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OF THE

# HYOID OR TONGUE BONE.

BY THE SAME AUTHOR.

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ON THE

# DISEASES AND INJURIES

OF THE

# HYOID OR TONGUE BONE.


BY

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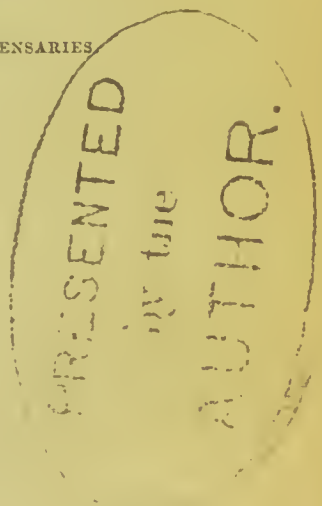


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1862.

# ADVERTISEMENT.

With the view of drawing the attention of the profession to the study of a hitherto neglected part of the throat, the following pages, chiefly reprinted from the *London Medical Review*, are humbly submitted in the hope that the author's efforts may meet with approval.

Portman Street, Portman Square,

*March*, 1862.

# ON THE DISEASES AND INJURIES OF THE HYOID BONE.

The belief is commonly entertained that the hyoid bone is rarely or never diseased, because it is one of those small bodies in the economy that is so protected in its position, that it remains to us intact. The constitutional vices of the system, also, are supposed to spare it, when other bones cannot escape. The extreme mobility of the tongue, as constantly occuring in speaking, and in deglutition, in place of being a predisposing cause to disease or injury, is thought to act as a protection to the peculiarly shaped body, which forms the basis of its support, and thus keeps it out of harm's way.

On reference to any medical or surgical work, diseases of the tongue-bone are wholly ignored; in a very few, perhaps two or three, fractures are briefly dwelt upon or merely referred to. The hyoid bone, therefore, although of much importance in some of the lower orders of the vertebrata, in which it is connected to the skeleton by bony media, and forms a very important and complicated apparatus, is looked upon in man as of secondary importance and unworthy of any special consideration.

This should not be so, for in the human economy this bone may justly be said to play a very important part, both in relation to speech, and as an intermediate basis of support between the tongue and the larynx. The perfection of its simplicity is to be seen in man. It is subject to various diseases and injuries, which, although comparatively infrequent, yet are of that urgency and importance, when they do arise, as to require much diagnostic skill and attention to recognise, and some care to treat. An attempt, therefore, for the first time, to give an account of the diseases, displacements, and injuries of the tongue-bone—to pioneer the way as it were—cannot but be of advantage, and I should not have felt myself competent for the task, had not this and other parts of the throat and neck occupied my earnest attention and study for some years.

I hope to show that there are many anomalous symptoms referred to the throat by the sensations of the patient, which have been attributed to the larynx, and *post-mortem* inspection, has proved the normality of the latter. If the examina-

tion had been pursued further, a little careful dissection would have revealed that the cornua of the hyoid bone were so implicated as to give rise to the symptoms which were complained of during life.

In thus drawing attention to the hyoid bone, many obscure affections of the throat will be hereafter better understood; we shall have a rational basis to go upon for treatment, with the hope of either perfecting a cure or of affording much relief.

It shall be my endeavour to show, also, in connection with the subject, the influence of disease of the neighbouring parts upon this bone, and upon the larynx, of which it forms the superior protecting boundary.

It will be convenient to consider its various diseases and injuries in the following order :—

Diseases.

1. Inflammation and its consequences, such as necrosis and expulsion.
2. Sub-hyoid abscess.
3. Thyro-hyoid inflammation and abscess.
4. Thyro-hyoid cysts.
5. Osseous tumours of the hyoid bone.
6. Tumours springing from the hyoid periosteum.
7. Eburnation of the hyoid bone.
8. Diseases of the thyro-hyoid articulation :
   *a*. Relaxation of the ligaments producing dislocation.
   *b*. Hydrarthrosis.
   *c*. Anchylosis.
   *d*. Spontaneous rupture of the ligaments.
9. General displacement of the entire tongue-bone.
10. Disease of the bone, or its periosteum by extension from the tongue and neighbouring parts.
11. Hyoid neuralgia.

Injuries.

1. Fracture of the bone.
   *a*. Fracture from manual violence.
   *b*. Fracture from accidental causes.
   *c*. Fracture from hanging.
2. Laceration of soft structures attached to the hyoid bone.
3. Wounds of the hyoid bone.

## I. INFLAMMATION AND ITS CONSEQUENCES, SUCH AS NECROSIS AND EXPULSION.

Like other bones in the body, the tongue-bone is subject to inflammation of its substance and its periosteal covering. This, perhaps, is one of the most general affections of this little bone.

It may arise in the progress of constitutional syphilis, of scrofula, and of tuberculosis. That this is correct, examples which have been noticed, fully tend to confirm. Some of these shall be presently given.

In the true syphilitic disease, the primary inflammation is periosteal, which, according to its progress and extent, cuts off the supply of arterial blood to the body of the bone, which then dies; and, if the patient be not suffocated, he fortunately escapes by the expulsion of the necrosed bone, sometimes in its entirety, at other times, one-half of it only. The latter would seem to prove, therefore, that now and then the necrosis is limited to one-half of the bone. The following is a good example of it, preserved in the Museum of the Royal College of Surgeons.

*Necrosis and exfoliation of the left half of the hyoid bone.*

Sp., No. 1832, *Cat. Path.*, Vol. IV., "The left horn of an os hyoides expectorated after necrosis and exfoliation."

"The patient, a woman, 28 years old, laboured under dyspnœa for a fortnight, and it became at last so urgent as to threaten suffocation. Tracheotomy was performed, and gave immediate relief. On the thirteenth day after the operation, the patient, in a violent fit of coughing, discharged this portion of bone. She afterwards recovered." — *From the Museum of Robert Liston, Esq.*

It resembles necrosed bone in appearance, and, in some parts, is quite porous; it is hollow for the greater part of its extent, and I have no doubt, when expelled, the periosteum of the new bone was left entire. The accompanying sketch shows its natural size.

There is no history of syphilis from the description given above, and I am disposed to believe that it was an instance of idiopathic inflammation.

In 1844, M. Rozart, of Bordeaux, brought before the Academy of Medicine of Paris, an instance of

*Spontaneous Expulsion of the Hyoid Bone.*

The patient who was the subject of this remarkable case, was an unmarried lady, 36 years of age, of rachitic (scrofulous) constitution, although enjoying good health, and was seized with cough and difficulty of respiration, accompanied by submaxillary glandular swellings. These symptoms gradually became more intense; fits of suffocation, colliquative sweats, and general marasmus ensuing. She often expectorated purulent sputa without coughing. Her state seemed hopeless, when, five years from being first attacked, she threw up, in a

convulsive fit of coughing, a bone, which was found to be the hyoid, in a state of caries (necrosis). All the abnormal symptoms then rapidly disappeared, and she soon recovered her health. The shape of the neck was modified, being flattened and widened.*

This case again, was an example of idiopathic scrofulous inflammation and not syphilitic, and from the account given we do not know whether the whole or part of the hyoid bone was expelled. I am disposed to believe it was the whole or greater part of the bone, in consequence of the flattening of the neck afterwards. Here then are two instances wherein the cause was not syphilitic.

It is unfortunately a too prevailing error to set down a great many throat affections, as the consequence of syphilis, when such disease is not present; cases of the kind come under my notice almost every other day, and I find that the patient's general health is occasionally very bad from the treatment which has been pursued (chiefly mercurial), under the belief that the throat disease was syphilitic.

The following case which I had the opportunity of seeing, most strongly simulated syphilitic ulceration of the fauces, but beyond the throat affection there was no evidence to prove that the patient had ever suffered from that malady. She had the appearance of a strumous, ill-nourished female, and I will venture to assert had an attack of follicular disease of the fauces proceeding to destruction of tissue; there was no history of any attack of diphtheria, although I have seen examples with considerable loss of parts of the velum, uvula, and tonsils, which looked like the ravages of a terrible venereal throat. The patient of Mr. Bryant's died, and I had the good fortune of carefully examining the parts of the throat which he exhibited before the Pathological Society.

The account of the case I take from the "Transactions of the Society," Vol. XI.

*Necrosis of the os-hyoides, with ulceration of the pharynx.*

The patient was a girl, aged 22, admitted under Mr. Bryant into Guy's Hospital. She was a pale, attenuated-looking person, who had never experienced good health, but had no definite complaint or illness.

Three weeks before coming under observation, she was attacked with an ulcerated throat, which gradually became worse; but when seen there were no symytoms of laryngeal mischief. The ulceration of the throat was very extensive, involving the whole soft palate and the posterior wall of the pharynx. The uvula had entirely disappeared.

* *The Lancet*, Vol. I., 1845, p. 7.

Regarding the case as one of syphilitic origin, careful inquiries were instituted; but no other questionable symptoms were present, and no history of it could be obtained, the girl denying most positively having been in the way of contracting such a disorder.

Tonics and local stimulants were given with apparent advantage, as the soft palate cicatrized. Upon the third day after admission, some huskiness of voice appeared, accompanied with difficulty of deglutition. Stimulants and liquid nourishment were freely administered; but the patient gradually sank, six weeks after the first appearance of the disease, and three weeks after her admission into the hospital, having for a few days previously been confined to her bed from pneumonia, but unaccompanied with any laryngeal obstruction.

*Post-mortem Examination.*—Extensive pneumonic consolidation existed of a low type, having evidently been the primary cause of death. The walls of the pharynx, base of the tongue, and the whole of the upper part of the larynx down to, but not involving the vocal cords, were covered with ulceration. The two greater cornua of the os-hyoides were projecting and necrosed, one being loosened from the body of the bone. The epiglottis had disappeared, with all the folds of the mucous membrane of the larynx above the rima.

Upon examining the genitals for any signs of syphilis nothing could be detected. The vagina was small, and a partial hymen was present. The uterus was also in a healthy condition. The skin was clear, and free from stain, and the inguinal glands were also natural. Upon the whole no one fact could be obtained, with the exception of the character of the pharyngeal ulceration, to support the opinion that the case was one of syphilitic origin, and it remains a question whether the primary seat of the disease might not have been located in the os-hyoides, and the extensive ulceration be produced as a secondary result.

I quote with much pleasure Mr. Bryant's observations on the possible nature of the disease, and would solve his question in this way:—The hyoid and general throat disease were simultaneous, because it is impossible to imagine that the extensive ulceration which was present could have had time to succeed to the hyoid disease had it been primary, that is to say, if the early history of the patient be correct.

An examination of the preparation (No. 1685[10]) since it has been preserved in spirit in the museum of Guy's Hospital, has, moreover, convinced me, that had the patient lived a little longer, both of the greater horns of the bone would have been

expelled; and I am most firmly persuaded that the patient never was the subject of syphilis.

In the *Cyclopædia of Anatomy and Physiology*, at the conclusion of the article Tongue, is a brief notice of an instance of

*Necrosis of the Hyoid Bone*,

which is thus described by Dr. Hyde Salter.

"The only instance of disease of the hyoid bone with which I am acquainted, is one related by Mr. Spry. The disease was necrosis, the result of extended ulceration, which commenced in the throat, and continued till the bone was laid bare and dead. It was then *expectorated entire*. The patient died several weeks afterwards. The bone was entirely deprived of periosteum, irregular on its surface, and in a perfect state of necrosis."

I have been unable to lay my hand on the original account of Mr. Spry, but imagine it was not the result of syphilis, else it would have been mentioned by such an acute observer as Dr. Salter. The importance of this case consists in the destruction of the *whole* of the hyoid bone, which was expelled entire. Although the case terminated unfavourably, I assume that a new hyoid bone was in the course of formation from the remaining periosteum. My reason for this belief is the analogy which subsists between the periosteum of the lower jaw and that of the hyoid bone; in the former the entire bone has been regenerated by this membrane, and it is but fair to conclude that the same phenomenon takes place when the tongue bone is expelled by natural efforts.

There is a very important preparation in the museum of St. George's Hospital, in which the left inferior horn of the hyoid bone is denuded of periosteum, and apparently in a state of necrosis from syphilitic disease. It is described in the catalogue as follows, but the heading is my own:

*Extensive ulceration of the fauces and neighbouring parts, exposing the left cornu of the os hyoides from syphilis.*

"Specimen showing extensive ulceration of the fauces and adjoining structures, especially on the left side, the glottis being much affected and the hyoid bone quite exposed and projecting from the ulcerated surface. The epiglottis is completely destroyed. History: The specimen was removed from the body of a patient, who was admitted into the Lock Hospital with secondary syphilis, and died there. Presented by Sir. B. Brodie." (Series 30. sub series 12. b. 2.)

