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A

SYSTEM

OF

DISSECTIONS,

EXPLAINING THE

ANATOMY OF THE HUMAN BODY,

WITH THE

Manner of Displaying the Parts,

THE

DISTINGUISHING

THE NATURAL FROM THE DISEASED APPEARANCES,

And pointing out to the Student the objects most worthy of attention:

DURING A COURSE OF DISSECTIONS.

VOLUME II.

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A SYSTEM

OF

Dissections.

DISSECTIONS

OF THE

NECK.

BEFORE the student proceeds to the dissection of the neck and face, besides having laid down certain important practical points to be the subject of his more particular attention during his progress, he ought to consider, or endeavour to learn, what are the peculiarities to which his attention should here be turned, and in what he is to expect this dissection to differ from that of the arm or leg.

He will have learned that the extremities are covered with strong fascia, that their vessels are protected by this fascia, and strong condensed cellular membrane, which invests them. In the neck, however, he will find no such fascia, but only an extended web of muscular fibres, which is stretched from the chest

obliquely over the side of the neck to the cheek, and which, mingling with the common cellular membrane immediately under the akin, embraces and compresses the important vessels beneath. He will, of course, inquire into the necessity and effect of this peculiarity. It may, therefore, be observed, that the neck, having a great breadth or thickness in proportion to its length, the several parts are necessarily more upon the stretch in the various easy turns of the head; and that there is here an ease and variety of motions, which could not be allowed, were the parts bound down by strong fascia.* Again, not only is there a necessity for free motion in the head and neck, but the motions of the throat are so extensive, that they could not have freedom, unless the uniform compression (which is required to every part of the body) were yet so moderate as freely to relax, whilst it kept a degree of tension on the parts.

Partly for these reasons, and partly for the accomplishment of other purposes, which we shall presently notice, the neck is not invested with a firm and unelactic fascia, but with a cutaneous muscle, the platysma myoides.

When the dissector makes his incision down the middle of the throat, and carelessly dissects back the integuments, he is apt to lift back this cutaneous muscle with them, because, where the muscles of either side meet in the middle of the neck, the fibres are extremely thin, and confounded with the sheath of cellular membrane which covers the veins and straight muscles. But, by taking little of the integuments off, except the cutis vera, and drawing his scalpel, in the

**When the neck is peculiarly short, and when the fat deposited still further separates the muscles, then are the turning motions of the head impeded, and the straining to the attempt has the effect of compressing the veins returning the blood from the head.*

length of the fibres from the clavicle to the chin, he will recognise the loose fibres, and be able gradually, by a nice dissection, to display the superificial anatomy of the neck, a most important part to the surgeon.

When you have dissected back the integuments from the side of the neck, and behind the mastoid muscle, the connecting membrane becomes looser, and here it is interwoven with the extremities of the cervical nerves, and their connexion with the sub-occipital and portio dura. There will be found here also numerous meshes of veins, the occipital and cervical veins forming areolæ with the axillaris and jugularis externa.

On the throat too, there are many superficial ramifications of the external jugular vein, which inosculate with the thyroid veins. Here also we find several delicate nerves, the branches of the anastomoticus colli descendens, and the extremities of the descending division of the ninth pair, or descendens noni.

DISSECTION OF THE MUSCLES OF THE NECK.

The first muscle you have to dissect is the platysma myoides. It arises from the integuments which cover the pectoralis major and clavicle; and descends obliquely upon the side of the neck to the base of the jaw. It is called a tutaneous muscle; but improperly. This name however, implies the mambranous nature of the muscle, and that it is to be found immediately under the skin. The integuments are to be lifted from it by carrying the knife in the direction of the fibre. When displayed in all its extent, from the deltoid and pectoral muscles to the cheek and base of the jaw, you will be satisfied that it has no connexion with the skin, and readily conclude that there is no truth in the explanation of its action, which supposes a muscle to arise on the fore part of the chest, to pull back the angle of the mouth. You

will also see that it is superfluous as a muscle for drawing down the lower jaw, considering how little force is necessary for that operation, and the numerous muscles which lie beneath. The use of this muscle is to compress the veins, and to impel the blood into the chest. It is in oction wherever there is straining of the muscles of the chest, as in difficult breathing, in coughing, or vomiting.

During this first part of the dissection, you have to observe, that the external jugular vein lies under this muscle; the small nerves which you find upon the side of the neck are branches of the decendens noni, and of the cervical nerves. On raising the platysma myoides (which is to be done by taking up its origin, and throwing the muscle upwards, having it connected with the face,) you see the beautiful muscle, the sterno-cleido-mastoideus.

After dissecting carefully the origin from the sternum and from the clavicle, and following up these portions towards their insertion into the temporal bone, you have to consider them as subject to disease. The wry neck is produced by a disease of this muscle; a portion of it loses its natural structure, and degenerates into a kind of cartilage, which of course is equally incapable of contraction or of being stretched. The consequence is, that the head is tied down to one side, the mastoid process brought towards the sternum, and the chin pitched directly upwards. Sometimes this disease affects the clavicular, sometimes the sternal portion; and by observations on the dead body in the course of this dissection, the student will learn to distinguish these portions in the living body, and to avoid the error of cutting more, in operation, than the portion which is diseased.

During the dissection of this muscle, a considerable nerve will be observed, perforating it in its upper part. This is the spinal accessory nerve, a branch of the eighth pair.

SECOND DISSECTION.

THE MUSCLES OF THE JAW, THROAT, AND TONGUE.

Before proceeding to this dissection, you must take the cartilages of the throat in your hand, and make yourself familiar with them.

Os hyoides. 1. Its base; that part which is felt at the root of the tongue. 2. Its greater cornua, which stretch the bag of the pharynx, as the fingers do the mouth of a purse. 3. The lesser cornua. 4. The ligament which connects this bone with the styloid process.

Thyroid cartilage. 1. Its broad shield-like part. 2. The prominent part near the os hyoides, called the ponum adami. 3. The inferior cornua. 4. The superior cornua. 5. The ligament which connects the corner of the os hyoides and thyroid cartilage.

Cricoid cartilage. You have principally to observe: 1. That the ring is narrow at its fore part, and that there is a space between this and the lower part of the thyroid, occupied only by a membrane. 2. That the cartilage rises remarkably on the back part. 3. That on this prominence there are two articulating surfaces for the arytenoid cartilages.

Arytenoid cartilages. These are not at all like peas. They are of a singular and very irregular form. You will observe: 1. Thier base and articulating surface. 2. The apex or tip. 3. Their posterior angle.

Epiglottis. This is a broad triangular cartilage, of the shape of an artichoke leaf. It is connected with the other cartilages of the larynx, and with the

root of the tongue. In swallowing, it falls down like a valve upon the opening of the larynx.

The dissector proceeds to the dissection of the muscles, which cover the fore part of the throat, and which arise from the scapula and sternum, and are inserted into the os hyoides and thyroid cartilage. These are muscles which draw down the throat : viz.

1. The STERNO-HYOIDEUS,
2. OMO-HYOIDEUS, and
3. STERNO-THYROIDEUS. (See Appendix.)

He has then to dissect the muscles which lie betwixt the lower jaw and os hyoides : viz.

The DIGASTRICUS, or BIVENTER MAXILLÆ.
MYLO-HYOIDEUS.
GENIO-HYOIDEUS.
GENIO-HYO-GLOSSUS.
LINGUALIS.

These two last classes of muscles are antagonists to each other. In the degree of permanence of contraction, I consider the long muscles of the throat to resemble the sphincter muscles. The throat is moved upwards in swallowing by the second class, during which these of the first class relax ; but when the second have ceased to act, these resume their stationary tension and action, which is to keep down the cartilages of the throat.

When the platysma myoides is taken off, if the veins have been injected, we shall be astonished with the irregularly dilated state of the internal jugular vein ; but we shall perceive that it is so in a particular manner, where it is under the influence of the mastoid and cutaneous muscles, which by their alternate and spasmodic action, force the blood from the head into the thorax, during coughing or other violent inspiration ; and we may perceive that without this provision, the blood would actually stagnate in the head when there was a strain upon the lungs, and an interruption to the blood entering the chest. For

the same reason (the occasional difficulty of the return of the blood into the thorax,) we see that even what may be considered as the cutaneous veins, are still under the platysma myoides. The effect of this muscle on them may be at any time observed during the violence of a cough. This muscle is, therefore, quite unlike the cutaneous muscles of quadrupeds, and must not be classed with them. Neither is it a muscle, the principal use of which is to pull down the corner of the mouth, or to act on the lower jaw ; but its real effect is to compress the veins.

Bronchotomy, here, forms the first subject to which the attention is naturally attracted in this dissection. Observe the thickness of the integuments over the trachea, the veins which cover it, the small muscles which are to be held aside : observe, also, the extent of the thyroid gland, the profussion of veins and arteries which supply it, the motion of the trachea, the rings of the trachea, the size of the passage of the tube, and that the space for the operation is bound in by the carotids, sternum, and thyroid gland. In short, all those circumstances ought to be noted and observed, which have proved fatal during the operation, or which are, by our best writers, conceived to threaten suffocation, viz. the danger of blood falling into the windpipe, and causing suffocation ; the motion of the throat throwing out the tube, and causing sudden obstruction, with the risk of transfixing the trachea by the trochar, and the possibility of accidents from the swelling of the integuments, &c. Let the student make up his mind now to the difficulties, the dangers, and the uses, of this operation ; for when the call is made upon him, and his patient is in danger of immediate suffocation, the mind will not be free for deliberation.

FARTHER DISSECTIONS OF THE MUSCLES OF THE THROAT.

To proceed with the dissection of the muscles of the throat, you ought now to take away the lower jaw: or, if you do not wish to preserve the skeleton, saw through the jaw at the symphysis, and dislocate one side of it from its articulation. You then get a lateral view of the throat. You dissect these muscles:

1. The STYLO-GLOSSUS.
2. The STYLO-HYOIDEUS.
3. The STYLO-PHARYNGEUS.
4. The CONSTRICTOR PHARYNGIS SUPERIOR, MEDIUS, and INFERIOR.

For these muscles see the Appendix.

The throat and tongue being washed with a little vineger and water, you should attend to these parts:

1. VELUM PENDULUM PALATI. This you find to be a soft fleshy membrane, eking out the soft palate in the roof of the mouth, and hanging from the palate bone; behind it and above it you see the posterior nares. This velum you may consider in the first place as a valve, which falling against the back part of the pharynx prevents the food or drink from passing out of the mouth into the nostrils: it is also an organ of the voice; if I had ever doubted this, I lately had an opportunity of assuring myself of it, for I examined a man who had so entirely lost the bones of the face that I could look down into the throat from the nose, and as he spoke I saw this membrane rising and falling, and changing its degree of tension, so as to modulate the voice.

2. UVULA. This is the part which hangs down in the centre of the velum palati. It is a very sensible part, and is in some degree a centinel to call into ac-

tion the surrounding parts, for as soon as the morsel passes the uvula, it is grasped by the arches of the palate and pharynx. It no doubt also assists in modulating the voice.

3. Towards the root of the tongue you find two arches with an intermediate space, somewhat like the gothic arch. The anterior one is made by the constrictor isthmi faucium drawing the membrane: the posterior one in the same way by the palato pharyngeus.

4. AMYGDALA. In the hollow between these arches, they receive a large mucous gland, the amygdala. You observe a member of follicles here, in which the mucus lodges. This gland is one of many for covering the morsel with mucus, that it may glide from the œsophagus into the stomach.

5. ITER AD AUREM. The last thing I wish you to observe is the Eustachian tube, or the iter a palato ad aurem. You have now the following muscles to dissect:

1. AZYGOS UVULÆ.
2. CONSTRICTOR ISTHMI FAUCIUM.
3. PALATO-PHARYNGEUS.
4. CIRCUMFLEXUS PALATI.
5. LEVATOR PALATI MOLLIS.

See the Appendix. p. 1.

The names imply the actions of these mus cles.

Some further remarks upon the dise ses.

From what has been said, it will be readily understood, that, if the curtain of the palate be destroyed by ulcer, the voice will be affected, and in swallowing, fluids will regurgitate into the nose. By inflammation the velum may attach and adhere to the back part of the pharynx. This I have seen as the consequence of sibbens. The amygdalæ, as every one knows, swell enormously in inflmmation of the throat; so as to threaten suffocation. They suppurate, or rather, as I

imagine, the suppuration is in arches of the palate. These glands are subject to a hardness like callosity, and require to be extirpated on account of the unpleasant effect which is thus produced on the voice. The uvula is subject to relaxation: and by this too the voice is affected. Sometimes the uvula degenerates into tumour, and requires to be cut off. The student should accustom himself to the natural appearance of all these parts, so that he may not fall into the error which I have known to be committed, of giving a course of mercury, under the persuasion of the throat being ulcerated when there was nothing unnatural, nothing but glandular irregularities, the foveæ of the amygdala. As the communication between the throat and the cavity of the ear is for supporting the ballance of the air in the cavity of the tympanum, so that the membrane of the tympanum may vibrate easily; the deafness from cold is explained when we know that the swelling and relaxation of the membrane at that place closes the communication through the Eustachian tube. And so we may understand how tumours of the polypous kind, overspreading the upper part of the pharynx and posterior nares, produce deafness.

In swallowing, the parts act in this succession: When the morsel is masticated, there is as yet an ungratified appetite: and to gratify the palate completely, the morsel must be thrust back into the pharynx: this is done by the dorsum of the tongue, by the muscles which raise and draw back the tongue. At this time the velum is pressed up, to prevent the matter from passing into the nostrils. The morsel is then seized by the constrictor pharyngis and palatopharyngeus, which by their action push it down into the pharynx: it is then pressed by the upper portion of the constrictor pharyngis, and successively by the middle and by the inferior portion of that muscle until it is delivered to the grasp of the tunica vaginalis gulæ, which by the successive action of its fibres, carries it into the stomach.

A singular disease has been produced by the lodging of a cherry stone or such small body, in some inequality of the bag of the pharynx, perhaps originally an ulcer or a lacuna, whenever lodged here, it is by each subsequent aciton of the throat pushed deeper. The fasciculi of the fibres of the surrounding muscle yield to it; and every time the food passes, some part of it is deposited so as to encrease the distention of the little sac, till gradually it becomes an immense bag, receiving a great part of every meal: at last by its size it presses on the œsophagus, and finally obstructs deglutition.

The pharyngeus and tunica vaginalis gulæ being the muscular covering of a tube connected directly with the stomach, and further united by sympathy with that organ though the branches of the great pair of nerves, are subject to spasm, as well as to paralysis, from disorders of the stomach. This leads me to point out the propriety of attending to the anatomy of the parts, as the directors in the introduction of the tube into the stomach for conveying nourishment during obstructed deglutition.

Cut up the side of the gullet and pharynx, and observe once more the velum, the root of the tongue, the opening of the larynx, and the epiglottis. You will observe that the epiglottis is connected with the root ef the tongue, that it is raised from the larynx when the tongue is thrown forward, and it falls down to cover the glottis when the root of the tongue is drawn backward: with the present view before you, if you think of introducing the flexible tube, the propriety will occur to you of forcing it against the back part of the pharynx, and of making the patient pull the tongue back, as in the action of swolling, so that the glottis may be protected, and the point of the tube prevented from being introduced into the larynx.

DISSECTION OF THE LARYNX.

You now take out a portion of the trachea along with the larynx; that is, the cartilages which have already been enumerated, and which form the upper part of the trachea. Dissect the following muscles;

On the fore part:

1. THE THYRO-HYOIDEUS.
2. THE CRICO-HYOIDEUS.

On the back part:

1. THE CRICO-ARYTÆNOIDEUS POSTICUS.
2. ——————————————LATERALIS.
3. THE THYRO-ARYTÆNOIDEUS.
4. THE ARYTÆNOIDEUS OBLIQUUS.
5. ——————————————TRANSVERSUS.
6. THE THYRO-EPIGLOTTIDEUS.
7. THE ARYTÆNO-EPIGLOTTIDEUS.

Having dissected these muscles, slit up the larynx upon the back part, and observe, 1st. The soft and delicate nature of the mucous membrane, which covers all these parts. 2d. The sacculus laryngeus. 3d. The rima glottidis; and the manner in which it is formed: a tendon passes from the back and middle part of the thyroid cartilage towards the base of the arytænoid cartilage, and membrane of the throat being drawn over that ligament, a chink or slit is formed, which is enlarged or diminished by the operation of the small arytænoid muscles; these operating on the upper and outer part of the arytænoid cartilages move their base, and draw tense, or relax the tendon of the glottis.

DISEASED APPEARANCES IN THE LARYNX.

1. Inflammation of the membrane of the larynx is very frequent. While in a less degree, the mucous secretion is only made more viscid, and lodges about

the sacculus laryngeus. In violent inflammation, the nature of the secretion is changed, and a membranous substance is formed: for example, in the cynanche trachealis, or croup, a complete tube of membrane is formed. In examining this diseased appearance, you will generally find a serous effusion on the outside of the larynx: if the child has died early in the disease, much inflammation about the inside of the larynx, and a yellowish cineritious membrane lining the larynx and trachea: the child dies in consequence of effusion in the lungs, and you have to observe during dissection whether the lungs, collapse upon opening the thorax, or whether there is this membranous production or effusion in the branches of the trachea, the bronchiæ, and cells.

2. I have frequently of late found ulcers in the larynx.

3. I have found the epiglottis entirely eaten away.

4. Abcesses form in the outside of the larynx; many of these have opened internally so as to cause suffocation.

When the parts are before the student, he has to consider the effect of bodies entering the chink of the glottis, or lodging about the larynx; of a bit of bone sticking in the throat near the larynx; the operation of bronchotomy as it relates to the internal structure. In the consideration of all these subjects, the leading fact is this, that there is scarcely such a thing as mechanical obstruction to respiration, but that if a husk or shell lodge about the larynx; or if inflammation excites it to a more irritable state; or if an ulcer is formed in these parts; the sense of suffocation and the coughing come in successive paroxysms, because they proceed from the contraction of the glottis and the action of these lesser muscles.

It too often happens that the surgeon thinks he has done enough when he has learned to count the branches of the external carotid artery, and their con-

nections with the glands; and, with these thoughts, he confidently undertakes all kinds of operations on this part of the body. But I have so often seen, during an operation, mistakes and hesitation, proceeding from ignorance of the outward appearance of the parts, and particularly from inattention to the effect of the platysma myoides, that I feel myself called upon to solicit the student's attention to it.

In dissecting out a small superficial tumour from the neck or cheek, we often find a few fibres encumbering us, and embracing the tumour with a firmness, which will readily be ascribed to the fibres of the platysma myoides, only by those who recollect the wide difference betwixt the muscle acting as a living part, and the relaxed and feeble state in which it is found in dissecting the dead body.

Again, I have seen surgeons experience much difficulty in dissecting round the base of a tumour seated in the neck, or above the angle of the jaw, merely from forgetting the effect of this cutaneous muscle in binding it down, and in more particularly connecting the base with the surrounding parts; for thus misled he has to dissect wide, deep, and irregularly, to destroy the adhesion of the tumour to the parts beneath. To dissect out a diseased gland, we ought to lay the skin, cellular membrane, and fibres of this muscle, freely open, and reach fairly down through the bed of fat or membrane in which it lies. By getting thus to the immediate surface of the tumour, which is generally smooth and uniform, the dissection will in almost every instance be very easy; and often the gland may be turned out with the point of the thumb or handle of the knife, so as to hang by its vessels, the artery supplying the tumour being the only one which will require to be cut. By attending to this it will be possible to dissect tumours from parts surrounded with important vessels, without hæmorrhage or other danger.

FIRST DISSECTION OF THE MUSCLES OF THE FACE.

The knife should be carried from the occiput to the nose; then carried above the eye-brow. The dissection is to be begun on the forehead, by carrying the scalp off towards the ear. The anatomist must take care only to raise the skin, and not go too near the bone. He will find the fibres of the anterior portion of the occipito-frontalis running down to be inserted into the eye-brow; and a strong slip passing down on the nose. When he has dissected the frontal and occipital portion of this muscle, he will raise the lower part of it near the inner extremity of the eye-brow, and then he will find the corrugator supercilii arising from the nasal portion of the frontal bone, and inserted into the eye-brow.

The second part of this dissection will comprehend the muscles of the eye-lid and the oblique muscles of the eye-ball. In dissecting for the orbicularis muscle, the eye-brow ought to be preserved in its place. The knife must still be carried in the direction of the fibres of the muscle, in this instance, in a circular direction round the eye-lid.

The eye-ball and recti muscles are now to be dissected out, and displayed, when if the student is desirous of comprehending something of the use and function of these muscles, he has these subjects of enquiry before him.

1. The action of the muscles of the eye-brow, as bestowing a capacity of expression. 2. The action of the orbicularis, in gently closing the eye-lids and in weeping, in opposing the occipito-frontalis, in combining with the corrugator supercilii. 3. The question; are these obliqui muscles to roll the eye-ball, or merely to suspend it, and prevent the recti from dragging the eye-ball into the socket? 4. Then

comes an enquiry regarding the action of the recti muscles on the optic nerve and on the ball of the eye. 5. And, lastly, the distinction of squinting, as it proceeds from a weakness in the sensations of the retina, or an irregular action of the muscles of the eye.

SECOND DISSECTION OF THE MUSCLES OF THE FACE, VIZ. THOSE WHICH SURROUND THE LIPS AND ACT ON THE NOSTRIL.

The anatomy of these muscles is sufficiently explained in the Appendix; they require niceness and care in the dissection; an incision is carried down the side of the nose from the inner angle of the eye, this is in the direction of the levator labii superioris, alæque nasi. By the side of this muscle toward the nose, is the constrictor nasi. The levator labii superioris comes down from the edge of the orbit so as easily to be found, and beneath it lies the levator anguli oris.

The dissection of the muscles on the lower part of the face must be begun by carrying the integuments off the neck and dissecting the platysma myoides. As this cutaneous muscle of the neck ascends over the corner of the jaw, it runs forward to the angle of the mouth, under the name of risorius santorini.

This risorius muscle, being superficial, may be dissected away, and then a clearer view may be had of the zygomaticus, the buccinator, the depressor anguli oris, and the depressor labii inferioris.

The dissector in the last place makes the dissection of the orbicularis oris, and the levator menti.

N. B. This last class of muscles are to be considered, 1. As muscles of mastication. 2. As muscles of expression in modulating sound. 3. As muscles of expression in moving the features. 4. The enquiry may

be carried to the comparison of the muscles of man, with the two classes of brutes, the carnivorous and granivorous, and lastly to the observance of what is peculiar to the human face, and indicative of human character.

DISSECTION OF THE ARTERIES OF THE NECK.

The student having injected the arteries of the head and made himself master of the plan of the carotid artery, which he will find in the Appendix, proceeds to the most important dissection of the whole body.

The FIRST DISSECTION ought to be the outer muscles on the fore part of the neck, the thyroid gland, its veins and arteries.

The SECOND DISSECTION is begun by turning off the platysma myoides, and clearing the mastoideus muscle. Then the sheath of the trunk of the carotid artery is to be opened, and the jugular vein and the par vagum displayed.

THE DISSECTOR WILL BE LED TO CONSIDER THESE POINTS.

1. He will attend to the direction of the carotid artery, and how it retires behind the cartilages of the throat, and receives protection from the mastoid muscle.

2. Seeing the deep situation of the carotid, and the manner in which it is surrounded by the sheath of membrane, and under the compression of muscles, it will be easily comprehended how it is supported, after its coats have given way and are dilated in aneurism; and observing how it must be supported and compressed on the outside, the effects of its aneurismal dilatation in obstructing the muscles of

the throat, and compressing the trachea, will be understood.

3. No part of anatomy can more interest the surgical student than this intricate intertexture of vessels and nerves under the angle of the jaw.

We observe how the platysma myoides covers and embraces all the vessels, even the commencement of the external jugular vein: Again, how the vessels recede under the protection of the edge of the mastoid muscle. We find a mass of cellular membrane mingled with the glandulæ concatenatæ, or lymphatic glands of the neck, lying on the outside of the jugular vein, and connected with the sheath of the great vein and artery. These are the glands which are so often diseased, and form large hard tumours, requiring operation. Observing their situation in this their natural state, we may learn how far they must compress and encroach upon the vessels before they torment the patient with the alarms of suffocation; and being under the pressure of muscles before they distend the integuments, they have generally sent their roots very deep. When a gland enlarges from disease, it pushes aside the cellular membrane, and condensing it, forms a firm sheath or bed in which the gland lies; by getting through this cellular membrane, as I have observed, and cutting fairly down to the surface of the gland, or raising up by dissection layer after layer the surrounding celluar membrane, the surgeon will often be able to dissect it out from its bed with ease. But these glands, we may observe, during dissection, are close upon the processes of the cervical vertebræ. During their enlargement, therefore, they press down upon the bone, and form an adhesion so broad and intricate, that it is impossible to take the gland away with any certainty of eradicating the disease.

4. When these glands under the angle of the jaw, and before the mastoid muscle, enlarge, they push

up the lobe of the parotid gland before, form firm connexion with it, and are nearly incorporated with it. Hence, I have no doubt has frequently arisen the mistake of the surgeon, that he was extirpating the parotid gland, when he was merely taking out the lymphatic gland, and perhaps along with it the extended lower lobe of the parotid. Twice I have seen in operation the lower part of the parotid gland dissucted off with much trouble and nicety from the enlarged glands beneath, and the diseased lymphatic gland taken out. In these several operations being assistant, I have found it necessary to observe to the surgeon, that the surface of the tumour consisted of the natural granulated parotid gland, and to show him how to turn up the parotid gland to take out the tumour of the lymphatic gland.

5. Observing in the first and superficial dissection of the side of the neck, the manner in which the platysma myoides covers all and sends its slips upwards on the cheek, we shall understand how, by these means, it firmly braces down the lower part of the parotid gland ; and that before we can come to the surface of a tumour seated here, we have in general to make a free incision through this muscular expansion. It may be further remarked, that the embracing of the fibres of this muscle has, during operation, a strength which the relaxed state of the parts in the dead body cannot explain.

6. Observing the numerous branches of arteries and veins here, the surgeon, digging in this deep cavity, will perhaps endeavour to insulate the connexions of the gland rather by the finger than by the knife. But I have found the root of such tumours striking so deep by the side of the vessels, that there was actually in this attempt danger of lacerating the internal jugular vein.

