

4. When an adult complains of difficulty or inability to swallow, the surgeon must first of all determine whether there is any real obstruction or not, and should see for himself how the act is performed, and notice whether fluid and well-chewed bread can be slowly swallowed. He should inquire as to the apparent seat of obstruction, and the duration and course of the symptoms. He should then look at the general state of the patient's nutrition, and examine the neck and chest carefully for evidences of tumour of any kind. Should there be no evidence of tumour or aneurism, he should proceed to examine the part with a bougie. The patient being seated, and with the head at right-angles to the spine, a well-softened lubricated bougie should be gently passed to the back of the pharynx and on down the gullet; on encountering resistance no pressure should be made, but the bougie may be withdrawn a little, and its direction slightly altered. Smaller bougies may be passed until one is found to pass through and enter the stomach.

(a) If the patient be a young or middle-aged woman, of "neurotic," or obviously "hysterical" temperament, and the dysphagia came on suddenly, without any obvious cause, and at once became complete, or is complete for certain articles only, the case may be regarded as *hysterical dysphagia*. This diagnosis will be confirmed by a history of "globus hystericus," and by the fact that the patient can swallow certain articles, or swallows well when unobserved; and it will be rendered certain if a full-sized bougie passes readily into the stomach.

(b) If the dysphagia have come on gradually, extend to all substances equally, and the patient have become emaciated and anæmic, while the bougie is arrested in some part of the gullet, there is an *organic stricture*. Should there be a history of an injury or of

the swallowing of corrosive fluid, or hot liquid, and especially if the patient be young and no tumour be felt, and the lymphatic glands are unaffected, it may be diagnosed as *traumatic* or *cicatricial stricture*. If the patient be at or past middle life, and a tumour be felt in the neck, or lymphatic glands be found enlarged, or blood-stained mucus be hawked up or come up on the bougie, it is to be diagnosed as *malignant stricture*.

(c) Should there be a bronchocele or an aneurism of the aorta, the dysphagia may be attributed to external pressure unless there are very clear indications of stricture. The surgeon must never pass a bougie unless reasonably satisfied that there is no aortic aneurism. Regurgitation of food, unaltered and not acidulated, indicates the formation of a pouch in the gullet above the stricture.

(d) Severe pain and difficulty in deglutition coming on immediately after urgent vomiting or the swallowing of a large or too hot bolus, or a sharp fragment of bone, may last for some time, being dependent upon a laceration or abrasion in the œsophagus.

Repeated hæmorrhage from the pharynx, without any obvious cause, is probably due to *œsophageal nævus*.

## CHAPTER XXX.

### DIAGNOSIS OF DISEASES OF THE TONGUE.

THE frænum linguæ may be too short and prevent the tongue being protruded beyond the teeth or moved about in the mouth; this is the condition known as *tongue-tie*. The tongue may also become adherent in the mouth through the cicatrisation of ulcers. Other congenital malformations of the tongue are fissures in



the tongue, absence of the tongue, and imperfect development of the tongue with adhesion to the floor in the mouth.

#### A. General enlargement of the tongue

is due either to macroglossia or acute glossitis. If it is a chronic affection, congenital or noticed soon after birth, and the tongue is tough, uneven on the surface, with enlarged papillæ, and small rounded glistening elevations, it is *macroglossia*. The tongue may attain a very large size; the exposed part is then hard and dry, and its surface may be fissured and ulcerated, while the lower jaw is deformed by the pressure of the mass.

If the swelling of the tongue be acute, attended with pain and much distress from dyspnoea, dysphagia, and fever, and the surface of the organ is livid and indented by the pressure of the teeth, it is *acute glossitis*. This may be limited to one half of the tongue; if fluctuation can be detected in the swelled organ it indicates an *abscess*. The disease may arise from mercurialism, iodism, cold, and other less understood causes. A moderate amount of swelling of the tongue is common in ptyalism.

#### B. Tumours of the tongue.

(1) If a tumour be congenital in origin, livid, or bright-red in colour, compressible, not fluctuating, swelling out under effort, it is a *naevus*. The diagnosis of this condition is usually quite obvious.