On looking at the specimen, more important changes have occurred than are even described in the foregoing account, for

the ulcerative disease has been so extensive as to completely denude and expose the entire left greater cornu of the hyoid bone, which projects backwards, and no doubt in a little time would have been wholly detached and expelled. About two lines above its origin is seen a piece of bone, which probably may be the body of the os hyoides itself. For the amount of destruction of tissue and general ravages of the syphilitic disease, I have seen no specimen so remarkable as this.

Here we have a clear history of syphilis, the patient had extensive ulceration of the throat during life which involved the hyoid apparatus, I will not undertake to say by extension of the disease, for very probably the cornual periostitis was coeval with the mucous ulceration.

There is a preparation in the museum of the College of Surgeons, which I would consider an

*Illustration of how syphilitic or other disease may extend to the os hyoides.*

(No. 1856, vol. iv. *Path Cat.* R.C.S. "A larynx and tongue from a negro. The epiglottis is deficient, having been probably destroyed by syphilitic ulceration. The surface of all the membrane between the root of the tongue and the upper part of the larynx is uneven, but polished, and depressed like that of a cicatrix. On the left side, opposite the cornu of the os hyoides, there is a deep oval depression, with a smooth base, resembling the cicatrix of an ulcer. *From the museum of Joseph Taunton, Esq.*"

I have seen other specimens like this in some of the museums, and believe that it shows how the disease may extend sometimes to the hyoid bone in syphilis. In this preparation also, it would seem as if the ulceration had at one time actually extended to the horn of the hyoid, and had subsequently healed.

*Necrosis of the right horn and half of the body of the os hyoides, from syphilitic ulceration of the tongue.*

Whilst preparations and examples among the living are very numerous, of destruction of the tongue, particularly its base, from cancer, solutions of continuity from other diseases are by no means so frequent. One of the most striking examples that I have as yet come across, however, of the latter, is preserved in the museum of St. Thomas's Hospital. It consists of the larynx, trachea, and tongue. (W. 30).

"The destruction of the mucous membrane, and of the muscular structure at the root of the tongue, is very great. The epiglottis and the arytenoid cartilages, with their connecting folds of membrane are nearly destroyed; and the mem-

brane of the upper part of the larynx is much ulcerated. From a person affected with syphilis." *Cat. of Mus.*, vol. 3., p. 12.

The ulceration has evidently spent itself on the right side of the tongue, which has been hollowed out into a cavity, exposing the inner surface of the right horn and half of the body of the os hyoides, which are denuded of periosteum and evidently in a state of necrosis. I think it probable that the disease primarily existed in the tongue and thence extended to the hyoid bone; yet it may have simultaneously attacked the structures at the root of the tongue, upper part of the larynx, and periosteum of the hyoid bone.

In 1855 there was a male patient in the surgical wards of University College Hospital, who was the subject of

*Necrosis of the hyoid bone from syphilis,*

which was diagnosed during life. He was a painter, and suffered from syphilitic laryngitis, with destruction of a part of the soft palate; on introducing the finger into the back part of the mouth, a distinct, rough, hard projection could be felt, corresponding to one of the inferior cornua of the hyoid bone situated towards the base of the tongue. This was diagnosed to be necrosis of the hyoid bone. The dyspnœa became so great that laryngotomy was performed, and the man ultimately recovered. A portion of the denuded bone must have been expelled, although unknown, perhaps, to the patient himself.

Besides the diseases which have been already described, the hyoid bone is attacked with inflammation as the result of the extension of carcinoma (usually ulcerated) involving the base of the tongue. As examples of this are very numerous in our museums, I shall reserve its consideration for a separate section.

## II.—SUB-HYOID ABSCESS.

The neck is subject to various and deeply situated abscesses in the areolar structures, the result of inflammatory and other causes, which require, in many instances, great skill on the part of the surgeon to make out. With these it is not my province to dwell, unless in so far as they may involve the tissues in the vicinity of the hyoid bone, and thence by extension implicate both it and the larynx. Cases of this kind occasionally present themselves to our notice; the symptoms are of the most urgent and distressing character, and frequently prove fatal. The following example is one in illustration of

*Abscess of the neck, communicating with the pharynx, and exposing the hyoid bone and larynx.*

The preparation is to be seen in the museum of University College Hospital. It is one of an interesting nature, and labelled, "Specimen of abscess of the neck, communicating with the pharynx; ossification and necrosis of the thyroid cartilage." The importance of not only making a more careful examination, but also of giving a more detailed description, will be seen from what now follows. It is one of the most instructive specimens it has fallen to my lot to examine, and it beautifully illustrates the ravages of an abscess in the neck. It has laid bare the upper part of the thyroid cartilage, which seems to be calcified, and probably necrosed. Hanging over, and almost overlapping the upper border of this cartilage, is what has been mistaken at first sight for a piece of necrosed cartilage projecting from the bottom of the ulcerated parts. Careful examination, however, reveals the small but still prominent lesser cornu on the upper surface of the right half of the body of the hyoid bone completely laid bare, and probably denuded of periosteum, so far as can be judged from its appearance in the spirit. The remaining part of the anterior of the body of the hyoid bone, namely, its left half, hangs down somewhat in front of the thyroid cartilage, and looks as if it were detached from the right half by a fracture; this can only be determined, however, by an examination of the preparation out of the jar. During life, all these parts, most probably, were bathed or soaked in pus.

The gratification which I experienced in deciphering the hidden mysteries of this valuable preparation (No. 2,264), if it may be permitted me thus to express myself, can only be compared to the satisfaction I have derived when making the discovery of some rare and beautiful fossil amongst a heap of stony fragments. And although my research throughout the London museums was rewarded by many other discoveries, yet none possessed the importance attached to the preparation just alluded to.

In chronic abscess of the neck, the matter may exist on either side of the larynx, extending from the hyoid region downwards towards the entrance of the chest. There is one form of abscess, however, which is now and then to be met with immediately beneath the body of the hyoid bone, and it has been called *sub hyoid abscess* by Jamain, in his "Manual de Path. et de Clin. Chir.," t. 2, p. 84.* It assumes an importance according to the depth at which it is situated. When superficial, it is readily recognised, and calls for no other treatment

* It is also noticed in Nélaton's Path. Chir.

beyond early puncture. If deep seated, on the other hand, it has a tendency to extend to the mouth and pharynx, in consequence of the resistance presented to it in front. The following are the symptoms :—

"Heat, painful distension of the sub-maxillary region, and even of a part of the cheek ; an uneasiness in the movements of the jaw and tongue ; swallowing and speech painful. Fluctuation can only be distinguished with great difficulty, and at an advanced stage of the disease. It often opens spontaneously into the mouth."

The treatment recommended for this is of an antiphlogistic character at the commencement, poultices, &c. I would advise two or three leeches as early as possible. When suppuration, however, has become established, an incision should be made to evacuate the matter as early as can be, so that the cicatrix may be less visible than if the abscess is allowed to evacuate itself spontaneously.

## III.—THYRO-HYOID INFLAMMATION AND ABSCESS.

Inflammation and abscess of the thyro-hyoid region, have been particularly described by Sestier and Vidal. The precise seat of origin, according to both, is a mass of cellular tissue occupying a space behind the thyro-hyoid membrane, close to the base of the epiglottis. The suppurative inflammation of this part of the throat may be either idiopathic, or symptomatic, of an affection of the tongue, of the epiglottis, or of the thyroid cartilage, and leads to an œdematous infiltration into the neighbouring parts, the sub-epiglottic areolar tissue, and in that of the arytæno-epiglottic ligaments, and forces the epiglottis upon the superior orifice of the larynx. The importance of this form of abscess will be seen when the subject of cysts and inflammation of the hyoid bursa comes up for consideration.

A thyro-hyoid abscess may be known by the presence of aphonia, difficulty of inspiration, turgescence of the face, intense dyspnœa, acute pain in the thyro-hyoid region, and by the distress experienced in swallowing and speaking.

According to M. Nélaton, this abscess extends towards the mouth, and it is probable that with the finger introduced into that cavity, the projection of the abscess may be felt in the situation between the base of the tongue and epiglottis.

The treatment recommended for this affection consists in local and general blood-letting, emetics and mercurial frictions, at the commencement of the attack. If pus is present, an incision must be practised through the thyro-hyoid membrane, between the os hyoides and thyroid cartilage. To this operation M. Vidal has given the name of *bronchotomie sus-laryn-*

*gienne*, but I think the most suitable term amongst English surgeons would be *supra-laryngotomy*.

I believe that both the sub-hyoid and thyro-hyoid abscess is more common than is supposed, and I am satisfied that such cases have come under my notice after the abscess has burst into the mouth at the base of the tongue. On reference to my notes, I find several instances in which there was deep and ragged ulceration in the hollow on one or other side of the base of the tongue, which secreted a good deal of pus, and the symptoms much resembled those already described.

When the abscess has pointed in the hollow at the base of the tongue, it is possible to see it with the laryngoscope, besides feeling it with the point of the finger, in which case it would be more convenient to puncture it in that situation. It is astonishing with what facility the parts at the base of the tongue, anterior to the epiglottis, can be examined with this instrument, which now renders easy the diagnosis of many affections which were hitherto obscure.

In the site of the mass of areolar tissue, previously referred to, namely, in the upper part of the thyro-hyoid space, in this tissue (erroneously called epiglotidean gland by some) a small lymphatic gland has been found in the young subject, and in delicate children. Professor Harrison has frequently met with a small tumour in the same place, a locality which this accomplished anatomist considers not uncommonly the seat of suppuration, which he asserts is occasionally very dangerous.*

In the "Boston Medical and Surgical Journal," for May 9th, 1861, page 308, is a case called

*Abscess in front of the larynx*,

which I am satisfied, from perusal of the details, was thyro-hyoidean. The case occurred in the practice of Dr. Seaverns, of Jamaica Plain, and was brought before the Boston Society for Medical Improvement. The patient was a stout labouring man, of intemperate habits, aged 26, in whom an abscess extended from the hyoid bone downwards, and irregularly over the greater part of the region of the thyroid cartilage, a piece of which lay loose in its cavity. The larynx was much swelled, especially above the left vocal cord, but no opening into it from the abscess could be found.

## IV.—THYRO-HYOID CYSTS.

M. Nélaton has received the credit of being the first to call attention to this variety of tumour of the neck, under the name of *sub-hyoidean ranula*. Many years back, however, Mr.

* "Dublin Dissector," vol. 1, p. 61. 1847.

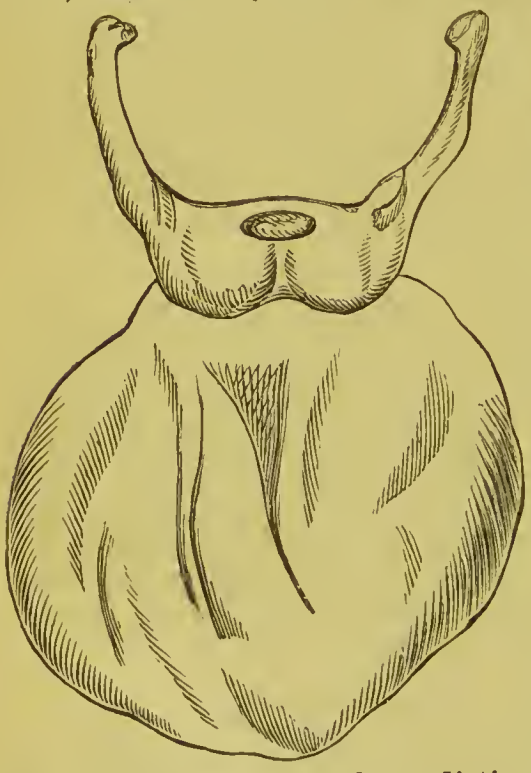
Liston described these cysts in a course of lectures "On the Operations of Surgery," which appeared in the first and second vols. of the "Lancet" for 1844, and he is unquestionably entitled to all the merit of having first described them. I shall quote the paragraph entire in which they are mentioned:

"Occasionally we see watery tumours of the neck, what have been called hydroceles of the neck; they sometimes lie in the middle of the region, and may depend on an enlargement of the bursa between the thyroid cartilage and the os hyoides. Acute inflammation of this bursa occasionally takes place. An old fellow-pupil, Mr. Mackenzie, the demonstrator of anatomy in the Edinburgh University, used to suffer from this affection, and very troublesome it was to him now and then. It was he who pointed out to me this synovial pouch. These tumours sometimes increase slowly, and bulge out on the lower part of the neck. There is a very good specimen of this disease in the museum of the College of Surgeons; there is a large sac attached to the hyoid bone."

This interesting and most curious specimen I had the opportunity of inspecting in the college museum, and made the accompanying sketch of it.