7. It will be observed from the dissection, that the arteries which are in danger from the extirpation of

tumours behind the angle of the jaw, are the continued trunk of the external carotid, or the temporal artery, the internal carotid at its acute turn, and the occipital artery ; observe the relations of these points accurately. The most exposed is the temporal artery, as it ascends under the lower part of the parotid gland. The occipital artery will be observed to lie very deep under the mastoid process, defended by the transverse process of the atlas ; and no surgeon will attempt to go within the sheath of the carotid and juglar vein, so as to endanger the internal carotid artery. See Rules for tying arteries when divided in wounds, and a description of the manner of dissecting for them. Operative Surgery, Vol. II.

8. Surgeons, in common practice, often extirpate tumours with merely a general knowledge of the arteries, and after feeling and examining the tumour, they cut it out by merely going round the diseased parts. We cannot but shudder to think how many operators of this kind there have been in this country, and how many there still are, giving themselves out as operators, with an intention of establishing themselves in the superior ranks of the profession, with the sin of a conscious deficiency both of knowledge and expertness.* Here in the neck the surgeon can use no tourniquet to stem the torrent of blood, until he have cut round the diseased parts : he must have an accurate knowledge of the parts, and dissect so as to avoid danger. The want of a knowledge of this part of anatomy does not so much lead to rash and fearless operations ; but as the parts are really of so essential importance, and errors so fatal, the patient is put off from time to time with frivolous pretexts, until the disease becomes so extensive, or the adhesions of the

* *The author is happy to say that these remarks do not now apply to what is within his sphere of observation.*

tumour so deep, and so widely spread, that no other surgeon can venture upon an operation.

9. Observe also that sometimes there is found lying on the parotid, or in its substance, a lymphatic gland, which may be diseased, and which I have seen diseased, and taken out from its socket in the gland. We ought also to attend to the vessels passing through the parotid gland, particularly the continued branch of the external carotid, the going off of the internal maxillary, and the transversalis faciei. We shall be convinced from the actual view of the parts, that it is impossible to extirpate the parotid gland.

I assisted my brother formerly in this operation. The whole gland was diseased ; it was dissected all round, until it remained attached only at that deep point which is behind the jaw bone, where it encircles the artery. A ligature was put upon its root, and in a few days it dropt off, more completely eradicated than could have been possible with the knife.

The following day I assisted Mr. J. Walker, surgeon, to dissect out a tumour from the same place. It would have appeared to a superficial observer to be the same disease of the parotid gland ; but, though the tumour was firmly rooted behind the angle of the jaw, its degree of lateral motion convinced us that it was a diseased lymphatic gland, rolling under its bed of cellular membrane, and the lobe of the parotid gland. Mr. Walker, therefore, laid his account with going through the cellular membrane, cutaneous muscle, and the lobe of the patrotid gland, before he touched the surface of the diseased gland. By these means, without hæmorrhage, he was enabled completely to insulate it ; but finding its roots to run very deep, and the artery pulsating strongly, (the tumour being in actual contact with the external carotid,) he put a ligature round the root of the gland, which came away on the following day.

I also assisted Mr. Renton on a similar occasion.*

When we dissect up the parotid gland, we observe the strong cord of nerves (the portio dura) which passes up through it, branching to the side of the face. These nerves will retain the ligatures for a very long time, unless they are, after a few days, snipt across. We ought to explain to the patient that there is often a slight distortion of the mouth, or a falling down of the eyebrow, from taking out tumours about the jaw.

10. The student must not leave the dissection of the carotid arteries, the thyroid and lingual arteries, without turning his attention to the circumstance of wounds in the neck, and state of those who have attempted suicide.

11. And having examined the thyroid gland and its four arteries, he ought to think of its enlargement and the conseqnences of the attempt to extirpate it.

DISSECTION OF THE ARTERIES OF THE HEAD.

The student proceeds with the dissection of the arteries of the jaws and face, and the first thing which arrests him is the anatomy of the salivary glands.

1. He observes the place of the parotid gland, its great extent from the jugum to the mastoid process of the temporal bone. He observes the character of its substance; he notices the socia parotidis; the course and exact plan of the duct. He will take into his consideration the necessity of avoiding this duct in operations on the face, and the consequence of wounding it, viz. a fistulous opening, discharging saliva copiously during meals.

2. He will next turn his attention to the submaxillary gland—notice its place and the lymphatic

These cases occurred some years ago in Scotland.

glands which are attached to it. These lymphatic glands are often diseased; the salivary gland rarely.

3. He will then dissect the genio and mylo-hyoidei muscles, and expose the sublingual gland, thus tracing large salivary glands round the whole lower jaw. He will next attend to the opening of the salivary ducts under the tongue, and think of the effect of their obstruction, and place and appearance of salivary concretions.

4. The student now traces the branches of the carotid artery, marking their exact place, that they may be avoided in operation, or secured in the event of being wounded.

THE DISSECTION OF THE EYE.

Before the student proceeds to the dissection of those coats of the eye, which are called the proper coats, he must observe what is meant by the accessory or adventitious coats, viz. the tunica conjuctiva, or adnata; the albuginea, formed by the expanded tendons of the muscles. In studying these he takes also into consideration the apparatus for secreting the tears, and for absorbing and conveying them into the nose.

The tunica conjunctiva he finds to be the inner membrane of the eye-lid, reflected over the surface of the eye, so as to prevent foreign bodies from passing deep into the socket. He ought to attend to the seat of the lachrymal glands, by dissecting down the upper eye-lid, and pulling it from its situation under the roof of the orbit. He ought to examine the ducts of this gland which open on the surface of the inner eye-lid. He ought also to observe the *puncta lacrymalia* on the edge of the eye-lids, near the inner angle, for absorbing the tears after they have washed the surface of the eye; the caruncula

lacrymalis; the membrana semilunaris will be examined.

A careful observation should also he made of the situation of the lacrymal sac and duct; the relation it bears to the ligament of the tarsus, to the angular artery, to the strong point of the nasal process of the upper maxillary bone, and its seat in the os unguis. An opportunity must be taken of tracing the duct down to its opening in the nose, under the lower spongy bone, and of observing particularly the direction of the stilet in the operation for the fistula lacrymalis.

Upon taking out the eye, the ducts of the lacrymal gland should be examined; the Meibomian ducts and glands.

The surgical student will now enquire what is the nature of the *Pterygion* and *Pannus* and *Encanthis*, and the effect of inflammation on the conjunctiva and cornea.

He will think of the nature of the disease called *fistula lacrymalis*, and the operation for its cure.

Having dissected the eye-ball free of all parts external to the sclerotic coat, I should advise this method of proceeding: lay the eye in a flat dish, and pour round it warm jelly, so that just the surface of the sclerotic coat be above the jelly, and a small part of the margin of the cornea. When the jelly has congealed, it keeps the eye-ball uniformly supported and steady, and prevents the necessity of such pressure on the coats as would make the vitrious humour burst through the choroid coat or retina, upon making the incision of the strong outer coat. The instruments must be nice and sharp; two pairs of small forceps, a lancet, pointed knife, and very delicate scissors, and blow-pipe.

With the sharp lancet, by repeated scratches, cut up a portion of the sclerotic coat; then insinuating the point of the scissors under it, raise a triangular

flap. Under the sclerotic, the choroid coat, of a dark brown colour, will be recognised; vessels and nerves will be seen passing from the sclerotic to the choroid coat; the nerves running forward betwixt the sclerotic and choroid coats to the iris: the arteries of the choroid will be distinguished from the veins, by their running forward, and in a direction nearly parallel; while the larger veins, when followed through the sclerotic coat are seen to send out their branches, diverging from the centre, and at the same time making circles in their course, so as to have the name of *Vasa Vorticosa.**

A general black colour will be observed to pervade the substance of the choroid coat; and upon teazing up this outer surface of the choroid coat, we have what is considered as the proper choroid coat, while the inner surface is the *tunica Ruyschiana.*

Upon turning back a portion of the dark choroid coat, you find a black pigment on its under surface, the *Pigmentum Nigrum.* If the subject is not perfectly fresh, the black matter will be loose and floating; part of it will also adhere to the surface of the retina, which is now seen lying under the choroid, and under the *Pigmentum Nigrum.*

The retina will be found whitish, or having a considerable degree of opacity. By dropping a little weak acid upon it, it will become more opaque and stronger, and the vessels upon the inside will be more obscurely seen; but if we turn up a portion of the retina, we see the vessels on its inner surface still distinct, and running apparently without any membrane to support them. This, however, is owing to the perfect transparancy of the inner surface of the retina; and these ramifications are a proof that there is a

* *This is on the presumption that the veins and arteries of the eye are injected; if they are not, they will appear like a fibrous structure in this choroid coat.*

membrane here, the *lamina vasculosa tunicæ retinæ*; while that which is external, and contiguous to the pigmentum nigrum, is the medullary portion of this internal coat, called retina, and the seat of the sense.

Returning to the sclerotic coat, and cutting it further up towards the cornea, we have to attend to the connexions of the iris and ciliary processes, and chambers of the aqueous humour. We find, upon carefully dissecting up the most anterior part of the sclerotic coat, that there is a whitish kind of band which connects the outer circle of the iris and the ciliary circle with the sclerotic coat. This circular connexion best deserves the name of ciliary ligament. When we have taken up a considerable piece of the pellucid cornea, we can then observe the size of the anterior chamber of the aqueous humour; and the situation of the iris, the nature of the pupil and the situation of the lens. The lens will be seen with its anterior convexity close upon the pupil, or perforation of the iris; and the greater posterior convexity will also be observed, when you look from behind.

Now, the student ought to turn in his mind all the precepts he has received regarding the operations of extracting and couching the cataract; for now he can understand that the great principle of extracting the opaque lens is, that the vitrious humour being compressed, protudes the lens through the dilated pupil. He may now convince himself, by observing the nearness of the lens to the iris, of the very small quantity of the aqueous humour contained behind the iris, and the impossibility of depressing the lens (by the operation of couching) into the posterior chamber of the aqueous humour, there being no such cavity. He will observe also, the point at which the needle for couching ought to be introduced, and the direction of the needle, so as to transfix the cataract. In short, he must now study the parts, and trust to no verbal description; for such is the use of dissection.

We will observe further in this view, that where the choroid coat advances forward, it is, as it were, confined, so as to form plicæ ; and these passing inward, touch the margin of the lens. Now observing the place of these ciliary processes, introduce your hook, transfix the lens, and bring it away ; and now you will observe that these ciliary processes are very short ; are like one circle within the larger circle of the iris ; and that there is no space betwix, these and the iris ; that when the lens is depressed, it is unsocketed from these connexions, and lies under the vitrious humour.

OF PREPARING THE RETINA FOR DEMONSTRATION.

Suppose that we make sections of the eye, with the intention of studying the structure of the optic nerve and retina, we dissect and follow the coats of the nerve until we find them terminating in the coats of the eye. In making a section of the optic nerve, we can now trace the arteria centralis retinæ through the porus opticus ; and the medullary matter of the nerve itself through the lamina cribrosa. When we have made a section of the eye, so as to see the back of lens and the ciliary processes, we may observe that the retina seems to terminate at the root of the circle of the ciliary body, or corona ciliaris, as I have called it. But here the opaque and medullary part of the retina only terminates ; the transparent part of it is continued inward ; not only touches the lens, but passes over its back part. By pouring a little vinegar on the retina, the opaque medullary part will become more opaque, but the vessels on the inside will not be obscured. To demonstrate the vascularity and membraneous nature of the retina further, float it in water, so that its outer surface may be exposed ; then take a solution of the caustic alkali, and with a hair pencil wash away the outer medullary surface ; then only will there remain the

web of membrane, which serves as a base to the medullary part : or float the whole retina in a very weak solution of the alkali, and then it will appear that the medullary part is gradually dissolved, and there only remains the delicate and transparent web of membrane, full of vessels ; which transparent membrane is the base upon which the medullary part is as it were superimposed.

When the web of the retina is minutely injected, and thus prepared, it may be hung in spirits, and then the vessels are seen beautifully ramifying : while the membrane which conveys them being transparent, is not discernible ; and this I conceive must have been the manner in which Ruysh must have prepared the vessels of the retina, so as to represent them as he has done in his works.

To examine the iris the eye is put in jelly until it is all covered but the cornea. The cornea is then to be punctured with a lancet, and cut off. The iris is then seen to be a delicate membrane perforated in the centre, which perforation is the pupil : directly behind, the lens is felt, not seen, because of its extreme transparency. In the living eye the depth of the posterior chamber of the aqueous humour is just enough to prevent the lens and iris from being in contact. The iris is properly the anterior part of this perforated membrane ; the back part of it is sometimes called uvea. It will be best to look for the muscular fibres of the iris in the eye of some of the larger animals.

Of the petitian canal.—To demonstrate this canal, we may cut off an anterior segument from the eye, leaving the lens seated on the fore part of the vitrious humour. To do this, the sclerotic coat must be carefully cut in the circle, a little behind the cornea ; then the choroid coat, with the ciliary body and iris, raised carefully rom the connexion to the fore part of the vitrious humour. Observing now the

margin of the lens, we perceive that the membrane of the vitrious humour appears to be reflected over it. Puncturing at this place, and blowing gently with the blow-pipe, you find that the air passes the circle round the margin of the lens, forming a canal, like a chain of regular vesicles : or, instead of using the blow-pipe, to adapt it for demonstration, the point of the mercurial injecting tube may be forced into the angle betwixt the lens and vitrious humour, and a few drops of quicksilver allowed to fall into it, when they will show a connected chain of globules running round the lens.

The *Membrana Pupillaris* is seen in the fœtus of from seven to nine months. It is a web of membrane which is hung across the pupil. To show this membrane, we may cut across the eye, keeping the anterior segment, then gently separate the vitrious humour and lens. But this is a slovenly way of displaying the membrane : we ought carefully to cut away the cornea also, so as to show the ciliary circle and the iris, and membrana pupillaris on both sides.

If the eye of the fœtus be injected, we may socket the eye ball in a small cup with jelly, and then open the sclerotic coat, the choroid and retina. When we have done this, and look down into the vitrious humour, we shall see the arteria centralis retina send forward an artery, which is distributed to the back of the capsule of the lens. It the capsule of the lens be injected, we shall be able to trace the connexion of the fœtal system of vessels in the eye, from the arteria centralis retinæ to the branches of the ciliary arteries on the membrana pupillaris.

DISSECTION OF THE NERVES OF THE ORBIT AND FACE.

To have a distinct veiw of the nerves passing through the orbit, and to the eye, we must raise the upper part of the orbit, so as to have easy access to the parts within.

Observing the points at which the 4th, 5th, and 6th pairs of nerves pass through the dura mater, we have to dissect the dura mater up, so as to show the further course of these nerves. We have particularly to attend to the Gasserian ganglion of the fifth pair, and the passage of the sixth pair through the carvernous sinus. We must dissect the dura mater from the fore part of the petrous bone, and from the sphenoid bone, showing the cavity which it forms here for the lodgment of the ganglion of the fifth pair. We have to distinguish betwixt the interlacing of the membrane of the dura mater, and the branching of nerves. We ought also to lay open, with caution, the cavernous sinus, and display the turns of the carotid artery, and the course of the sixth pair, and the beginning of the great sympathetic nerve.

To prosecute the dissection of these nerves, the frontal bone must be cut down to the orbit, so as to lay open all the outside of the orbit; and the sphenoid and temporal bones must be cut down, so as to lay open the foramen lacerum, and the foramina rotundum and ovale. The cheek bone ought also to be cut down, and the lower jaw cut through at its symphysis, and the portion of the side you are dissecting ought to be torn back, and left attached at the articulation.

Now you have free access to the dissection of the whole course of the nerves of the face.

1. You have to attend to the nerves passing into the orbit, viz. the 3d, or motor oculi, the 4th, or trochlearis, the opthalmic branch of the 5th, and the 6th, or abducens.

The distribution of those nerves, or at least their general course, is to be traced by dissecting very carefully at the outer side of the optic nerve, where they are apparently in much confusion.

You ought then to attend to the further and minute distribution of these nerves in the orbit : 1st, The subdivisions of the fifth pair, viz. To the lachrymal gland ; to the forehead ; to the lenticular ganglion ; to the nose (by passing again into the cranium through the internal orbital foramen.) 2dly, The distribution of the third, or motor oculi, to the muscles. 3dly, The formation of the lenticular ganglion by the 3rd and 5th pairs, and the course of the fasciculi of ciliary nerves into the eye-ball.

Having followed the nerves of the orbit, you may trace the nasal branch through the foramen, by breaking up the cells of the frontal and œthmoid bones until you find it passing down again with the first pair into the nose, or sending its branches into the frontal sinuses.

Certain phenomena are now to be considered :

1. The languor in the eye and eye-lids ; the squinting in approach of death ; in hydrocephalus ; in the drunken man ; after fever, &c. 2. The convulsions and nervous symptoms which have resulted from a wound of the eye-brow. 3. The connexion established betwixt the eye and membrane of the nose. 4. Betwixt the iris and retina. 5. Betwixt the viscera and senses.

Having the Gasserian ganglion and first great division of the fifth pair already dissected, it remains to follow the distribution of the superior and inferior maxillary nerves.

To do this, there is much careful dissection and patience required, particularly for the dissection of the superior maxillary nerve ; for we find it lodged in the deep fossa, behind the maxillary sinus of the upper jaw amongst loose fat. Here it sends off

many branches; and the ganglion of meikel, with the retrograde Videan nerve, and the branches to the nose and palate, are exceedingly difficult to follow.

The whole of this dissection must be done by breaking up the bones, and their accidental fracture may tear away the chief point of demonstration.

The dissector turns to the other side of the head and traces the portio dura of the seventh nerve, properly enough called the *nervus communicans faciei*, sometimes the *lesser sympathetic*; he finds it coming out from the sylo mastoid foramen, and forming the pes anserinus under the parotid gland. He finds it connected with the supraorbital nerve, with the branches of the fifth on the temple, with the infra orbitary nerve on the cheek, with the mandibula labralis on the chin, with the ninth and the eighth, and sympathetic and cervical nerves under the lobe of the ear.

To follow the lower maxillary nerve (the third division of the fifth pair is easier,) you must recollect, 1. The great branch to the lower jaw: 2. The gustatory nerve into the substance of the tongue, and finally to the gustatory papillæ; and, 3. The reflected branch passing into the ear, the chorda tympani. 4. The connexions which it forms with the ninth nerve, and its twigs to the submaxillary gland. Lastly, the ninth nerve is to be followed and traced in its distribution to the muscles of the tongue.

After these dissections there are several things which ought to be noticed, and which may be explained from the circumstances of the anatomy: 1. Paralysis of the tongue takes place, and taste remains. 2. Hemicrania. 3. Tic doloureux. 4. The sensibility of the teeth. 5. The extreme pain in fracture and caries of the lower jaw. 6. Distinct sensation in the classes of the papillæ of the tongue. 7. Pain in the ear in affections of the teeth and throat. 8. Pain in the integuments of the head, and

those symtoms which are called nervous, of the head and senses in derangement of the abdominal viscera.

DISSECTION OF THE NERVES OF THE NECK.

The side of the scull is now to be cut down, and the lower jaw taken away. The dissector seeks the ninth nerve under the angle of the jaw, traces it into the tongue, and follows the descendens noni. This branch of the ninth nerve he finds passing down upon the side of the neck to the muscles of the throat, and forming connexions with the cervical nerves.

He then seeks the *par vagum* the *glosso-pharyngeal* nerve, the *spinal accessory* nerve, being the three divisions of the eighth pair.

Having followed the lesser divisions to their destinations, he returns and follows the par vagum down the neck, tracing its branches to the throat and larynx, to the heart. He follows it into the thorax, returns upon the recurrent branch, traces it round the great artery, and backwards behind the trachea to the larynx.

Here he naturally pauses to consider the distribution of these nerves, as they explain certain circumstances in the living system.

1. How tickling the throat produces vomiting. 2. How the secretions of the tongue and Pharynx are affected by the state of the stomach. 3. How the viscid secretions of the fauces and larynx will be changed by the operation of an emetic. 4. How it is explained that there is pain in the shoulder when there is inflammation of the throat. 5. How experiments on the par vagum and its branches affect the voice.

The dissection being resumed, the knife is carried

nearer the spine, and the great sympathetic nerve is traced downwards to the chest. Then the cervical nerves are to be dissected, and with particular care, the origin of the phrenic is to be demonstrated from the cervical nerves.

When the phrenic nerve is dissected, the external respiratory nerve should also be displayed, viz. that nerve which, arising from the nerves of the neck, like the phrenic, passes through the axilla, past the axillary plexus, and to the muscles clothing the chest, a nerve which I have described as combining together the action of the internal and external muscles of respiration.

PROSECUTION OF THE DISSECTION OF THE LONG NERVES INTO THE THORAX AND ABDOMEN.

The dissector having perused the classification, and general description of the course of the par vagum, sympathetic, and phrenic nerves, proceeds to the dissection of the thorax. There are two principal dissections, 1st. The nerves to the heart, viz. from the sympathetic, par vagum, and recurrens: the phrenic, in its course through the thorax to the diaphragm. 2d. The prosecution of the par vagum on the œsophagus and to the lungs. 3. The sympathetic nerve and splanchnic branches. To do this last dissection, it will be necessary to cut down the ribs; preserving only the lower margin of the thorax to keep the diaphragm distended; or the trunk may be opened, the diaphragm cut from its connexion with the ribs, and the sides pressed down to the table.

This dissection explains some obvious sympathies. 1. Seeing the net-work formed by the par vagum around the œsophagus, and considering their distribution to the stomach, we cannot wonder that in

hysterical women, with affections of the stomach, there should be spasm or paralysis of the œsophagus, or that sensation which is called globus hystericus. 2. By the circumstances of the anatomy, we are drawn to observe the connexion betwixt the stomach and lungs, and the asthmatic attack, from mere affection of the stomach, since we see the pulmonic plexus of nerves to be a division of the œsophageal plexus. 3. The same circumstance of connexion explains the effect of an antispasmodic draught instantly relieving spasm of the chest, or difficult breathing. 4. Seeing that the nerves of the heart are supplied by the sympathetic nerve and par vagum, we are prepared to expect that in the disorder of the viscera, the pulses of the heart may intermit, and the action be otherwise deranged.

5. Now it will be understood how a man, being wounded low in the spinal marrow, survives for a time paralytic; but being wounded low in the neck, and the spinal marrow injured, he dies. Because the wound in the neck being above the origin of the phrenic nerve, the muscles of respiration cease to act.

6. Seeing the derivation of the phrenic nerve to be from nerves whose branches are sent to the shoulder, and considering the proximity of the liver and diaphragm, we may conceive how disease of the liver is attended with pain in the shoulder.

DISSECTION OF THE NERVES OF THE ABDOMEN.

When we have dissected the par vagum in its course through the thorax, and have traced its branches on the œsophagus, we see them passing the diaphragm with the œsophagus, to be distributed upon the stomach (the corda ventriculi;) we may observe also

that the right nerve becomes the more anterior of the two.

To prosecute these nerves we must now follow their course in the abdomen, elevate the diaphragm, and press down the stomach, and shew the manner of their distribution to the superior orifice, and along the arches of the stomach. Here the student naturally recurs again to the consideration of the various sympathies, explained by the course of this nerve, and its distribution to the throat, lungs, and stomach, &c. Having dissected the branches of the par vagum, which are sent to the upper side of the stomach, and down to the solar plexus, he ties the lower orifice of the stomach, and cuts away all the length of the intestines, excepting a part of the duodenum and rectum.

Raising the stomach, he seeks the splanchnic nerve (the anterior branch of the sympathetic in the thorax) where it comes into the belly by the side of the lesser muscle of the diaphragm.

He finds the semilunar ganglion formed by this splanchnic nerve; it is like an irregular gland, being red and fleshy.

The solar plexus or great central ganglion of the abdomen is formed by numerous branches from the two semilunar ganglions, and a plexus descends to it from the nerves of the stomach.

Having found the two glanglia and traced them into the great solar plexus which lies before the aorta, and at the root of the cœliac artery, the lesser division of nerves is to be traced from this centre. We do not however now follow individual branches out meshes or plexus—viz. the hepatic plexus, along the veins tand arteries of the biliary ducts, splenic plexus along the splenic artery, the superior mesenteric plexus, the inferior mesenteric plexus on the upper and lower mesenteric vessels.

The next dissection, or division of this labour, is

prosecuted by lifting up the kidney and its vessels, and tracing down the continued trunk of the sympathetic nerve, which continues its course from the thorax into the abdomen, keeping close on the side of the spine. Here are to be observed the branches which it receives from the lumbar nerves; the plexus which it gives to the kidney; the additional branches it throws to the mesenteric plexus. From the plexus of the kidney are to be traced the nerves to the testicle or ovaria and womb, and finally the hypogastric plexus is to be shewn.

The connexion or consent of parts which will naturally recur to us during this dissection are, 1. The consent betwixt the stomach, and every other part of the living body, particularly betwixt the head and stomach, and the sickness from affection of the brain. 2. The consent of the stomach with the liver, exemplified in the sickness from disease, of the liver and in the increased discharge of bile during the excitement of the stomach. 3. With the testicle as shown in the sickness and lowness, the consequence of injury of the testicle. 4. With the womb as shown in the sickness ond retching during any change taking place in the uterus. 5. With the diaphragm as in vomiting. 6. We must admire too, the extraordinary sensibility of the stomach, independent of the conscious exercise of the mind. 7. We must consider the stomach as the most vital part, for a blow on the stomach kills more suddenly than when the injury falls on the brain or heart.

In dissecting the nerves of the loins, and especially in tracing them round upon the walls of the abdomen, and down upon the fore part of the thigh, and to the testicle, we cannot close our eyes to the evident connexion of parts established through them.

1. A numbness and stiffness in the thigh, is sometimes to be attributed to the accumulation of hardened fœces in the colon. 2. Nephritic cholic is a spas-

modic state af the colon, affected by the contiguity of the inflamed kidney, or sympathising through the connexion of nerves. 3. When we inject the coats of the testicle for hydrocele, we enquire of the patient if he has numbness in the loins and back, or if he has a weary numb sensation passing down the thigh. 4. Rheumatic affection of the thigh or loins, gives the sensation of pain in the testicle. 5. When there is stone in the kidney or ureter, there is numbness and pain of the thigh, and retraction of the testicle. 6 When there is disorder of the womb, there is a weight and pain of the loins. All these symptoms are to be explained by considering the common origin of the nerves from the loins.

DISSECTIONS

OF THE

UPPER EXTREMITY.

DISSECTION OF THE MUSCLES OF THE SHOULDER.

I MIGHT refer my reader entirely to the Appendix containing a history of the muscles, for this part of the anatomy of the muscles, did I not consider that it was too often considered as a mere lesson of dissection, in which there was no knowledge of surgery to be obtained.