(2) A branched villous growth from the surface of the tongue without any induration or swelling of the tongue itself is a *wart* or *papilloma*.

(3) A pendulous or pedunculated firm growth, of rounded outline, and covered by smooth healthy mucous membrane, is probably a *fibroma*.

(4) A firm infiltrating tumour growing rapidly in the substance of the tongue, painless, and not causing trouble except from its size, is a *gumma*. These tumours may be superficial and small, or seated in the

muscular substance of the tongue where they attain a larger size. They have a tendency to soften and ulcerate.

(5) Other very rare solid tumours of the tongue are lipoma, enchondroma, sarcoma, and scirrhus.

(6) If a fluctuating tumour be found in the substance of the tongue, and there be evidence of inflammation, or of injury connected with it, or if the surrounding tissues be swelled or tender, it is to be diagnosed as an *abscess*.

(7) If a fluctuating tumour be quite superficial, growing from the mucous membrane, of a bluish opalescent appearance, and painless, it is a *mucous cyst*. If too small to give the sense of fluctuation, the diagnosis must be made from the globular outline, translucent appearance, superficial position, and the absence of all signs of inflammation.

(8) If a very chronic tense globular fluctuating tumour be found in the tongue, deeper than a mucous cyst, and unattended with signs of inflammation, it may be diagnosed as a *hydatid cyst*. If inflamed and suppurating, it is indistinguishable from an abscess unless there is a clear history of a long pre-existing tumour.

(9) A softening *gumma* may give rise to a fluctuation: it will be recognised by the induration around the fluid, and by the history of a hard lump in the tongue which has become soft, and also by the other signs of syphilis, and by the effects of treatment.

In any case of fluctuating tumour where the surgeon is doubtful of the diagnosis he should make an exploratory puncture and examine the fluid that escapes. (See pages 274 *et seq.*)

#### C. Ulcers of the tongue.

(1) *Age*.—Children are subject to aphthous ulceration; at and after middle age epithelioma becomes common.



(2) *Duration.*—Aphthæ are of short duration; syphilitic ulcers are chronic and are very prone to relapse; epithelioma is steadily progressive.

(3) *Depth and position.*—The deep ulcers are epithelioma or ulcerating gumma; although both these diseases may exist as superficial ulcers. Gummatous ulcers and dyspeptic ulcers are generally on the dorsum; epithelioma, aphthæ, and syphilitic fissures are commonest at the edge; chancre is generally near the tip; mercurial ulceration is on the under surface.

(4) *Induration* of the base and edges of an ulcer is an extremely important sign; any ulcer when chronic may become indurated; those specially characterised by induration are chancre and epithelioma.

(5) *The teeth* should be carefully examined to see if there is any rough mass of tartar, or sharp corner opposite the ulcer; the presence of a plate of false teeth should also be taken note of.

(6) The *lymphatic glands* under the lower jaw become enlarged in chancre and epithelioma. (See page 284.)

(7) *Concomitant affections* should be enquired into; among these may be specially mentioned syphilitic affections of all kinds, dyspepsia, salivation, phthisis, and ulcers on the fauces, cheeks, and lips.

(8) *Microscopical examination* of a scraping from the surface of the ulcer. (See page 273.) If the scraping consist of blood and pus-cells and normal epithelium, a little of it should be stained,\* and if the tubercle bacillus is found, the sore is a tubercular

\* To stain tubercle bacilli spread some of the scraping thinly on a cover glass, and dry over a bunsen burner; then heat a few drops of Gibbes' rosanilin and methyl blue stain, pour into a watch glass, and invert the cover glass on this, and leave it for five minutes, then wash it in methylated spirit, and dry over a spirit lamp, and mount it in Canada balsam. The tubercle bacilli appear as fine rods stained of a red colour; putrefactive bacteria and micrococci will be seen stained blue.

ulcer; syphilitic and other simple sores show no distinguishing structures.