*Cyst springing from the depression on the inner or posterior surface of the body of the hyoid bone.*

Vol. I., Pathology, p. 64, No. 148.—"An os hyoides, with a round, thick-walled, membranous cyst, more than two inches in diameter, attached to the posterior surface of its body. The cyst was loosely connected to all the surrounding parts, and full of brownish yellow, thick, grumous, honey-like fluid, containing abundant crystals of cholesterine.



"From a sailor between fifty and sixty years old, in whom it has existed nearly as long as he could remember. It was covered by the sterno-hyoid muscle."—*From the Museum of Robert Liston, Esq.*

The body of the bone is wider than natural from above downwards, and seems somewhat expanded out. The general concavity of its posterior surface is considerable, and it is from the upper part of this that the tumour took its origin. The walls of the cyst seem firm, and in some parts have distinct yellowish white layers as if from calcareous deposits. It is well worthy of inspection.

It was not until after I had examined this very rare prepa-

ration that I referred to Liston's writings, and I could not come across an account of it either in his "Elements," or his "Practice of Surgery." A reference to his lectures published in the "Lancet" was more successful. The one in the second vol. for 1844, which includes diseases of the neck, is full of original and practical information, and should be read and studied by every physician as well as every surgeon. In former years I derived many useful hints from the perusal of these lectures.

In the College Museum there is another preparation which comes within the same category, and I introduce a notice of it here.

*Enlargement of the thyro-hyoid bursa.*

No. 1861. Vol. IV., p. 38, *Path. Cat.*—"Part of a larynx, of which the mucous membrane above the vocal ligaments is beset with minute superficial ulcerations. At the posterior extremity of the left laryngeal ventricle there is a deep, probably tuberculous, ulcer, exposing a part of the arytænoid cartilage. The bursa on the front of the thyro-hyoid membrane is enlarged."—*From the Museum of Robt. Liston, Esq.*

The bursa will admit a small marble. But here I would observe that when inflammation or abscess has been found in the thyro-hyoid region, corresponding to some of the parts which have been already described, there is a tendency towards the formation of cystic tumours. An inflammation of the hyoid bursa in many instances will not end in suppuration, but in dropsical enlargement, the tumour or cyst forces its way through the thyro-hyoid space, and hangs downward in front of the thyroid cartilage beneath the skin. I have reason to believe that a preparation which I examined in the museum of the Charing Cross Hospital, is an example of the kind; the tumour is as large as a small orange, and was taken from a child, but there is no distinct history of the case during life. The tongue, larynx, and cyst are preserved together.

It is but fair to M. Nélaton that I should give his description of the thyro-hyoid cyst, as his observations, no doubt, were made independently of those of Liston.

"This tumour," he observes, "is situated in the median line, beneath the base of the hyoid bone; it forms at this part a projection as large as the half of a hazel-nut; it is sufficiently hard and fluctuating; remains a long time stationary, and then the skin which covers it commences to redden; it becomes very thin, is perforated, and the opening allows a muco-purulent fluid to escape. When the tumour is punctured before the appearance of the inflammation of which I have spoken, the liquid that flows is transparent, viscid, and resembles that which we find in the greater number of ranulas. When the sac is emptied, either by puncture or spontaneously, the oozing of muco-purulent fluid becomes perpetual, and there remains in the thyro-hyoid region a fistula very difficult to cure. If this fistula is probed, we find that it extends much further than might be presumed at first; it recedes among the muscles in the sub-hyoid region, and its extremity corresponds to the base of the epiglottis."—*Elem. Chir. Path.*, tom iii., p. 383.

A careful study of the structures in this particular part of the neck leads to the question, What is the true origin of these cysts? Without doubt the greater number spring from the hollow at the posterior part of the centre of the body of the hyoid bone, from the loose patch of areolar tissue which fills up the space. Such was clearly the origin of the cyst in the sailor under Mr. Liston, of which a drawing has been given. Occasionally the bursa between the hyoid bone and thyroid cartilage is the seat of the cyst, as was believed by Boyer* and Malgaigne. Beclard described a bursa in front of the thyroid cartilage as the seat of it. Jamain believes, from the nature of the fluid contents, which he says is mucous rather than serous, and the prolongation of the fistula as far as the base of the tongue, that the cyst is formed by the enlargement of a sub-mucous follicle, rather than by any of the other structures mentioned. Possibly in some cases cysts may arise in that way, but to maintain that all do so, would be most unphilosophical, for we have already pathological evidence sufficiently strong to prove that these thyro-hyoid cysts arise from the other different parts described, and they have been noticed at birth.

When the nature of these cysts is readily made out, the treatment comes up for consideration. This may be briefly summed up. Excision is not to be attempted, as it is almost impossible sometimes to say where they may lead to, and a partial operation for removal is highly objectionable.

It is recommended to treat this small tumour in a similar manner to ranula properly so called. Evacuation of the contents by puncture, and the injection of iodine, seems to be the best mode of treatment when the tumour extends to some depth, and is disposed to transform itself into a mucous canal, of which the obliteration is very difficult, and which cannot be attained but with great suffering from the use of caustic.

I have seen congenital serous cysts in the lateral regions of the neck treated in this way with success at St. George's Hospital, and feel satisfied that iodine injections will be equally successful in curing cysts in the thyro-hyoid region.

Since writing this paper I have come across an instance of congenital cyst in front of the neck of a child two years old, which was successfully extirpated by M. Drittl. It reached from the chin to the sternum, and outwards on both sides of the median line beneath the sterno-mastoid muscle. Its extir-

* The passage in Boyer's work in reference to these tumours is this:—"It forms sometimes between the os hyoides and thyroid cartilage, upon the membrane which unites them behind the thyro-hyoid muscle and the platysma myoides, constituting an encysted tumour filled with a yellowish viscid matter. This tumour acquires a certain size before it is apparent, and elevates the parts which cover it; it may exist for a long time without considerable volume or causing any inconvenience, but it is an object of deformity, especially in women, and patients are very anxious to get rid of it."

pation, it appears, was difficult, on account of its connexion with the hyoid bone, the larynx, and trachea. From this I infer that the tumour was thyro-hyoid at birth, and in the course of its growth it became adherent to the larynx and trachea. The operation was a bold one, and the child made a rapid recovery.*

## V.—OSSEOUS TUMOURS OF THE HYOID BONE.

Dr. John C. Warren relates, in his "Surgical Observations on Tumours," the following :—

"A man came to my late father with an exostosis of the right cornu of the os hyoides, of a sugar-loaf form, about three inches in height. My father dissected the tumour to the os hyoides, exposed this bone, sawed it off near its base, and thus succeeded in curing the patient speedily and effectually."—p. 117.

Of all the diseases of the hyoid bone, exostosis seemed to me to be almost an impossible occurrence, and yet I came across the above example described by Dr. Warren. It is probably the only case of the kind on record, and therefore interesting, not only from its rarity, but also from the size which the bony tumour had attained.

## VI.—TUMOURS ORIGINATING IN THE HYOID PERIOSTEUM.

A study of all the preparations of tumours involving some part of the neck, preserved in the London museums, has led me to adopt a distinct class for growths originating in, or springing from, the periosteum of the hyoid bone. This membrane is a fertile source for the origin of tumours in other parts of the body, and that covering the hyoid bone is so likewise to some extent. It is to be feared, however, that the great majority of those springing from the latter will be found malignant. The following examples have been selected as affording strong presumptive evidence of their having originated in the situation described: two are medullary cancer, whilst the third appears to be simply fibrous. When more care is adopted in the *post-mortem* dissection of diseases of this part of the throat, it is not improbable that by-and-bye many such examples as the following will be met with.

*Cancer of the Tongue projecting backwards from the body of the hyoid bone, and pressing the epiglottis flat upon the glottis.*

There is a remarkable preparation in the museum of St. George's Hospital, of "Extensive Carcinoma of the Tongue and neighbouring parts." (*Ser.* 29 ; *sub ser.* 1, h. 3.) The specimen consists of a portion of the upper jaw with the

* Year Book of Med., &c., for 1859. New Syd. Soc.

tongue and larynx. A section of the tongue and larynx is shown, and it represents the growth of a mass of medullary cancer extending from the body of the hyoid bone backwards on a level with the greater horns, to the extremity of their terminations, and pressing the epiglottis flat upon the glottis, but still leaving space for the admission of some air. The posterior part of the tongue, at its origin from the hyoid bone, seems to be especially affected. The mucous membrane of the lateral part of the mouth and fauces is also extensively engaged in the disease.

*Medullary tumour developed within the base of the tongue, pushing the hyoid bone towards the thyroid cartilage.*

This is a preparation which shows the influence of a tumour developed within the base of the tongue, upon its osseous support; in the present instance it is pushed towards the thyroid cartilage. It is described in the catalogue of the museum of St. Bartholomew's Hospital as—

"A tongue, with the larynx and other adjacent parts. A large medullary growth, formed in the base of the tongue, has been exposed by a section carried through the right side of the tongue from before backwards. Part of it has softened, and the centre of its surface has ulcerated, forming a large ulcer with elevated, sinuous, and everted margins. The larynx has been œdematous; its mucous membrane is wrinkled."—(*Series* 23, No. 19.)

*The hollow of the hyoid bone filled in with a fibrous tumour.*

This is a preparation in the museum of St. George's Hospital, which consists of a fibrous tumour connected with the surface of the back part of the tongue, filling in, as it were (so far as I can distinguish through the spirit), the body of the hyoid bone. The epiglottis appears to have been destroyed by ulceration.—(*Ser.* 29; *sub ser.* 1, i. k.)

## VII.—EBURNATION OF THE HYOID BONE.

This is a rare form of disease (?) of this bone, and the only example of it with which I am acquainted is illustrated by a curious specimen that came under my notice in the museum of the College of Surgeons. It is numbered 1,830, and is described in the fourth vol. of the Pathological Catalogue, as

"The half of an hyoid bone, completely ossified."—*Hunterian.*

On close examination, the bone seems to have become converted into a very hard and compact substance, and greatly differs from ordinary specimens. No doubt this attracted the attention of John Hunter, who preserved the specimen. I am at a loss to explain this condition, for I do not observe that there are additional nutritious foramina. As the anatomist is aware, the hyoid bone is supplied with special branches to its

upper and under border. The *superior hyoidean* artery is a small and irregular branch derived from the lingual in its course to the base and tip of the tongue. The *inferior hyoidean* artery is also a small and irregular branch derived from the superior thyroid, and is distributed to the lower border of the hyoid bone and adjacent muscles. In connection with the arterial supply of this bone, it may be mentioned that the hyoid branch of the superior thyroid is often very small, or even absent altogether; and the hyoid branch derived from the lingual is not unfrequently deficient. Mr. Quain has observed, in his truly great work on the arteries, that generally when a hyoid artery of good size is given from the lingual, the thyroid supplies none, or a very small one, and the converse. See plates 3, 8, 10, and 11, of his work, in which different conditions of the hyoid arteries are illustrated.

Perhaps I might say that the minute foramina in the preparation under consideration, are more numerous than usual. In health, the middle part of the body of the hyoid bone, together with the larger extremity of the greater cornua, are somewhat cancellous, and contain much areolar tissue, whilst the remainder of the bone is more compact. Here all appears as if a piece of ivory. Could this condition be called syphilitic or gouty eburnation? Conjecture leans to the former.

## VIII.—DISEASES OF THE THYRO-HYOID ARTICULATION.

### *(a) Relaxation of the Ligaments producing Dislocation.*

When we reflect upon the complicated movements of the tongue, and of the part that the hyoid or tongue bone plays in their performance, it might seem, at first sight, especially to those versed in the minute anatomy of this bone, somewhat novel and surprising that it could by any possibility become dislocated. Nevertheless, such is the fact; and a displacement of one or both of the cornua or horns of the bone is, perhaps, of more frequent occurrence than is imagined. This little bone is attached to eleven pairs of muscles, which are its elevators and depressors; it forms the base of attachment to numerous muscles in the neck, and is the principal support to the tongue itself. The extremities of the greater horns of the bone, and the superior horns of the thyroid cartilage, are connected together by two round cords, which are known as the *thyro-hyoidean ligaments*. Usually they contain cartilaginous or osseous grains, which represent sesamoid bones in other situations, the knee cap for example. An acquaintance with these facts is essential for the comprehension of the diseases of this articulation. The superior cornua of the thyroid

do not possess synovial membranes, nor capsular ligaments, as in the slightly moveable arthrodial joints, formed by the articulation of the inferior cornua with the cricoid cartilage, but, owing to a natural weakness of the parts, or a general relaxation of the throat muscles, the greater horns of the hyoid bone are liable to become dislocated, and most materially interfere with the movements of the throat and general comfort of the person so affected. Moderate violence will give rise to the same thing. Instances of each have come under my notice. The consequence of this is the formation of an abnormal pouch, or synovial capsule, around the thyro-hyoid articulation, which is liable to assume the diseased conditions of the natural joints.