1. The first thing which claims the attention of the student after making the dissection of the pectoralis major, the deltoides and latissimus dorsi, is to be able to answer intelligibly that question which is so frequently put, what are the muscles which surround the shoulder joint ? you will not be satisfied with running over the names, deltoides, supra and infra-spinatus, subscapularis, teres major and minor, brachialis and triceps. 2. But you will observe that the pectoralis major, the latissimus dorsi and the teres major, are the greatest protection to the joint by commanding the humerus, for there cannot be a dislocation of the shoulder joint without the humerus be previously raised. 3. Then it is expected that you will be able to say where the head of the humerus bursts through;

betwixt what muscles its neck is embraced; and where the head of the bone commonly lies when it is dislocated. 4. And as of most consequence of all, what are the impediments to reduction.

In the dissection of the muscles of the arm, there is nothing to detain the student's attention, but when he comes to the fore arm he must make careful observation of the fascia, and the connexion of the expansion of the biceps flexor cubiti with it. He will have to notice that there is a very tolerably strong membrane covering the belly of the biceps muscle, but that the facia of the fore arm is of a tendinous strength. Having observed how it is connected with the spines and condyles of the humerus, he will trace it down to the wrist, and observe its connexion with the ligaments there; and in dissecting it up he will notice the strong partitions which descend betwixt the muscles of the fore arm. On the back of the arm as the facia is more distinctly provided for the attachment or origin of muscles he will find it stronger, and the partitions more distinct than on the fore part of the arm. In dissecting on the palm of the hand, let him observe the peculiar nature of the fat, and the strong and regular aponeurosis which is under it. All these circumstances are worthy of the regard of the surgeon.

CLASSIFICATION OF THE MUSCLES OF THE FORE ARM.

There is no remembering the muscles of the fore arm and hand without an arrangement. I use the following.

We have first to observe the extreme simplicity of the muscles which lie on the arm, resulting from the simplicity of the motions performed at the elbow joint. In the same way we find that the muscles

which lie on the fore arm hold a relation to the movement of the hand and wrist. To know the motions to be performed, is to obtain a key to the anatomy of the muscles of the fore arm.

Before proceeding to the dissection of the muscles of the arm, the student should once more put the skeleton before him, and take note of the points of origin and insertion, and the nature of the joins, and the motions performed; he will on this occasion notice: 1. The prominence of the inner condyle. 2. The excavation, as it were, of the bones of the fore arm, for the lodgment of the stronger class of muscles, the flexors. 3. He will see that the hand bends on the wrist joint. 4. That the radius rolls and carries with it the whole hand. 5. That the fingers and thumb must have their flexors and extensors.

I. Class. FLEXORS, they arise from the inner condyle:——they are flexors of the wrist, or flexors of the thumb and fingers.

II. Class. EXTENSORS, they arise from the external condyle:——they are extensors of the wrist, or of the thumb and fingers.

III. Class. ROTATORS of the hand, they are peculiar in their insertion, viz. into the radius. They are pronators, (carrying the palm downwards,) or supinators, (raising the palm supine.)

A kind of artificial memory of the muscles of the fore arm may be had by arranging them in numbers; for example, if we take the biceps flexor as supinator in this instance, which it truely is; and the mass of the flexor muscles, as one great pronator for such is their conjoint operation; then the muscles go in threes, thus:

1. For the motion of the wrist three flexors, the ulnaris, radialis, and medius, commonly called palmaris longus.—Three extensors, the ulnaris, the radialis longior, and brevior.—Three pronators, the teres, the quadratus, and the mass of flexor muscles.

—Three supinators, the supinator longus, brevis, and the biceps cubiti.—There are also three extensors of the fingers, the extensor communis, the indicator, the extensor minimi digiti.—Three extensors of the thumb ; the extensor primus, secundus, and tertius—Three flexors of the fingers and thumb ; the flexor digitorum sublimis, flexor digitorum profundus, the flexor pollicis longus.

For the anatomy of these muscles, and of those lying on the hand, I may refer the reader to the Appendix.

DISSECTION OF THE ATTERIES OF THE ARM.

The arm should not be cut from the trunk until observations are made upon the exact situation of the subclavian and axillary arteries.

Having made yourself acquainted with the divisions of the great artery into subclavian, axillary brachial, &c. and of the several branches (see Appendix,) you commence your dissection by a particular attention to the relations of the subclavian artery : you dissect above the clavicle and clear the lower part of the sterno-cleido-mastoideus, and the scaleni muscles. 1. The dissector has to observe how the subclavian artery rises from the chest. 2. How the axillary nerves descend from the side of the neck to meet it. 3. He is to judge whether he can compress the artery here with his finger above the clavicle. 4. He has to observe that the nerves may be wounded by the cut of a sabre, but the edge being stopped by the clavicle, the main artery may escape. 5. In a surgical view he has to look to the manner in which the lower thyroid artery rises, and how the transvérsalis humeri passes across the root of the neck to the shoulder.

The dissection is prosecuted by turning off the in-

teguments of tht deltoid and pectoral muscles. Then the clavicular portion of the pectoralis may be raised, and avoiding the branch of the artery you see here (the thoracica humeraria,) you also raise a kind of fascia, and taking care not to wound the cephalic and subclavian veins, you find the subclavian artery deeper than the vein, and coming obliquely from under the clavicle. 1. Here the artery may be compressed in any case of dangerous bleeding from the axilla; or even so as to restrain the hæmorrhage during amputation at the shoulder joint. 2. The student will now be well employed in considering the place of this artery, and the shape of the thorax. He will now be aware that to the superficial observer, a ball will seem to enter ths thorax when it has only wounded the shoulder. The consideration of this subject will lead him to the anatomy of the axilla.

ANATOMY OF THE AXILLA.

The intricacy of the anatomy of the axilla, with the danger of wounds, and the occasional necessity for operations in it, make this a very important dissection; a piece of anatomy, of which no surgeon can be ignorant, without risking the safety of his patients, and feeling in himself a state of mind far from enviable. It is evident enough, that during an operation in the axilla, the surgeon cannot distinguish parts; he is operating among deep parts, feeling rather than seeing; endeavouring to insulate the glands with his fingers, and tearing rather than cutting;* but a

**I recollect this to have been written after cutting out large diseased glands from the axilla in the case of cancerous breast. I now believe this operation in the axilla to be insufficient to restrain the course of a cancerous disease.*

thorough knowledge of the parts is necessary to give him boldness and decision; which are most of all required in operations upon parts so near the great trunks, where the smaller branches bleed with an impetuous jet, and where the tourniquet cannot be applied.

In making this dissection of the axilla, we must be especially careful to keep all the parts in their natural situation, so as to be able to judge accurately of their relation to each other in the living body. We have but a small space to dissect; but our success so much depends on our more general knowledge of the branching of the arteries, and the course and proximity of the nerves of the arm, that the student can scarcely expect to make an elegant dissection, or thoroughly to understand the relation of the parts, till he have first dissected for the general anatomy of the arm. He should at least have dissected the muscles and nerves before he makes his dissection of the axilla.

The integuments are to be dissected off the outer surface of the pectoralis major and latissimus dorsi, but the fat in the pit betwixt these tendons ought not to be taken away, as in muscular dissection.

1. You have to observe the place of the axillary glands, the size of the branches of the thoracic arteries, or of the subscapular which supplies them, the nerves which come out from the intercostal spaces which pass amongst them. 2. The whole plexus of nerves and the axillary artery will be found to be braced down by a web of aponeurosis. 3. This being lifted, we now find that the nerves closely surround the artery, and hence we conclude that this artery must not be attempted to be secured by diving with a needle here. For the surgeon would in that case include the nerves, and the ligature would not come away until it was cut from the bundle of nerves. 4. When you have disentangled the nerves

and artery, and traced the divisions of the plexus, you recognise the radial nerve running upon the fore part of the humeral artery ; the ulnar nerve taking its course towards the inner condyle of the humerus ; the muscular spiral nerve passing through the triceps and behind the bone ; the external cutaneus nerve passing before the humerus and through the coraco brachialis. You turn your attention to the circumstance of wounds penetrating the axilla ; for often when a ball has passed through the arm-pit, or lodges, the tract or the seat of it may be discovered by the numbness in the part of the arm supplied by the extremities of the nerve. If there should happen to be a wound of the axilla, attended with great hæmorrhage, and yet it is not evident whether the axillary artery or the subscapular artery be wounded ; if we find the muscles supplied by the radial nerve, paralytic, and the sensibility of the thumb, and fore and middle fingers lost, it is evident that the ball has passed through the main artery, since the radial nerve clings around it. 5. You consider how the head of the hnmerus being dislocated, may press on the plexus of nerves or the artery, and cause a symptom announcing the dislocation. 6. The question may pass through your mind, Does a punctured wound of the axillary artery call for amputation? Does a wound where the artery and the whole plexus of nerves are cut through require amputation ? 7. You consider the part in the axilla and the muscles of the shoulder in relation to the amputation of the arm at the shoulder-joint. 8. Of the glands in the axilla you have to observe the great group of lymphatic, or absorbent glands of the axilla, which, when diseased, and clustering together, form a tumour, which it is dangerous to extirpate. Other more solitary glands will be noticed.

SOME FURTHER OBSERVATIONS ON THE TWO LAST DISSECTIONS.

1. No one who knows the strength required in screwing a tourniquet on a limb, will think lightly of the difficulty of compressing the subclavian artery with his finger. An instrument might be made to press strongly on the first rib above the clavicle, which might stem the impetuosity of the blood, but the finger or thumb is preferred. The common tourniquet may undoubtedly be applied much farther up than usually is conceived to be practicable, by placing the pad deep in the axilla, and resting the screw of the tourniquet on the acromion process of the scapula, an additional strap crossing the breast, and preventing the belt of the tourniquet from slipping off the shoulder.

2. To this edition I must add that I have seen the operation of amputation at the shoulder-joint performed, and have been filled with admiration at the boldness and dexterity of the surgeon, Mr. Vance of Haslar. But it is a hazardous operation, where the assistant must be equal if not superior to the surgeon; he has to stand behind the prtient and compress the subclavian artery, by pressing above the clavicle. It is with a view to your situation as an assistant that I now advise you to look to the relation of the subclavian artery, the clavicle, and the insertion of the cucullaris muscle, and the place of the scaleni. In the next edition of my Operative Surgery I will offer a substitute for this operation.

3. If morbid matter be absorbid by the lymphatics in the arm, buboes are formed in the axilla, as in the lymphatic glands of the groin. But if the sore be in the course of the distribution of the ulnar nerve, there are small glands a little above the internal con-

dyle which may previously swell. It is from partaking of the disease of the mamma, the most frequent source of cancerous matter, that these axillary glands become so often diseased; and it is this disease of these glands chiefly, which occaisions the necessity of operations in the axilla, and gives importance to the anatomy of the part.

If, when these glands are not far advanced in the disease, only feeling through the integuments hard and enlarged, a small incision be made, there is danger of their eluding us, slipping amongst the loose cellular substance. They should be firmly fixed with the two fingers, so that when the incision is made, they may start out; and the fingers; should not be removed from them, when small and moveable, until they are taken up by the assistant's hook.

When the glands become more enlarged, they form adhesions with the surrounding cellular membrane; they group together, and form a fixed indurated mass.

When these glands inflame, become enlarged, and suppurate, numbness of the arm arises from the abscess involving the nerves; and when the abscess heals, the indurated stool includes or presses upon the plexus of the nerves.

Since those arteries which are passing through the glands are the same which proceed to supply the mamma, it might be thought, that if we were first to extirpate the axillary glands, we should not have to take up with the tenaculum the same arteries twice. But this is no object. The extirpation of the breast is a simple operation. If the breast be small, the arteries which bleed during the operation can be stopped with the point of the assistant's finger. If it be large, they can be easily tied as they are cut; and in this case it is better to tie them when they first bleed; for being stopped by the finger, they do not bleed when the finger is lifted, and are with dif-

ficulty found; and if not found, bleed when the woman is laid to rest, and begins to recover from her apprehensions. The arteries which bleed in the extirpation of the breast, are those coming from the interstices of the three first ribs, viz. branches of the internal mammary, and those thoracic arteries which we see in this dissection coming round from the axilla, the thoracica longior and branches from the subscapular.

In wounds here, we have sometimes a resource independent of the ligature of the bleeding arteries. Two or three firmly compressed sponges, with ligatures attached, should be in readiness; the sponge is to be thrust into the axilla, another, if it should be required, and one or more compresses above it. The roller is applied round the breast and neck, and firmly upon the compresses in the axilla, and then the arm is bound down to the side. When the sponges come away, they leave a clean surface, which easily unites, or fills up.

I have said that it is dangerous to dive with the needle in this part; for you observe the proximity of the great arteries and nerves of the arm; yet it has happened, that the needle has been struck round the ulnar nerve, which was marked by the pain, the numbness and contraction of the ring finger and little-finger. We see how imminent the danger was of striking through the axillary artery. It is inded difficult to conceive how the nerve could be struck without the artery.

Dissection of the arteries of the arm prosecuted.—The dissection may now be prosecuted by taking the integuments off the inside of the fore arm. After recognising the muscles in this more partial view you trace the branches of the humeral artery; you trace the radial nerve in company with the main artery; the ulnar nerve, and its accompany-

ing artery from the profunda humer ; and also the course of the muscular spiral nerve.

You may perhaps now see why surgeons will sometimes say that arteries have acute feeling. You are careful to observe the manner in which the humeral artery, and radial nerve, and venæ comites, are involved in a sheath and bound down by a membrane, and particularly how they pass under the stronger fascia near the bend of the arm. You notice that to cut for the humeral artery, you have only to lay bare the edge of the biceps flexor cubiti, to open the sheath, and avoid the radial nerve, that high in the arm the nerve is superficial to the artery, that towards the bend of the arm it is on the inside of the artery ; what difference will there be in a wound of the artery before and after it has passed under the aponeurosis of the biceps ?

The FULL ANATOMY OF THE BEND OF THE ARM is very important. The following are the chief circumstances to be noticed.

On the fore part of the fore arm you have to save 1. The superficial veins, viz. the cephalic vein, which is coming up the radial edge of the fore arm ; the basilic, on the ulnar edge ; the median, in the centre. You have further to notice that the median splits, and that the division which passes to the cephalic vein is called the median cephalic, and that the division which passes towards the inside of the arm, and unites with the basilic, is called the median basilic vein. I have to call your attention particularly to these divisions of the median vein, as they are commonly selected for bleeding. You have now to notice the two superficial or cutaneous nerves. 2. Betwixt the supinator longus and the outer edge of the biceps muscle, you find the external cutaneous nerve, that which passes before the arm-bone and perforates the coraco-brachialis muscle ; you may trace its branches under the cephalic and median

cephalic veins. 3. The internal cutaneous nerve is found coming directly down from the inside of the arm over fascia and under the median basilic vein; while the principal branch goes under the vein, sometimes a small filament passes over it. 4. You may now lift the fascia, covering the humeral artery and observe how thin, but at the same sime how strong a membrane covers it, aud that if in bleeding the lancet transfixes the vein and fascia, the artery must be opened. 5. You ought to draw a line from the inner condyle across the bend of the arm, and observe how far the bifurcation of the humeral artery is below this. 6. Next observing the radial, the ulnar, and the interosseous arteries, you attend to the recurrent branches, and their inosculations.

REMARKS CONNECTED WITH THE SUPERFICIAL DISSECTION OF THE BEND OF THE ARM.

1. Let the student, in the first place, mark well the connexions of the cutaneous veins, and nerves, and fascia, and arteries ; let him not confound, as some authors do, the description of deep-seated and superficial veins ; let him note the extreme delicacy of these superficial nerves, and not think of looking for them in the midst of a bloody operation ; let him not confound the symptoms of the injured nerves with the effect of inflammation under the fascia ; and, above all, it is important that he should consider the appearance of these parts in the aneurism of the brachial artery, and in other diseases which may affect them.

2. The median basilic vein, is above the expansion of the biceps muscle, or the place at which the broad tendon ofthat muscle expands into the general

fascia of the fore arm. You notice the edge of the fascia, where it is reflected towards the internal condyle (or perhaps we should say where it takes its origin from that bone ;) you see that the vein is a very little removed from the artery. We find, upon examining the arm of the subject, that the artery (at the point where the vein crosses it obliquely,) is covered by the fascia only ; and that at this point it is thrown up more superficially by the bulging of the joint.*

3. With the parts before us, we can be at no loss to understand the peculiar appearance which the parts assume in forming the aneurismal tumour, when the artery has been wounded in bleeding. By the firm compress and roller, the external wound, and that of the facia, soon heals ; but the artery continues to bleed, though not outwardly : the blood is impelled under the fascia ; the connexions of the fascia are torn up ; a regular tumour is formed, occupying the bend of the arm ; and this tumour stretching the facia, contracts the fingers, and keeps the fore arm at a right angle with the arm ; as in other diseases in which the fascia is contracted, or the biceps muscle swelled or contracted, or the muscles under the fascia inflamed.

4. In the aneurism of the bend of the arm thus regularly formed, the first incision of the operation lays bare the fascia ; for the integuments contract, and the glistening fascia appears forming the distended sac of the aneurism with the dark-coloured coagulum under it.

* *This superficial seat of the artery, and contiguity to the vein, causes the blood to flow from the vein, sometimes in phlebotomy, per saltum ; which circumstance has given a pale face to many a youth, conceiving it to be the blood leaping from a wound of the artery. This ceases upon bending the arm a little.*

5. Sometimes the aneurism takes a very different form, viz. when the artery punctured by transfiixing the vein, bleeds through the vein. It has thus happened, that the stream of blood has continued into the vein, and the parts inflaming and thickening round this communication, it has formed an established and permanent opening from the artery into the vein; while the outer wound of the vein healing, the proper aneurismal varix is formed. In this case, the effect of the impulse of the arterial blood sent in upon the veins is, that, in the first place, the median basilic vein is raised into a tumour, and the other veins being also successively enlarged, the whole veins of the arm become varicose, and assume a very peculiar character. If we press the blood from the vein, we can feel the arterial blood rushing through the communication; it can be stopped by the point of the finger. Notwithstanding the very distinct characteristic marks of the aneurismal varix, I have heard surgeons boldly maintain, for their own credit, a common aneurism to be a case of aneurismal varix, though there was not a varicose or enlarged vein in the whole arm; and this merely because, in the commencement of the tumour, the blood could be forced back, or the tumour made to disappear; nay, even after the operation was performed, and the artery was seen lying in the bottom of the wound, fairly punctured crossways, they would maintain, that it had been an aneurismal varix, but that it had burst!

6. We may observe, that the internal cutaneous nerve passes down upon the inside of the fore arm; but although its branches are very numerous, we see that they take, in general, a course under the veins; and we observe a very considerable branch taking a course directly under the median basilic vein.* Some

* *This or even the radial nerve itself, might be punctured by transfixing the vein.*

of the external cutaneous nerves, take sometimes a course over the veins. This, in bleeding in the median vein, makes the danger of puncturing the nerve much greater than when the operation is performed in the median basilic: in bleeding in the median basilic, on the contrary, there is more danger of wounding the artery. But with a delicate hand a wound of the artery is scarcely possible; while the most dexterous surgeon cannot be sure of avoiding the puncture of the nerve.

7. Effects of puncture of the nerve.—When a nerve is wounded in bleeding, the patient feels a more actuate pain than usual in that operation; has a sense of numbness communicated to the shoulder, and down to the fingers, or is disturbed and alarmed in a manner he cannot account for, and has a sense as of trilling of water down the arm. These, in the worst cases, are but preludes to a long train of miserable feelings, spasm about the neck and jaw, frightful dreams, and a general loss of health from the extremely irritable state in which the patient is left after the accident. These spasmodic affections attack chiefly when the patient is going to sleep, when the system is exhausted. I have known a young man in this situation, that when just falling asleep, his jaw was sometimes suddeny and violently clenched together, and a violent spasm of the muscles of the back of the neck, and trunk, seized upon him, which did not leave him till he was again roused and awake; thus exhausting him with watching and fatigue. In this state of body, the slightest scratch, or ruffling of the skin, was attended with an aggravation of all the distressing symptoms. The complaint had existed for several years.

8. Another and more frequent occurrence after bleeding, is a swelling, and inflammation of the puncture; an erysipelatous inflammation spreading all over the arm, and a bad suppuration.

9. The inflammation of the internal coat of the vein itself is also an alarming occurrence, as it may spread along the vessels to the heart itself.

10. Sometimes inflammation from bleeding, with successive suppuration and inflammation, extend under the fascia, or affect the fascia itself, or cause an obstinate hardening and contraction of the biceps muscle. In these accidents, we are enabled, by observing the peculiar connexion of the fascia, to understand the effect, and often to remedy the evil: From inflammation and abscess in the fore arm, I have seen the most obstinate contractions in consequence of the newly-formed connexions and thickening of the fascia. After the inflammation has subsided, I have cured the contractions by poultices, with camphor, and a splint laid alongst the fore arm, padded, and adapted to the curvature, so as to keep the arm always gently on the stretch.

REMARKS UPON THE FULL DISSECTION OF THE ARTERIES AND NERVES OF THE ARM AND FORE ARM.

The place of the wound of the brachial artery in bleeding, was long misunderstood; and we find anatomistis arguing the propriety of operating for aneurisin here, not from the probability of the collateral arteries being sufficient to carry on the circulation, but on account of the probability of only one of the branches being wounded. Having the parts now before us, we see, that in the natural distribution of the arteries, by transfixing the median basilic vein, we should wound the trunk of the brachial artery a full inch above the bifurcation into the radial and ulnar arteries.

Of the variety of the distribution in the brachial artery.—But the confusion on this point had arisen from the frequent irregularities of the distribution of the brachial artery: very frequently the artery does not descend in one trunk under the fascia of the fore arm; on the contrary, it sometimes divides into the two arteries of the fore-arm, even in the axilla; in which case they run parallel, the radial branch taking a spiral turn round the other, and instead of dipping deep under the expanded tendon of the biceps muscle, and under the protection of the muscles, it takes a superficial course upon the forearm; sometimes the brachial artery divides in the middle of the arm, sometimes near to the edge of the expansion of the biceps: When the radial artery runs thus superficially, it lies sometimes above the fascia, and immediately under the cutaneous veins; but still it is tied down by the crossing fibres of the fascia, appearing rather as if included in it than running above it.

This distribution of the arteries is to us no motive for the operation; it does not come into our calculation; we operate with the expectation of the trunk being wounded; but we have to attend to the probable consequences of a wound of this superficial radial branch. It lies superficially, so as even in the living body to be traced by its pulsation evident to the eye. The trunk of the brachial artery can be hurt only by so rude a wound as to have pierced the fascia; but in the case of a high bifurcation, the radial artery lies in immediate contact with the vein, and may be touched even in a delicately performed operation.* We have no cases of the wound of this branch on

* *Yet it is not in every subject having this distribution of the artery, that we find it so entirely superficial, for generally it is fairly covered with the expansion of the biceps muscle, and it has always shreds of fibres binding it down.*

record; such a wound might, more than the pricking of the deep artery, be apt to form the aneurismal varix. If this more superficial artery should happen to be punctured, perhaps a general echymosis will be the consequence, from the driving of the blood into the cellular membrane.

Of the arteries which surround the joint. —Those are what are called the collateral arteries; that is, the smaller branches which run parallel with the trunks. Those from the brachial artery are the extremities of the profunda, the lesser profunda, the anastomaticus major, and some lesser anastomosing branches. These lesser anastomosing branches either follow the direction and general course of the anastomaticus major, or pass towards the outside branching betwixt the biceps and brachialis internus muscles, and inosculate with the recurrens radialis, or a branch of the main artery, which takes a retrograde course, and which is sent off immediately before the separation of the radial and ulnar arteries.

The branches of the arteries of the fore arm which correspond with these, are, the recurrens radialis, the recurrens ulnaris anterior and posterior, the recurres interossea.

To make a dissection of these, we present the back of the arm; we must carefully dissect the muscular branches of the profunda superior from the flesh and tendon of the triceps; we find it sending down a branch upon the back of the external condyle, which forms a net-work of vessels on the ligaments, and which chiefly communicates with the recurrens interossea. The profunda inferior, being a smaller and more superficial branch, comes down upon the inner edge of the triceps, turns over the back of the internal condyle, inosculates with the profunda major, and with the recurrens ulnaris posterior. The anastomoticus major turns likewise round the projecting bone, but does not keep its course upon the

back part of the arm; it again turns to the fore part, and inosculates with the recurrens ulnaris anterior.

The retrograde branches of the arteries of the fore arm seen upon the back part, are, the recurrens interossea and the recurrens ulnaris posterior. The recurrens interossea comes off from the interosseus artery; immediately after it has perforated the membrane, it ascends backwards to the joint, lying betwixt the ulna and the mass of the extensor muscles, as they arise from the outer condyle of the humerus. The recurrens ulnaris comes out from betwixt the heads of the flexor muscles.

All those arteries form a net-work of inosculations, which surround the elbow-joint, and which continue the circulation in the fore arm, when the main artery, at the bend of the arm, is tied in the operation for aneurism. But this is so in the beginning, only, not in the end; for those arteries do not all continue to be enlarged; on the contrary, some one of superior size, or more direct communication, takes the lead, enlarges becomes tortuous, and seems to annihilate others. As far as my observation goes, this is the business of the anastomosis, betwixt that branch of the brachial artery, which is called the anastomoticus major, and the recurrens posterior ulnaris. This artery becomes wonderfully enlarged, and is felt pulsating strongly behind the inner condyle soon after the operation.

Of the ulnar and radial arteries at the wrist.—There is no part of the body in which it is more necessary to connect the anatomy with the accidents, than here at the wrist; for, from apparently slight accidental wounds of these arteries, there come great pain, inflammation, deep driving of the blood, unskilful operations, and bad surgery, and danger of losing the arm, and even the life of the patient. The danger is from these vessels,—the ulnar artery, as it turns over the wrist and the ra-

dial artery, as it turns over the root of the thumb, or the palmar arch in the hand not being neatly tied at first. The consideration of this department of surgery would lead us too far; I only say look to it now when the parts are before you. I have required you also to look to the peculiar appearance of the fat, and the aponeurosis on the palm.