(9) *Effects of treatment.*—When a doubt is entertained it is often useful to give the patient iodide of potassium, when, if it heal up, the ulcer is shown to be gummatous; improvement of a sore under mercury would show it to be due to the earlier manifestations of syphilis. The healing of an ulcer under anti-dyspeptic treatment, or after the removal of a jagged tooth, indicates that it is a dyspeptic or local ulcer.

(a) If the ulcer be quite superficial, painful and tender, looking sharply punched-out, and especially if multiple, situated on the sides and tip, and there are other similar ulcers on the lips or cheeks, it is *aphthous*. Aphthæ commence as small white blisters, run a rapid course, and are accompanied with slight salivation.

(b) If the ulcer be situated on the side of the tongue being ragged and irregular, without induration of its edge or base, unless it is very chronic, and then with only limited induration, and it be opposite a mass of tartar, or an angle of a tooth, or the edge of a "plate," it is a *local ulcer*. This diagnosis will be confirmed if on removing any local irritation the ulcer heal up. The glands are not enlarged.

(c) If the tongue be swelled and there be salivation with great fœtor of the breath, and along the under surface of the tongue and at the tip there are irregular superficial ulcers with greyish base, while the gums are swelled and softened or ulcerated and receding from the teeth, it is a case of *mercurial ulceration*. The knowledge that the patient is exposed to the influence of mercury in some form will establish this diagnosis.

(d) A superficial crack or fissure on the side or tip of the tongue, multiple, chronic, or relapsing, is



*syphilitic ulceration.* This form is very common in the secondary period of the disease, and accompanying it are often found mucous patches, similar ulcers of the cheeks, or papular eruptions on the skin.

(e) A chronic superficial circular or oval ulcer on the dorsum of the tongue with a smooth base, free from induration and without glandular enlargement, is probably a *dyspeptic ulcer*, and the surgeon must look for signs of lithæmia or gouty dyspepsia.

(f) A single ulcer of recent origin near the tip of the tongue, with marked induration of the edge and base, and induration of several glands beneath the jaw, is a *chancre*.

(g) Shallow sinuous fissures on the dorsum of the tongue, the intervening mucous membrane being healthy, are to be regarded as *syphilitic*.

(h) If an ulcer on the tongue have a thin undermined edge, and a depressed shreddy base, without surrounding induration, it must be suspected to be a *tubercular ulcer*. If the patient show signs of phthisis, or if a scraping from the sore contain tubercle bacilli, this diagnosis becomes certain. These ulcers may be single or multiple, and may be found on the palate and fauces as well as on the tongue.

(i) If an ulcer on the dorsum of the tongue be deeply excavated, with a greyish, dirty, sloughy base, and if the history show that there was at first a hard lump in the tongue which softened and burst, it is to be diagnosed as an *ulcerated gumma*.

(j) If an ulcer on the tongue of a middle-aged or elderly person have a widely indurated base, thick everted edge, and an irregular warty surface with a watery discharge, and there be enlargement of one or more of the submental glands, it is an *epitheliomatous ulcer*. These ulcers are more common in men than women, and are generally seated on the side of the tongue. As they spread (and their growth is

continuous) they interfere with the movements of the tongue, or may bind it down to the mouth or jaws. The disease usually begins in a crack, or a wart-like papule, or a blister, or in leucoplakia.

#### D. Non-ulcerative affections of the mucous membrane.

(1) A milk-white deposit on the tongue which can be scraped off, leaving the surface a little raw, and which under the microscope shows spores and fibres of *oidium albicans*, is *thrush*.

(2) Slightly raised patches of mucous membrane having a pale-blue opalescent appearance, are *mucous patches*. Look for other evidences of syphilis.

(3) A pale pink rash in rings or crescentic patches, spreading rapidly over the surface of the tongue, leaving the mucous membrane smooth and deep red in colour, without pain, ulceration, or salivation, and quite uninfluenced by treatment, is *annulus migrans*.

(4) If the surface of the tongue be red, smooth, with a glazed appearance, as if bare of its epithelium, it is *subacute superficial glossitis*. This is often spoken of as the "smooth glazed tongue."