In illustration of this, I exhibited a preparation before the Pathological Society of London, in April, 1859, which I had removed myself from the body and carefully dissected. The case is published in the tenth volume of its transactions, and the interest and importance attached to it have been such, that it has been particularly quoted in some late works, amongst others, the second volume of "A System of Surgery," edited by Mr. Holmes, in the article on "Injuries of the Throat," written by the late Mr. Henry Gray. The following is a brief outline of it :—

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

A man, 45 years of age, consulted me several times about his throat. He would feel a sudden click in the *left* side of his neck, which produced a sensation as if something was sticking in the throat. On examination, this appeared to me to depend upon a displacement of the left horn of the hyoid bone, and was generally reduced by throwing the head backwards towards the *right* side, so as to stretch the muscles of the neck, and then suddenly depressing the lower jaw, and so putting the depressors of the hyoid bone into operation. He died some years after of pulmonary consumption. On examining his throat after death, I found a sort of pouch which answered the purpose of a synovial capsule, embracing the horns of the left thyro-hyoid articulation. It was filled with a clear fluid, had a comparatively large, rhomboid, sesamoid bone developed in its outer wall, and permitted an extraordinary amount of motion.

I regret now that I did not make an examination of the fluid contents of this capsule, more particularly in regard to the presence of albumen. Should another opportunity be afforded me in a similar instance, I shall not allow it to escape.

The condition of the parts in the foregoing case readily explained the symptoms present during life. It made the fourth example which had come under my notice, but I have since met with dislocation of the same part in a female during the past summer, of which I shall presently speak. I might here add that the styloid processes were remarkably long in the case just narrated, and so also were the lesser cornua of the hyoid bone; the stylo-hyoid ligament connecting the two was natural, and did not contain any ossific deposit, as is sometimes observed.*

On the 6th of December of the eventful year 1848, whilst residing in Paris, I was present at a meeting of the "Parisian Medical Society," (of which I was then honoured by being a Member of its Council,) when a short paper was read by my lamented friend, the late Dr. Ripley, of Charleston, South Carolina, upon dislocations of this bone, especially illustrated in his own person, and the manner of reducing them. He described this process very lucidly, which I have seen him perform upon himself several times, when the dislocation was present; it consisted in throwing the head backwards as far as possible, so as to place the muscles of the neck upon the stretch, then relaxing the lower jaw, when the displacement becomes reduced, after a few attempts, with a click, at the same time gently pressing or rubbing over the displaced part.

The following is a well-marked instance in a female, in whom the dislocation was double:—

*Lateral dislocation of both thyro-hyoid articulations in a female from relaxation.*

Mrs. Sarah N———s, aged 30, first consulted me on the 7th May, 1861. She felt several "lumps" under the jaw six months before, which caused some inconvenience; they were diminished in size from the use of an embrocation. These "lumps" were accompanied by a feeling of pressure, with a pricking sensation, more particularly felt on twisting the neck to either side, laying down in bed, or when troubled with wind. Deglutition was also affected. Her father died of asthma, her mother is subject to it, and she states that throat complaints are hereditary in her family. At times she is a great sufferer from them, and frequently has a cough.

On examination I discovered that she had lateral dislocation of both thyro-hyoid articulations; the grating of relaxation could be felt very distinctly on either side, and hence I inferred that the thyro-hyoid ligaments were shortened, and were

* I have seen this ligament ossified.

probably surrounded with capsules. This was an instance of the disease from general relaxation of the parts. The thyroid cartilage was larger than in most females. The peculiar grating sensation which was felt with my fingers, and was also perceptible to the patient, being similar to the rubbing of two pieces of broken cartilage together.

The treatment to be pursued in this peculiar malady is, to reduce the dislocation in the manner that has been described, when present on one side of the neck only. When double, the forefinger and thumb must be gently pressed on either side of the hollow between the hyoid bone and thyroid cartilage, and the patient directed to swallow, which draws the greater cornua of the bone upwards, and the natural position is assumed. More inconvenience is experienced when the dislocation is single.

The general health must be improved by the administration of suitable tonics, especially those that will give tone and firmness to the muscular fibre, because it is owing not unfrequently to simple relaxation of the parts from constitutional causes that displacement occurs. When it has arisen from violence, such as the forcible squeezing of the throat, or by garotting, if the bone is not fractured, and the muscular tissues not lacerated, better prospects of a permanent cure are held out than when it arises from relaxed tissues.

In some of my dissections I have found the thyro-hyoid ligaments vary in length on the two sides to the extent sometimes of a quarter, and even half an inch in dislocation that was not suspected during life. I have also found the direction of the hyoid horns and the length of the thyroid to vary.

In the museum of the Royal College of Surgeons may be seen a preparation of the thyro-hyoid articulations forming true joints. It is a tuberculous ulcerated larynx (No. 1864), in which both thyro-hyoid articulations seem to be distinct cavities like joints, and there can be no doubt that during life there has been relaxation of the throat at times with dislocation. From a preparation of Sir Astley Cooper's. It illustrates to some extent what I have already written upon the subject.

The subject of this essay was brought before the British Medical Association, at its annual meeting held at Canterbury, in July, 1861. At the conclusion of my remarks, Dr. Lewis, of Carmarthen, kindly mentioned to me an instance which came under his observation of what he believed was an illustration of the disease just described. He afterwards favoured me with the following account of the case :—

### *Displacement of the right inferior cornu of the hyoid bone from fright.*

Elizabeth Jones, æt. 65, mother of six children, always enjoyed good health up to eight years ago, when she received a great fright, in consequence of seeing a very large quantity of blood pouring out of her son's mouth suddenly, while she was conversing with him in the street. The effect of the fright was to produce sudden sobbing, and after a few sobs she felt a sudden pain in the right side of the throat and right ear; considerable difficulty of swallowing came on immediately. A few days after this fright the voice became hoarse, gradually difficulty of breathing came on, and this varied from time to time in intensity. Her case was considered at the first to be some catarrhal affection of the throat, and treated with liniments. She continued in a very distressing state for several years, and was not able to obtain any relief. About May, 1859, she was first seen by me. She was examined by the finger in the throat, and the passage behind the epiglottis and larynx was found very much encroached upon by a projection backward of what at that time was considered thickening of the glottis, but which, from subsequent information, I have no doubt was a displacement or *dislocation of the right arytænoid cartilage* (right inferior horn of the hyoid bone). She complained of feeling an occasional snapping or cracking when she moved her head, and then her condition was as follows:—rather livid palor of the face; some fulness of the cervical veins; a gasping form of breathing; voice very hoarse; swallowing solids very difficult; can only swallow pieces of bread about the size of a pill. Has occasionally an attack of more than usual difficulty of breathing. She referred the distress and difficulty in her throat to the right side. The introduction of the finger during the examination of the state of the throat was followed with relief, therefore a bougie was occasionally introduced into the throat, and the result was most gratifying. She recovered her voice almost completely, and also her power of swallowing. Her general health afterwards recovered.

About May, 1860, she was residing near to Aberystwith, and was suddenly attacked with all her former distressing symptoms, brought on, she thinks, from cold. For this attack she went into the Aberystwith Infirmary, where she remained a fortnight; afterwards she continued for nearly twelve months as an out-patient. I have seen her to-day, August 14th, 1861, and she is in a very comfortable state, but still feels occasional pain in the right ear. She cannot swallow dry bread, or dry lumps of food, but with the aid of liquids she can swallow pieces of moderate size.

The foregoing case is of considerable value, as illustrating the effect of emotional causes on the thyro-hyoid articulations. At first sight it would seem as if there had been a rupture of the right thyro-hyoid ligament, produced during the convulsive sobbing; the general description, however, agrees with that of dislocation in an aggravated form.

When illustrating the pathology of dysphagia, Dr. Abercrombie describes two instances of "Dislocation of the Os Hyoides," in his work on *Diseases of the Stomach*,* which are comprised in the following extract. As both he and Dr. Mugna were unacquainted with the correct pathology of the displacement, I will correctly designate them as

### *Two examples of double displacement of the thyro-hyoid articulation.*

"An eminent medical man, now deceased, was liable to this accident, and I have seen him seized with it in an instant, while engaged in conversation. It

* Second Edition. 1830. 8vo., p. 102.

produced slight difficulty of articulation and total inability to swallow. He easily relieved himself by a particular movement of the parts with his hand, which had become familiar to him from the frequent occurrence of the accident. A man, mentioned by Dr. Mugna,* while swallowing a large morsel of tough beef, suddenly experienced a sensation as if it stuck at the entrance of the œsophagus, and immediately lost all power of deglutition. A sound having passed without difficulty, Dr. Mugna suspected dislocation of the os hyoides. He accordingly introduced the fore and middle fingers of the right hand beyond the root of the tongue, and, on moving the parts a little by the left hand applied to the front of the neck, the affection was speedily removed.

In the first case, the displacement was double, as the hand alone was employed to reduce it; had it been present on one side only, there would not have been the complete dysphagia, nor could the reduction have been accomplished without some lateral or backward movement of the head and neck. Dr. Mugna's case was also one of double displacement, brought on by sudden spasm, the result of extreme distension of the lower part of the pharynx.

From the evidence which has been brought forward, it will be seen that displacements of the thyro-hyoid articulation are by no means infrequent or of minor importance.

### *(b) Hydrarthrosis.*

As there is occasionally a combination of the hydrarthrosis and dislocation, as illustrated by the remarks made and cases referred to in the preceding section, in the course of which the dropsical condition of the acquired joint has been described, it is unnecessary that I should go over the same ground again. It is a very curious and singular anomaly, however, in the economy, that a capsule should form around two moveable extremities for the purpose of keeping them together, and thus constitute a joint, and that the small osseous grains present in the ligament between them should enlarge and perform the part of sesamoid bones.

The hyoid apparatus in some of the mammalia, particularly the quadrumana (not all the genera) is observed to constitute naturally a sort of true thyro-hyoid joint in place of the ligaments. In such a case the superior cornua of the thyroid cartilage are very short, and are almost in direct contact with the extremities of the greater cornua of the hyoid bone. Thus in ourselves, through the agency of disease, we approach a natural condition of things in some of the lower animals.

If the membranous sac, thus artificially formed as a morbid product, should become greatly distended with fluid and cause serious inconvenience, and the diagnosis be clear, it should be punctured with a very fine trocar and canula and the fluid allowed to escape. It is an operation requiring great delicacy

* *Annali Universali*, quoted in the Medical Gazette, vol. iv.

of manipulation and a familiar acquaintance with the structures in this part of the neck.

This condition is present once in a while in phthisical patients who suffer much from their throats, and the peculiar pricking sensation sometimes experienced in swallowing is, in certain instances, due to the movements of the cornua in the sac thus affected with dropsy. It may also be looked for in long standing cases of chronic bronchitis and emphysema ; and in certain forms of asthma.

(*e*) *Anchylosis.*

The thyro-hyoid joints, acquired in the manner previously described, undergo partial anchylosis, in certain rare instances, as a process of reparation, and when such is the case, several of the osseous particles or grains will be found enlarged and partake somewhat in the formation of the anchylosis. True, firm, and solid anchylosis is very rare, on account of the mobility of this part of the throat, and it would be found on one side only. This is a condition that, so far as my researches have extended, has not as yet been detected during life, although I have met with two instances wherein I suspected that it was present.

*(d) Spontaneous rupture of the ligaments.*

Although the possibility of the occurrence of a spontaneous rupture of the thyro-hyoid ligaments has passed through my mind in the course of my labours, yet I was not aware that it had taken place during life, until I was startled into belief by the recital of a case before the Pathological Society, on May 15, 1860, by Dr. Stallard, who at the same time exhibited the preparation itself. This I examined with great care and attention, and thoroughly satisfied my mind that it was a rupture, as for a certain distance the remains of the ligament could be felt as a thin and delicate cord between the finger and thumb. It really required a familiarity with this part of the throat by frequent dissection to make it out. I was therefore astonished to hear Mr. Partridge (who has the reputation of being a good anatomist) doubt the existence of such a lesion in that instance, which, besides the tangible evidence of its presence, was most clearly confirmed by the history given of the patient during life.

Being perfectly assured that it was present, I encountered him in argument upon a subject that I could rightly express an opinion upon.

And here it is well to observe that the results of honest and laborious research, carefully conducted, with facts well made out, cannot be set aside or overthrown by the mere *ipse dixit*

opinion of any one. If I had not been a *patient* anatomist, some of the new facts given in the present communication would not have been discovered. To ignore, therefore, the valuable and reliable facts constantly brought before us, on the part of those who have had no share in working them out, is simply ridiculous.