In a wound of the artery in the palm, we put in a large pad, or compress, and close the hand, and bind it firmly; but if the arch of the palm be cut, this does not completely stem the blood, or the pain and inflammation are such, as will not allow the bandage to be drawn sufficiently tight; we must then undo the bandage, and endeavour to find the artery; but the appearance of the wound is changed; it is tumid, and the cellular membrane stuffed with blood, so that, from the confusion, we probably cannot see the mouth of the artery. In this state of things, the patient getting weak from loss of blood, and the vessels, perversely bleeding only when the dressings are applied, and stopping when they are undone, the surgeon is tempted to follow the artery with incisions, fruitless perhaps, because he is still amongst the disordered parts. He is at last tempted to dive for the roots of those vessels with his needle. And now let us observe the consequence of this: Suppose that a surgeon does not dissect neatly for the radial or ulnar artery at the wrist, but plunges for it with his needle, the skin, tendons, and nerves are included, and the ligature is drawn tight upon them; there may be most dangerous nervous symptoms from the including of the nerve, or more certainly, the next day, by the fading of the parts, the ligature slackens, and the artery bleeds again.

When the student, then, is studying this part of the anatomy, let him not run with too much rapidity over this important lesson. I would recommend it to him to read Mr. John Bell's Principles of Surgery

upon this point, where he will find surgical cases so pictured and represented to him, that he will not quickly forget them; let him return then again to his subject; let him examine the fascia at this fore part of the wrist, and the manner in which it covers the artery; let him observe the palmar aponeurosis, and mark accurately the place at which the arteries turn over the wrist; let him mark the connexion of the ulnar artery and nerve, where they lie connected, and observe the radial nerve free from the arteries, passing under the ligament of the wrist, and then he will not be guilty of seeking (as I have seen surgeons do) the radial nerve, in order to separate it from the radial artery.

DISSECTIONS

OF THE

LOWER EXTREMITY.

DISSECTIONS OF THE THIGH.

THE order of the student's dissecting the lower limb should be this : 1. He ought to have part of a subject to teach himself the anatomy of the fascia, and of the muscles of the thigh and leg. 2. He ought particularly to dissect the joints of the hip, knee, and ankle. 3. He ought next to attend to the anatomy of the arteries only. 4. And in the last place he ought to dissect the arteries, veins, and nerves of the lower extremity together, attending, in this last instance, particularly to the places of the arteries as they hold relation to the other more prominent parts, and to the mutual relations of arteries, veins and nerves.

Remarks intraductory to the Dissection of the Extremities ; the Effects of the Muscles and Fascia upon the Vessels ; and the Peculiarities in the Distribution of the Veins and Arteries.

In the dissection of the thigh, the method of investigation, as well as the object of it, is essentially different from that which is followed in the dissec-

tions of the belly and thorax. We find the limbs made up of a solid muscular flesh, which surrounds the bones, gives symmetry and action to the limbs, and poises the trunk upon them : and, besides the integuments common to every part of the body, we find them covered with strong fasciæ, or the aponeurotic expansion of tendons ; which not only support and brace the muscles in their action, but gives the limbs a defensive strength, by forming them into a firm concentrated pillar.

The fibres of the fascia, too, mingling with the common cellular membrane, dive amongst the deeper muscles, and divide and class them. We find the arteries branching amongst the muscles, and exposed, we might at first suppose, to be interrupted in their actions amongst those active and contractile parts; but these arteries have energy and force to overcome and resist the contraction of the muscles of the limbs. The more languid flow of blood in the veins is indeed left exposed to casual interruption by compression of the muscles ; but this pressure upon the veins is counteracted, or its bad effects avoided, by their peculiar distribution. In the legs and arms, and in the neck and all fleshy parts, there are two sets of veins : the venæ comites, accompanying the arteries through their whole course amongst the muscles ; and the cutaneous veins, which though like the others they receive the returning blood from the arteries, take a different course to the heart, emerge from the oppression of the muscles, and return their blood by a superficial distribution to the great veins of the trunk. We observe no such variety of distribution in the chest or belly—no valves to counteract the retrograde impulse of the blood ; because in these cavities there is no occasional and partial action of parts by which the return of the blood can be retarded, the pressure being uniform through the whole

cavity—and because, from this uniform pressure, no distribution of the veins could free them.

When any pressure is made upon the upper part of the thigh, if the pregnant uterus, for example, should press upon the vessels of the pelvis, or a schirrous tumour should arise from the glands of the groin surrounding the crural vessels, the veins are the first to suffer; the supply of blood is not diminished, but the free return of the blood is retarded, causing œdema. In the case of an adventitious tumour, both arteries and veins passing through it, the arteries, by the strength of their pulsation remain free, and possessed of full room for action, however large the tumour, while the veins, being more passive, having no action, are encroached upon by the tumour, and compressed, and the blood is consequently retarded in their dilated extremities.

We learn from this the importance of making the pressure uniform over all the lower part of the limb, when we apply bandages or compress an artery. Were it possible so uniformly to compress a limb, from the toes to the top of the thigh, as to leave no part unincluded or unsupported (unless in inflammation of the parts,) almost any degree of compression might be used; for in that case the blood would flow uniformly over the whole limb; and though stifled in a degree, no part would be overloaded with stagnant blood.

Further peculiarities in the anatomy of the extremities will naturally come to be noticed in the course of the history of each dissection.

FIRST DISSECTION OF THE THIGH.

Of the fascia of the thigh, the inguinal glands and superficial vessels, the lymphatics and cutaneous nerves.

In acquiring a knowledge of the economy of the body, of the peculiarities in the distribution of the vessels of the extremities, of the use and effect of the fascia, and of the characteristic difference betwixt the limbs and cavities of the trunk and head, this forms an important dissection. With a view to surgery it is no less important; since a knowledge of the points of anatomy, which it includes, is extensively applicable to practice. It is almost impossible, by description alone, to give such an idea of the appearance of the vessels and membranes, as to enable any one readily to distinguish them in the dissection; yet surely something may be done so to point out the character of the parts, that when once seen, the recollection of them will not be quickly effaced.

Precautions necessary in conducting the dissection.—We lay the subject on the side, and begin the dissection on the outside of the thigh; here the fascia is strong and cannot be mistaken, or its layers lifted. The dissection is continued up towards the back of the ilium, and here it covers the fascialis and the gluteus medius, but the gluteus maximus is not under a fascia. That muscle is to be carefully dissected; then the dissection of the fascia is to be continued towards the fore part of the thigh.

In dissecting the integuments of the fore part of the thigh, we should not cut too deep, nor look for the smooth and strong fascia, which, from description, we may naturally have been led to expect; for upon the fore part, and above the tract of the important

vessels, the fascia is of a loose and cellular texture; and the gradual change which it undergoes is to be observed only by tracing it from its stronger expansion on the outer part of the thigh. We begin anew on the abdomen near the groin. We dissect the true skin back, leaving much of the subjacent cellular membrane. The parts which then come into view, may be now described as a general instance.

The LYMPHATIC VESSELS are immediately under the true skin. They are more superfical than the veins and nerves. They run in straight lines; are only partially seen, or seem to be abruptly broken off by the intervening pellicles of fat. They are very large and varicose in appearance, when distended, especially in the course of the saphena vein; more numerous upon the middle part of the thigh, and more thinly scattered, but more distinctly seen upon the outer part. In colour and appearance, when in their natural state and collapsed, they resemble loose muscular fibres; being flat reddish lines, most distinctly and strongly muscular in their colour, ond pellucid only when distended with air. When these vessels are snipped obliquely with their scissors, or puntured with the lancet and blown up, or injected with mercury, they take a very peculiar appearance; for they swell only betwixt their valves, whilst the valves seem to cut them into beads irregularly joined.

LYMPHATIC GLANDS.—At the groin, immediately under the skin, on a level with the lymphatics, and above the fascia ond cutaneous veins, we find the congeries of lymphatic glands. But all the inguinal glands are not thus superficial; on the contrary, many are sunk amongst the condensed cellular membrane, which mingled with the aponeurotic membranes, forms a bed covering the femoral artery and vein. We have particularly to notice such as belong to the lymphatics of the penis.

VEINS.—The saphena vein, we are told, lies above

the fascia; the great femoral vein below it. This is true; but it must at the same time be understood with some limitation. About six inches from the groin (if merely the skin have been dissected back) we can only see the saphena vein shining faintly through the fascia, even in the leanest subject. It comes up upon the inside of the knee and thigh, and does not dive suddenly under the fascia, but is gradually enveloped, and more firmly embraced, by the fibres of the fascia; which at the fore part of the thigh is split into layers, and so filled with the adipose membrane and fat, that it might be more justly eatimated as condensed cellular membrane. Farther down upon the thigh, again, on the inside of the vastus internus muscle, the more natural connexion of this vein is with the cellular membrane, being immediately attached to the skin, and having no protection but a very thin layer of cellular membrane.

NERVES.—Above the fascia of the thigh several delicate and extensively prolonged nerves are seen.

1st, Upon the inner and upper part of the thigh, branching to the scrotum, testicle, and pubes, is the INGUINAL NERVE, consisting of delicate twigs, which come by a circuitous course, and are derived by very delicate twigs from the first and second lumbar nerve. Within the belly it may be seen coming out betwixt the psoas and iliacus internus muscles: it winds round part of the spine of the os ilium and inside of the ligament, and pierces the ligament, and appears upon the pubes.

2dly, The INTERNAL CUTANEOUS NERVE comes out from Poupart's ligament above the crural vessels, and is largely distributed upon the inside of the thigh, extending its branches round upon the internal condyle of the os femoris and patella. It is a branch of the anterior crural nerve.

3dly, The MIDDLE CUTANEOUS NERVE,* from the same source with the last, comes out from the point marked by the sartorius muscle, crossing the head of the rectus muscle. It is distributed upon the fore and middle part of the thigh.

4thly, The EXTERNAL CUTANEOUS NERVE, derived from the third lumbar nerve, appears upon the outside of the thigh, a little below the lower spinous process of the os illium; and dividing into branches, one runs round the back and outer part of the thigh, and the other runs down the fascia, where it covers the vastus externus and outside of the rectus muscles.

These vessels and nerves have been mentioned before describing the fascia more particularly; as we must be aware of them in the first cut of the knife, or they are lost to us.

OF THE SUPERFICIAL PARTS SEEN IN THE FIRST DISSECTION OF THE THIGH CONSIDERED AS SUBJECT TO DISEASE.

It has been already explained, that, in treating of morbid anatomy, it is intended, not merely to include the diseased state of the viscera, but also the derangement of the natural anatomy of the extremities and external parts, whether by violence or by disease, with the consequences of their derangement to health and life. In the review of the parts before us now, we have more to observe than might seem strictly to belong to so limited a dissection; for I shall here consider the diseases of the cutaneous veins, and nerves, and fascia in general.

** Some very minute nerves form the deeper branches of the anterior crural nerve join those; but they may be overlooked in the general arrangement.*

Mr. Hunter pointed out the effect of inflammation upon veins; shewed, by dissection, how inflammation propagated alongst their cavities after amputation, bad compound fractures, and extensive abscesses; proved that matter was sometimes formed in them; and that, in general, the consequence of the inflammation was to produce partial or interrupted adhesions of their inner coats, preventing the matter from passing into the tide of blood. At the same time, the possibility of matter thus formed mixing with the blood, and being driven to the heart, was explained. "I have seen (says he,) from a wound in the foot, "the vena saphena inflamed all up the leg and thigh, "nearly as high as the groin; and I have been "obliged to open a string of abscesses almost through "its whole length." In other instances, after similar injuries, he found the inner surface of the veins furred over with coagulable lymph.* These observations of Mr. Hunter are given in illustration of the effects produced by accidents in blood-letting, and as establishing a new principle upon which to explain the strange series of symptoms which sometimes take place after bleeding.

It has already been explained how the pressure of the uterus, or of an adventitious tumour in the pelvis or groin, may distend the veins of the leg, merely by increasing the resistance to the circulation without any disease or failure in the coats of the veins. In old people, again, such distention has an evident connexion with the general plethora of the venous system, and, in all probability, with a failure of that greater degree of resistance which the veins of the lower extremities should possess, and which is required in them to keep the balance of the

**The inner coat of arteries has, in some instances, shewn a degree of inflammation, propagated in a retrograde course to the heart, as after the operation for aneurism.*

system, and counteract the pressure of the column of blood.

But the dilatation of the cutaneous veins is not confined to such cases as these; for we find that in younger men and women the veins are often diseased; that sometimes they are varicose, not unfrequently degenerating into tumours, which, amassing the blood, affect the neighbouring parts, and form a dangerous disease. Sometimes, again, influenced by the contiguity of disease, they become tortuous and enlarged, round the base of some tumours, or the margin of callous ulcers, forming in many instances the most characteristic feature of such tumours.

Since we know that the natural capacity of the veins must depend upon the just mean of their resistance to the action of the heart and arteries, we cannot be at a loss to conceive how disease should so weaken the elasticity and power of resistance of their coats as to allow them to dilate; and (as their dilatation is in length as well as in diameter) to become consequently varicose and tortuous. But I suspect there is something more than this; there is some specific influence exerted on the vascular system of the part, which becomes apparent in the dilatation of the veins only, though receding equally in the arteries.

We are often consulted by patients with varicose enlargements of the veins of the spermatic chord and of the thigh, where there appeared no tendency to disease in the venous system, or in the vessels of the lower part of the body; where it proceeds from a sedentary life and slowness of the bowels, and is a mere mechanical effect. The exertion in going to stool, and the pressure on the veins of the abdomen, gradually dilates the veins in the groin until the valves lose their office, and the column of blood presses down on the veins of the thigh and leg. When the veins of the thigh and leg become varicose, there is a deficiency felt at intervals, pitts with hard incom-

pressible edges, into which the fingers sink. These induratinos are formed by the indurated coats in the abrupt angles of the branches, in consequence of the deposition of coagulable lymph. The stimulus of distention which the veins suffer seems to be the cause of this.

A state of the veins, not, however, analogous to the last case, sometimes takes place without any apparent cause. Tumours will gradually arise from veins, which, upon dissection, are found to contain only a confused mass of coagulated blood and mucus, blending all distinction of bones, membranes, and muscles. Such tumours will sometimes seem to take their origin from the bones, being small, inert, firm tumours, at first; but by slow progression, assisted perhaps by the means used to bring them to suppuration, increasing, till, upon a rash attempt to extirpate them, it will be found that they are intersected with lamellæ of bone, and that it is absolutely necessary, from the confusion of diseased parts, to finish the operation by the amputation of the limb.

We should perhaps class with these last, such tumours as, appearing at birth hardly raised above the common integuments, gradually dilate as childhood advances, and form spongy varicose tumours, which have an irregular tuburculated surface, and increasing in the brightness of their hues, purple and red, bleed in their advanced stage, and require operation. Such spongy tumours being allowed to increase too much, and take a firm seat upon the bones, will generally, though extirpated, regenerate. In the operation there is much bleeding; the tumour is, when cut into, like a honey-comb; and the arteries, as if emptying into these sacs, send out their blood with great force. I have seen such tumours on the head, under the chin, and on the belly; though they occur, I believe more commonly on the spine, in the back or neck. The general opinion seems to be, that they arise from in-

jury done to the child in the womb ; an opinion having no foundation but in the desire to explain every thing.

But let me not be understood to say, that such a tumour is simply a congeries of varicose veins ; for it is evident, that in these cases, as in other more familiar examples, there is a local disease acting upon the neighbouring veins, and drawing them into disease, allied in its nature to proper cancer. Thus we shall find a tumour growing from some fleshy part, hard and knobular, with distorted veins, with a fretting sore upon its most prominent part, and bleeding, sometimes an acknowledged cancer, yet differing in no very definite character from those of which we have been speaking.*

Diseases of the lymphatics.—The superfical lymphatics point out to us, in some instances, the nature of disease ; for, being extremely susceptible of inflammation, they apprize us of infection, and lead us by a hard inflamed line to the neighbouring glands. This effect of local poison and inflammation on the absorbent vessels has been long observed ; being considered as one of the great proofs of the theory of absorption. But Dr. Ferrier of Manchester, has endeavoured to prove a more general affection of the lymphatics of the leg and thigh in those swellings incident to women after childbirth. It has appeared to me that, in the swelling of the thigh and leg after childbirth, there is more of the nature of a critical swelling, than a merely local affection ; and that the

* *I let these observations stand in this Edition (though I confess they are somewhat out of place now,) as a proof of what I had seen of these diseases before they obtained so general notice, and because I think still the opinion that the vessels are influenced to this peculiar character by a previous disease, and are not themselves to be considered as constituting the disease is the correct view of the pathology.*

obstruction and inflammation of the lymphatics of the limb may be more naturally explained upon the idea that this inflammation is sympathetic, and communicated from the extremities of the lymphatics to their trunks, than that the disease is primarily in the lymphatics, and that their affection is the cause of the swelling of the limb, else why should one leg begin to swell after the other subsides, and perhaps at the distance of three weeks from delivery, as I have seen it.

After violent and long continued exercise, where any part of a limb has been exposed to continued friction (as the inside of the leg or thigh after having been long on the saddle,) the lymphatics are liable to inflame; when a hard chord may be traced in their course alongst their limb to the neighbouring glands. This takes place without any lesion of the cuticle or the smallest ulceration; but it seems to be the mere effect of the continued friction which frets and inflames the coats of the vessel. In a case of a riding groom, which occurred in the Infirmary here, the inflamed lymphatics were so swelled and tender in their course upon the inside of the thigh, and in the glands of the groin, that the man could not move without excruciating pain. A rugged sore at the root of the nail of the toe, or a fretting sore on the shin, will sometimes produce a red line all the way up the leg, and a tumour in the groin.

What the appearance of the lymphatics in such inflammations may be, we can say only from analogy; for they have been little attended to in morbid dissection: but when we consider that their activity must be influenced by a stimulus propagated from their absorbing mouths to the trunks of the system, we have rather to wonder that inflammation and disease should be so seldom excited in them. Accident shews what from theory we are led to conceive, viz. that the fluids in the lymphatics are accelerated by

the action of the muscles; for when in wounds a large lymphatic is laid open, and continues to discharge after the surface is healed, we may observe a gush or acceleration of the discharge upon any exertion of the limb. This accident, from the puncturing of a lymphatic, must happen in even the most superficial incision, but is not generally observed till the sore is healing; when, from the tumefied extremity of the vessel, the fluid is seen discharging as from the head of a pimple, and so abundantly as quickly to moisten the dressings. Upon the continuance of this discharge, astringents are generally applied; but they sometimes fail: and n any cases in collections shew, that the discharge continues obstinate under these remedies. We have only to apply a compress in the course of the vessel below the orifice, this stops the discharge, and gives time for the healing of the ulcer.

Of the fascia.—Every one is aware of the bad consequence of tight bandaging in inflammation; and that where the parts are swelling under an unelastic bandage, the inflammation is increased, great pain is excited, and the member is very apt to fall into a gangrene. Nearly the same consequences, in a lesser degree, are frequently to be looked for from the binding of the fascia in deep seated inflammation. For the muscular parts swelling, as after penetrating wounds, and being confined by the strong imbrace of the fascia, especially in the thigh and fore arm, it causes excruciating pain, with contractions of the limb. The elastic feeling which this tension of the parts gives to the touch in the first stage of inflammation, conveys the sensation of matter beneath, and the surgeon is apt to mistake the case. In abscess, the fascia being of a more inert texture, not so readily partaking of inflammation and suppuration as the subjacent softer parts, it confines the matter, and

causes it to spread more extensively amongst the loose cellular membrane.

It was long believed, that in punctured wounds the bad symptoms were owing to the extreme sensibility in the tendinous parts when wounded; but they are now more universally attributed to wounds of the cutaneous nerves; while another and distinct train of symptoms follow the swelling of the inflamed parts, embraced by the fascia. The fascia possesses less life, will die and slough when the parts above and beneath remain alive.

DISSECTION OF THE FEMORAL ARTERY IN THE GROIN.

In proceeding to dissect away from the groin the glands and fat, we shall find a few delicate superficially distributed nerves coming from under the ligament of the thigh. We shall find also, that the cellular membrane which surrounds the great vessels forms a condensed bed, independent of an aponeurosis upon the subjacent muscles. The inner surface of this cellular membrane is strong from the interlacing of fibres. It covers and invests the great artery and vein. The same condensed cellular membrane is continued behind the vein and artery; and by pulling up these vessels, after dissecting it back from before them, their branches may be seen piercing it like the vessels of the heart going out from the pericardium. All the vessels in the body are more or less supported in this manner by sheaths of cellular membrane; but it is at such places as this in the groin, that it becomes a great object in surgical anatomy to observe it. If the subject be in a favourable condition, very large lymphatic vessels may be observed coursing obliquely over the great artery, and passing through a net-work of ligament under the Paupart ligament.

The dissector next traces the femoral artery and vein under the ligament of the thigh, and observes the exture of ligamentous chords through which these vessels and the lymphatics pass into the trunk. He looks again to the place where the femoral hernia comes out.

I advise him, on this occasion, to cut through the integuments and abdominal muscles, near the Paupart ligament, and to push up the peritoneum, and dig down upon the external iliac artery, that he may comprehend the nature of the operation for femoral aneurism.

The DISEASE which may be mistaken and confounded at the place of this last dissection are, femoral or crural hernia with inguinal hernia; bubo with femoral hernia; common scrofulous abscesses of the inguinal glands with the lumbar abscess; and lumbar abscess with disease of the hip-joint.

It is not at every point under the ligament of the thigh that the femoral hernia is found to protrude; but only at that point where the ligament is less firmly tied down by ligamentous lacing, and where the cellular membrane is looser, betwixt the femoral artery and vein on one side, and the os pubis and insertion of ligament of the thigh on the other. This, it may be observed, is a small outlet, strictly embraced by the crural vessels and epigastric artery on the outside, and by the acute edge of a semicircular process of the ligament of the thigh. It is immediately in the bend of the groin, and towards the inside; so that it is very near the seat of the inguinal hernia. And when a femoral hernia in the male comes down suddenly, and is attended with much inflammation and tumefaction, especially if the patient be corpulent, the tumour so spreads towards the ring, and is at the same time so tender, that it cannot be freely handled; and so it is sometimes a difficult matter to say precisely whether it be a femo-

ral or an inguinal hernia. In all the other instances of disease in this part, and in general in the femoral hernia, the ring and the spermatic chord remain free, so that no room is left for doubt. This rising of the femoral hernia is owing to the difficulty it has to make its way downward, and to the motion of the thigh, which presses it up. Although the tumour rises, yet the neck of the sac being deep and coming out from under the Paupart ligament, we have to take into consideration, while the parts are before us, the proper direction of the force necessary to reduce this kind of hernia.

If a patient with a bubo or glandular swelling, immediately in the seat of hernia, should at the same time be attacked with symptoms resembling those of strangulation, as vomiting or want of passage by stool (a case by no means unlikely,) it may become extremely difficult to determine upon the case, notwithstanding the lightness with which it is commonly mentioned. I have not seen a bubo mistaken for a hernia ; but what is more extraordinary, I have seen a hernia, and an inguinal hernia too, mistaken for a bubo. The tumour extended down from the ring upon the groin ; was small and circumscribed ; and so violently inflamed, that it seemed upon the point of suppuration. But the most deceiving circumstance was, that the patient was not reduced ; he was strong, and walked stoutly, insomuch as to make his escape from the surgeons. It was naturally conceived, that if it had been a hernia so far advanced, the patient must have been more reduced, and every symptom of strangulation more urgent. But the man died afterwards, and I saw the dissection.

Herniary tumours are soft and elastic at first, and become firm and more incompressible upon the approach of strangulation. Glandular tumours are in general very hard in their commencement, circum-

scribed, and moveable; and before they have attained a size which can be mistaken, become softer, more prominent, and discoloured: when matter is formed, it is sufficiently evident. I suspect that in the case of hernia which I have mentioned above, the inflammation, which occurred so early, had been an erysipelatous affection, occasioned by the attemps to reduce the gut. It appeared dark, and like inflammation verging to suppuration. The history of symptoms, the distinctions evident to the touch, the occasional retiring of the swelling, its diminution on the patient's lying down, the percussion communicated by coughing, &c. will sufficiently distinguish the femoral hernia.

The LUMBAR ABSCESS appears in the groin, commonly upon the outside of the femoral artery, under the stronger part of the fascia, and nearer the os ilium. When the tumour forms slowly and regularly, the fascia can be plainly felt; and when it is far advanced, and the fascia gives way, the deficiency is plainly felt with the tense edges of the fascia. The lumbar abscess, however, does not always point thus regularly, but is more extensively diffused in the groin, even surrounding and including the femoral vessels; or it runs so deeply amongst the muscles, that the lancet or trochar cannot reach it with safety. In the dead body, upon laying open the abscess in the thigh, and freeing it of matter, a new discharge is seen to come from within the belly. Upon following this sinus, it is found to run up behind the psoas muscle, upon the vertebræ of the loins; and these bones are often carious. In some instances the abscess continues its course by the spine and side of the intestinum rectum, and points by the side of the anus; rarely it marks its way up into the thorax. The patient will sometimes survive until a string of abscesses are continued from the thorax to the groin, and down upon the rectum, and round the hip.

The suppuration of the inguinal glands simply, where there is no communication with the internal parts, may be known by the history of the disease. A scrophulous disease of these glands will commence by their induration and clustering, and advance slowly to suppuration, and will not become fuller and tenser in the erect posture, as takes place in lumbar abscess.

Collections in the hip-joint may protrude in such a manner upon the groin, as to be mistaken for abscess of the glands, or lumbar abscess. The affections of the joint are so peculiar, however, that they cannot be misunderstood. Inflammation and disease of the joint is of necessity attended with lameness, distinctly referable to the hip-joint, with a lengthening or shortening of the leg.

OF THE ANATOMY OF THE FEMORAL HERNIA.

The frequent occurrence of the femoral hernia must impress us still more forcibly with the importance of this piece of anatomy. When the subject presents for dissection, the student should not be without some advice to enable him to improve by the opportunity.

In a recent hernia of the thigh, the tumour is in general small. Indeed sometimes during the life of the patient it is to be discovered only by the symptoms, not by the swelling in the groin ; and these herniæ are the most dangerous and suddenly fatal.

If the rupture have been suddenly fatal, then proportionally there is less derangement of the natural anatomy ; for it is little alterated but by the effect of inflammation. There will be found a membrane of condensed cellular substance coming down from the

belly, and covering the tumour; under this the fascia will be found tense and stretched; the tumour is formed in a bed of inflamed cellular membrane, and the fibres ot the fascia, mingling with the condensed cellular substance, required to be cut through before we arrive at the sac which is formed by the peritoneum. In the substance of the cellular bed which invests the proper sac, the inguinal glands will be found involved. If the thigh have been injected, and the tumour be considerable, we find the external pudic artery, and inguinal cutaneous branches, ramifying upon the sac. The femoral hernia, coming from under Paupart's ligament, does not stretch down upon the thigh, but turns up upon the belly, as I have said. The dissector has to observe this fact, and think of the proper means of relaxing the connexions of the femoral ligament with the fascia lata of the thigh, and of the propor direction of the force in the operation of the taxis.