(5) If the surface of the tongue is slightly thickened, of a white colour, with irregular cracks across the thickened epithelium, the condition is that known as *leucoplakia*, *ichthyosis linguae*, or *chronic superficial glossitis*. This condition often lasts many years; it varies somewhat in appearance, but is characterised by the white colour of the surface and the thickening and hardening of the epithelium.

(6) When a patch of leucoplakia becomes affected with ulceration, or deep fissures, and the edge and base of these fissures are felt to be indurated, and especially if at the same time the submental glands become enlarged, the disease is now *epitheliomatous*.

(7) If the surface of the tongue be puckered, or depressed along interlacing lines, and along these lines



or puckerings firm bands are felt, the condition is *syphilitic sclerosis*. The sclerosis is deep, and may leave the mucous membrane quite healthy.

## CHAPTER XXXI.

### DIAGNOSIS OF DISEASES OF THE NECK.

THE lymphatic glands of this region consist of a series lying under the body of the jaw, of another series between the chin and the hyoid bone, of a third set along the external jugular vein, and of a fourth series, deeper than these, lying along the carotid sheath, beneath the sterno-mastoid muscle, and extending beyond that muscle into the posterior triangle of the neck. These glands are very frequently enlarged, either from inflammation, acute or chronic, cancerous deposit, or lymphadenoma. Inflammation of the glands is very often to be traced to some local irritation in the area supplying lymph to the affected glands, in other cases it is due to syphilis or struma.

A. **Acute swellings of the neck** are, with the rare exception of that produced by emphysema (page 116), inflammatory in their nature. The surgeon must endeavour to discover the seat of the inflammation, and whether suppuration or sloughing have occurred.

(1) If the swelling be in the position and have the outline of a lymphatic gland, be firm and unyielding to the touch, and without much surrounding œdema, it is an *inflamed lymphatic gland*; if fluctuation be obtained in such a swelling, it is a *glandular abscess*.

(2) If the swelling occupy one side of the neck,

and the head be turned to the opposite side, and attempts to rotate it cause pain, while the inflamed part is very painful, ill-defined, and tense, it is to be diagnosed as *cellulitis* beneath the *sterno-mastoid muscle*, and if the superficial parts are œdematous and glossy, and *à fortiori* if there be deep fluctuation, *abscess* beneath the muscle is to be diagnosed. This inflammation is probably lymphatic in origin. It is important to detect suppuration at once, and, therefore, increasing swelling, tension and fever with marked superficial œdema warrant a puncture or small incision, even in the absence of fluctuation. A similar swelling in any other part of the neck will be recognised by the same characters to be deep *cellulitis*.

(3) If the swelling take the form of a hard collar-like induration, extending between the jaw and the hyoid bone, pushing forwards the skin of this region, and raising and fixing the tongue, it is to be diagnosed as *angina ludovici*; this swelling may come on very rapidly, and quickly lead to œdema glottidis, or sloughing of the cellular tissue, and fatal blood-poisoning. When first seen there may be a sinus in the floor of the mouth leading into the sphacelated tissue. It is only when this form of cellulitis is idiopathic that it claims the above name. It may be traumatic from injuries or operations in the mouth, or may have spread from inflammation of the glands of the part.

(4) If the swelling be very painful and tender, ill-defined, livid red in colour, and indurated, and there be small vesicles on the surface, or several small apertures in the skin exposing a soft grey slough, it is a *carbuncle*. This disease may be met with at any part, but is very common at the back of the neck. Carbuncles vary much in their rate of progress, some being very chronic; they are usually single. Examine the urine for sugar.



(5) If the swelling consist of a hard flat or conical elevation of the skin, deep-red in colour, clearly defined, painful and tender, on the summit of which a small pustule forms, which bursts and discloses a tough greenish slough of the deeper parts of the skin and perhaps also of the subcutaneous tissue, it is a *furuncle*. Furuncles are generally multiple, and although very common on the neck, are often widely distributed over the body. The "flat" or "blind" boil is sometimes distinguished from the more prominent "conical" or "ordinary" boil.