Dr. Stallard had not only the acumen to discover this lesion during life, but the zeal to turn it to account for the benefit of science after death. And the profession must feel much indebted to him for bringing it forward in such a clear and intelligible form as that published in the 11th volume of the Transactions of the Pathological Society, of which the following is an abstract :—

"The patient was a man aged 44, who had been suffering for three months with hoarseness and constant cough, which was loud and clangous, and aggravated by every attempt at deglutition. There had been hæmoptysis, and there were the physical signs of tuberculous deposit at the apex of both lungs, and in the left of incipient softening. The larynx was large, prominent, and tender; the epiglottis large and irritable; and the papillæ at the back of the tongue much enlarged. Two months after, during a paroxysm of cough, he felt something give way in his throat, and the difficulty of deglutition was increased. On examination, the right posterior cornu of the hyoid bone was felt to be floating loosely beneath the integument. It was separated by at least an inch and a half from the thyroid cartilage. On the left side there was great mobility of the hyoid bone, but the separation was not equally distinct. During the act of deglutition, the hyoid bone was drawn upwards, and the larynx tilted downwards at the posterior part, thus increasing the distance between the thyroid cartilage and the hyoid bone, the connection being maintained anteriorly only by the thyro-hyoid membrane. It thus happened that the closure of the larynx became incomplete posteriorly, and fluids entered with great ease. This opening was further increased by ulceration, which had denuded the laryngeal cartilages at the posterior part."

Dr. Stallard found the direct application of remedies to the larynx comparatively easy, and the extreme irritability of the part was greatly relieved.

From the foregoing account it will be observed that the chief point in the diagnosis of a rupture of the thyro-hyoid ligament, is the sensation experienced by the patient of something suddenly giving way, followed by the wide separation of the parts, and the discovery of the cornu of the hyoid bone floating loose beneath the skin. It is a lesion unfortunately that cannot be remedied by the resources at our command.

## IX.—GENERAL DISPLACEMENT OF THE ENTIRE TONGUE BONE.

Although the neck is frequently the seat of various kinds of tumours, it seldom happens that pressure is exercised upon the larynx or the hyoid bone unless they have attained to a considerable size, or that they have originated very close to these parts. Tumours originating in the submaxillary, sublingual,

or thyroid regions, more than any others involve the upper part of the larynx and base of the tongue. Not only do the larynx, trachea, and hyoid bone, become displaced by these tumours, but they become altered in form, compressed, and sometimes flattened. The last I have seen examples of in the trachea, especially in a lateral direction, now two or three times, and the calibre of the tube has been almost wholly obliterated by the growth of the tumour around it.

Tumours springing up in the submaxillary region, in the hollow that exists on either side of the neck between the greater cornu of the hyoid bone and the upper and lateral borders of the thyroid cartilage (which can be distinctly felt in our own necks by the finger and thumb), are especially dangerous, for as they increase in bulk, they may attach themselves to the lateral part of the thyroid cartilage, push up one side of the base of the tongue, displacing the hyoid bone, and nearly obliterating the aperture of the glottis, by lateral pressure. The result of this is constant dyspnœa, and sudden suffocation. A case of this kind was brought before the Pathological Society during the last session, by Mr. Henry Thompson, for Dr. Wm. Tindal Robertson, of Nottingham, and I had the honour of being appointed by the Society, with Dr. Dickinson, to examine and report upon the specimen exhibited.

It consisted of a tumour the size of an orange, situated above and to the right of the thyroid cartilage, overlapping its right wing.

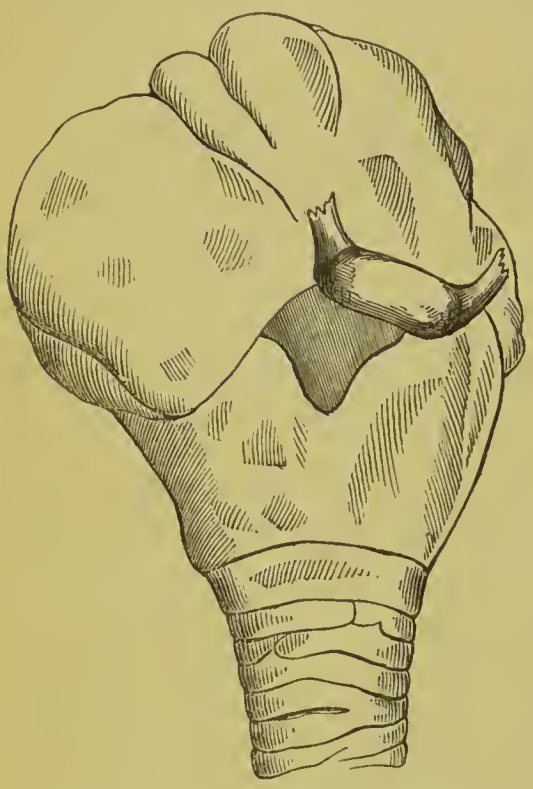
The body of the hyoid bone was pushed obliquely towards the left side of the thyroid cartilage, its right horn being much displaced upwards, and apparently lost in the substance of the tumour; whilst its left horn rested upon the superior border of the left wing of the thyroid cartilage, its extremity touching the anterior part of the base of the superior cornu of the latter. The thyro-hyoid membrane was stretched upwards.

Posteriorly the tumour rose up from the concavity of the upper part of the entire thyroid cartilage, but encroached on its right side; its most prominent part projected backwards an inch beyond the level of the cricoid cartilage. The right superior cornu of the thyroid cartilage was lost in the tumour. The course of the tumour now ran obliquely across to the left side, involving the right thyro-epiglottidean fold of mucous membrane, displacing the epiglottis to the extreme left, and so compressing it laterally as to leave a pear-shaped opening about two lines broad, but obliterating the passage at a depth of three lines, where a mere slit could be noticed. The entire larynx was compressed laterally.

The right side of the larynx thus seemed to be firmly attached to the tumour which absorbed into it the thyro-hyoid ligaments. It did not appear to have involved the tongue.

The disease was medullary cancer, of eight months' duration, and the patient was an elderly man who fell dead whilst going along the street.

The amount of compression which the tumour exerted upon the upper part of the larynx was quite remarkable, and it seems astonishing that the patient was enabled to breathe at all through such a small aperture as that described. The accompanying woodcut is from a drawing which I made of the tumour as sent up by Dr. Robertson. The lines show the position which the hyoid bone occupied in the diseased mass. The tongue had been wholly removed. The union between the thyroid cartilage and tumour was very strong; it is impossible to say, however, whether it arose primarily from the perichondrium, unless that point was ascertained at the commencement of growth. At one time I was strongly of opinion, whilst pursuing the dissection of the specimen, that it might have arisen in the right tonsil.



For further information about this interesting case, I must refer the reader to the twelfth volume of the "Transactions of the Pathological Society."

Professor Louis Porta, in his monograph on the "Diseases and Operations of the Thyroid Gland," published in 4to., at Milan, 1849, gives a plate of dislocation of the thyroid cartilage and os hyoides obliquely to the left side by the right lobe of the thyroid gland, affected with medullary cancer, in a man aged 66 years. The dislocation is considerable, and somewhat resembles that in the case just described.

The other examples of displacement which shall be now brought forward, are such as are offered by our London museums.

*Malignant disease of the tongue, which is pushed upwards, the body of the hyoid bone so dislocated downwards as to press on the upper part of the larynx.*

This is in the museum of St. George's Hospital, and is described as—

"Malignant disease of the tongue, preparation from a patient of Sir B. Brodie. The tongue presented several scirrhous tubercles in its substance. Tho root of the tongue is the part primarily affected: the disease has spread from the tonguo to tho fauces and soft palate."—L. ii.

An examination of the specimen shows the tongue to be elevated upwards by the tumours, it is also much ulcerated on its right side; the body of the hyoid is pushed downwards, pressing on the upper part of the larynx; and the horns on either side, especially the right, seem encircled by the different tumours, which must have occupied either side of the neck superiorly as well as beneath the jaw.

*The epiglottis and hyoid bone pushed downwards by a medullary growth.*

This is a preparation in the museum of St. Bartholomew's Hospital, described as—

"A larynx, with part of the fauees. A large growth of soft medullary substance, partially ulcerated, eovers tho basc of tho tongue, the soft palatc, the tonsils, and the upper and posterior wall of the pharynx."—(*Series* 23. No. 3.)

The cancerous disease has pressed the epiglottis backwards and downwards, and has pushed the hyoid bone also downwards. Respiration must have been seriously embarrassed in this case.

*Dislocation of the hyoid bone forwards.*

In the museum of the College of Surgeons is a preparation of cancerous disease of the pharynx and œsophagus, in which the hyoid bone is seen to be pressed forwards, although not mentioned in the history of the case; taken from a woman who died of cancer of these parts. (Vol. iii. *Pathology*, p. 35, Specimen No. 1,095.)

*Lateral displacement of the greater horns of the hyoid bone,* also in the museum of the College of Surgeons. No. 1,096. Preparation of cancer of the pharynx. The horns of the hyoid bone are dislocated or rather widely expanded laterally, giving to the bone a very much wider arch than natural.

*Dislocation of the larynx and base of the tongue to the left side, by a bronchocele.*

This consists of a cystic bronchocele, chiefly affecting the right side of the thyroid gland, preserved in the museum of St. Thomas's Hospital. (V. 5.) It is described at length in

the third volume of the catalogue, but its chief point of interest in illustration of the present subject is, that the tumour pushes the larynx and base of the tongue to the left side in a somewhat oblique direction.

*Dislocation of the larynx and base of the tongue by a bronchocele.*

In the museum of University College Hospital, is a preparation (550, W. 5) simply labelled a "Large tumour compressing the œsophagus, and separating it from the spine." On carefully examining it, I find that the tumour is an enlargement of the left lobe of the thyroid gland, which has also pushed the larynx and base of the tongue somewhat to the right side.

*Encircling of the larynx and trachea by a large bronchocele, with displacement of these parts, together with the hyoid bone forwards.*

The most remarkable instance of general displacement of the trachea, larynx, and hyoid bone forwards by a very large bronchocele, forming a girdle around the larynx and trachea, is to be seen in the museum of the Grosvenor School of Medicine. The thyroid gland is larger than a good sized cocoanut, and the enlarged lobes have extended backwards on either side, meeting posteriorly, behind the larynx and trachea, and displacing them much forwards, together with the base of the tongue and hyoid bone.

These parts appear to be completely crushed by this large tumour, up to the level of the hyoid bone, but the latter has participated in the general displacement forwards. There is no history attached to this wonderful preparation, which is much to be regretted.

*In prolapsus* or *protrusion* of the tongue from hypertrophy, the os hyoides and larynx are drawn upwards and forwards, necessarily by the great weight of the organ. The mental portion of the lower jaw is depressed in some instances, when the teeth assume a forward or horizontal direction. The larynx and hyoid bone are thus displaced, as it were, behind the lower jaw.

Contraction of the neck from *burns* is another cause of displacement of the hyoid bone, which is usually downwards, but it may take place upwards and forwards, if the chin is drawn downwards so that the mouth remains permanently open.

## X.—DISEASE OF THE HYOID BONE OR ITS COVERING, BY EXTENSION FROM THE TONGUE AND NEIGHBOURING PARTS.

Cancer of the tongue is fortunately a rare affection comparatively speaking, although I have seen many examples at the

Cancer and other hospitals of London, besides a few in private practice. In the London museums specimens are numerous. That the base of the tongue is involved in an equal ratio with the other parts of the organ is fully borne out by an examination of all the preparations. If the disease is extensive at the base of the tongue, and the patient lives long enough, it will extend to the hyoid bone, attacking its fibrous envelope with inflammation, and subsequently laying the bone bare, which now becomes necrosed.

Hopeless as the disease is, under ordinary circumstances, it becomes doubly so when this particular bone is attacked, as it utterly destroys all hopes of success from an adoption of the operation for the excision of the remains of the organ, in the performance of which the hyoid bone forms so important a guide. The description of this operation, as given by surgical writers, and the experience of Mr. Syme, Dr. Fiddes, of Jamaica, and some few others, fully shows this. The following examples, therefore, which have been selected to illustrate this section of our subject, tend to instruct us that if the patient or his friends desire operative interference as holding out a chance for life, it must be attempted before hyoid implication has occurred. The question might naturally be asked, How is this to be ascertained? When malignant disease is present, it is almost impossible to state the condition of this bone by the sensations of the patient, for pain is such a constant accompaniment. The chief sign to be relied upon is pain externally in the bone itself; the part is very tender to the touch, and the patient seems anxious to avoid anything like digital pressure. Besides this symptom, we now possess the aid of actual inspection of the parts by the assistance of the laryngoscope. It is unnecessary for me to describe the manner and mode of its application, for that I would refer the reader to Czermak's monograph on this most invaluable instrument, just issued by the New Sydenham Society, and which I have had the honour to translate for the Society, with the concurrence of the author. In it every information will be found regarding it. I may remark, however, that the back part of the tongue can be more readily examined and thoroughly inspected than any other part of the throat; and, notwithstanding the great swelling of the anterior part of the tongue, oftentimes, when its base is affected with cancer, by care and attention the ravages of the ulceration can be distinctly recognised, and its extent ascertained. No difficulty will be experienced in determining whether the hyoid bone is involved or not. Such cases as some of the following are especially suitable for laryngoscopic examination.