A celebrated author has said, that the femoral hernia is less apt to be strangulated than the hernia of the ring: but it is evident, that the latter is comparatively less liable to occasional derangement. For not only is the strangulation of the spermatic chord prevented by the mechanism of the parts when in their natural state, but even in hernia (especially where it has continued for some time) the extension of the fibres of the external oblique, round the margin of the ring or neck of the sac, is such, that before the action of the abdominal muscle can pull them, so as to compress the sac, it is held in check by those fibres, which continue in a direct line. Or, in other words, the passage through the tendon of the abdominal muscle is not such as we should conceive from a rupture splitting the parallel fibres, and obtaining a passage liable to compression, by the extension and consequent approximation of those fibres; but on the contrary, the fibres are gradually elongated as the rupture protrudes and in-

creases; thus forming a circular opening, extending outwards and downwards conically, so as not to be liable to compression by the action of the muscles. In the femoral hernia the thigh, forcing the tumour upwards, encreases the sudden angle of the neck, when almost of necessity strangulation must follow.

In operating for the femoral hernia, there are two points of the anatomy of much importance: First, the knowledge of the membranes which invest the tumour, and which must be carefully attended to in the external incision: And, secondly, the danger which attends the second stage of the operation in cutting the ligaments of the thigh, to free the gut from stricture. If therefore the dissector possess the opportunity, he ought to examine very particularly the manner in which the ligament binds down the neck of the sac, with a view to the manner of cutting it during operation. Unless the person has died of the hernia, the colours of the contained parts are of no importance.

FURTHER DISSECTION OF THE ARTERIES AND NERVES OF THE THIGH.

It is needless to speak of the importance of this dissection: the next division of our subject, which treats of the ACCIDENTS AND DISEASES, will sufficiently evince it.

As we have now to dissect back the general fascia, and as in separating the muscles we have much of their connexions to attend to, it may be well to point out such circumstances as may illustrate the general description of the fascia.

In carrying an incision through the fascia above the tract of the femoral artery, and dissecting back that portion which covers the outside of the thigh,

the direction of the fibres on the outer and on the inner surfaces of the fascia will be found very different, shewing the two plates of which it is composed. Upon the outer surface its fibres run in circles round the thigh; upon the inside they run in the length, and are more silvery and closer.

Upon the inside of the thigh, besides the coat of cellular membrane which involves the veins, there is a more appropriated sheath, though by no means like the fascia on the outside of the thigh in strength. Upon dissecting this part of the fascia from the more slender muscles which come down from the os pubis, it will be found to send down interlacing fibres betwixt the muscles, keeping them in some measure distinct from each other. Of this we have an example in the gracilis muscle; for, when we slit up and dissect back the fascia which covers it, we still find a condensed membrane separating it from the triceps.

The femoral artery, as it descends from the groin, gets betwixt the tendinous insertion of the triceps and the origin of the vastus internus muscles. Betwixt these two muscles there is such an interlacing of tendinous filaments, that they form the bottom of a deep groove in which the artery runs. Observe the tendinous sheath which covers this part of the artery.

The great accompanying vein keeps on the inside of the artery, and turns more and more under the artery as it descends to pass through the triceps muscle. The vein is very strong in its coats; and perhaps in an operation it might be mistaken for the artery, if the surgeon should be left to judge by the feeling betwixt his fingers, which in many cases is a good criterion.

The student will no doubt turn here to the Appendix, and make himself thoroughly master of the arrangement of the branches of the femoral artery; but there is a knowledge to be gained by the eye,

which words will not convey. After noticing the sheath of the great artery, and the passing off of the lesser branches, he must retire a step from the body, look to the general figure of the limb, and notice carefully the course of the artery down the thigh; the probability of its being wounded by stabs in such and such places and direction, the situation of the trunk of the profunda, as distinguished from the great artery, and the probability of wounds of the descending branches of the profunda being mistaken for wounds, of the femoral artery itself, will now be thought of.

NOTE OF THE NERVES WHICH ARE TO BE TRACED AMONG THE MUSCLES ON THE FORE PART OF THE THIGH.

Of the trunk of the anterior crural nerve.—This nerve commences by a twig from the second lumbar nerve. The third is almost entirely expended upon it. It receives likewise a twig from the fourth. The body of the nerve lies betwixt the psoas and iliacus internus muscle. It comes from under the ligament of the thigh, by the outside of the femoral artery, and is in part covered by the vessel. As it lies betwixt the muscles, it splits into numerous branches, which tend downward upon the thigh. It here receives twigs from the lumbar nerves; and it sends delicate branches to the internal iliac muscle, and to the psoas muscle, viz. recurrentes nervi psoæ.

Of the distribution of the anterior crural nerve.—A very minute knowledge of muscular branches will add little to our practical knowledge. In dissection, when we find a branch of this nerve going to a muscle, we know its origin and distribu-

tion, and consequently its name. Thus, three branches to the sartorious muscle :

Nervus musculi sartorii brevis vel superior,
——————————— medius,
——————————— longus vel inferior.

In the same manner the three nerves of the vastus externus : Nervi lividi, or pectenales, going down upon the pectenalis ; nervus musculi cruralis ; nervus musculi recti, &c.

From a branch of the anterior crural nerve, going to the vastus internus, is sent off the NERVUS SAPHENUS, or CUTANEUS LONGUS. This nerve runs down under the sartorius, and is joined by some minute twigs from the deeper muscular branches of the obturator nerve. Continuing its course, it appears as a cutaneous nerve upon the inside of the knee. From this proceeding downwards, it is largely distributed over the tibia ; is connected with the saphena vein ; and, finally, ends on the inner ankle and fore part of the foot and toes.

OBTURATOR NERVE.—This nerve commences with a twig from the second lumbar nerve ; as it passes the third lumbar nerve, it is joined hy some delicate twigs ; it has also additional twigs from the fourth lumbar nerve. It comes out from the pelvis by the thyroid hole, consequently in the middle of the muscular flesh of the thigh, and is chiefly distributed to the adductor muscles ; one branch descends towards the knee. In opposition to the last mentioned nerve, it is sometimes called the posterior crural nerve, but improperly.

OF THE ACCIDENTS AND DISEASES OF THE ARTERIES IN THE THIGH, AND OF THE POPLITEAL ANEURISM.

It has been already mentioned, in treating of the diseases of the arteries, how frequent their enlargements are at the flexures of the groin and ham ; and the explanation which appeared to be the most natural of this circumstance was there fully detailed. (See Vol. I. page 181.) But it is not merely the structure or situation of those parts which occasions the many diseases of these arteries ; they are besides exposed to many accidents.

A wound of the great artery high in the thigh is suddenly fatal. If by a slighter puncture, or the external wound healing quickly in consequence of compression, an aneurismal, tumour should be formed, those connexions amongst the muscles, which have been carefully pointed out, cannot withstand the continued impulse of the blood ; but in a short time, the blood driving amongst the muscles insulates them ; and upon operation an extensive irregular cavity is found.

It must be a much more difficult operation to tie a wound of the lesser branches of arteries, than where the trunk is pierced ; for if the wound be deep, others are, in searching for the wounded artery, unavoidably cut, and even the great trunk endangered ; and on enlarging the wound, there is such confusion of the effused coagulated blood in the interstices of the muscles, that the artery is with difficulty found, and extensive incisions are necessary ; which, if not very cautiously made, increase the evil.

In the encysted aneurism the progress of the tumour is slow. A case of aneurism in the groin,

which I saw lately, may serve us as a general example. A small tumour arose immediately below the ligament of the thigh. It remained stationary a long time; but upon some slight exertion it suddenly enlarged, stretching down the thigh. Here its progress seemed again arrested for some time; but it again increased, and showed, by the knobular figure of its surface in its last stage, these three successive changes which it had undergone. The smaller division of the tumour which first arose, gradually lost its pulsation; whilst the beating was very great in the more extensive tumours further removed from the ligament. When the two hands were extended over the tumour (for its size was so great,) the beating of the collateral arteries was distinctly felt on each side round the base of the tumour. Though the veins of the thigh were much enlarged (the aneurism compressing them as they go up under Paupart's ligament,) the limb was not œdematous, which generally happens in such cases.

The DISSECTION showed exactly what the preceding views of the anatomy would lead us to expect. Upon the most prominet part of the tumour, and where the pulsation had been more distinctly felt, the skin and fascia and sac of the aneurism were blended together. Upon the outside of the thigh, the firm and tendinous aponeurosis tied down the aneurismal sac. The aneurismal sac was distinct, and separated the clots of blood from the surrounding parts; but still it was impossible to distinguish whence it was derived. The external iliac artery was much enlarged and ossified; and along the whole track of the aorta several enlargements and ossifications were found.

We cannot be at a loss to account for the successive stages of the growth of the tumour, nor for the want of pulsation in that first formed. The tumour in the beginning was probably formed by the dilated coats of the artery, and they were sustained by the

uniform resistance of the surrounding parts; but upon the failure of some of the connexions of the fascia, a sudden dilatation was allowed, and the tumour spread irregularly to the weaker points, and down the thigh, in the direction of the original impulse of the blood. While the dilatation is so small, that the blood keeps moving in the sac there is probably no coagulum formed; but when it stretches into distinct sacs, the stream is diverted from the original channel, and the tumour first formed fills with firm coagula, and the pulsation is consequently suppressed.* Since this was written I have had many other examples of the disease before me.

When the operation for aneurism is performed in the groin for a case like the present, it cannot succeed; and the practice of the most expert surgeons shows us the confusion which is likely to follow. Upon the first incision for laying bare the sac, so many collateral arteries (which we have noticed to be much enlarged,) and the veins, too, which are likewise enlarged in that direction, in consequence of the obstruction and pressure of the tumour, pour out so much blood, that the whole operation is to be done upon parts covered with blood, where the only guide is the feeling. In regard to the ligature of the great artery, we must be under perpetual alarm; and for the space of two weeks we cannot be assured that the failure of the ligature, or rather the ulceration of the coats of the artery by the ligature, will not be instantly fatal. Or, if the bleeding should for this time be stopped by the surgeon, the repeated failure of ligatures, and the endeavour to follow up the trunk of the artery below the ligament of the thigh, with the deluge of blood, and faint exertions of a patient dying

* *See an interesting paper upon diseased blood-vessels, by Dr. Baillie, in the Transactions of a Society for the Improvement of Medical and Surgical Knowledge.*

in your hands, make a terrible scene. We are therefore much indebted to Mr. Abernethy for shewing us the practicability of cutting above the Paupart ligament, pushing aside the peritoneum, and tying the trunk of the external iliac artery.

In considering the propriety of these operations for aneurism in the groin, axilla, and neck, we ought never to lose sight of the fact that they are sometimes spontaneously cured, as happened in a case in the York Hospital lately.

As the femoral artery descends, is approaches the bone; and especially as it turns round to go into the ham, it lies very near it, which exposes it to be punctured by the spiculæ of the bone in fractures. As the artery here is much more firmly embraced by the muscles than in the upper part of the thigh, there is presented, in such an accident, upon dissection, a very curious appearance; for the large muscles, the vasti, are undermined, and they cover the acquired sac of the aneurism with a layer of fibres, causing it to resemble a strong muscular bag. I have had a second case of this kind under my knife lately.

OF THE OPERATION ON THE FORE PART OF THE THIGH FOR THE POPLITEAL ANEURISM.

Particular attention should be paid to the anatomy of the crural artery, as it pierces the triceps muscle; with a view especially to the high operation for the popliteal aneurism. We cannot study surgical anatomy by dissection alone; but by a careful examination and comparision with the points of the living body, which are to be our guides. Here, for instance the course of the sartorious muscle is of infinite importance. It is not easily brought into such action as

will show its course on the limb; but if a weight be placed upon the ground, and we attempt to shove it sidewise with the ball of the great toe, or if we turn the heel over the knee of the other leg, it will be brought to swell and show its course. In the event of the examination of a patient this is to be done with the sound limb. The incision is to be made upon the outer margin of the muscle, beginning a little below the middle of the thigh, and following the curve of the muscle. In pursuing this first incision under the sartorius (its upper surface being kept connected with the integuments,) betwixt the origin of the vastus internus and the insertion of the adductor longus into the thigh bone, we find the artery covered by irregular fibres of the fascia. There appears to be no foresight nor method of operating which can ensure success in this operation, except by guarding against too large an incision; by the accuracy with which it is made to correspond with the point of the artery to be tied; and by taking care that, in uncovering the artery, the parts are not too much loosened, especially the sartorius muscle; and by cutting the artery betwixt the two ligatures, and allowing it to contract and bury itself amongst the cellular membrane. When the wound is extensive (and it is perhaps impossible to avoid it in a big and fat man,) a large suppurating sore is the consequence; and there will be a greater chance of the sinuses forming up along the side of the artery, which sometimes takes place even in the most dexterous operation. The consequence of this state of the artery is, that instead of being supported by the surrounding parts, it lies surrounded with matter; the ligatures, like setons, keep up the discharge; and the vessel ulcerating, the patient dies by the loss of blood, if not by one gush, at least by successive smaller bleedings. Another circumstance with regard to the sar-

torius muscle is, that when it is left loose in the wound, it swells and fills up the opening, so that the matter is confined.

OF THE ANATOMY OF THE HAM, AND OF THE ANEURISM AT THIS PLACE.

As the anatomy of the ham, and the disease of the artery, have so strict a connexion with the subject of which we have now been treating, it will be better to finish the consideration of them here, than to leave it for separate explanation after the dissection of the hip and back part of the thigh.

Upon laying aside the true skin and superficial cellular membrane from the back part of the knee-joint, we have first to observe, as of the utmost importance in the diseases and operations, the strong fascia which covers the muscles and great vessels and nerves. We find a strong layer of fibres coming down obliquely from the outside, derived from the fascia lata of the thigh. From the projecting head of the fibula there runs upwards a layer of silvery fibres crossing the first. From the tendon of the semi-membranosus muscle an aponeurosis comes down, which, gaining additional fibres as it descends, forms a very strong sheath, covering all the back part of the leg. In other words, betwixt the two condyles of the thigh bone, and from the head of the fibula and betwixt the ham-string tendons, a strong fascia of interwoven fibres is extended, and this is prolonged down upon the origin of the gastrocnemii muscles and back of the leg.

Upon slitting up and dissecting back the fascia, the great nerve appears. It comes down betwixt the biceps and semi-membranosus muscles, on a level with the top of the trochanter. It splits into two great

branches: the greater continues its course betwixt the heads of the gastrocnemii muscles; whilst the lesser goes outwardly and obliquely downwards superficially (but under the fascia;) this lesser branch, splitting into branches, gives off directly in a middle course betwixt the gastrocnemii muscles and fascia, a small nerve, which is accompanied by a considerable vein.

Below the nerve, and the superficial vein and long slender artery which accompanies it, there is much cellular membrane and fat. Under this fat, and close to the bone, lie the popliteal artery and vein. They are imbeded in this tissue, and are intimately connected together; the vein more outwardly in its uninjected state clinging round the artery, and the lesser branches of veins striding over it.

If the parts be accurately retained in their natural situation during dissection, it will be seen, that in order to find the easiest access to the artery in operation, our incision should be made rather towards the outer hamstring than immediately in the middle. By this means we keep to the outside of the ischiatic nerve. We shall find the artery lying deep and covered with the vein, and to tie it separately, it must be disentangled from under the vein. But let us consider the state of the parts in disease.

STATE OF THE PARTS IN POPLITEAL ANEURISM. The limb is generally œdematos; sometimeus so much so as to make the pulse at the inner ankle to be felt with difficulty, independently of its faintness from the aneurism. The limb is in general considerably bent. Round the whole knee-joint there is much swelling; so that the tumour in the ham is not very distinct, but has more the feelling of general tension.

Upon laying open the integuments, the tumour comes more distinctly into view, distending the fascia,

With regard to the appearance and situation of the parts, particularly of the nerve, and great vein, and lesser saphena, it must depend upon the direction in which the coats of the artery first give way. If the artery shall have given way towards the inside, then the tumour will increase in that direction chiefly; while the artery itself will, in some degree, be pushed in the opposite direction, and the nerve and the vein will be crowded towards the outer ham-strings.

For the same reason, when the tumour, while yet small, has got to the outer side of the vessels, as it enlarges it pushes them towards the inside; or the nerve may even be carried directly forward upon the tumour. The natural anatomy, therefore, can only teach us the appearance of the parts, enabling us quickly to recognize them. In viewing the tumour we should immediately determine, that the tumour could not originate from the coats of the artery, nor be an extension of them, since the tumour is so abrupt and circumscribed, and the artery immediately above partakes so little of the enlargement. It is only by observing the progress of similar tumours in the breast and belly, that we are convinced of the great dilatation, I should rather say growth which membranes will allow. They acquire so gradually additional strength and increase of thickness, that unless we were in a manner witness of the gradual change in the nature and properties of the arterial coats, we could not doubt that these tumours were formed by the cellular membrane gradually condensing, in conseqeuence of inflammation and the impulse of the blood.

The popliteal aneurism takes place exactly in that part of the artery which must accommodate itself to the flexure of the joint. It would appear, however, that sometimes it occurs lower, in consequence of some violent action of the heads of the gastrocnemii

muscles, or where the arteries of the leg are given off. The ostensible reason for the new method of operating, viz. on the fore part of the thigh, is, that the artery may be supposed to partake more of the disease, in proportion to its proximity to the tumour. But this is putting the merit of the operation upon an insecure footing; for we know that the diseased state of the arterial system is always greater towards the trunks, and that it is gradually encroaching upon the extremities; that the disease is common to all the system, though the peculiar situation of the artery at the joint subjects it to additional risks. These may even be increased by the circumstances of a patient's general habits or way of life; but especially this disease is frequent in such as keep the joint habitually bent, but are liable to occasional violent efforts of the limb, and chiefly of the gastrocnemii muscles. It was formerly observed that horsemen were more especially exposed to it; and that class of men still continue to be the great sufferers by this disease. Whatever may be our reasoning upon this fact, it is evidently to be attributed to some cause which affects the portion of the artery which is subject to the flexion of the joint only; and if the ligature can be as easily and effectually secured three inches above the joint as upon the fore part of the thigh, it will be as effectually removed from those causes of failure of the artery which are peculiar to the joint, and there will be less chance of the general affection of the trunks having reached so far. The better reasons for preferring the new operation seem to be, the difficulty of operating in the ham; the debth at which the artery lies; and consequently the difficulty of drawing the ligature accurately: the extensive suppuration which follows, and the greater risk of hæmorrhage: and when the operation succeeds, a permanent contraction of the limb is apt to remain, arising from the adhesion among the parts,

and perhaps in some measure from the great nerve being so much exposed in the operation, that it must partake of the inflammation, and remain in the midst of the parts condensed and hardened. The power, or conveniency rather, which the higher operation gives of tying the artery again and again, following it up the thigh as the ligature successively gives way, is but a forlorn hope. This is not the merit of the operation. It is, that it allows us at once, with a small incision, to tie the artery; and when firmly secured with ligatures in the extremities of the incision, to cut in the middle portion, which allows the ends to shrink, and bury themselves amongst the cellular membrane, without interfering with the diseased and disordered parts. Even in the modern operation, when the disordered parts suppurate, the limb, or even the life of the patient is often lost.

OF THE CHANGES WHICH TAKE PLACE IN THE CAPACITY AND ACTION OF ARTERIES WHEN TIED, AND THE CIRCUMSTANCES WHICH INFLUENCE THESE CHANGES.

As morbid anatomy, or the changes which disease occasions, and the effect of operations upon the neighbouring parts, deserve so much of our attention; and as the laws by which the arteries in these cases are influenced, prove so useful and curious an inquiry, and so necessary to be remembered in determining upon every operation, I shall here endeavour to lay before the reader a few of the more important circumatances which influence the arteries.

What I now most anxiously wish to explain is, the connexions and sympathies of the trunks of

vessels supplying a limb, with the changes in the limb or part of the body which they supply. When part of a limb is amputated, the trunks of the arteries which supplied it rapidly diminish in size, and contract their diameter. If the lower part of a limb mortify, and the disease gradually encroach upon the limb, and spread upwards, the activity of the arteries is found proportionally decreasing, and their diameter shrinking; insomuch, that if it be thought fit to amputate the limb above the diseased part, the size of the arteries will be found diminished, and the bleeding consequently less. In these circumstances, the leg has been amputated without the necessity of tying the arteries on the stump; and, upon dissection, it is found that the arteries in mortified parts are stopped with coagulated blood.

In contrast with this, we have to contemplate the changes to which the arteries are subject in the natural growth of the body, or when an adventitious tumour grows upon a limb. As a limb enlarges in the course of nature, the arteries supplying it increase in size and strength. No one in these days will say, that this is merely a dilatation of the artery; on the contrary, it is an increase of size, strength of coats, and energy of action. In the case of an adventitions tumour growing upon a member, we find the arteries of that member gaining strength and increase of capacity, and enlarging their diameter, and becoming more tortuous proportionally as the tumour increases in size. In reasoning upon these facts, Dr. Hunter writes thus :* "Every body must see, that in this case the trunk of the artery would dilate till it became proportionable in capacity to its branches; for till then the trunk would be the narrowest part of the canal, the part where there would be the most resistance; and therefore the yielding coats of the

* *See Medical Observations, Vol. II.*

artery would give way till the just proportion was established between the trunk and all its branches." This explanation proceeds upon a false principle ; for although the trunk of the artery may be supposed proportionably narrower than the branches, yet as it is not narrower now than formerly, why should it give more resistance than formerly ? Should not the greater diameter of the extremities rather lead to the inference, that since the resistance to the passing forward of the blood is diminished, the force of the blood laterally upon the trunk of the vessel is likewise diminished ? But this is not the way in which the difficulty is to be solved : It is evident that an increase of blood is sent to the limb ; and the question is, How is this bestowed ? It is observable by every one in any degree conversant with the trifling accidents and local diseases of the body, that where there is an injury, an inflammation, a swelling, whether inflammatory or indolent, there is, according to the importance of the tumour, a strict connexion and sympathy betwixt the diseased part, and the vessels more or less remote by which it is supplied. Where there is a smart inflammation, there is a very perceptible increase of action quickly ceasing with its cause. Where there is an indolent tumour, there is a more imperceptible, but permanent change in the size and activity of the vessels. In this view, I hope, it will appear that the explanation, which rests merely upon the distention and dilatation of the arteries by the blood, is but lame and imperfect; and it will be evident that in the vessels of a limb, when influenced by a great tumour growing upon it, the same change takes place as under the influence of the natural growth of the limb from childhood,

Let us take the question in another light. Let us trance the observations of Dr. Hunter to the phenomena which gave rise to his most ingenious reflec-

tions, viz. the case of varicose aneurism, in the second volume of the Medical Observations.

In that species of aneurism in which a communication betwixt the artery and vein is formed in the bend of the arm, and by which a proportion of the blood which should circulate in the arm is drawn aside from the trunk of the artery into the basilic vein, and finds a less circuitous route back to the heart, it seems invariably to happen that the brachial artery is enlarged from the axilla down the arm to the communication. It becomes larger, and more tortuous, and its pulsation is more distinctly felt. This increase of diameter and strength, Dr. Hunter ascribes to the derivation of blood by the aperture, and reasons upon it in the words already quoted; conceiving this derivation of blood to act in a manner analogous to the adventitious tumour growing upon the limb. Did the motion of the blood in the arteries depend upon the laws of hydraulics simply—this breach in the vessel, this less circuitous route back to the heart, giving an easier circulation than through the extreme vessels, the supply of blood to the forearm would be permanently diminished. But the laws of the economy have directly a different tendency: for as the natural growth of a limb has an immediate effect (by what sympathies, or mode of action, we must remain ignorant,) in enlaging the parent trunk, soliciting a greater action and supply of blood; and as after the natural increase of the limb is arrest, a preternatural tumour growing upon the member will still farther in crease the agency of the vessels, it is natural to infer, from such strong analogy, that it is the influence of the forearm which occasions the increase of stength in the brachial artery; that the breach in the artery has withdrawn a quantity of blood from the arm, which is supplied by a more vigorous action in the trunk of the artery.

OF THE COLLATERAL ARTERIES IN ANEURISM.

But it is only from a more extensive view of the changes which take place in arteries, that we can form a decided opinion respecting the circumstances which affect them. We should naturally conceive, upon a superficial view, that when the trunk of an artery is tied, the collateral arteries enlarge merely as a consequence of the greater impulse of blood into them. But it is evident, that it is not the force of the blood upon their coats which distends them; since, when their extremities are tied, as after amputation, they do not dilate: and from an examination of the collateral arteries in aneurism, we see, that there is not a dilatation or extension of the coats merely, but at the same time an increase of strength and thickness of the coats, as in the natural growth of the arteries. We have to show how the arteries become tortuous, also, as they increase in power; and we hope to show, that this tortuous figure of the artery is the great means of the additional exertion.

In Dr. Hunter's remarks upon the case already quoted, there are several instances of the serpentine course which arteries take, as illustrating the increase and convolutions of the artery of the arm in aneurismal varix. This change he supposes to happen, "because the artery is lengthened, and therefore cannot preserve its course;" and that it is lengthened by the distension of the blood. Mr. John Bell, in his Anatomy of the Heart and Arteries, has objected to the reasoning of Dr. Hunter, but has come nearly to the same conclusion. "It is merely (says he) a consequence of the long continued pressure of the blood: it is this only which can account for the slowly increasing tortuosity in the temples or hands of an old man, or the sudden tortuosity which the newly dilated artery assumes after the operation for aneurism." (p. 291.) When the functions of an artery are considered, this matter will appear in a different light. As the artery possesses a power of accelerating the blood, or of circulating it by an

action alternating with the heart, the force exerted by an artery upon the blood must be in proportion to the length of the artery. A portion of an artery, of the length of three inches, will have a greater power of accelerating the blood than one of two inches, though they are equal in diameter, there being in the one a greater force of action than in the other. The combination of the muscular reaction of the first artery, exerted to accelerate the blood, will, when compared with that of the other, be as three to two. It follows, therefore, that the increased length of an artery, which has assumed the serpentine zig-zag course which arteries take in the several instances already mentioned, as in the temporal arteries when a great tumour grows upon the head, in the collateral arteries in aneurism, and in the brachial artery in the aneurismal varix, is a means of additional force and power to the circulation. It seems to depend upon the same principle, and to be consonant with the same laws, which influence the natural increase of the artery in diameter and in muscular strength. That part of the member which remains beyond the ligature of the artery in the operation for aneurism, comes to act upon the collateral branches in a manner strictly analogous to the way in which a great tumour growing upon a limb, or upon the head, acts upon the arteries of the part. The arteries become enlarged and tortuous, with an increase of pulsation and force; or the limb acts upon its collateral arteries as its growth did upon the trunk, there being such an effect mutually existing betwixt the increase of the member in bulk, and the capacity and energy of the arteries which supply it. The serpentine form of the arteries in old age is the natural course of the economy acting in a uniform tenor from childhood. It is a mark of the gradual failure of the activity of the muscular fibre, but is attended with a proportional increase of the contractile substance sustaining the powers of the system to a longer period.