**B. Chronic swellings** may be conveniently grouped into *fluid*, *solid*, and *pulsating* tumours.

(1) *Fluid tumours* are either *cysts* or *abscesses*. If the tumour be congenital, and consist of a single sac of fluid, as proved by fluctuation extending quite across it in every direction, and no solid matter be felt in it, it is a *hydrocele of the neck*, or *serous cyst*. If of large size, such a tumour may be translucent; if tapped, clear watery fluid escapes. Where a congenital tumour is found to be partly fluid and partly solid, forming a soft lobulated irregular swelling, it is a *cystic hygroma* (page 285). If the tumour be tense, rounded in outline, and situated over the pomum Adami, or over the side of the thyroid cartilage, and if it move with the larynx during deglutition, it is a *bursal cyst*; when tapped a glistening jelly-like fluid escapes. If the tumour be situated on either side of the trachæa or larynx, and it be found to rise and fall with the larynx during deglutition, it is a *thyroid cyst*. These cysts may be single or multiple; when tapped they may afford a clear glairy mucous fluid, or a dark red fluid containing altered blood pigment and cholesteroline. If the tumour be globular in outline, tense, fixed to the skin, and freely movable over all the deeper parts, it is a *sebaceous cyst*. The *dermoid*

*cysts* described on page 417 may form prominent swellings in the neck, and extend down under the sternomastoid muscle in connection with the sheath of the carotid vessels. They are distinguished by their depth, their immobility during deglutition, their extending into the floor of the mouth, and, if tapped, by the opaque fatty fluid that escapes. If the tumour correspond in position to a lymphatic gland, or be accompanied by signs of inflammation in the part, or in the spine, or if it be the sequel to a solid tumour which has softened down, it is to be diagnosed as a *chronic abscess*. The great majority of these abscesses are of lymphatic origin, occurring in young delicate subjects who show also enlarged glands or old scars. Where this is not the case, and the abscess is deep, and especially if pointing low down behind the sternomastoid muscle, a careful examination of the spine should be made.

(2) *Solid tumours*.—Those most commonly met with are *glandular*. (See page 283.)

If the tumour occupy the middle of the sternomastoid muscle, and is movable only with that muscle, and when it is relaxed, it is known as a *sternomastoid tumour*; this is met with in young children, as a congenital affection. Soft solid tumours, with ovoid or flattened lobules to be felt at one or more parts of the surface, will be recognised as *lipomata*. When occurring in the superficial fatty tissue they are more globular and prominent than in other parts of the body, and may resemble in shape sebaceous cysts. The author recently had under his care two congenital lipomata of the neck, one of which involved the clavicular head of the sternomastoid muscle, and grew also from the periosteum of the clavicle; the other was beneath the complexus muscle just below the occiput, and was closely adherent to the spine. He recently saw also a large



globular superficial lipoma which might have been easily mistaken for a sebaceous cyst.

A solid tumour in the front of the neck, below the larynx, or on either side beneath the sterno-mastoid muscle, moving with the larynx in deglutition, is a *bronchocele*.

When of very great size bronchoceles may lose their mobility with deglutition. The enlargement may affect any part or the whole of the gland, and the outline of the tumour varies accordingly. If the bronchocele is uniformly soft and elastic to the touch, it is known as a *simple bronchocele*; but if it is irregular in outline, with dense nodules or bands in it, it is a *fibrous bronchocele*; while if it pulsates, the pulsation being expansile and unaffected by raising the tumour away from the carotid artery, it is a *pulsating bronchocele*; this, when combined with exophthalmos, is known as *exophthalmic goitre*. The surgeon should feel carefully for fluctuating areas, which may be single or multiple; and which are diagnostic of *cystic bronchocele*. There is a tumour of the thyroid gland which is associated with growths (probably secondary) occurring in the bones of the skull, pelvis, spine, clavicle, etc.; this form is known as *malignant bronchocele*. The surgeon should specially notice whether there is evidence of pressure upon the trachæa, œsophagus, or recurrent laryngeal nerves.

