling deficiency in resonance was detected in the second left interspace, close to the sternal border. On auscultation no abnormal heart sound or bruit was audible, but the respiratory murmur was somewhat weaker on the left side than the right, and on applying the stethoscope in the second left interspace a slight pulsation was communicated to the head of the auscultator, which pulsation was scarcely appreciable to ordinary palpation. Taking all the symptoms together it was considered highly probable that an aneurism existed in the third part of the arch of the aorta, which by its pressure upon the left recurrent laryngeal nerve produced the paralysis of the left cord, and by its pressure upon the left bronchus caused the slight deficiency in respiratory power on the left side. He was admitted into the medical wards, and after rest in bed his attacks of dyspnœa became less urgent, but the paralysis of the cord remained unaltered. When he left the hospital and returned to his work his dpspnœa returned, and the symptoms of aneurism, which were most obscure at first, became well developed and undoubted.

Remarks.—This case is of much interest, as showing the great value of the laryngoscope in the early diagnosis of aneurism and other thoracic tumours, since without its use to stimulate the physician to a very careful examination of the chest, the slight and doubtful symptoms of aneurism which at first were present would in all probability have escaped detection.

Case 7.—The second case was that of a horsekeeper, aged fifty, who came to the hospital suffering from hoarseness and some difficulty in breathing, and general weakness. A laryngoscopic examination showed a well-marked paralysis of the left vocal cord. There were no indications whatever of the

presence of aneurism or other thoracic tumour. The larynx, however, appeared somewhat prominent, and there seemed to be some undue solidity and bulk about the neck, although no distinct tumour was anywhere observable. A few weeks after his first visit he came to the hospital with a piece of meat stuck in the upper part of his gullet, which was removed by the house-surgeon, and a similar accident happened to him a few weeks later. A further examination showed that there was no paralysis of the pharynx; and on trying to pass an œsophagus bougie with great gentleness into the stomach an obstruction was encountered not far below the upper extremity of the gullet. It was highly probable that the obstruction of the œsophagus and the pressure on the recurrent laryngeal nerves which caused the paralysis of his left cord, were due to the same cause. Whether this was malignant or not was never clearly made out, as the patient disappeared when the hospital was closed for repairs.

Case 8.—The third case was that of a shoemaker, aged sixty-four, who was sent to the throat department on October 15th, 1879, from one of the other departments of the hospital, suffering from almost complete aphonia and great shortness of breath. On examining the larynx the fact of complete paralysis of the left cord and slight laryngeal catarrh was fully established. On examining the chest, the left side was seen to be smaller than the right and almost motionless during respiration. There were the ordinary signs of pleuritic effusion rising to the level of the second rib in front, third rib in axilla, and the spine of the scapula behind. Above the level of absolute dulness in front the resonance was defective, especially towards the left sternal border. The right lung presented all the signs of emphysema, and the general form of thorax was of an emphysematous type, with a large antero-posterior diameter. The superficial arteries were everywhere tortuous and pulsated visibly, the right carotid appearing to pulsate rather more forcibly than the others. The heart-sounds were normal, the radial pulses were equal, and there were no special indications of thoracic aneurism or other tumour. The history of the onset of the illness was that of acute pleurisy, the patient stating that he had been takenly suddenly ill about three months previously with a stitch in the side and shivering. Failing to discover any other cause for the paralysis of the left cord present in this patient, it seems warrantable to conclude that the thickening of the left pleura has implicated the recurrent laryngeal nerve at its origin, a condition which

is enumerated by Niemeyer among the causes of paralysis of this nerve.

Case 9.—*Temporary immobility of the left vocal cord* was present in a middle-aged woman who was suffering from moderately severe laryngeal catarrh, with a good deal of mucous exudation. On first examining the larynx the left cord was seen to be completely immovable, and a diagnosis of paralysis was hastily made, but during a violent attack of coughing the cord, which was apparently mechanically fixed by tenacious mucus, freed itself, and was then seen to move with perfect freedom. This patient completely recovered.