The increase of the collateral arteries after the

operation for aneurism, which from experience we know to be the harbinger of a successful termination, and of the closing of the trunk, is to be accounted for upon the same principle. It shows a degree of youthful pliancy in the branches; it proves that the influence of the limb has succeeded: that the current of blood has changed; and that the trunk of the artery is left dormant to take those changes, which are completely to preclude the flow of blood in that direction. (See Of the State of the Vessels in Abscess, &c. Vol. 1 page 155.)

The numerous melancholy instances of the death of patients from the operation of aneurism, teach us the importance of attention to the state of the system in determining upon the operation. If the patient be young, and the aneurism have been produced by an accident, as a violent strain and twisting of the knee-joint, the spiculæ of a fractured bone puncturing the artery, &c. to tie the artery, even by an operation apparently bold or fool-hardy, will be attended with success; and so all experiments upon animals will be. But we must not be misled to conceive that, without regard to circumstances, an operation, if done after a certain manner, and with such and such precaution, shall be universally successful. It is to the state of the patient that we are chiefly to look. A man far advanced in life, with a diseased state of the arteries, will often fall a sacrifice however dexterously the operation may be perfomed. The collateral arteries will not be in a state to take an increased action, and to enlarge, so as to give a new route to the blood, and make a complete derivation from the trunk, which is tied. But the blood making an effort to keep in the old channel, will retain the artery unsealed by the coagula, which should form in it; and in a few days the ligature cutting its way out by the ulceration of the artery, there will be a profuse bleeding.

It may be useful to observe the consequences of amputation to such a patient, and the changes which we know to take place. After amputation, there is a diminished energy of action in the whole remaining arteries of the limb, and a real permanent contraction of the trunk of the artery and of the smaller branches, the extremities of which were distributed to the amputated parts. When we consider that, in general, in aneurism the arteries are in a diseased state, and that their partial failure is to be taken as a proof of this; is not the diminution of the diameter of the artery, and of the velocity of the blood, the most likely way to secure the remaining part of the artery from the farther effects of disease? Is it not most likely that, by allowing it a more quiet state, this may secure the patient from the formation of successive aneurismal tumours in the arteries connected with that limb? Thus differently do facts prove the case to stand from what a superficial observation would lead us to infer. We should conceive, that the amputation of a limb would endanger the remaining stump by the greater impulse communicated to the obstructed extremities. On the contrary, if it were by any accident to happen, that there was a necessity of amputating below the knee in a case of aneurism in the ham, I have no hesitation in saying, that the tumour would diminish and the aneurism surffer a kind of spontaneous cure.

In offering these remarks, I mean only to illustrate the laws of the animal economy in these diseases; not to draw a practical conclusion: for in determining upon the propriety of amputation, even after the operation for aneurism has failed, there are circumstances to be attended to which do not fall under our consideration.

After the lessons which the reader has received on more difficult dissections, he can be at no loss to prosecute the dissection of the leg and foot. The knowledge of the bones, fascia, and ligaments, and of the actions of the muscles of the lower extremity are very necessary to the surgeon; and after making himself acquainted with these as I have advised, he will prosecute the dissection of the arteries. In doing this, let him take particular notice of the course of the arteries and nerves, and of their relations to each other and to the surrounding parts; he will think of the practicability of tying them when wounded in the living body.

APPENDIX

TO THE

SYSTEM OF DISSECTIONS.

DESCRIPTION OF THE MUSCLES

IN

THE ORDER OF DISSECTION

DISSECTION I.

MUSCLES SITUATED ON THE FORE PART OF THE ABDOMEN.

THERE are five pair, consisting of three broad muscles on each side of the belly, and two in the central part.

LATERAL MUSCLES.

1. OBLIQUUS EXTERNUS DESCENDENS.

ORIGIN. From the lower edges of the eight inferior ribs, at a little distance from their cartilages

Its origins are serrated, and mix with portions of the serratus major anticus; the pectoralis major, sometimes, sends down fibres which unite with it; the fibres run down obliquely forwards, and terminate in a thin and very broad tendon.

INSERTION. 1. Into the whole length of the linea alba. 2. By the pillars of the ring into the os pubis. 3. Into the Paupart ligament. 4. Into the spine of the ilium.

The minute anatomy and the action of this muscle must be learned from the text, Vol. I. page 42.

2. OBLIQUUS INTERNUS ABDOMINIS.

OR. 1. The spine of the ilium; the whole length between the posterior, and superior anterior spinous process. 2. The os sacrum and the three undermost lumbar vertebræ, by a tendon common to it, and to the serratus posticus inferior muscle. 3. From Paupart's ligament.

IN. The cartilago ensiformis. 2. The cartilages of the seventh and of all the false ribs. 3. The linea alba. 4. The os pubis.

the text, Vol. I. page 46.

3. TRANSVERSALIS.

Or. 1. The inner or concave surface of the cartilages of the seven lower ribs, where some of its fibres are continued with those of the diaphragm. 2. From the transverse processes of the last vertebra of the back and the four superior vertebræ of the loins. 3. The whole spine of the os ilium internally.

In. The cartilago ensiformis and the linea alba.

THE CENTRAL MUSCLES ARE THE

RECTI AND PYRAMIDALES.

4. RECTUS ABDOMINIS.

Or. The ligament of the symphisis pubis.

In. 1. The cartilages of the three inferior true ribs. 2. Ensiform cartilage. It somestimes intermixes with the fibres of the pectoralis.

It is divided by tendinous intersectious, and at these places it adheres firmly to the anterior part of the sheath, in which the muscle is included.

Use. To compress the fore part, but more particularly the lower part of the belly; to bend the trunk forwards, or to raise the pelvis. By its tendinous intersections, it has been supposed that it is enabled to contract at any of the intermediate spaces; and, by its connexion with the tendons of the other muscles, it is prevented from changing place, and from rising prominent when in action.

5. PYRAMIDALIS.

Or. The os pubis and ligament of the symphisis.

In. Into the linea alba and inner edge of the rectus muscle, half-way between the os pubis and umbilicus.

It is often wanting.

Use. To assist the last muscle.

DISSECTION II.

MUSCLES OF THE PERINEUM

AND

MUSCLES ABOUT THE MALE ORGANS OF GENERATION.

DARTOS.

This appears to be no more than a condensation of the cellular membrane lining the scrotum ; yet the skin here is capable of being corrugated and relaxed in a greater degree than in other places.

The muscle proper to each testicle is the

6. CREMASTER.

Or. The internal oblique sends down a few fibres; these, near the junction of the os ilii and pu-

bis, pierce the ring of the external oblique, and then descend upon the spermatic chord.

In. The tunica vaginalis of the testicle, upon which it spreads, and is insensibly lost.

Use. To suspend and draw up the testicle, and to compress it.

MUSCLES IN THE PERINEUM.

7. ERECTOR PENIS.

Or. The tuberosity of the os ischium; running upwards, it embraces the crus of the penis.

In. The sheath of the crus penis.

8. EJACULATOR SEMINIS.

Or. The crura penis and body of the penis; the inferior fibres run more transversely, and the superior descend in an oblique direction.

In. In the middle of the bulb and spongy body of the urethra, and here the fibres of both sides uniting, the bulb is completely enclosed.

It is connected behind with the fibres of the sphincter ani and transversalis muscles; these accordingly co-operate in their action.

9. TRANSVERSUS PERINEI.

Or. The tuberosity of the os ischium; it runs transversely.

In. The ejaculator seminis and fore part of the sphincter ani.

There is often another muscle, named

TRANSVERSUS PERINEI ALTER.

Or. From the tuberosity of the ischium behind the former; it runs more obliquely forwards.

In. The side of the ejaculator seminis. (See farther Vol. I. page 227.)

MUSCLES OF THE ANUS.

10. SPHINCTER ANI.

This muscle consists of fibres which encircle the verge of the anus, and properly it has neither origin or insertion. We, however, remark its connexion forward with the ejaculator, and backwards with the os coccygis.

USE. Shuts the anus ; and, by resisting, gives effect to the levator ani and other muscles.

The SPHINCTER ANI INTERNUS is little more than part of the circular fibres of the muscular coat of the rectum, which is strengthened towards its extremity.

11. LEVATOR ANI.

OR. 1. The os pubis within the pelvis, and the upper edge of the foramen thyroideum. 2. From the thin tendinous membrane that covers the obturator internus and coccygeus muscles. 3.

From the body and spinous process of the os ischium; its fibres run down converging.

IN. The sphincter ani, and verge of the anus, and anterior part of the two last bones of the coccyx. It surrounds the extremity of the rectum, neck of the bladder, prostate gland, and part of the vesiculæ seminales.

USE. To sustain the contents of the pelvis, and to help in ejecting the semen and contents of the rectum. To restrain the protrusion of the anus in evacuation of the fœces.

See what is said of the action of these muscles of the perineum in the text, p. 235.

MUSCLES OF THE FEMALE ORGANS OF GENERATION.

12. ERECTOR CLITORIDIS.

OR. The ramus of the os ischium; it covers the crus of the clitoris.

IN. The crus and body of the clitoris.

13. SPHINCTER VAGINÆ.

Or. (Connected with the sphincter ani) the back part of the vagina, near the perineum.

In. The crus and body, or union of the crura clitoridis.

14. TRANSVERSUS PERINEI.

Or. (As in the male) from the tuberosity of the os ischium.

In. The upper part of the sphincter ani, and into a white tough substance in the perineum, between the lower part of the pudendum and anus.

Use. To sustain the perineum.

DISSECTION III.

MUSCLES TO BE DISSECTED AFTER OPENING THE ABDOMEN.

The diaphragm is a broad thin muscle, which, with its tendon, makes a complete transverse septum or partition betwixt the thorax and abdomen; it is concave downward and convex upward; the middle of it on each side reaches as high within the thorax as the level of the fourth rib.

The diaphragm is generally described as consisting of two muscles and an intermediate tendon.

15. THE SUPERIOR OR GREATER MUSCLE OF THE DIAPHRAGM.

Or. By distinct fleshy fibres. I. From the cartilago ensiformis. 2. From the cartilages of the

seventh, and of all the inferior ribs on both sides.

In. From these origins, the fibres run radiated from the circumference to the centre of the septum, and terminate in a cordiform tendon, which forms the middle of the diaphragm, and in which the fibres from opposite sides are inserted and interlaced. To the right of this tendinous centre there is perforation for transmitting the vena cava.

16. THE INFERIOR OR LESSER MUSCLE OF THE DIAPHRAGM.

Or. The second, third, and fourth lumbar vertebræ, by several tendinous heads, of which the central and longest are called the crura. (Between the crura, the aorta and thoracic duct pass; and, on the outside of these, the great sympathetic nerves and branches of the vena azygos perforate the shorter heads.) The fibres run upwards, and form in the middle two fleshy columns, which decussate and leave an oval space between them for the passage of the œsophagus and eighth pair of nerves, then expand.

In. The back part of the central tendon of the diaphragm.

Use. The diaphragm is the principal muscle of respiration; when it is in action, the fibres bring the septum towards a plane, by which the cavity of the thorax is enlarged. When relaxed, it is pressed by the abdominal muscles, which, acting through the viscera, thrust it up, and compress the lungs.

See further of the anatomy and action of the diaphragm Vol. I. page 195.

17. QUADRATUS LUMBORUM.

Or. The posterior part of the spine of the os ilium.

In. 1. The transverse processes of all the vertebræ of the loins. 2. The last rib near the spine. 3. The side of the last vertebra of the back.

Use. To move the trunk, and pull down the last rib.

18. PSOAS PARVUS.

Or. The sides of the two upper vertebræ of the loins; sends off a small long tendon, which ends thin and flat, and is

In. Into the iliac fascia and Paupart tendon.

Use. To strengthen the insertion of the abdominal muscles, and prevent their yielding in the straining of the muscles of the trunk.

19. PSOAS MAGNUS.

Or. 1. The body, and transverse process of the last vertebra of the back. 2. From all those of the loins.

In. The trochanter minor of the thigh bone, and into that bone a little below the trochanter.

Use. To bend the thigh forwards, or, when the inferior extremity is fixed, to assist in bringing the body forward.

20. ILIACUS INTERNUS.

Or. 1. The transverse process of the last vertebra of the loins. 2. All the inner lip of the spine of the ilium. 3. The edge of that bone between its anterior superior spinous process and the acetabulum. 4. From most of the hollow part of the ilium. It joins with the psoas magnus, where it begins to become tendinous, and is

In. Into the lesser trochanter.

Use. To assist the psoas magnus.

DISSECTION IV.

MUSCLES SITUATED ON THE FORE PART OF THE CHEST.

21. PECTORALIS MAJOR.

Or. 1. The cartilages of the fifth, sixth, and seventh ribs, where it intermixes with the external oblique muscle of the abdomen. 2. Almost the whole length of the sternum. 3. The anterior half of the clavicle.

In. Outside of the groove for lodging the tendon of the long head of the biceps. The tendon is twisted before it is inserted.

Use. To move the arm forwards, or to draw it down, or to draw it towards the side.

22. SUBCLAVIUS.

Or. The cartilage that joins the first rib to the sternum.

In. Extensively into the lower part of the clavicle.

Use. To pull the clavicle downwards.

23. PECTORALIS MINOR.

Or. The upper edge of the second, third, and fourth; or the third, fourth, and fifth ribs, near their cartilages.

In. The coracoid process of the scapula.

Use. To bring the scapula forwards and downwards, or to raise the ribs when the shoulder is fixed.

24. SERRATUS MAGNUS.

Or. The nine superior ribs, by digitations, which resembling the teeth of a saw, the anatomist calls them serrated origins.

In. The whole base of the scapula internally, between the insertion of the rhomboid and the origin of the subscapularis muscles; it is in a manner folded about the two angles of the scapula.

Use. To roll the scapula and raise the arm.

MUSCLES OF THE CHEST CONTINUED.

INTERCOSTALES.

25. INTERCOSTALES EXTERNI.

Or. The inferior edge of the rib, the whole length from the spine to near the joining of the ribs with their cartilages. (From this to the sternum, there is only a thin membrane covering the internal intercostal muscle.)

In. The upper obtuse edge of the rib below, as far back as the spine, into which the posterior portion is fixed.

26. INTERCOSTALES INTERNI.

Or. Like the external muscle; the fibres run down and obliquely backwards.

In. Into the margin of the rib below. From the

angle of the rib to the spine, the internal intercostal muscle is deficient.

Use. By means of these muscles, the ribs are raised upwards during inspiration. Their direction being oblique, they have a greater power of bringing the ribs near each other, than could be performed if they were straight.

27. TRIANGULARIS, OR STERNO-COSTALIS.

It lies on the incide of the sternum.

Or. 1. All the length of the cartilago ensiformis laterally. 2. From the edge of the lower half of the middle bone of the sternum, from whence the fibers ascend obliquely.

In. (By three triangular terminations,) into the lower edge of the cartilages of the third, fourth, and fifth ribs, near their joining with the ribs.

Use. To depress these cartilages and the extremities of the ribs, and, consequently, to assist in contracting the cavity of the thorax.

DISSECTION V.

OF THE MUSCLES LYING ON THE CRANIUM.

28. OCCIPITO-FRONTALIS.

Or. The superior transverse ridge of the occipital bone, and part of the temporal bone; a tendinous web covers the cranium, which terminates forward in a fleshy belly (the frontal portion;) this muscular portion covers the frontal bone.

In. 1. Into the orbicularis palpebrarum. 2. Into the skin of the eye-brows. It sends down a fleshy slip upon the nose.

Use. It draws up the skin of the forehead and raises the eye-brows.

29. CORRUGATOR SUPERCILII.

Or. The internal angular process of the os frontis.

In. The skin under the eye-brows near the middle of the arch.

Use. We have no power over the individual muscle. The corrugators knit the eye-brows, and are antagonists of the last muscle.

MUSCLES OF THE EXTERNAL EAR.

30. ATTOLLENS AUREM.

A thin and almost tendinous sheet.

Or. The tendon of the occipito-frontalis, where it covers the aponeurosis of the temporal muscle.

In. The upper part of the ear, opposite to the antihelix.

31. ANTERIOR AURIS.

A membranous muscle also.

Or. Back part of the zygomatic process of the temporal bone.

In. The back of the helix, near the concha.

32. RETRAHENTES AURIS.

Two delicate membranous muscles.

Or. The mastoid process, above the insertion of the sterno-cleido-mastoideus.

In. That part of the back of the ear which is opposite to the septum that divides the scapha and concha.

These muscles in a state of nature are designed to give tension to the ear, to make it more capable of receiving sounds, and especially to bring us acquainted with the direction of sounds; but their use is almost entirely lost.

THE MUSCLES OF THE EAR, LYING ON THE EXTERNAL EAR, OR IN THE CAVITY OF THE TYMPANUM.

33. HELICIS MAJOR.

OR. The upper and acute part of the helix anteriorly.

IN. Into its cartilage a little above the tragus.

34. HELICIS MINOR.

OR. The inferior and anterior part of the helix.

IN. The crus of the helix, near the fissure in the cartilage opposite to the concha.

35. TRAGICUS.

OR. The middle and outer parts of the concha, at the root of the tragus.

IN. The point of the tragus.

36. ANTITRAGICUS.

Or. The internal part of the cartilage that supports the antitragus.

In. The tip of the antitragus, as far as the inferior part of the antihelix, where there is a fissure in the cartilage.

37. TRANSVERSUS AURIS.

Or. The prominent part of the concha on the dorsum of the ear.

In. Opposite to the outer side of the antihelix.

These muscles are for the most part scarcely discernible: they are no doubt for emitting or giving rigidity to the ear, the better to enable it to collect the sound.

DISSECTION VI.

MUSCLES OF THE FACE AND JAWS.

THE MUSCLES OF THE EYE-LIDS.

38. ORBICULARIS PALPEBRARUM.

Or. 1. By many fibres, from the edge of the orbitary process of the superior maxillary bone. 2. From a tendon near the inner angle of the eye; these run a little downwards, then outwards, over the upper part of the cheek, covering the under eye-lid, and surround the external angle, being loosely connected only to the skin and fat, they run over the superciliary ridge of the os frontis, towards the inner canthus, where they intermix with those of the occipite-frontalis and corrugator supercilii;

then covering the upper eye-lid, descend to the inner angle opposite to the inferior origin of this muscle, firmly adhering to the internal angular process of the os frontis, and to the short round tendon which serves to fix the palpebræ and muscular fibres arising from it.

IN. The nasal process of the superior maxillary bone covering a part of the lachrymal sac.

USE. This muscle should be divided into the external and internal muscles. See the Text.

The CILIARIS is a part of this muscle which covers the cartilages of the eye-lids, called cilia or tarsi.

39. LEVATOR PALPEBRÆ SUPERIORIS.

OR. The upper part of the foramen opticum of sphenoid bone.

IN. By a thin tendon into the cartilage that supports the upper eye-lid.

USE. To open the eye, by drawing the eye-lid upwards.

OF THE MUSCLES OF THE EYE-BALL.

The muscles of the globe of the eye are six, viz.

Four straight and two oblique.

The four straight muscles very much resemble each other; having their.

Or. From the bottom of the orbit around the foramen opticum of the sphenoid bone, and of course surrounding the optic nerve as it enters the orbit. They may be taken out, adhering to the nerve. They have neat small fleshy bellies.

In. The sclerotic coat on the fore part of the globe of

the eye. Their tendons form the tunica abluginea.

The recti muscles of the eye, being four in number, and inserted at four opposite points into the eyeball are competent to perform (as they act individually or in combination) all the motions of the eyeball. They are distinguished by these names:

40. LEVATOR OCULI, OR RECTUS SUPERIOR.

41. DEPRESSOR OCULI, OR RECTUS INFERIOR.

42. ADDUCTOR OCULI, OR RECTUS INTERNUS.

43. ABDUCTOR OCULI, OR RECTUS EXTERNUS.

There are two obliqui.

44. OBLIQUUS SUPERIOR, SEU TROCHLEARIS.

Or. The edge of the foramen opticum at the bottom of the orbit, between the levator and adductor oculi; from thence it takes its course along

the os planum ; its tendon passes through the cartilaginous loop, attached to the inside of the internal angular process of the os frontis. It then runs backwards and outwards, over the eye-ball.

In. The tunica sclerotica, about half way between the insertion of the attollens oculi and the optic nerve.

Use. In co-operation with the next muscle to suspend the eye-ball and prevent its being retracted by the recti muscles.

45. OBLIQUUS INFERIOR.

Or. The outer edge of the orbitary process of the superior maxillary bone, near its union with the os unguis ; it runs backward and outward.

In. The sclerotica, betwixt the insertion of the abductor and optic nerve.

Use. To co-operate with the former muscle.

§ 1. MUSCLES OF THE NOSE AND LIPS.

46. COMPRESSOR NARIS.

It consists of a few fibres which run along the cartilage of the nose in an oblique direction, towards the dorsum of the nose.

Or. The anterior extremity of the os nasi and nasal process of the superior maxillary bone, where it meets with some of the fibres descending from the occipito-frontalis muscle.

In. The root of the ala nasi.

Use. I conceive this muscle to expand the nostril. As its name implies, it is supposed to compress the nose.

47. LEVATOR LABII SUPERIORIS ALÆQUE NASI.

Or. The nasal process of the superior maxillary bone where it joins the os frontis.

In. 1. The upper lip. 2. The ala nasi.

Use. To raise the upper lip and dilate the nostril.

48. LEVATOR ANGULI ORIS OR LEVATOR LABIORUM COMMUNIS.

Or. The hollow on the face of the superior maxillary bone, between the root of the socket of the first dens molaris and the foramen infra orbitale.

In. The angle of the mouth.

Use. To draw the corner of the mouth upwards.

49. LEVATOR LABII SUPERIORIS PROPRIUS.

Or. The superior jaw bone, above the foramen infra orbitale.

In. The upper lip and orbicularis muscle.

50. DEPRESSOR LABII SUPERIORIS ALÆQUE NASI.

Or. The superior maxillary bone, immediately above the joining of the gums with the two dentes incisivi and the dens caninus.

In. The upper lip and root of the ala nasi.

Use. To draw the upper lip and ala nasi downwards, and to compress the nostril.

51. ZYGOMATICUS MAJOR.

Or. The zygomatic process of the os malæ.

In. The angle of the mouth.

Use. To draw the corner of the mouth obliquely upwards.

52. ZYGOMATICUS MINOR.

(Often wanting.)

Or. The upper prominent part of the os malæ above the origin of the former-muscle.

In. The upper lip, near the corner of the mouth, along with the levator anguli oris.

Use. To draw the corner of the mouth upwards.

53. DEPRESSOR ANGULI ORIS.

Or. The base of the maxillary bone near the chin.

In. The angle of the mouth, uniting with the zygomaticus major and levator anguli oris.

Use. To pull down the corner of the mouth.

54. DEPRESSOR LABII INFERIORIS.

Or. Broad and fleshy, intermixed with fat, from the inferior part of the lower jaw next the chin, runs obliquely upwards, and is

In. Into the edge of the under lip, extends along one half of the lip, and is lost in its red part.

Use. To pull the under lip and the skin of the side of the chin downwards, and a little outwards.

55. LEVATOR LABII INFERIORIS.

Or. The lower jaw, at the roots of the aveoli of two dentes incisivi, and of the caninus.

In. The skin of the chin.

Use. To pull up the chin, and, consequently, to raise and protrude the lip

56. BUCCINATOR.

(Membranous muscle in the cheek.)

Or. 1. The elveolar part of the lower jaw. 2. The fore part of the root of the coronoid process. 3. The upper jaw. 4. The peterygoid process of the sphenoid bone.

In. The angle of the mouth, within the orbicularis oris.

Use. To draw the angle of the mouth, and to turn the morsel in the mouth, and to place it under the action of the grinding teeth.

57. ORBICULARIS ORIS.

This is a muscle, consisting of circular fibres, which surround the mouth, and constitutes a great part of the thickness of the lips.

Use. To shut the mouth, and to oppose the muscles which converge to be inserted into the lips.

58. NASALIS LABII SUPERIORIS.

Or. The fibres of the orbicularis muscle.

In. The lower part of the septum nasi.

Use. To draw down the point of the nose, by operating on the elastic septum.

§ MUSCLES OF THE LOWER JAW.

The jaw of the carnivorus animal has no lateral motion, but only muscles, which close the jaw. The

gramenivorus animals have powerful muscles for the lateral or grinding motions. Man, also, possesses a double set. First, for closing the jaw, these :

59. TEMPORALIS.

Or. 1. The semicircular ridge of the lower and lateral part of the parietal bone. 2. The pars squamosa of the temporal bone. 3. The external angular process of the os frontis. 4. The temporal process of the sphenoid bone. 5. It is covered by an aponeurosis, from which also it takes an origin. The muscle passing under the jugum has for its

In. The coronoid process of the lower jaw which it grasps with a strong tendon.

Use. To raise the lower jaw.

60. MASSETER.

Or. 1. The superior maxillary bone, where it joins the os malæ. 2. The inferior part of the zygoma, in its whole length.

In. The outside of the angle of the upright part of the lower jaw.

Use. To pull up the lower jaw, for performing the grinding or lateral motions there.

61. PTERYGOIDEUS INTERNUS.

Or. 1, The inner and upper part of the internal plate of the pterygoid process of the sphenoid bone. 2. The palatine bone. It fills the space between the two plates of the pterygoid process.

In. The inside of the angle of the lower jaw.

Use. To move the jaw latterally.

62. PTERYGOIDEUS EXTERNUS.

Or. 1. The outside of the external plate of the pterygoid process of the sphenoid bone. 2. Part of the upper maxillary bone adjoining. 3. The

root of the temporal process of the sphenoid bone.

In. The neck of the condyloid process of the lower jaw.

Use. To assist the former muscle.

MUSELES OF THE INTERNAL EAR.

There are three muscles of the internal ear.

63. LAXATOR TYMPANI.

Or. The extremity of the spinous process of the sphenoid bone, behind the entry of the artery of the dura mater; runs backwards, along with the chorda tympani, in a fissure of the temporal bone, until it reaches the tympanum.

In. The long process of the malleus.

Use. To relax the membrane of the tympanum.