**C. Pulsating tumours of the neck** form an important class. The surgeon must first of all decide whether the pulsation is inherent in the tumour or only transmitted to it, and if the former whether the tumour is an aneurism or a very vascular growth. The swellings liable to be mistaken for an aneurism are pulsating bronchocele, simple or cystic bronchocele lying over the carotid artery, and abscess over the carotid artery. A study of chapter xviii. will enable the surgeon to distinguish these various swellings with

certainty. But it may be here pointed out that bronchoceles move with deglutition; aneurisms do not. A pulsating abscess fluctuates readily, but is quite incompressible when the artery is compressed on the cardiac side of the tumour.

When the surgeon has decided that a given pulsating tumour is an *aneurism*, he must then determine from which artery the tumour springs. When occurring in the upper carotid triangle it will be at once recognised as a *carotid aneurism*; if limited to the posterior triangle it is equally easy to diagnose a *subclavian aneurism*, but when the aneurism is placed at the root of the neck in front it may be difficult or impossible to determine this point. The surgeon should learn, if possible, where the tumour first appeared; if between the two heads of the sterno-mastoid on the right side it is probably *innominate aneurism*; if internal to the sternal head it is probably *carotid aneurism*; if external to the interval it is probably a *subclavian aneurism*; this sign is not absolutely decisive, and in many cases the surgeon cannot obtain it. He must then study the pulse in the arteries beyond the aneurism, comparing it with those in the same vessels of the opposite side. If the pulse in the carotid artery and its branches is unaffected it shows that the aneurism is neither innominate nor carotid; similarly if the subclavian or brachial pulse is unaffected, it shows that the aneurism is neither innominate nor subclavian, and *vice versâ*. The pulse in either of these arteries may be affected by the tumour involving the parent trunk, by its occluding the mouth of the artery, by some portion of the sac compressing the vessel, or lastly, by a portion of clot plugging the vessel. Aneurisms of the arch of the aorta may extend up into the root of the neck.

In aneurisms at the root of the neck the surgeon



must carefully notice whether there is dyspnoea or respiratory stridor (either from pressure upon the trachæa or upon the recurrent laryngeal nerve) dysphagia from pressure upon the œsophagus, or irregularity of the pupil on the same side from pressure upon the sympathetic. Pressure upon the recurrent laryngeal nerve will be shown by paralysis of the abductor muscle of the same side and fixity of the vocal cord in the cadaveric position. In pure trachæal stridor and dyspnoea the larynx is immovable and the vocal cords will be seen widely abducted with each inspiration; the two forms of respiratory difficulty may co-exist, and it is very important to remember this when contemplating opening the trachea to relieve laryngeal obstruction.

D. A small congenital fistula or sinus in or near the middle line of the neck is a remnant of a *branchial fissure*. These fistulæ are most common close to the sternum; they may communicate with the trachæa or pharynx; this is shown by the escape of air or liquid.

E. **Rigidity of the neck** is a symptom which accompanies an important group of diseases. The head may be fixed in the upright position, or it may be inclined to one or other side.

(1) If the head be drawn down and rotated so that the chin is turned towards one shoulder and the occiput towards the other, and one ear is approximated to the clavicle, while the neck on that side is hollowed, and on the other convex, the deformity is known as *torticollis* or *wry-neck*. In many cases the deformity is *congenital*, and in these the face on the same side develops less rapidly than on the other side, the eye becomes oblique, and the cervical spine curved. If acquired, search must be made for its cause; in children, painful inflamed glands may be found beneath the sterno-mastoid muscle, or there may be a history of such; these cases may be distinguished as *inflammatory*;

in young women it is met with as a result of *hysteria*; in this form the muscular spasm may vary from time to time, subside altogether at intervals, and even change sides. Where any attempt at movement causes severe pain, and especially where neither of the above causes is present, suspect *caries of the spine*. (See page 439.) Another rare form of this affection is due to *paralysis* of one sterno-mastoid muscle, which will be recognised by the great wasting of that muscle and the ease with which the deformity may be at any rate partially corrected by the surgeon. Where the head is from time to time jerked into the position of wry-neck from clonic spasm of the sterno-mastoid muscle, it is distinguished as *clonic spastic torticollis*.