*Extensive cancer of the tongue and neck, producing a deep excavation, with denudation of the left side of the body of the hyoid bone.*

(Series 8. No. 1.) "The ulcer has destroyed the tongue on the right side, its surface is rough and uneven, the edge thickened and irregular. The ulceration extends a considerable distance into the neck."

The foregoing is the description of this specimen in the museum of the Middlesex Hospital, but a view of the preparation conveys an idea of a larger amount of disease, and it shows to what an extent it may proceed before destroying life. The ulceration has produced an irregular cavity the size of an orange, which extends as low down as the lower border of the thyroid cartilage on the right side; and, although the cavity is continuous from the tongue, its walls are formed by tongue and enlarged carcinomatous glands on the right side of the organ. In one spot, to the left of the base of the cavity, a little hollow is noticed, about a line and half in diameter, which reveals a part of the left half of the body of the hyoid bone denuded of its periosteum. This is a very remarkable preparation, and well worthy of study.

*Ulceration of the base of the tongue, destroying the epiglottis and other parts, and extending to the posterior part of the body of the hyoid bone.*

"The base of a tongue, with parts of the fauces, pharynx, and larynx. Deep and extensive ulceration, which appears to have succeeded the growth of a medullary tumour, has destroyed the epiglottis, the folds connecting it with the arytænoid cartilages, the base of the tongue, and parts of the arches of the palate. The ulceration is bounded below by the superior vocal cords."—*Series* 23. No. 2.

This preparation, of great interest, is in the museum of St. Bartholomew's Hospital; all the back part of the tongue, together with its base, appears to be destroyed with the disease right down to the inner surface of the hyoid bone.

*Destruction of nearly the whole of the tongue by cancerous disease as far as the os hyoides.*

The following description sufficiently explains itself. The preparation fully shows the fearful ravages which the tongue has sustained. It is in the museum of St. Bartholomew's Hospital.

"A larynx, with part of the pharynx and palate, and the remains of the tongue. Nearly the whole of the tongue has been destroyed by cancerous ulceration. Its base and a small portion of the left side alone remain, and the ulceration which has exposed them has also spread in the tissues beneath the tongue, nearly as deep as the os hyoides. The tissues around the ulcerated parts are hardened, consolidated, and confused, and have cancerous matter infiltrated in them."—*Series* 23. No. 18.

*Cancer of the base and centre of the tongue, extending close to the hyoid bone.*

This is another example in the museum of St. Bartholomew's

Hospital, in which the disease has extended to the very base of the tongue, in close proximity to the hyoid bone. In the catalogue it is described thus :—

*Sections of a Carcinomatous Tongue.*—"The disease is situated in the base and centre of the tongue, and a hard tubercle projects on its upper surface. The diseased structure is very firm, irregularly intersected by white lines, and closely blended with the surrounding muscular substance. The left tonsil is ulcerated, and a bristle is passed through an artery distributed to it, from which a considerable hæmorrhage occurred just before death."—(*Series* 23. *No.* 11.)

*Epithelial Cancer, involving the tongue, larynx and tonsils; on the left side of the tongue the ulceration extends to the cornu of the hyoid bone.*

This is a preparation in the museum of St. Bartholomew's Hospital, in which the base of the tongue, the tonsils, and portion of the larynx are involved in an epithelial growth. It was removed from a man in whom there was likewise an epithelial cancer of the scrotum—(*Series* 25. *No.* 35.)

The ulceration on the left side of the base of the tongue appears to have extended to the left cornu of the os hyoides, although I cannot distinguish the bone to be bare.

*Probable extension of cancer of the tongue and structures at its base to the hyoid bone.*

(Ser. 29. Sub. Ser. 1. i.h.) "Specimen of cancer of the tongue, glottis and epiglottis," in the museum of St. George's Hospital.

The preparation shows the ulceration to have extended through the left posterior half of the organ deeply inwards, most probably right down to the body of the hyoid. A part of the left side of the epiglottis is destroyed as well.

*Malignant ulceration of the tongue extending to the hyoid bone.*

In the museum of the Westminster Hospital is a specimen of malignant disease of the tongue, in which the morbid action would appear to have extended right down to the hyoid bone, for the ulceration and loss of substance is seen in the preparation to extend downwards in front of the epiglottis. There is no history of the case.

In some of the foregoing cases, although the bone was not seen, yet I believe it was involved, or very nearly so; they, however, clearly show what the result would have been had the patient lived a little while longer. Mr. John D. Hill, house-surgeon to the Royal Free Hospital, recently informed me that there were two out-patients at that institution affected with extensive cancerous ulceration of the base of the tongue, which he believes may extend to the hyoid bone. I refer to

them here, for the purpose of showing that, notwithstanding the amount and extent of the ulceration, they are still able to go about, without confinement to their beds.

*Ulceration of the tongue extending to the hyoid bone.*

In the museum of the Royal College of Surgeons.

*Path. Series.* 1068.—"A tongue with the larynx and neighbouring parts. An irregular ulcer, with hard, sinuous, and nodulated margins has destroyed the apex of the tongue, and extended through its length to its base, where there is a wide aperture just in front of the epiglottis. On the anterior and upper part of the tongue, behind the ulcerated part of the apex, many of the papillæ are elongated, and form slender processes of the one-eighth of an inch in length.

From a man 50 years old, in whom the disease had existed several months; it commenced at the apex of the tongue and slowly extended backwards.—*From the museum of Robert Liston, Esq.*

(Vol. 3. Pathology. p. 24.)

So far as I can perceive by examination of the specimen in spirit, the ulceration has extended to the upper edge of the body of the hyoid bone, and most probably has affected the periosteum. No mention is made as to its real nature; it might be an example of syphilitic ulceration, from the character of the margins of the ulcer.

*A hollow ulcerated cavity in the right side of the tongue, close to the hyoid bone.*

This is a remarkable preparation in the museum of St. Bartholomew's Hospital, taken from a woman 40 years old, who, till within 4 months of her death, when this disease was first observed, had good health. The affected side of the tongue is completely hollowed out by the ulceration, and a great cavity extends close to the hyoid bone. It is described as "a tongue, the inferior part of which is, on the right side, completely destroyed by ulceration. Around the ulcerated surface the muscular substance is indurated, but has undergone no other obvious change of structure."—(*Series* 23. No. 11.)

The nature of the disease is here also not described, and I hesitate to call it cancer, from the rapidity of the ulceration. I might infer that perhaps the foregoing is an instance of the foul and sloughing ulcer of the tongue.

*Gangrene of the Tongue extending to the hyoid bone.*

I have seen an instance in which the tongue began to mortify, and did not cease until it destroyed the entire organ right down to the points of its attachment to the hyoid bone. This occurred when I was a pupil, and made a strong impression upon me at the time. The patient was a man of about 60 years of age, and died after some days; the tongue bone was deprived of its periosteum. The case was one of, I believe,

malignant pustule of the tongue—an affection of extreme rarity.

## XI.—HYOID NEURALGIA.

At the commencement of my observations on diseases of the hyoid bone, it was stated that there were many anomalous symptoms referred to the throat which have been attributed to the larynx, when the latter was found to be normal, the fatal result ensuing from other causes. Thus, in cases of cancer of the tongue, I have seen patients complain of pains at the root of the organ, which they were told was the result of extension of the mischief to the larynx, when the latter was quite healthy: and from what has been already stated in the description of the foregoing diseases of this bone, it can be readily comprehended why the diagnosis may have proved erroneous.

In my work on "Diseases of the Throat and Windpipe," there is a chapter devoted to neuralgia and nervous sore throat, wherein I have endeavoured to point out the means of diagnosing these from other affections. Besides what is there described, there is a form of neuralgia occasionally to be met with, which is deserving of a distinct appellation, and I propose to call it *Hyoid Neuralgia*. A sharp, severe, sometimes very acute, pain is felt at the root of the tongue, which may or may not shoot forward through the organ. The patient can put the point of his finger upon the neck, at the spot where it commences, and this is the body of the hyoid bone. It may be located at the junction of one of the greater cornua with the body of the bone. In one instance that came under my observation, the patient, a thin spare young man of nervous temperament, the larynx had been regularly mopped, under the impression that the pain was due to ulceration of the mucous membrane. Sometimes the pain may extend upwards, on either side of the neck to the ear, and is compared to a needle running into the ear, with an associated pain also in the region of the tonsils. Under these circumstances the mere effort of deglutition is exceedingly painful.

The same measures which I have found serviceable in other forms of neuralgia of the throat are equally so here; but especial attention must be devoted to the application of a grain or two of the aconitina ointment to the small circumscribed space in front of the bone in the neck. Its formula is given in my other work already alluded to.

## INJURIES OF THE HYOID BONE.

These consist of fractures from manual and other forms of violence, wounds of the bone and parts around it, and lacera-

tion of the soft structures from various causes, injuring the muscles, ligaments, and thyro-hyoid membrane.

## I.—FRACTURE OF THE BONE.

When the tongue-bone is fractured, the injury is of a much more serious nature than a dislocation, from the urgent character of the symptoms, and the extreme danger to which the patient is exposed from suffocation. Direct violence, in some one of its forms, usually produces it. The part fractured is either one or both of the horns at their middle, or close to their junction with the body of the bone. Should the body be broken at its middle, the result would prove more serious. There is generally bleeding from the ruptured mucous membrane, which is sometimes most profuse, and blood is coughed up. There is great difficulty and pain in swallowing, and occasionally it is impossible; whilst speech is equally distressing, and the voice is gone. Simple protrusion of the tongue will produce symptoms of suffocation. The organ itself is now and then swollen from the inflammation, which is sure to extend to the throat and pharynx. Mobility of the horns, with distinct crepitation, can be felt with the finger and thumb externally, or when the patient swallows, and the finger introduced into the mouth will feel the displaced and broken bone if projecting towards the throat.

The following examples of fracture of this bone are divided into three classes, for convenience of study. In one the violence is of a manual kind, that is, the throat has been forcibly grasped and clenched by the hand of another person and the lesion accomplished, a favourite method of the garotters of modern days. In the second class, fracture has taken place through the agency of sudden contraction of some of the muscles attached to the cornua of the bone; whilst in the third the lesion has arisen from a fall, or some other accident, in which direct contact of the part with some foreign substance has been the force producing it.

### *(a) Fracture from Manual Violence.*

I have come across the particulars of five cases of this form, and add two others, making seven examples. One of the earliest recorded is by Dr. Lalesque, in the *Jour. Hebdomadaire*, March, 1833 (See also *Amer. Jour. Med. Sciences*, vol. xiii., p. 250, 1833, and *Revue Médicale*, vol. ii., for 1833, p. 115). The following are the leading features:—

*Fracture of the os Hyoides in a Marine, whose Throat was clenched by the hand of an adversary.*

The subject of this was a Marine, aged sixty-seven, who had his throat violently clenched by the hand of a vigorous adversary. At the moment there

was very acute pain, and the sensation of a solid body breaking. The pain was aggravated by every effort to speak, to swallow, or to move the tongue, and when this organ was pushed backwards, deglution was impossible, articulation indistinct, and the patient was unable to open his mouth without exciting a great deal of pain. He placed his hand upon the anterior and superior part of the neck to point out the seat of injury. This part was slightly swollen, and presented on each side a small ecchymosis, one above, more decided, immediately under the left angle of the lower jaw. The large horn of the os hyoides was felt very distinctly to the right side; and it could be felt on the left, deeply seated, by pressing with the finger. In following it in front towards the body of the bone, a very sensible inequality near the point of junction of these two parts could be perceived. By putting the finger within the mouth the same projections and cavities inverted could be felt, and even the points of the bone, which had pierced the mucous membrane, were evident.

The left horn was broken, near the body of the bone, and had pierced the membrane, giving rise to bleeding.

He was bled; the broken horn was easily reduced with the aid of the finger. The head was inclined backwards. Rest, silence, diet, and lead lotions composed the after treatment. He was fed by an œsophagus-tube for twenty-five days, and in two months the cure was complete. Within the mouth a slight nodosity could be felt by the finger in the spot where the splintered points had been first felt.

### *Fracture of the os Hyoides by manual seizure, Complicated with a Cystic Tumour of the Tongue.*

A married man, aged fifty-five years, was violently seized in the throat by a very strong man, in a state of intoxication. The latter, named Poulain, was known for brigandage and acts of cruelty, and was nicknamed the "Iron Arm."