64. TENSOR TYMPANI.

Or. The cartilaginous extremity of the Eustachian tube just where it begins to be covered by the pars petrosa, and spinous process of the sphenoid bone, from thence running backwards near the osseous part of the Eustachian tube, it forms a very distinct fleshy belly, the tendon turns into the tympanum along with the nerve called chorda tympani.

In. The posterior part of the handle of the malleus, a little lower than the root of its long process.

Use. To pull tense the membrane of the tympanum.

65. STAPEDIUS.

Or. A hollow in the pars petrosa, near the cells of the mastoid process; its tendon passes straight through a small round hole in the bone, enters the fore part of the tympanum, and has its.

In. Into the head of the stapes.

Use. Perhaps to steady the stapes, and to prevent the communication of too strong a sensation to the seat of the sense.

DISSECTION VII.

MUSCLES OF THE NECK AND THROAT.

66. LATISSIMUS COLLI, OR PLATYSMA MYOIDES.

Or. By many delicate fleshy fibres, from the cellular substance which covers the upper parts of the deltoid and pectoral muscles. They pass over the clavicle adhering to it. They ascend obliquely, to form a thin muscle, which covers all the side of the neck.

In. The outside of the base of the lower jaw. 2. The depressor anguli oris, terminating in the risorius sanctorini.

Use. It is said to assist the depressor anguli oris in drawing the skin of the cheek downwards;

and, when the mouth is shut, it draws all that part of the skin to which it is connected, below the lower jaw, upwards. The true use of the muscle, I think I have explained in the text, as properly belonging to the respiration and circulation.

67. STERNO-CLEIDO-MASTOIDEUS.

Or. 1. The top of the sternum near its junction with the clavicle. 2. The upper and anterior part of the clavicle.

In. The mastoid process of the temporal bone and mastoidean angle.

Use. To turn the head to one side, and bend it forwards.

MUSCLES LYING BETWEEN THE LOWER JAW AND OS HYOIDES.

68. DIGASTRICUS, OR BIVENTER MAXILLÆ INFERIORIS.

Or. The groove in the mastoid process of the temporal bone. It runs downward and forward;

the tendon passes through the stylo-hyoideus muscle, and is fixed by a ligament to the os hyoides; then the tendon is reflected forward and upward, and becoming again muscular, it has an

In. Into a rough part of the lower jaw behind the chin.

Use. To open the mouth, by pulling the lower jaw downwards; when the jaws are shut to raise the larynx, and, consequently, the pharynx, in deglutition.

69. MYLO-HYOIDEUS.

Or. All the inside of the base of the lower jaw.

In. 1. The lower edge of the basis of the os hyoides,
2. Into its fellow of the opposite side.

Use. To pull the os hyoides upwards.

70. GENIO-HYOIDEUS.

Or. A rough protuberance within the arch of the lower jaw, which forms the chin.

In. The basis of the os hyoides.

Use. To raise the chin.

71. HYO-GLOSSUS.

Or. The base, cornu, and appendix of the os hyoides.

In. The side of the tongue.

Use. To pull the tongue into the mouth, or draw it downwards.

72. GENIO-HYO-GLOSSUS.

Or. The rough protuberance on the inside of the lower jaw.

In. The tip, middle, and root of the tongue, and base of the os hyoides, near its cornu.

Use. According to the direction of its fibres, to move the tongue, to draw its root and the os hyoides forwards, and to thrust the tongue out of the mouth.

73. LINGUALIS.

(Seated in the substance of the tongue.)

Or. The root of the tongue laterally; runs forward between the hyo-glossus and genio-glossus.

In. The tip of the tongue, along with part of the stylo-glossus.

Use. To contract the substance of the tongue, and move the tip of it.

MUSCLES ON THE FORE PART OF THE THROAT.

74. STERNO-HYOIDEUS.

Or. 1. The cartilaginous extremity of the first rib,

2. The upper and inner part of the sternum.
3. The clavicle, where it joins with the sternum.

In. The base of the os hyoides.

Use. To pull the os hyoides downwards.

75. OMO-HYOIDEUS, OR BIVENTER INFERIOR.

Or. The superior costa of the scapula, near the semilunar notch, and the ligament that runs across it; ascending obliquely, it becomes tendinous below the sterno-cleido-mastoid muscle, it grows fleshy again towards its

In. Into the base of the os hyoides.

Use. To assist in pulling down the os hyoides.

76. STERNO-THYROIDEUS.

Or. The edge of the trianglar portion of the sternum internally, and from the cartilage of the first rib.

In. The inferior edge of the thyroid cartilage.

Use. To draw the larynx downwards.—See muscles of the larynx.

77. THYRO-HYOIDEUS.

Or. The lower part of the thyroid cartilage.

In. Part of the basis and the cornu of the os hyoides.

Use. To bring the bone and cartilage together.

78. CRICO-THYROIDEUS.

Or. The side and fore part of the cricoid cartilage.

In. The lower part of the thyroid cartilage and its inferior cornu.

Use. To draw the cartilages or to affect their vibration and influence the voice.

MUSCLES OF THE THROAT AND PHARYNX CONTINUED.

79. STYLO-GLOSSUS.

Or. The styloid process, and from a ligament that connects that process to the angle of the lower jaw.

In. The root of the tongue, being insensibly lost on the side and tip of the tongue.

Use. To draw the tongue laterly or backwards.

80. STYLO-HYOIDEUS.

Or. The middle and inferior part of the styloid process.

In. The os hyoides at the junction of the base and cornu.

Use. To pull the os hyoides upwards.

Its fleshy belly is sometimes perforated by the tendon of the diagastric muscle. There may be found another accompanying it, the stylo-hyoideus alter.

81. STYLO-PHARYNGEUS.

Or. The root of the styloid process.

In. The side of the pharynx and back part of the thyroid cartilage.

Use. Supposed to dilate and raise the pharynx and thyroid cartilage upwards; perhaps rather, in combination with others, to grasp the morsel, and to assist in swallowing.

82. TENSOR SEU CIRCUMFLEXUS PALATI.

Or. 1. The spinious process of the sphenoid bone, behind the foramen ovale. 2. The Eustachian tube. It then runs down along the pterygoideus internus muscle, passes over the hook of the internal plate of the pterygoid process, and spreads into a broad membrane.

In. The velum pendulum palati. Some of its posterior fibres join with the constrictor pharyngis superior, and palato-pharyngeus.

Use. To stretch and draw down the velum palati.

83. LEVATOR-PALATI.

Or. The extremity of the pars petrosa of the temporal bone, near the Eustachian tube, and from the membranous part of the same tube.

In. The velum pendulum palati, and the root of the uvula. It unites with its fellow.

Use. To draw the velum upwards, so as to shut the posterior nares.

84. CONSTRICTOR ISTHMI FAUCIUM.

Or. The side of the tongue, near its root; from thence running upwards, within the anterior arch of the uvula.

In. The middle of the velum pendulum palati, at the root of the uvula. It is connected with its fellow.

Use. Draws the velum towards the root of the tongue, which it raises at the same time.

85. PALATO-PHARYNGEUS.

Or. The middle of the velum pendulum palati, and from the tendinous expansion of the circumflexus palati. The fibres are collected within the posterior arch behind the amygdala, and run backwards to the top and lateral part of the pharynx, where the fibres are scattered, and mix with those of the stylo-pharyngeus.

In. The edge of the upper, and back part of the thyroid cartilage, some of its fibres being lost between the membrane of the pharynx and the two inferior constrictors.

Use. Draws the uvula and velum downwards, and backwards; and, at the same time, pulls the thyroid cartilage and pharynx upwards. In swallowing, it thrusts the food from the fauces into the pharynx.

N. B. A few of the fibres of this muscle have been called

86. SALPINGO-PHARYNGEUS,

And supposed to operate on the mouth of the Eustac hian tube.

87. AZYGOS UVULÆ.

Or. The extremity of the suture which joins the palate bones.

In. The tip of the uvula.

Use. Raises the uvula and shortens it.

MUSCLES ON THE BACK PART OF THE PHARYNX.

88. CONSTRICTOR PHARYNGIS INFERIOR.

Or. 1. The side of the thyroid cartilage. 2. The cricoid cartilage. This muscle is the largest of the three constrictors.

In. It joins with its fellow on the back of the pharynx, the superior fibres run upwards, and cover part of the middle constrictor, the infe-

rior fibres run more transversely, and surround the œsophagus.

Use. To compress the pharynx.

89. CONSTRICTOR PHARYNGIS MEDIUS.

Or. The appendix and cornu of the os hyoides, and the ligament which connects the os hyoides, and the thyroid cartilage, the fibres of the superior part run upwards, and cover a considerable part of the superior constrictor.

In. The middle of the cuneiform process of the os occipitis, and it is joined to its fellow at the back of the pharynx.

Use. To compress the pharynx, and draw it upwards.

90. CONSTRICTOR PHARYNGIS SUPERIOR.

Or. 1. The cuneiform process of the os occipitis, near the condyloid foramina. 2. The ptery-

goid process of the sphenoid bone. 3. Alveolar process of the upper jaw. 4. The lower jaw.

In. A white line, in the middle of the pharynx, where it joins with its fellow, and is covered by the constrictor medius.

Use. To compress the upper part of the pharynx, and draw it upwards.

MUSCLES OF THE GLOTTIS.

They consist generally of four pair of small muscles and a single one.

91. CRICO-ARYTÆNOIDEUS POSTICUS.

Or. Fleshy, from the back part of the cricoid cartilage.

In. The posterior part of the base of the arytænoid cartilage.

Use. To open the rima glottidis a little, and, by pulling back the arytænoid cartilage, to stretch the ligament so as to make it tense.

92. CRYCO-ARYTÆNOIDEUS LATERALIS.

Or. From the crycoid cartilage, laterally, where it is covered by part of the thyroid.

In. The side of the base of the arytænoid cartilage near the former.

Use. To open the rima glottidis, by pulling the ligaments from each other.

93. THYREO- ARYTÆNOIDEUS.

Or. The under and back part of the thyroid cartilage.

In. The arytænoid cartilage, higher up and farther forwards than the cryco-arytænoideus lateralis.

Use. To pull the arytænoid cartilage forwards and to shorten and to relax the ligament of the larynx or glottis vera.

94. ARYTÆNOIDEUS OBLIQUUS.

Or. The base of one arytænoid cartilage, crosses its fellow.

In. Near the tip of the other arytænoid cartilage.

Use. When both act, they pull the arytænoid cartilages towards each other.

Very often one of these is wanting.

95. ARYTÆNOIDEUS TRANSVERSUS.

Passes from the side of one arytænoid cartilage, (its origin extending from near its articulation, with the cricoid, to near its tip,) towards the other arytænoid cartilage.

Use. To shut the rima glottidis, by bringing these two cartilages with their ligaments, nearer one another.

There are a few pale disgregated muscular fibres on each side, which from their general direction are named,

96. THYREO-EPIGLOTTIDEUS.

Or. The thyroid cartilage.

In. The side of the epiglottis.

Use. To expand the epiglottis.

97. ARYTÆNO-EPIGLOTTIDEUS.

Consisting of a few fibres.

Or. From the side of the arytænoid cartilage.

In. The epiglottis.

Use. To pull down the epiglottis on the glottis.

DISSECTION VIII.

MUSCLES SITUATED ON THE FORE PART AND SIDE OF THE VERTEBRÆ OF THE NECK.

98. LONGUS COLLI.

Or. 1. The bodies of the three superior vertebræ of the back and lowest of the neck. 2. From the transverse processes of the third, fourth, fifth, and sixth vertebræ of the neck.

In. The fore part of the bodies of all the vertebræ of the neck.

Use. To bend the neck forwards or to one side.

99. RECTUS CAPITIS INTENUS MAJOR.

Or. The points of the transverse processes of the third, fourth, fifth, and sixth vetebræ of the neck.

In. The cuneiform process of the os occipitis a little before the condyloid process.

Use. To bend the head forwards.

100. RECTUS CAPITIS INTERNUS MINOR.

Or. The fore part of the body of the first vertebra of the neck.

In. The root of the condyloid process of the os occipitis.

Use. To nod the head forwards.

101. RECTUS CAPITIS LATERALIS.

Or. The point of the transverse process of the first vertebra of the neck.

In. The os occipitis, opposite to the foramen stylo-mastoideum of the temporal bone.

Use. To move the head a little to one side.

102. SCALENUS ANTICUS.

Or. The fourth, fifth, and sixth transverse processes of the vertebræ of the neck.

In. The upper side of the first rib, near its cartilage.

103. SCALENUS MEDIUS.

Or. The transverse processes of the vertebræ of the neck.

(The nerves to the superior extremity pass between this muscle and the former.)

In. The upper and outer part of the first rib, extending from its root to within the distance of an inch from its cartilage.

104. SCALENUS POSTICUS.

Or. The fifth and sixth transverse processes of the vertebræ of the neck.

In. The upper edge of the second rib near the spine.

The three muscles bend the neck to one side. When the neck is fixed, they elevate the ribs, and dilate the chest.

There are a number of small muscles situated between the spinous and transverse processes of contiguous vertebræ, which are accordingly named,

INTERSPINALES COLLI AND INTERTRANSVERSALES COLLI.

DISSECTION IX.

MUSCLES OF THE BACK.

The first layer consists of two muscles, which cover almost the whole posterior part of the trunk.

105. TRAPEZIUS OR CUCULARIS.

Or. 1. The protuberance in the middle of the os occipitis, by a thin membranous tendon, which covers part of the splenius and complexus muscles. 2. From the transverse edge of the occiput which extends from the protuberance towards the mastoid process of the temporal bone. 3. From the ligamentum nuchæ, where it seems to arise from its fellow. 4. From the spinous processes of the two inferior vertebræ of the neck, and from the spinous processes of all the vertebræ of the back, (adhering to its fellow.)

In. The outer half of the clavicle. 2. The acromoin. 3. The spine of the scapula.

Use. Moves the scapula according to she three different directions of its fibres; for the upper descending fibres may draw it obliquely upwards, the middle being transverse fibres directly backwards, and the inferior ascending fibres obliquely downwards and backwards.

106. LATISSIMUS DORSI.

Or. 1. The posterior part of the spine of the os illium. 2. All the spinous processes of the os sacrum and vertebræ of the loins. 3. The seven inferior spines of the vertebræ of the back. 4. The extremities of the three or four inferior ribs. The inferior fibres ascend obliquely, and the superior run transversely over the inferior angle of the scapula, towards the axilla, where they are all collected and twist.

In. By a strong thin tendon into the inner edge of the groove for lodging the tendon of the long head of the biceps: (sometimes into the tendon of the triceps.)

Use. To pull the arm backwards, and downwards; and to roll the os humeri.

107. SERRATUS POSTICUS INFERIOR.

(Lying under the latissimus dorsi.)

Or. In common with that of the latissimus dorsi, from the spinous processes of the two inferior vertebrae of the back, and from the three superior of the loins.

In. The lower edges of the four inferior ribs, by distinct fleshy slips.

Use. To depress the ribs.

108. RHOMBOIDEUS.

This muscle is divided into two portions, rhomboideus major and minor.

Rhomboideus major.

Or. The spinous processes of the five superior vertebræ of the back.

In. The basis of the scapula below its spine.

Use. To draw the scapula obliquely upwards, and backwards.

Rhomboideus minor.

Or. The spinous processes of the three inferior vertebræ of the neck, and from the *ligamentum nuchæ.*

In. The base of the scapulæ opposite to its spine.

Use. To assist the former.

109. SPLENIUS.

This is the muscle of the back of the neck.

Or. 1. The four superior spinous processes of the vertebræ of the back. 2. The five inferior of the neck, (adheres to the ligamentum nuchæ

At the third vertebra of the neck, the splenii recede from each other, so that part of the complexus muscle is seen.

IN. 1. The five superior transverse processes of the vertebræ of the neck. 2. The posterior part of the mastoid process. 3. The os occipitis.

USE. To bring the head, and upper vertebræ of the neck backwards and laterally, and, when both act, to pull the head directly backwards.

That portion which *arises* from the five inferior spinous processes of the neck; and is *inserted* into the mastoid process and os occipitis, is called SPLENIUS CAPITIS : and that portion which *arises* from the third and fourth of the back, and is *inserted* into the five superior transverse processes of the neck, is called SPLENIUS COLLI.

110. SERRATUS SUPERIOR POSTICUS.

(Under the Rhomboidei.)

Or. The spinous process of the three last vertebræ of the neck, and the two uppermost of the back.

In. The second, third, fourth, and fifth ribs.

Use. To elevate the ribs, and dilate the thorax.

111. SPINALIS DORSI.

(Lying betwixt the spine, and longissimus dorsi.)

Or. The spinous processes of the two uppermost vertebræ of the loins, and the three inferior of the back.

In. The spinous processes of the vertebræ of the back, from the second to the ninth.

Use. To erect and fix the vertebrae, and to assist in raising the spine.

112. LONGISSIMUS DORSI.

Or. Tendinous superficially, and fleshy within:
1. From the side, and spines of the os sacrum.
2. From the posterior spine of the os illii.
3. From all the spinous processes of the loins.
4. The transverse processes of the vertebræ of the loins.

In. 1. All the transverse processes of the vertebræ of the back, chiefly by small double tendons.
2. By a tendinous and fleshy slip, into the lower edge of all the ribs, except the two inferior, at a little distance from their tubercles.

Use. To raise, and keep the trunk of the body erect.

From the upper part of this muscle, there runs up a round fleshy portion which joins with the cervicalis descendens.

113. SACRO LUMBALIS.

Or. In common with the longissimus dorsi.

In. All the ribs, where they begin to be curved forwards, by long thin tendons.

From the upper part of the six or eight lower ribs arise bundles of thin fleshy fibres, which soon terminate in the inner side of this muscle, and are named MUSCULI AD SACRO-LUMBALEM ACCESSORII.

Use. To pull the ribs down, and assist to erect the trunk of the body.

114. CERVICALIS DESCENDENS.

Or. From the upper part of the last muscle.

In. The fourth, fith, and sixth transverse processes of the vertebræ of the neck, by distinct tendons.

Use. To turn the neck obliquely backwards, and to one side.

We turn again to the dissection of the back of the neck.

115. COMPLEXUS.

Or. 1. The transverse processes of the seven superior vertebrae of the back, and four inferior of the neck. 2. By a fleshy slip from the spinous process of the first vertebræ of the back: from these different origins it runs upwards, and is every where intermixed with tendinous fibres.

In. The protuberance of the os occipitis, and transverse line,

Use. To draw the head backwards, and to one side, when acting as an individual muscle; and, when both act, to draw the head directly backwards.

N. B. The long portion of this muscle that is situated next the spinous processes, lies more loose, and has a roundish tendon in the middle of it; for which reason Albinus calls it *biventer cervicis*, but if this portion should be called biventer, the term complexus is quite misapplied to the other portion.

116. TRACHELO-MASTOIDEUS.

Or. The transverse processes of the three uppermost vertebræ of the back, and from the five lowermost of the neck by thin tendons.

In. The posterior part of the mastoid process.

Use. To assist the complexus ; but it pulls the head more to the side.

117. LEVATOR SCAPULÆ.

Or. The transverse processes of the five superior vertebræ of the neck, the slips unite to form a muscle that runs downwards.

In. Near the superior angle of the scapula.

Use. To pull the scapula upwards.

We turn once more to the back.

118. SEMI-SPINALIS DORSI.

Or. The transverse processes of the seventh, eighth, ninth, and tenth vertebræ of the back.

In. Into the spinous processes of the vertebræ of the back above the eighth, and into the two lowermost of the neck.

Use. To poise the spine and support the trunk.

119. MULTIFIDUS SPINÆ.

Or. 1. The spines of the os sacrum. 2. The part of the os ilium, where it joins with the sacrum. 3. All the oblique and transverse processes of the vertebræ of the loins. 4. all the transverse processes of the vertebræ of the back, and those of the neck, except the three first, by distinct tendons, which soon grow fleshy, run in an oblique direction, and are

In. Into all the spinous processes of the vertebræ of the loins, back, and neck, except the first.

Use. To support the spine and trunk.

On the back part of the neck these.

120. SEMISPINALIS COLLI.

Or. The transverse processes of the six uppermost vertebræ of the back, (it ascends obliquely under the complexus.)

In. The spinous processes of all the vertebrae of the neck, except the first and last.

Use. To move the neck backwards.

121. TRANSVERSALIS COLLI.

Or. The transverse processes of the five uppermost vertebræ of the back.

In. The transverse processes of the cervical vertebræ, from the second to the sixth.

122. RECTUS CAPITIS POSTICUS MAJOR

OR. The spinous process of the second vertebra of the neck.

IN. The os occipitis, (near the rectus capitis lateralis, and the insertion of the obliquus capitis superior.)

USE. To pull the head backwards, and to assist a little in its rotation.

123. RECTUS CAPITIS POSTICUS MINOR.

OR. The knob in the back part of the first vertebra of the neck.

IN. The os occipitis, near its foramen magnum.

USE. To assist the rectus major in moving the head backwards.

124. OBLIQUUS CAPITIS SUPERIOR.

Or. The transverse process of the first vertebra of the neck.

In. The os occipitis, near the mastoid process of the temporal bone, and under the insertion of the complexus muscle.

Use. To draw the head backwards.

125. OBLIQUUS CAPITIS INFERIOR.

Or. The spinous process of the second vertebra of the neck.

In. The transverse process of the first vertebra of the neck.

Use. To turn the head, by moving the atlas on the dentatus.

126. INTERSPINALES DORSI ET LUMBORUM, AND THE INTERTRANSVERSALES DORSI,

Are rather small tendons than muscles, serving to connect the spinal, and transverse processes.

127. INTERTRANSVERSALES LUMBORUM.

Are four distinct small bundels of flesh, which fill up the spaces between the transverse processes of the vertebræ of the loins, and serve to draw them towards each other.

DISSECTION X.

MUSCLES OF THE SHOULDER LYING ON THE SCAPULA.

128. SUBSCAPULARIS.

Or. 1. All the base and hollow of the scapula internally. 2. Its superior and inferior costæ.

In. The upper part of the internal protuberance on the head of the humerus.

129. SUPRA SPINATUS.

Or. 1. From all that part of the base of the scapula which is above its spine. 2. From the spine and superior costa. 3. From the fascia of the scapula.

In. The part of the larger protuberance on the head of the os humeri that is next the groove.

130. INFRASPINATUS.

Or. 1. All that part of the base of the scapula which is between its spine and inferior angle. 2. The spine, as far as the cervix of the scapula. 3. The fascia of the scapula.

In. The upper and middle part of the large protuberance on the head of the os humeri.

131. TERES MINOR.

Or. All the lower edge, or, the inferior costa of the scapula.

In. The back part of the large protuberance on the head of the os humeri.

132. TERES MAJOR.

Or. 1. The inferior angle. 2. Inferior costa of the scapula.

In. The ridge at the inner side of the groove, for lodging the tendon of the long head of the biceps, (along with the tendon of the latissimus dorsi.)

133. DELTOIDES.

Or. 1. From the outer part of the clavicle. 2. From the acromion. 3. From the lower margin of almost the whole spine of the scapula opposite to the insertion of the cucullaris muscle.

In. A rough protuberance in the outer side of the os humeri, near its middle.

Use. Its centre raises the humerus, the lateral portions sustain the shoulder joint.

134. CORACO-BRACHIALIS.

Or. The coracoid process of the scapula, adhering in its descent to the short head of the biceps.

In. The middle of the internal part of the os humeri near the origin of the third head of the triceps.

Use. To raise the arm upwards and forwards.

N. B There passes a *nerve* through this muscle, the external cutaneous.

DISSECTION XI.

MUSCLES LYING ON THE OS HUMERI, AND MOVING THE FORE ARM.

These are two before and two behind.

FLEXORS.

135. BICEPS FLEXOR KUBITI.

Or. By two heads: 1. tendinous, from the upper edge of the glenoid cavity of the scapula. This tendon passes over the head of the os humeri within the capsule; and, in ts descent

without the joint, runs in a groove on the head of the os humeri, and covered by a membranous ligament that proceeds from the capsule and adjacent tendons. 2. The *second*, and shorter head, arises from the coracoid process of the scapula, in common with the coraco-brachialis muscle.

In. 1. By a strong round tendon, into the tubercle near the upper end of the radius; 2. and by a lateral slip of fascia into the sheath of the fore arm.

136. BRACHIALIS INTERNUS.

Or. The middle of the os humeri, at each side of the insertion of the deltoid muscle, covering all the inferior, and fore part of this bone adheres to the ligament of the joint.

In. The coronoid process of the ulna.

EXTENSORS.

137. TRICEPS EXTENSOR CUBITI.

Or. By three heads; the first and longest, from the inferior costa of the scapula, near its cervix. The second head from the back part of the os humeri, under the great tuber. The third arises by an acute beginning from the back and inner part of the humerus, and continues its origin all down the bone. These three heads unite lower than the insertion of the teres major, and cover the whole posterior part of the humerus, from which they receive additional origins in their descent.

In. The *olecranon*, and partly into the condyles of the os humeri, adhering to the ligament.

138. ANCONEUS.

Or. From the back part of the external condyle of the os humeri; it soon grows fleshy.

In. A ridge on the outer and posterior edge of the ulna, being continued some way below the olecranon. It is covered with a strong fascia.

DISSECTION XII.

MUSCLES LYING ON THE FORE ARM.

FLEXORS OF THE WRIST.

139. FLEXOR CARPI RADIALIS.

Or. The internal condyle of the os humeri, and from the fore and upper part of the ulna.

In. The fore and upper part of the metacarpal bone that sustains the fore finger, (runs over the os trapezium.)

140. FLEXOR CARPI ULNARIS.

Or. The internal condyle of the os humeri and side of the olecranon, and from the fascia.

In. The os pisiforme, and ligament of the wrist.

141. FLEXOR CARPI MEDIUS, OR PALMARIS LONGUS.

Or. The internal condyle of the os humeri, it forms a neat small belly, and by a long slender tendon has,

In. Into the annular ligament of the wrist, and palmar aponeurosis.

EXTENSORS OF THE WRIST.

142. EXTENSOR CARPI RADIALIS LONGIOR.

Or. From the lower part of the external ridge of the os humeri, above its external condyle, and below the supinator radii longus.

In. The back and upper part of the metacarpal bone that sustains the fore-finger.

143. EXTENSOR CARPI RADIALIS BREVIOR.

Or. 1. The external condyle of the os humeri. 2. the ligament that connects the radius to it.

In. The upper and back part of the metacarpal bone that sustains the middle finger.

144. EXTENSOR CARPI ULNARIS.

Or. 1. The external condyle of the os humeri. 2. The ulna.

In. The posterior and upper part of the metacarpal bone that sustains the little finger.