(2) If the head be fixed upright, or but slightly inclined to one side, or with the chin poked forward, the surgeon has to diagnose whether the condition is dependent upon disease of the spine or is "muscular rheumatism." The history of the case must be studied, whether the rigidity and pain came on gradually or suddenly, followed on injury or exposure to cold, and attention should be paid to the character of the pain, its exact seat, whether increased at night, or relieved by friction and warmth. The examination should be conducted with great gentleness and care. The patient being seated, the surgeon should place his hand flat on the top of the head, and gently press it vertically down, graduating the pressure, and watching for any expression of pain. Then grasping the head, with one hand under the chin, and the other below the occiput, he should steadily lift it, and ask whether that relieves the pain or not. Grasping the head again at the sides, he should gently rotate it to either side, and nod it to and fro, and notice whether and when rotation causes any pain. Then a careful examination of the spine should be made with a view of detecting any undue prominence of the cervical spinous processes or thickening



around them, and the pharynx should be examined for a retro-pharyngeal abscess. An abscess or sinus in any other situation of the neck will be noticed.

If the pain and stiffness have come on suddenly, or after exposure to cold, and if they be found to be relieved by heat and by gentle friction, and not to be worse at night, while gently raising or depressing the head on the spine does not give pain, it is probably *rheumatism*. The surgeon should then learn which active movements are most painful to the patient, and if he find that these very movements when passive are not painful, but that the opposites are, and if there be no sign of abscess, or protrusion of any of the cervical spines, this diagnosis will be established. The movements and manipulations must all be made without jar or shake, and in applying the test of the different effects of active and passive movements, the surgeon must be sure that the latter are really passive, and not partly active. If, for instance, a patient complain that he cannot actively extend the head without pain, but the surgeon finds that he can passively place the head in the extended position without pain, it demonstrates that the pain in the former case is not due to the position but to the agent, the muscle. Further, a muscle whose contraction is painful cannot be stretched without giving pain, and therefore when the head is well bent forwards so as to put these extensor muscles on the stretch, pain will be caused. The same phenomena are observed in the cases of "rheumatism" of the rotator muscles of the spine. When several muscles are affected some difficulty in diagnosis may be experienced, but with patience and care on the part of the surgeon, and docility and intelligence on the part of the patient, it is usually possible to come to a correct conclusion. In some cases great aid is afforded by observing the precise seat of pain and of tenderness,

and noticing that it is in the particular muscle contracting or stretched in the painful movements.

Where, however, the surgeon finds that the pain and rigidity have come on gradually, that the pain is worse at night, and is exaggerated by all movements; that pressure of the head down upon the spine gives pain, while raising the head relieves the pain or removes it altogether, he must diagnose *caries of the spine*. Should there be protrusion of the spine behind, swelling over the spine, or great local tenderness, or an abscess behind the pharynx or in the posterior triangle of the neck, the diagnosis will be rendered more easy and more certain. The surgeon should first try whether the simple nodding movement of the head is possible and painless; if so, it shows that the *occipito-atloid* joint is free from disease, while if any attempt at this movement causes great pain and great muscular spasm, while the other movements are more free, it indicates that this joint is diseased. If simple limited rotation of the head from side to side is painless, the *atlo-axoid* joint is not diseased, while if this movement, even to a small extent, is resisted, and is very painful, it points to disease of this articulation. When these two joints are found free from disease, but there is deformity or tenderness to vertical pressure and pain on carrying either nodding or rotation of the head beyond the degree possible in the two highest spinal joints, it shows that the disease is in the *lower cervical* vertebræ. Search should be made for evidence of syphilis in cervical caries. Retro-pharyngeal abscess must be regularly watched for in these cases. In disease high up in the cervical, swallowing a large morsel or taking a sudden deep inspiration may cause pain referred to the larynx or shoulder.