Soon after the injury very acute pain was felt in the anterior region of the neck. The patient had heard a sound resembling that of a solid body breaking. Efforts at phonation and deglutition increased the pain. The front of the neck was swollen and ecchymosed. In spite of the swelling, M. Auberge was enabled with the hand to recognise a fracture of the right horn of the hyoid bone. Almost the entire right half of the tongue was covered with an encysted tumour, present for some years. In consequence of this, the finger could not be introduced into the back part of the mouth without great difficulty, yet it encountered the projecting little splinters which had pierced the mucous membrane.

The patient was bled frequently, to obviate symptoms of cerebral congestion, and fomentations were applied to the head and front of the neck. After some hours Auberge proceeded to reduce the fracture, which he did successfully, not without a good deal of pain, by the aid of the index-finger of the left hand in the mouth at the seat of injury, and the right hand placed externally. The jaws were kept widely separated during this by a roller placed between the teeth.

Silence, quiet, immobility, fluid food by means of an œsaphagus-tube, effected a complete cure of the fracture in two months. Fourteen months after this Auberge extirpated the tumour of the tongue, the size of a small egg, which had existed for eight years.

This interesting and curiously complicated case is recorded by P. J. F. Auberge, in the third vol. of the *Revue Médicale* for 1835. The author's reflections upon it will be found well worthy of attentive perusal.

The example which now follows may be looked upon as unique. It forms the basis of a thesis, by Dr. R. Bitkow, published at Berlin, in 1832, entitled "De Ossis Hyoidea Fractura," 12mo., pp. 26. The author's observations are confined to

a single case, which came under his notice. He does not refer to any recorded instances. The following is an abstract of it:—

*Oblique Fracture of both greater horns of the hyoid bone from manual violence.*

Sophia Schuband, aged nineteen, a servant, in previous good health, on the 4th Aug., 1831, was seized in a quarrel by a strong man, with one hand upon her neck, as if to choke her, and, with the other, several blows were inflicted upon the head. This was followed by severe pain in the neck, which became swollen and inflamed, respiration was impeded, and swallowing difficult. Although leeches were applied and medicines given, the pain increased, and suffocation was imminent. She was, therefore, conveyed to a hospital on the 6th. The soft parts of the neck were now very painful, hot, and swollen; the swelling was greater near the chin, and less so near the sternum. Crepitus could be felt and heard on the right side of the hyoid bone. The greater horn was separated at its middle part, which, on being slightly pressed inwards, gave rise to the crepitus, and caused the sharp and pricking pain of the internal parts; but compression upon the separated parts restored them to their natural situation. The same symptoms were observed on the left side, except distinct crepitation, with swelling and bruising of soft parts in addition. These various symptoms were clearly made out to be the result of an oblique fracture of the two greater horns of the hyoid bone.

The treatment consisted in frequent leeching, cold applications to the neck, and aperients. On the 5th day the voice was not so hoarse, and swallowing was not so painful. On the 7th day crepitation was still present, but less distinct. On the 11th day speech and deglutition caused no pain; the voice was still rough and hoarse. On the 12th day an attack of fever and catarrh threw the patient back, but by the 28th day (August 31) all crepitation of the hyoid bone and swelling of the neck had gone; the fracture seemed to be firmly united. There was no hoarseness nor dysphagia, and the patient was convalescent.

Assuming that the diagnosis was correct in the foregoing case, then it is the only one on record in which both horns of the hyoid bone were fractured. Before meeting with it, which I did through the kindness of Mr. Canton, I had arrived at the conclusion that the two horns were never fractured by manual violence alone, for the reason that as one horn would give way, the other would escape by thus losing its opposite point of resistance. The extensive injury to the neck, however, in this exceptional case shows that a very great amount of force had been expended by a strong and powerful man, and thus a double fracture of the hyoid bone was combined with the other lesions inflicted.

A very remarkable case is mentioned by M. Devergie, in the second vol. of his "Médécine Légale" (1852, p. 163), which may be here briefly noticed. It consisted of

*Fracture of the hyoid bone and of both cartilages of the larynx from strangulation. Cutting of the throat after.*

The lesions especially noticed were, fracture of the left greater horn of the hyoid bone; a transverse section of the thryoid cartilage, about two lines beneath its superior border, this section was fourteen lines in length; a vertical fracture of the left half of this cartilage; a double fracture of the

cricoid cartilage; and ecchymosis of the left thyroid body in the inferior third of its dimensions. The subject of this severe injury was a woman, named Duval, who must have quickly succumbed from the hæmorrhage consequent upon the large wound in the neck, inflicted by an assassin, but not until he had first attempted to strangle her with his hand, in which the larynx and hyoid bone were broken.

From the absence of traces of a ligature on the throat, M. Devergie infers, and, I think, very correctly, that the throttling was accomplished by grasping exclusively; and he refers afterwards to the occurrence of such fractures as establishing generally a presumption of homicide.

In a paper on manual strangulation and death by external violence, with experiments and illustrative cases, by Dr. Alex. Keiller, in the "Edin. Med. Jour." (vol. i., 1855-6, pp. 824 and 527), is an instance of

*Fracture of the right hyoid bone, produced by throttling,*

which occurred to Dr. Murchison, who kindly drew my attention to it.

The subject of the injury was a married female, aged twenty-nine, who consulted him on the 28th June, 1855, at the Westminster Dispensary, complaining of swelling in the throat, considerable dysphagia, and slight dyspnœa. She stated that two days before, her husband had come home drunk at night, had thrown her down on the floor, and forcibly compressed her throat with his right hand until she felt something snap. On examining her throat, there was found to be considerable swelling, with ecchymosis about the upper part of the larynx; and on moving the fore part of the arch of the hyoid bone from side to side, distinct crepitus could be both heard and felt. His then colleague, Mr. Wade, Surgeon to the Dispensary, saw the case, and satisfied himself as to the existence of a fracture.

The exact nature of the fracture is not stated; but I think there can be no doubt that it was the right greater horn of the hyoid bone, from the circumstance of the throat having been grasped by the right hand, the thumb of which would produce the lesion.

On the 14th Feb., 1859, I learnt from Mr. Thomas Owen, house surgeon to the Royal Free Hospital, that there was then an out-patient labouring under

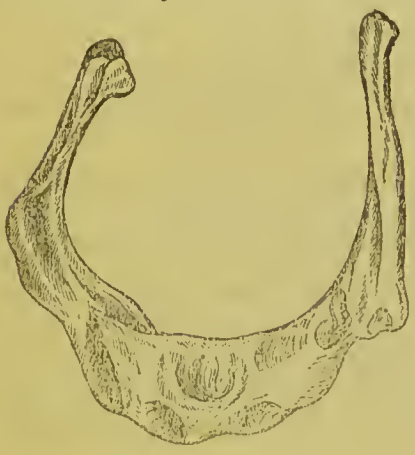
*Fracture of the Hyoid bone, produced by manual violence in a quarrel.*

The symptoms were characteristic and to the best of my recollection the lesion was confined to the right side only. There was much general swelling and ecchymosis of the throat externally; and at one time the dyspnœa was urgent. Mr. Owen promised me the particulars before going abroad; but as he forgot to do so, I think it right to give this brief reference to the case.

On the 15th October, 1861, I exhibited at the Pathological Society an example of

*Fracture of the hyoid bone at the junction of the right greater cornu with the body.*

The specimen was obtained from an adult male subject, about whose history during life nothing was known. The bone had been originally fractured at the junction of the right inferior cornu with its body. It had united in a faulty position, causing the cornu to become shorter than its fellow, and projecting inwards at its terminal end. The proximal end of the fractured horn was overlapped by the body of the bone to the extent of nearly a quarter of an inch. The terminal end of the same cornu gave evidence of its having formed a distinct joint, surrounded by a proper capsule. The appearances presented by the bone are shown in the annexed woodcut.



It is quite certain that the fracture must have occurred at least a couple of years before death, in consequence of the appearances presented by the bone, together with the formation of a thyro-hyoid joint. It may be reasonably assumed also that the fracture originated from manual violence, the chief force being exerted by the pressure of the thumb of the right hand of the person who inflicted the injury. For this very rare and at present unique specimen of united fracture of the hyoid bone, I am indebted to the kindness of Mr. Edwin Canton.

*(b) Fracture from accidental causes.*

I am enabled to give six examples of fracture, the result of accident, two of these not before published. In the three first the injury sustained caused sudden contraction of some of the muscles attached to the hyoid bone, and thus gave rise to the fracture. At first sight this might seem an almost impossible occurrence, but a careful analysis of the cases, leaves no room to doubt that the lesion has arisen in this way.

*Fracture of the hyoid bone, attributed to muscular action, in a fall from a waggon on to the face.*

This is a curious case recorded by Dr. Grunder in *Smith's Jahrbuch.* (See also *Brit. and For. Med. Chir. Rev.*, vol. 8, N. S. 1851.)

"A labourer, aged 63, fell from a waggon on to his face, and discharged a large quantity of blood by the mouth. He found he could not swallow, and twelve hours after there was severe pain in the neck. The voice was hoarse

and difficult. On attempting to drink the fluid was rejected with violent coughing, the patient declaring he felt it as if entering the air passages. Nothing abnormal could be found, and it was concluded that the case was one of disturbance in the function of the par vagum. On examining the fauces, the epiglottis did not appear to completely close the larynx as in its normal position. He went on well for six days, and in five more he died, having been ill with cough and aphonia.

"At the autopsy one of the larger cornua of the os hyoides was found broken, and had become firmly embedded between the epiglottis and rima glottidis, inducing the raised position of the epiglottis, loss of voice, and difficulty of swallowing."

The fracture in this case Dr. Grunder believed was probably induced by muscular action, a cause first assigned in a case occurring to Ollivier d'Angers.

*Fracture of the hyoid bone from muscular action.*

The case of Ollivier's, referred to by Dr. Grunder, I have been unable to find, although it must be familiar to some writers. I include this short notice of it here to render my series of cases complete. One of the cornua was broken, and as there was no direct violence sustained, the fracture was attributed to muscular action.

For the third case, I am indebted to the kindness of Mr. Obré, of Melcombe-place, Dorset-square. It is one of

*Fracture of the left greater cornu of the hyoid bone, with rupture of the thyro-hyoid ligament, from muscular action.*

The patient was a medical man who, when driving along the London streets, was thrown from his gig, falling upon his head. He was insensible for some time, and on recovery he had lost the power of swallowing. Every attempt to swallow nearly suffocated him from the fluid passing into the trachea. In every other respect he was perfectly well. His symptoms were attributed by some surgeons to injury of the brain; but on uncovering the neck and closely watching the efforts at deglutition, Mr. Obré observed no movement in the trachea or pharynx. There was very great tenderness in the left thyro-hyoid region, and on careful examination the hyoid bone was found to be much separated from the thyroid cartilage on this side; the left horn of the hyoid bone was bent inwards. The conclusion was correctly arrived at that there was a fracture of this portion of the os hyoides, associated with rupture of the thyro-hyoid ligament of the same side.

This gentleman was fed for some time with a stomach pump, until, in fact, he had sufficiently recovered to permit of confidence in his own powers of deglutition; and although more than a year has elapsed since the accident, he is now unable to take a large drink, being obliged to swallow fluid by sips.

The unusual complication present in the foregoing case

invests it with extreme interest. Not only has the force of the muscular contraction broken the hyoid horn, but it has torn through the small and delicate ligament which held it in connection with the thyroid cartilage. It is to be feared that the consequences of this singular lesion will remain permanent.

In the other three cases of accidental fracture the violence was direct; they form an instructive contrast with the preceding instances. One of them is published for the first time.

*Fracture of the left horn of the hyoid bone, from a fall down the cellar steps.*

"In the following case, under Dr. P. G. Fore's care, a female, aged 30, fell down the cellar steps, striking the prominent part of the larynx and tongue bone against a projecting brick, severely injuring the former, and fracturing the left horn close to the body of the bone of the latter. Profuse bleeding ensued from the fauces, speech was almost entirely lost, and great difficulty was experienced in swallowing. On attempting to depress or protrude the tongue symptoms of suffocation were induced. Considerable inflammation and swelling of the throat and pharynx ensued, and continued for some time. In four weeks she was able to converse with an impaired voice, and ultimately recovered.

"At the time of the injury crepitation was distinctly felt, on pressing the bone between the finger and thumb, or when the patient would swallow."*

The next is a truly wonderful case, recorded by Dr. Albert F. Sawyer, of San Francisco, California, in the *Amer. Journ. of Med. Sciences* for January, 1856.