Case 10.—*Paralysis of the crico-arytenoidei postici or dilators of the glottis.*

G. S—, aged thirty-three, a carpenter, complained that for the last twelve months he had had a feeling "as if he breathed through muslin," and further stated that when he ran or exerted himself the breathing became stertorous. The voice was unaffected. On laryngoscopic examination the laryngeal mucous membrane had a normal appearance. During phonation the cords approximated thoroughly; during inspiration there was no abduction of the cords; the glottis remained a mere chink, and no effort of forced inspiration served to increase the distance between them. During expiration the distance between the cords was much greater than during inspiration. The arytenoid cartilages presented the appearance of being tilted backwards. He stated that sixteen years ago he had "a lump as big as his fist" on the front of his throat, and that one of his sisters had the same thing. This was probably an enlargement of the thyroid body. There was no lump or enlargement of any kind when seen; could swallow without difficulty. When pressure was made upon the posterior margin of the alæ of the thyroid cartilage there appeared to be some undue tenderness. There was no evidence of any intra-thoracic tumour; no paralysis of the tongue or palate; no want of laryngeal sensibility. There was a doubtful history of syphilis ten years ago. Patient said he had got thin lately, and looked depressed; suffered from pain under the eyes, and said that for the past three months he had occasionally, when at work, "felt shaky all over, especially in the head and eyes." There was no lead line; no tremor of the limbs; no symptoms of ataxy; no muscular wasting.

Remarks.—This patient was evidently suffering from that

rare condition, paralysis of the crico-arytenoidei postici or abductors of the cords. All other muscles of the larynx, the adductors, and tensors, seemed to act perfectly. The cause of the peculiar appearance of the arytenoid cartilages was not evident. The cause of the want of power in the abductors was doubtful. The condition of the patient was more suggestive of hysteria than of any organic disease affecting the origin of the pneumogastric nerves. There was no evidence of any injury to the muscles themselves, or of any injury to the recurrent laryngeal nerves in their course. The patient was given iron and iodide of potassium, and was lost sight of when the hospital was closed for alterations during the autumn of 1879.

Cases 11, 12.—*Paresis of the adductors of the cords.*

This condition, which is the one which gives rise to the so-called hysterical aphonia, is perhaps the most common of all the paralytic affections of the larynx. The paralysis is seldom complete, and therefore the term paresis seems preferable. Two cases occurred in girls aged respectively sixteen and eighteen. They were both completely aphonic, and quite unable to speak above a whisper. They were both anæmic, both suffered from globus hystericus, both were much troubled by vomiting after meals; and in both a furred tongue, with enlarged papillæ at the tip and edges, gave evidence of a condition of gastric catarrh. A laryngoscopic examination showed that the larynx was healthy, but that during attempts at phonation there was scarcely any approximation of the vocal cords, and that of a tremulous, hesitating character. The application of faradism directly to the larynx was tried in both cases. It produced a momentary monosyllabic cry of discomfort, but no permanent benefit, and its use was not persevered with. The treatment was at first directed towards the relief of the gastric condition by the administration of mercurial purgatives, and this was followed by the treatment of the anæmia. A mixture containing perchloride of iron was ordered, combined with sufficient exercise and a nutritious diet. In both cases the aphonia had completely disappeared at the end of a few weeks.

Case 13.—The third case was that of a boy, aged twelve, who was completely aphonic, and had been previously treated for laryngitis. An examination of the larynx showed an extreme degree of paresis of the adductors of the cords,

combined with a very marked anæmia of the larynx. The patient was an anæmic, delicate-looking lad, but the pallid condition of the laryngeal mucous membrane was far greater than that of any other part. It was indeed a real case of what has been described as laryngeal anæmia. He was treated by the administration of cod-liver oil and steel wine, and after a few weeks his voice became normally strong.

Remarks.—These patients are always *aphonic* rather than *hoarse*. Hoarseness is characteristic of thickening or roughening of the glottic aperture, which in these cases is never present, and accordingly we find that true hoarseness is very seldom observed. This form of vocal palsy, although often occurring in hysterical women, seems to be due in most cases to anæmia, and is probably caused by an actual want of muscular power in the adductor muscles. When the anæmia disappears, the voice returns, and it is very seldom necessary to have recourse to local treatment of any kind. The throat should not be coddled, but should be rather stimulated in moderation by the use of cold water. Fresh air is always necessary for these patients, and they should be made to take daily exercise out of doors.

Ozæna.

In several cases of chronic inflammation of the nasal and pharyngeal cavities giving rise to offensive discharge, the author has found decided benefit result from the use of a stimulant and antiseptic snuff having the following formula: biborate of soda, nitrate of bismuth, of each one drachm; disulphate of quinine, ten grains; iodoform, five grains. This snuff has the effect of stopping the fœtor and greatly diminishing the amount of discharge from the nostrils. It is liable, as are all snuffs when used for similar conditions, to cake in the nostrils, and it is therefore necessary to thoroughly wash out the nostrils once a day. This may be done by means of a nasal douche, or the patient may easily be taught to snuff a lotion up the nose and allow it to run out of the mouth. A teaspoonful of glycerine of borax dissolved in a wineglass of tepid water forms an excellent wash for the nose, and with a little instruction patients learn how to wash out their nasal and pharyngeal cavities without the aid either of syringe or douche apparatus. In cases where the ozæna is of a simple kind, not due to caries or necrosis of bone, but rather to a sluggish inflammatory action occurring in a scrofulous subject, considerable benefit

is often derived from the administration of the sulphide of calcium in doses of half a grain (in pill), taken three times a day. It is often necessary to cleanse the nasal and pharyngeal cavities with a brush inserted through the anterior nares, and also behind the soft palate, so as to reach the summit of the pharynx. The brush may be moistened with glycerine of tannin, and after the cavities have been cleansed a little dry iodoform may be passed into the cavities on the tip of the brush. Further experience has shown that this snuff is nearly as efficacious if the iodoform be omitted. The deodorising power of the quinine is sufficient, in many cases, to counteract the ozæna.

CASE 14.—*Repeated expectoration of hydatid membrane; no physical signs of hydatid disease either in the chest or abdomen.*

G. R—, aged twenty-nine, attended as an out-patient on April 2nd, 1879, bringing with him some pieces of false membrane, which he stated that he had expectorated on March 26th. He had been under the the care of Mr. Shoppee, of Kentish Town, and from that gentleman and the patient the following facts were elicited. About four years before he had been laid up for eighteen weeks with attacks of hæmorrhage from the lungs, for which he was treated by Dr. Peter Rawlins. On inquiry of Dr. Rawlins it was ascertained that these attacks were genuine attacks of hæmoptysis, and very severe. Dr. Rawlins further stated that a year previous to these attacks the patient had suffered from aggravated double pneumonia. Between the attacks of hæmoptysis and December, 1878, the patient enjoyed good health. Just before Christmas, 1878, during the prevalence of a sharp east wind, he coughed up a piece of membrane the size of a half crown. He continued his work, however (that of a night storekeeper on the railway), till the 19th of March 1879, when he was suddenly seized with an attack of hæmoptysis, in which he lost "a quarter of a pint of blood." He took to his bed, and on March 22nd coughed up a piece of false membrane, and on March 26th coughed up more false membrane. There was no history of dyspnœa. The membrane had on each occasion been coughed up suddenly, and the patient attributed his attacks to the east winds which were blowing at the time.

When seen at the hospital on April 2nd the patient looked somewhat anæmic and delicate. Temperature 99·8°; pulse

100. Tongue rather big, and slightly fissured on the surface; tonsils red and slightly enlarged, with some amount of secretion lying in the crypts of the left tonsil. The mucous membrane of the epiglottis and larynx was rather red, and a little mucus could be seen lying in the fossa between the epiglottis and the tongue. The vocal cords were healthy. The trachea was plainly visible as far as the bifurcation, and appeared healthy. The urine was healthy, containing neither albumen nor sugar. A very careful examination of the lungs revealed a possible slight deficiency of expansion in the left infra-clavicular region, but no other abnormality of any kind. The signs elicited by percussion and auscultation were throughout those of health. No increase of liver dulness; abdomen normal.

The membrane was in three or four pieces, which collectively were sufficient to cover a crown-piece. It was grey, translucent, smooth, and could be split into several layers. It had the naked-eye characters of hydatid membrane, but under the microscope it presented a granular appearance, and neither fine laminations nor hooklets were detected at the first examination.

On April 24th he expectorated some more membrane, and again a small piece on June 16th, and on both these occasions the lamination characteristic of hydatid structure was plainly observable, although no hooklets were to be detected. Both these attacks of expectoration were attributed by the patient to a chill. On being asked for a description of his sensations when the membrane came up, the patient said that he felt "a fluttering at the chest" (pointing to the sternal region), and then the membrane came up with a cough, but without a feeling of sickness. He was sure it came up the windpipe.

Repeated examinations of the chest and abdomen revealed no physical signs, except the doubtful want of expansion of the apex of the left lung mentioned above. The patient had never been out of England.

Remarks.—The main interest in the case consists in the absolute absence of any physical signs indicative of an hydatid tumour in either of the thoracic or abdominal organs, although the pieces expectorated would lead one to suspect that the cyst must have been of no inconsiderable size. The history of repeated hæmoptysis is quite characteristic of hydatid disease. The confidence with which the patient ascribed his attack to the condition of the weather is a point of some interest.

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