*Fracture of the hyoid and inferior maxillary bones, with fracture and dislocation of the thyroid cartilages, and other injuries, the result of a fall from a height of forty-five feet; recovery after tracheotomy.*

"A strong muscular man was at work on a piling machine, which was carelessly overturned while he was near the top, and he fell with it to the ground, a distance of forty-five feet. The iron hammer of the machine, weighing 1,000 pounds, was at the time elevated, and precipitated his descent with the most fearful rapidity. The lower jaw was most extensively fractured into several portions, especially near the symphysis. The left side of the head and trunk was extensively bruised; the face was frightfully distorted. The cartilages of the larynx were fractured and separated, the right over-riding its fellow. On the left side the great cornu of the os hyoides could be felt loose, and detached from the body of the bone. The neck, upper part of chest, and back were emphysematous and slightly œdematous. The right radius and left patella were fractured and comminuted.

"Symptoms of concussion of the brain were present, followed by delirium on the second day, and asphyxia on the fifth, necessitating tracheotomy between the fourth and fifth rings, as the larynx above was so much injured. The trachea was deeply seated in a thick muscular neck, enormously swelled as far as the thorax from the effusion of serum, and escape of air from the fractured larynx into the areolar tissue. After the operation, it was necessary to use artificial respiration to bring the patient too. A recovery ultimately ensued, but the larynx was so extensively injured, being fractured through the pomum, and compressed laterally by over-lapping of the fragments that the passage was entirely obliterated, and the tracheal opening became patulous for life. For a time dilatation of the larynx was tried with bougies, but it proved of no avail."

* Stethoscope, Richmond, Virginia, U.S., June 1855.

The case is reported at length by Dr. Sawyer, who encountered many difficulties in its progress, and it was nearly twelve months before the patient's health was restored. An anchylosed knee, a fistulous trachea, and an ununited fracture of the jaw were the result of the injury. The fracture of the hyoid bone must have united, although it is not mentioned.

The following case was kindly furnished to me by Dr. Harley; it will be seen that in the nature of the lesion it differed from any of the others, and it is the only one that occurred in a child.

*Fracture of the body of the hyoid bone in a child from a fall against an iron bedstead.*

On the 28th March, 1856, a little girl aged six years, the daughter of Mrs. W—, while jumping fell upon the rail of an iron bedstead, which caught her across the neck. She was instantly seized with a fit of coughing, great dyspnœa, inclination to vomit, and a great flow of saliva from the mouth, the saliva being partly tinged with blood. She was seen almost immediately after by Dr. Harley, who found her quite black in the face. On examining the neck he saw a sharp body projecting beneath the skin, which felt very angular and was quite moveable. This he discovered to be a fracture through the middle of the body of the hyoid bone with displacement, one end of the body riding over the other. With a little careful manipulation the fracture was partly reduced, when the dyspnœa, the coughing, the excessive flow of saliva, and inclination to vomit, soon ceased. A bandage was applied around the neck to keep down the projecting end of the bone. It should be mentioned that before reduction was accomplished she could not swallow even a drop of water, and the child fainted once or twice. For the first three days she had a sharp attack of fever, and by the 3rd of April, six days after the accident, the fracture had united, and the angular projection was replaced by a rounded mass of callus. There was at this time an occasional pricking pain in the sides of the neck. Her subsequent recovery was perfect, without any deformity.

*Treatment of fracture of the hyoid bone.*

In the treatment of this form of throat injury, the first thing to be done is gently to restore the displaced and broken horns to their proper place, by introducing the forefinger of one hand into the mouth and holding the hyoid bone with the other externally. This will be only necessary if there is displacement with the fracture. General measures are now to be adopted for the inflammation, which is certain to arise, and

those consist of blood-letting from the arm, leeches to the throat, cold lotions, nitrate of potass in mucilage, with hyoscyamus and cherry laurel water. The strictest quiet is to be enjoined; efforts at speech are particularly to be avoided; absolute silence is to be maintained; and if swallowing is impossible, or the ends of the broken horns become again displaced in consequence of it, an œsophagus tube must be used to introduce liquid food into the stomach. Sometimes this is equally as injurious as the act of swallowing: when such is the case, recourse must be had to clysters to nourish the patient. Fluids only are to be taken by the mouth when circumstances permit it, and in small quantities at a time. If the hæmorrhage after the injury is profuse, or the inflammation violent, ice may be applied outwardly. Should, unfortunately, the body of the bone be broken, and the symptoms of suffocation become imminent, then the trachea must be opened to afford relief. The head of the patient should be kept rather low and inclined a little backwards, to keep the neck at rest.

*(c.) Fracture of the hyoid bone from hanging.*

The hyoid bone is sometimes found fractured in persons who have been hanged; indeed, Mr. South affirms, in his translation of "Chelius," that the only examples of fracture of this bone, with which he is aware, are those of persons executed in this manner, in which he says fracture is almost invariably found. I have not had the opportunity of satisfying myself as yet upon this point, but will do so on the first occasion that presents itself. My friend, Mr. F. J. Gant, examined the man Adams who was hanged in front of Newgate in 1859, and he did not find the cornua broken.

Mr. Mackmurdo, who was surgeon to Newgate Goal for very many years, and had examined the bodies of executed criminals, in reply to some inquiries which I addressed to him on this subject, kindly informs me* that *once* only he found the body of the hyoid bone broken, and in three or four cases *one* of the cornua, never the *two*. He sometimes found a dislocated cervical vertebra, and very generally a torn platysma myoides, but the skin was never injured. Interlobular emphysema was very common in the lungs as might be expected.

Orfila saw on one occasion a fracture of the os hyoides with considerable ecchymosis of the splenius and complexus muscles, as the result of suicidal hanging. This case he has recorded in the third edition of his "Treatise on Legal Medicine," (Vol. ii., p. 425).

* In a letter dated October 26th, 1861.

Remer cites one case of fracture of the larynx in 101 cases of voluntary suspension which he had collected; in none was there any lesion in the hyoid bone. If his observations are correct, then is there a great difference between hanging as a means of punishment and as a mode of committing suicide. This is well shown in a valuable paper by Dr. Duchesne upon "Strangulation by Incomplete Suspension," published in *Annales d'Hygiène Publique*, in 1845. It may be considered as an acknowledged fact, however, that fracture of the hyoid bone occasionally occurs as the result of punishment by hanging, and rarely so in suicidal suspension.

In voluntary suspension, Valsalva met with an instance of rupture of the muscles which united the os hyoides to neighbouring parts, of such a nature that the bone was separated from the larynx; in another, the sterno-thyroid and thyro-hyoid muscles were torn, and the cricoid cartilage broken. Weiss found the cricoid cartilage broken into several small pieces, and the superior part of the trachea entirely detached from the larynx. Morgagni and Valsalva have seen rupture of the larynx.*

In the museum of the College of Surgeons in Dublin are two preparations which I have seen. One (C. a. 57,) is the

"Larynx, &c., of a criminal who was hanged, showing the nature of the injury inflicted. The thyroid cartilage and os hyoides are widely separated from one another, the intervening muscles and membrane having been rent across. The epiglottis, pulled up by the root, has ascended, in connection with the os hyoides and tongue, into the cavity of the mouth. So much is exhibited in the preparation. In addition to these lesions, the sterno-mastoid muscle of the right side was ecchymosed, contused, and broken; that of the left side was but slightly bruised. The omo-hyoid, sterno-hyoid, and sterno-thyroid muscles were so lacerated that only a few shreds held them together. The skin alone interposed between the rope, and the interior of the pharynx remained unbroken. The cervical vertebræ and spinal marrow were uninjured."

Doctor Houston, in *Dub. Hosp. Reports*, vol. 5, p. 317, and cat. of Museum.

The other preparation (C. a. 58) is the

"Larynx and trachea of a man who was hanged. The lesions are in every respect similar to those shown in the preceding preparation."—*Idem.*

Although the lesions in both instances were extensive, yet the hyoid bone was not fractured.

In the punishment of the iron collar of the "garotte," as adopted in Spain and her colonies, I have heard it stated that the larynx and hyoid bone are completely crushed into fragments. The bone is also broken in the Turkish punishment of the bow-string.

* Devergie. Op. Cit.

## II.—LACERATION OF SOFT STRUCTURES ATTACHED TO THE HYOID BONE.

When manual violence has been offered to the throat of varying degrees of severity, should the hyoid bone escape fracture, it may so happen that the thyro-hyoid ligaments may become ruptured: or the thyro-hyoid membrane may be actually lacerated and torn by the pushing downwards of the thyroid cartilage. Both of these are very serious and grave injuries, and may be recognised by symptoms which have already been described. Fortunately, they are not so common as laceration of the fibres of the small delicate muscles attached to this bone, which in their results do not cause the same amount of inconvenience, nor such severe constitutional symptoms. Manual violence upon the throat is at all times to be dreaded, and in the event of no serious lesion being inflicted, the patient will for a long time be a great sufferer, from the shock that the nervous system has sustained.

## III.—WOUNDS OF THE HYOID BONE.

In attempts at suicide this bone is not only separated sometimes from its attachments, but is also wounded. The most common injury which it sustains is division of the thyro-hyoid membrane, of which very numerous instances are on record. Mr. McWhinnie, in a valuable paper published in the *Lancet* for 1846, "On Wounds in the Throat," (Vol. II., p. 268) relates a case of wound between the os hyoides and thyroid cartilage, extending through the base of the epiglottis, which proved fatal.

He gives another fatal case, wherein the wound extended immediately below the hyoid bone, in fact grazing it, and cutting through the thyro-hyoid membrane.

I have seen a large number of cases in hospital practice, but the following examples of sub-hyoid wounds, *i. e.*, through the thyro-hyoid membrane, I have examined in the museums.

*Wound of the throat, through the thyro-hyoid membrane and œsophagus.*

In the museum of St. Thomas's Hospital there is a preparation (W. 2) of the larynx, trachea, and œsophagus, in which a wound had been inflicted immediately above the thyroid cartilage, through the thyro-hyoid membrane, almost dividing the base of the epiglottis. It has healed to some extent for a circular opening is seen through the base of the epiglottis from behind.

Another preparation (W 4) somewhat resembles this, but has several incisions through the thyroid cartilage as well.

*Wound of the throat below the hyoid bone.*

There is a specimen of cut throat in the museum of the Westminster Hospital in progress of cure. There are two openings: one superior, large, situated just below the os hyoides; the other smaller, inferior, and through which a bristle is passed obliquely into the interior of the larynx.—(Series 4. sub-series 11, No. 1.)

An examination of the specimen shows the superior opening to lead into the upper part of the larynx immediately below the origin of the epiglottis.

*Wound of throat between the hyoid bone and thyroid cartilage.*

In the museum of the College of Surgeons, No. 1822 (Vol. 4, Path. Cat., p. 26.)

"The tongue, larynx, and pharynx, and a portion of the integuments from a man who cut his throat between the os hyoides and the thyroid cartilage. A large aperture remains in the situation of the wound, exposing all the anterior surface of the epiglottis. The integuments around it are completely cicatrised, and so contracted and sunk in, that the lower border of the cicatrix is smoothly continuous with the anterior surface of the epiglottis. The beard has grown almost to the margin of the aperture."—*Hunterian.*"

This is one of the most curious and remarkable specimens that I have ever examined, the skin extends beneath the lower edge of the hyoid bone, which forms the upper boundary of the wound, which is wide and gaping. There can have been no inconvenience in breathing, but much dysphagia. It was a case to illustrate the involuntary depression of the epiglottis during the mere act of deglutition, without the presence of food, to be seen through the wound.

*Wounds of the throat through the thyro-hyoid membrane.*

I examined the following preparations in the museum of King's College.

394. "Deep suicidal wound of the throat." The incision was made immediately below the edge of the hyoid bone, almost grazing it, and cut through the base of the tongue to the epiglottis, but not wounding the latter.

395. Another specimen of wound of the larynx through the thyro-hyoid membrane, cutting through the greater part of the base of the epiglottis.

396 Is another example of the same kind, with two or three gashes in the thyroid cartilage itself.

The hyoid bone is sometimes wounded by incisions *made from above*, and the muscles are not unfrequently divided right down to the bone. Mr. McWhinnie relates a case of the kind in the *Lancet* for 1846 (Vol. 2, p. 268). A man, aged 40, inflicted the wound with a clasp knife, dividing all the muscles

between the bone and the chin, extending through the mucous membrane of the mouth. He died on the fifth day of hæmorrhage from the lingual artery.

Some years ago (August 1845) I was called to a person named Redmond, who had cut his throat with a razor, and on seeing him I found two wounds several inches long and one and a half deep, inflicted across the neck above the hyoid bone, and cutting several of the muscles right down to the latter. There had been a good deal of venous hæmorrhage, but the lingual artery was not wounded, and on closing the wound with sutures a recovery ensued. I may mention, however, that an attempt some months later was more successful in destroying the life of the same patient.

Wounds above the hyoid bone generally cause but little inconvenience, unless the lingual artery is wounded, whilst those immediately below are of the most serious character and commonly prove fatal, in consequence of the inflammation of the glottis and neighbouring parts which results from ~~it.~~ *them*.

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