MUSCLES OF THE SUPINATION AND PRONATION.

These consist of six muscles, viz. two supinators, and two pronators, properly so called; and flexor muscles, as accessary to the action.

PROPER SUPINATORS, That is which turn the palm of the hand upward, and have no other office.

145. SUPINATOR RADII LONGUS.

OR. The external ridge of the os humeri, nearly as far up as the middle of that bone.

IN. The lower end of the radius.

146. SUPINATOR RADII BREVIS.

OR. 1. From the external condyle of the os humeri. 2. From the external and upper part of the ulna. 3. The ligament which joins these two bones.

IN. The neck and tubercle of the radius and ridge running downwards from the tubercle.

PRONATORS, that is, which throw the palm of the hand prone to the ground.

147. PRONATOR RADII TERES.

OR. 1. The internal condyle of the humerus.

2. Tendinous from the coronoid process of the ulna.

In. The outside of the radius about the middle of the bone.

148. PRONATOR RADII QUADRATUS.

Or. The lower part of the ulna; the belly of the muscle runs transversely.

In. The lower and outer part of the radius.

MUSCLES MOVING THE FINGERS, LYING ON THE FORE ARM.

FLEXORS.

149. FLEXOR SUBLIMIS PERFORATUS.

Or. 1. The internal condyle of the os humeri. 2. The coronoid process of the ulna. 3. The tubercle of the radius. 4. The middle of the fore part of the radius, where the flexor pollicis

longus arises. The tendons pass under the ligament of the wrist.

In. The second bone of each finger being near its extremity divided for the passage of the tendons of the perforans, or profundus.

150. FLEXOR PROFUNDUS PERFORANS.

Or. 1. The side, and upper part of the ulna. 2. From a large share of the interosseous ligament, and remotely through the fasciæ from the inner condyle; its tendons pass under the annular ligament of the wrist, and then pass through the slits in the tendons of the flexor sublimis.

In. Last bones of the fore fingers.

151. FLEXOR LONGUS POLLICIS MANUS.

Or. 1. The side of the coronoid process of the ulna. 2. The radius, immediately below its tubercle; it is continued down for some space on the fore part of the bone. The interosseous

ligament its tendon passes under the ligament of the wrist. It is described as having an origin from the internal condyle of the os humeri

In. The last bone of the thumb.

EXTENSORS, MUSCLES OF THE FINGERS AND THUMB.

152. EXTENSOR DIGITORUM COMMUNIS.

Or. 1. From the external condyle of the os humeri where it adheres to the supinator radii brevis. Before it passes under the ligamentum carpi annular externum it splits into four tendons, some of which may be divided into several smaller. On the back of the hand, the tendons are often united by interchange of tendinous filaments.

In. The posterior part of the bones, of the fingers by a tendinous expansion.

Use. To extend the fingers.

153. INDICATOR.

Or. The middle of the back part of the ulna; its tendon passes under the same ligament with the extensor digitorum communis, with part of which it is

In. Into the posterior part of the fore finger.

154. EXTENSOR PRIMI INTERNODII POLLICIS MANUS.

Or. 1. The middle and posterior part of the ulna, immediately below the insertion of the anconæus muscle. 2. The back part of the middle of the radius. 3. The interosseous ligament.

In. (By two tendons) into the os trapezium, and upper back part of the metacarpal bone of the thumb, and often joins with the abductor pollicis.

Use. To draw the metacarpal bone of the thumb outwardly.

155. EXTENSOR SECUNDI INTERNODII.

Or. 1. The back part of the ulna near the former muscle. 2. The interosseous ligament.

In. The posterior part of the first bone of the thumb, part of it may be traced as far as the second bone.

Use. To extend and draw the second bone of the thumb outwards.

156. EXTENSOR TERTII INTERNODII.

Or. 1. The middle and back part of the ulna. 2. From the interosseous ligament, its tendon runs through a small groove at the inner and back part of the lower end of the radius.

In. The last bone of the thumb.

Use. To extend the last joint of the thumb.

157. EXTENSOR MINIMI DIGITI.

Or. 1. Outer condyle of the humerus. 2. The fascia : adhere to the common flexor.

In. The last bone of the little finger.

DISSECTION XIII.

THE MUSCLES OF THE HAND.

158. PALMARIS BREVIS.

Or. The ligamentum carpi annulare, and tendinous membrane that is expanded on the palm of the hand.

In. Into the skin and fat that covers the abductor minimi digiti, and into the os pisiforme.

Use. To assist in contracting the palm of the hand: to sustain the grasp of the hand.

Muscles which form the the ball of the thumb.

159. ABDUCTOR POLLICIS.

Or. The os trapezium and ligament of the carpus.

In. Root of the second bone of the thumb.

Use. To separate the thumb from the fingers.

160. OPPONENS POLLICIS.

(Under the last.)

Or. Os trapezium and ligament of the carpus.

In. First bone of the thumb, or metacarpal of the thumb, as it is sometimes called.

Use. To bring the thumb towards the palm and fingers.

161. FLEXOR BREVIS POLLICIS.

(Divided by the tendon of the long flexor.)

Or. 1. Os trapezoides : 2. os magnum : 3. os unciforme.

In. Ossa sesamoidea and second bone of the thumb.

Use. To bend the thumb

MUSCLES OF THE LITTLE FINGER.

162. ABUCTOR MINIMI DIGITI.

Or. Os pisiforme and ligament of the carpus.

In. The side of the first bone ofthe little finger.

163. FLEXOR PARVUS MINIMI DIGI TI.

Or. The ulnar side of the os uneiforme and ligament of the wrist.

In. Frst bone of the little finger.

Use. It is an assisting flexor of the little finger.

164. ABDUCTOR MINIMI DIGITI.

Or. Edge ofthe os uneiforme and ligament of the wrist.

In. The side of the metacarpal bone of the little finger.

Use. To draw the little finger towards the others.

165. LUMBRICALES.

These are four muscles lying in the palm of the hand, thin and fleshy, so as to resemble earth worms.

Each of these muscles may be thus described.

Or. One of the tendons of the flexor profundus digitorum.

In. The sheath on the back of the fingers along with the interossei.

Use. To move the finger on the metacarpal bone.

166. ABDUCTOR INDICIS.

Or. Os trapezium and metacarpal bone of the thumb.

In. The first bone of the fore finger.

Use. To bring the fore finger towards the thumb.

167. INTEROSSEI INTERNI.

These are muscles lying deep betwixt the metacarpal bones, each having its origin thus.

Or. By one head from a metacarpal bone.

In. Into the sheath of the extensor muscles on the back of the first phalanx.

168. INTEROSSEI EXTERNI.

These are bicipetes and lie on the back of the hand, but betwixt the metacarpal bones.

Or. The roots of the metacarpal bones.

In. The tendinous expansion of the extensor communis.

The prior indicis is a muscle of the same character with the former, only that lying on the radial edge of the metacarpal of the fore finger; it cannot be so properly called an interosseous, as those which are seated betwixt the metacarpal bones.

Use of the interossii. While there seems much reason in the supposition that the lumbricales being small muscles are better calculated for the quick movements of the fingers (whence they have been called findicinales) the interossei interni and externi are for the lateral movements of the fingers, or the adduction, and abduction of the fingers, and are of the same class with the adductors and abductors of the thumb and little finger.

MUSCLES LYING ON THE FORE, AND INSIDE OF THE HIP.

FIRST LAYER.

169. GLUTEUS MAXIMUS.

Or. 1. The posterior part of the spine of the os ilium, near the sacrum. 2. From the convexity of the os sacrum. 3. From the sacro-ischiatic ligament. 4. From the os coccygis.

In. By a strong broad tendon, into the upper and outer part of the linea aspera.

Use. To carry forward the trunk upon the thigh.

SECOND LAYER.

170. GLUTEUS MEDIUS.

Or 1. The anterior superior spinous process of the os ilium. 2. The edge of the spine of the ilium. 3. From the back part of the dorsum of the ilium.

This muscle is covered by a strong fascia from which many of its flehy fibres arise.

In. By a broad tendon into the trochanter major.

Use. To darw the thigh bone outwards, and a little backwards; to roll the thigh bone outwadrs, especially when it is bended; to assist the former muscle.

171. GLUTEUS MINIMUS.

Or. A ridge that is continued from the superior anterior spinous process of the os ilium, and from the middle of the dorsum of that bone, as far back as its great notch.

In. Into the fore and upper part of the trochanter major.

Use. These two last muscles assist the maximus, and, as their size indicate, they are muscles of the trunk. They move the trunk forward by a succession of actions commencing in the facialis.

This fascia should be dissected in connexion with fascia lata of the thigh.

Third layer consists of four muscles.

172. OBTURATOR INTERNUS.

Or. The os pubis and ischium, when they form the foramen thyroideum and from the obturator ligament, a round tendon passes out of the pelvis, between the posterior sacro-ischiatic ligament and tuberosity of the os ischium ; it passes

over the capsular ligament of the thigh bone, where it is inclosed, as in a sheath, by the gemini muscles.

In. The pit at the root of the trochanter major.

Use. To roll the thigh bone outwards.

173. COCCYGEUS.

Or. The spinous process of the os ischium.

In. 1. The extremity of the os sacrum. 2. The os coccygis.

Use. To support the os coccygis and to unite it with the sacrum.

174. PYRIFORMIS

(Within the pelvis.)

Or. 1 From the hollow of the os sacrum. 2. A few fleshy fibres of the os ilium. It passes out of the pelvis along with posterior crural nerve.

In. By a round tendon into the cavity at the root of the trochanter major.

Use. To roll the thigh, and twist the body forward on the ball of the great toe.

175. GEMINI.

Or. 1. The superior from the spinous process. 2. The inferior, from the tuberosity of the os ischium. 3. From the sacro-ischiatic ligament. (They are united by a tendinous and fleshy membrane, over which the tendon of the obturator internus muscle plays.)

In. The cavity at the root of the trochanter major, on each side of the tendon of the obturator internus, to which they adhere.

Use. The same as the last.

176. QUADRATUS FEMORIS.

Or. The outside of the tuberosity of the os ischium, (runs transversely.)

In. The intertrochanteral line or ridge.

Use. To roll the thigh outwards.

177. TENSOR VAGINÆ FEMORIS.

Or. The external part of the anterior superior spinous process of the os ilium.

In. Into the fascia which covers the outside of the thigh, and through it into the outside of the knee.

Use. It is an abductor.

Inside.

178. SARTORIUS.

Or. The anterior superior spinous process of the os ilium, soon grows fleshy, runs down for some space upon the rectus, and going obliquely inwards, it passes over the vastus internus, and, about the middle of the os femoris, over part of the triceps, it runs down further between the tendon of the adductor magnus, and that of the gracilis muscle.

In. By a broad and thin tendon, into the inner side of the tibia, near the inferior part of its tubercle.

Use. To draw the leg inward, and to bend the knee joint.

179. PECTINALIS.

Or. Broad and fleshy, from the upper and fore part of the os pubis, (or pectinis,) immediately above the foramen thyroideum.

In. The anterior and upper part of the linea aspera of the femur, near the trochanter minor, by a flat tendon.

Use. To move the thigh forwards and inwards, and to point the toes outwards.

Under the name of the TRICEPS ADDUCTOR FEMORIS, are comprehended three distinct muscles.

180. ADDUCTOR LONGUS FEMORIS.

OR. The os pubis, near the symphysis, and lower than the last muscle.

IN. The inner and upper part of the linea aspera, from a little below the trochanter minor, to the beginning of the insertion of the adductor longus.

181. ADDUCTOR BREVIS FEMORIS.

OR. On the inside of the pectinalis, from the upper and fore part of the os pubis, and ligament of the symphysis.

IN. The middle part of the linea aspera, being continued for some way down.

182. ADDUCTOR MAGNUS FEMORIS.

OR. 1. From the os pubis and the former. 2. From the ramus and the tuberosity of she os ischium.

IN. 1. The whole length of the linea aspera. 2. Into a ridge above the internal condyle of the os femoris. 3. By a long round tendon (which is united to the vastus internus) into the upper part of the condyle.

Use. Of these three muscles, or triceps. To bring the thigh inwards, and forwards, as in clinging to the saddle, and, in some degree, to roll the toe outwards.

183. GRACILIS.

Or. The os pubis near the symphysis, and from the ramus; it forms the outline of the thigh on the inside.

In. Fore part of the tibia under the sheath of the sartorius.

Use. It is an adductor.

184. OBTURATOR EXTERNUS.

Or. 1. The os pubis. 2. Crus of the ischium. 3. The membrane which fills up the foramen thyroideum.

In. The cavity at the back part of the root of the trochanter major; it adheres to the capsular ligament.

Use. To roll the thigh bone, and to point the toe.

QUADRICEPS EXTENSOR CRURIS.

185. RECTUS.

Or. 1. The lower, and anterior spinous process of the os ilium. 2. Tendinous from the dorsum of the ilium.

In. The upper part of the patella, and through the medium of the patella and its ligament, into the anterior tubercle of the tibia.

Use. To extend the leg, or raise the body.

186. VASTUS EXTERNUS.

Or. 1. The root of the trochanter major. 2. The whole length of the linea aspera, by fleshy fibres which run obliquely forwards to a middle tendon, where they terminate.

In. The patella; part of the muscle ends in an eponeurosis, which is continued down on the leg and is firmly fixed to the head of the tibia.

Use. To extend the leg, or raise the body from the seat.

187. VASTUS INTERNUS.

Or 1. The fore part of the os femoris. 2. Root of the trochanter minor. 3. Almost all the inside of the linea aspera, the fibres run obliquely forwards and downwards, and it is fleshy considerably lower than the last.

In. The patella; part of this also ends in an aponeurosis, which is continued down the leg.

Use. To extend the leg, or raise the body.

188. CRURALIS.

Or. 1. The two trochanters of the os femoris.

2. It adheres firmly to the fore part of the os femoris and joins the vasti muscles.

In. The patella, (behind the rectus.)

Use. To assist the three last muscles.

MUSCLES LYING ON THE BACK OF THE THIGH.

FLEXORS OF THE LEG.

189. SEMITENDINOSUS.

Or. The posterior part of the tuberosity of the os ischium, in common with the long head of the biceps.

In. The ridge, and inside of the tibia, a little below its tubercle.

Use. To bend the leg.

190. SEMIMEMBRANOSUS.

Or. The upper and backmost part of the tuberosity of the os ischium.

In. The inner and back part of the head of the tibia.

Use. To bend the leg.

N. B. The two last form the inner ham-string.

191. BICEPS FLEXOR CRURIS.

Or. (Two distinct heads,) the first, longus, in common with the semitendinosus, from the back part of the tuberosity of the ischium. The second, brevis, from the linea aspera, beginning a little below the insertion of the gluteus, maximus, it continues to take its attachment, till within a hand breadth of the condyle.

In. Head of the fibula and ligaments.

Use. To bend the leg.

192. POPLITEUS.

Or. The lower and back part of the external condyle of the os femoris, on the back of the joint.

In. The ridge on the inside of the tibia, a little below its head.

Use. To assist in bending the leg.

MUSCLES LYING ON THE BACK OF THE LEG.

Fist class are, extensors of the foot. The second, flexors of the toes.

FIRST DISSECTION.

193. GASTROCNEMIUS EXTERNUS, OR GEMELLUS.

Or. 1. The upper and back part of the internal condyle of the femur, and from that bone, a little above its condyle. 2. The second head arises tendinous from the upper and back part of the external condyle of the femur. After forming two beautiful bellies, which are united by a middle tendon, the muscle terminates in the tendo Achillis.

194. SOLEUS, OR GASTROCNEMIUS INTERNUS.

Or. (Two origins.) 1. The upper and back part of the head of the fibula, continuing to receive many of its fleshy fibres from the posterior part of that bone, for some space below its head. 2. From the back part of the tibia, lower down than the insertion of the popliteus. The flesh of this muscle, covered by the tendon of the gemellus, runs down, nearly to the lower end of the tibia, by the tendo Achillis.

In. Into the backmost part of the os calcis, by the projection of which these muscles gain a considerable lever power.

Use. To extend the foot.

195. PLANTARIS.

Or. The upper and back part of the external condyle of the femur; it adheres to the ligament of the joint. It passes under the gastrocenemius, and forming a long slender tendon, then runs down by the inside of the tendo Achillis.

In. The inside of the os calcis.

Use. From its delicacy, and insufficiency to assist the last muscles, it is supposed to have a use in pulling the capsular ligament of the knee from between the bones.

FLEXORS.

These consist of four, two that belong to the tibia, and two to the fibula.

Second disse ction, viz. tibiales and peronel, muscles of the foot.

196. TIBIALIS ANTICUS.

Or. 1. The process of the tibia, to which the fibula is connected above. 2. The outside of the tibia. 3. The upper part of the interosseous ligament.

In. The inside of the os cuneiforme internum, and nearer extremity of the metatarsal bone that sustains the great toe.

Use. To bring the foot to right angles with the leg.

197. TIBIALIS POSTICUS.

Or. 1. The fore and upper part of the tibia, just under the process which joins it to the fibula. 2. Then passing through a perforation in the

upper part of the interosseous ligament, it continues its origin from the back part of the fibula next the tibia. 3. From near one half of the upper and back part of the tibia. 4. From the interosseous ligament, the tendon passes behind the malleolus internus.

In. Spreads wide in the bottom of the foot, and os cuneiforme internum and medium; and also to the os calcis os cuboides, and to the root of the metatarsal bone that sustains the middle toe.

Use. To extend the foot, and to turn the toes inward.

198. PERONEUS LONGUS.

Or. From the head and whole length of the fibula, as far down as to within a hand breadth of the ancle. The tendon passes through a channel at the outer ancle, at the back of the lower head of the fibula; it then runs along a groove,

in the os cuboides, above the muscles of the sole of the foot.

In. The root of the metatarsal bone that sustains the great toe, and the os cuneiforme internum.

Usl. To move the foot outwaads, and to press down the ball of the great toe.

199. PERONEUS BREVIS.

Or. From the middle and lower part of the fibula; from the fibula above the middle; from the outer side of the anterior, spine of this bone; as also from its round edge externally, the fibres running obliquely outwards, towards a tendon on its external side; it sends off a round tendon which passes through the groove at the outer ancle, being there included under the same ligament with that of the preceding muscle; and a little further, it runs through an appropriate sheath.

In. The root and external part of the metatarsal bone that sustains the little toe.

Use. To direct the foot outwards, and by pressing the ball of the great toe to the ground, to assist in carrying forwards the whole body.

200. PERONEUS TERTIUS.

Or. The middle of the fibula, down to near its inferior extremity; the tendon passes under the annular ligament.

In. The root of the metatarsal bone that sustains the little toe.

Use. To assist the other peronei muscles.

N. B. The belly of this muscle is united to the extensor digitorum.

DISSECTION OF THE EXTENSORS OF THE TOES.

These consist of two:

201. EXTENSOR LONGUS DIGITORUM PEDIS.

Or. 1. The outside of the head of the tibia. 2 The

head of the fibula where it joins with the tibia, and spine of the fibula. 3. From the interosseous ligament. 4. From the tendinous fascia, which covers the outside of the leg.

In. The root of the first bone of each of the four small toes, and is expanded over the upper side of the toes, as far as the root of the last bone.

Use. To extend the four lesser toes.

202. EXTENSOR PROPRIUS POLICIS PEDIS.

Or. Beginning some way below the head and anterior part of the fibula, along which it runs to near its lower extremity, connected to it by a number of fleshy fibres, which descend obliquely towards a tendon.

In. The first and last joint of the great toe.

Use. To extend the great toe.

203. FLEXOR LONGUS DIGITORUM PEDIS, PERFORANS.

Or. The back part of the tibia, some way below its head, and near the entry of the medullary artery; from this, it is continued down the inner edge of the bone; also by tendinous and fleshy fibres, from the outer edge of the tibia, and between this double order of fibres the tibialis posticus muscle lies enclosed. Having passed under two annular ligaments, then it passes through a sinuosity at the inside of the os calcis, and, about the middle of the sole of the foot divides into four tendons, which pass through the slits of the perforatus, and, just before its division, it receives a considerable tendon from that of the flexor pollicis longus.

In. Into the extremity of the last joint of the four lesser toes.

Use. To bend the last joint of the toes:

This muscle is assisted by the accessorius. See dissection of the sole of the foot.

204. FLEXOR LONGUS POLLICIS PEDIS.

Or. By an acute, tendinous, and fleshy beginning, from the posterior part of the fibula some way below its head, being continued down the same bone, almost to its inferior extremity, by a double order of oblique fleshy fibres ; its tendon passes under an annular ligament at the inner ancle.

In. Into the last joint of the great toe, and it generally sends a small tendon to the os calcis.

Use. To bend the last joint of this toe.

MUSCLES SITUATED ON THE FORE PART OF THE FOOT.

205. EXTENSOR BREVIS DIGITORUM PEDIS.

Or. The fore and upper part of the os calcis; and it divides into four portions, which send tendons that pass over the upper part of the foot, under the tendons of the former.

In. The tendinous expansion, which covers the toes, except the little one.

Use. To assist in extending the toes, and somewhat change the direction of the force of the long extensor.

MUSCLES OF THE SOLE OF THE FOOT, AFTER DISSECTING THE PLANTAR APONEUROSIS.

206. FLEXOR BREVIS DIGITORUM PEDIS, PERFORATUS.

Or. The inferior and back part of a protuberance of the os calcis, (between the abductor of the great and little toes.) It sends off four tendons, which split for the transmission of the tendons of the flexor longus.

In. The second phalanx of the four lesser toes. (The tendon of the little toe is often wanting.)

Use. To bend the second joint of the toes.

207. FLEXOR DIGITORUM ACCESSORIUS, SEU MASSA CARNEA JACOBI SYLVII.

Or. The sinuosity at the inside of the os calcis, the fore part of the bone.

In. The tendon of the flexor longus, just at its division into four tendons.

Use. To assist the flexor longus, and to change the direction of its operation.

228. LUMBRICALES PEDIS.

Are four in number. Each has its origin thus:

Or. The tendon of the flexor profundus, just before its division, and near the insertion of the massa carnea.

In. The inside of the first joint of the toe. It is lost

in the tendinous expansion that is sent from the extensor tendon to cover the upper part of the toe.

Use. To assist the other lesser muscles in supporting the arch, and adding to the elasticity of the foot.

SHORT MUSCLES OF THE GREAT TOE.

209. FLEXOR BREVIS POLLICIS PEDIS.

Or. 1. The under and fore part of the os calcis where it joins with the os cuboides. 2. From the os cuneiforme externum, and it is inseparably united with the abductor and adductor pollicis.

In. The external sesamoid bone, and root of the first bone of the great toe.

Use. To bend the first joint of the great toe.

210. ABDUCTOR POLLICIS PEDIS.

Or. The inside of the protuberance of the os calcis, where it forms the heel, and from the same bone where it joins with the os naviculare.

In. The internal os seamoideum, and root of the first joint of the great toe.

Use. To pull the great toe from the rest, but its power is lost by the use of shoes.

211. ADDUTOR POLLICIS PEDIS.

Or. 1. The os calcis. 2. The os cuboides. 3. The os cuneiforme externum, from the root of the metatarsal bone of the second toe.

In. The external os sesamoideum, and root of the metatarsal bone of the great toe.

Use. To bring this toe nearer the rest, but by the pressure of the shoe reduced to move a flexor of the great toe.

MUSCLES OF THE LITTLE TOE.

212. ABDUCTOR MINIMI DIGITI PEDIS.

Or. Side of the protuberance of the os calcis, and from the root of the metatarsal bone of the little toe.

In. The root of the first bone of the little toe.

Use. To draw the little toe outwards from the rest, but, for the reason assigned, to bend the toe.

213. FLEXOR BREVIS MINIMI DIGITI PEDIS.

Or. 1. The os cuboides, near the furrow for the tendon of the peroneus longus. 2. The outside of the metatarsal bone that sustains this toe.

In. The first bone of this toe.

Use. To bend the toe,

214. INTEROSSEI PEDIS EXTERNI BICIPITES.

These are similar to the interossei of the hand. The following names have been bestowed upon them.

215. ABDUCTOR INDICIS PEDIS.

216. ADDUCTOR INDICIS PEDIS.

217. ADDUCTOR MEDII DIGITI PEDIS.

218. ADDUCTOR TERTII DIGITI PEDIS.

IMTEROSSEI PEDIS INTERNI.

These are also like internal interossei of the hand, and have been called,

219. ABDUCTOR MEDII DIGITI PEDIS.

220. ABDUCTOR TERTII DIGITI PEDIS.

221. ADDUCTOR MINIMI DIGITI PEDIS.

222. TRANSVERSALIS PEDIS,

Or. The extremity of the metatarsal bone of the great toe ; the internal os sesamoideum of the first joint (adheres to the adductor pollicis.)

In. The anterior extremity of the metatarsal bone of the little toe, and ligament of the next toe.

Use. To contract the foot by bringing the great toe and the two outermost toes nerver each other; to support the lateral arch of the foot.

The numerous muscles about the toes, the free motion of the toes of childern, and the power resumed by those who have lost their hands, prove the intention of nature to have bestowed as free a motion on the toes as on the fingers.

Why such variety of action has been given we know not, but of this we may be sure, that they are by habit reduced merely to the support of the arches of the foot.

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SECOND PART

OF

APPENDIX

TO THE

SYSTEM OF DISSECTIONS.

CLASSIFICATION AND ORDER

OF THE

ARTERIES.

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ARTERIES TO BE DISSECTED IN THE TAORAX.

AORTA.

IN THE THORAX.

anterior to the arch, viz. 2 branches.	Aa Corinaria dextra*. ————sinistra†.
From the arch, viz. 3 branches.	1. Aa Innominata. Carotis dextra. Subclavia dextra. 2. Aa Carotis sinistra. 3. Aa Subclavia sinistra.

* *The right is the larger and inferior, it passes under the projecting auricle : distributed to the aorta, pulmonary artery, right auricle and sinus venae cavae ; but chiefly to the inferior plane surface of the heart and the right lateral convexity.*

† *The left passes betwixt the pulmonic artery, and right auricle ; distributed to the aorta and pulmonary artery, to the convex surfaces, and septum of the heart, in two principal branches.*

From the Thoracic aorta posterior to the arch, viz. 4 classes of small arteries.

- Aa Pericardiaca posterior,
- ——— inferior.
- Aa Bronchialis dextra†
- ———sinistra inferior.
- Aæ Œsophageæ§
- Aæ Intercostales aorticæ.

ARTERIES OF THE LOWER PART OF THE NECK, CHEST, &c.

SUBCLAVIAN ARTERY.

A_a MAMMARIA INTERNA.

1. Thymicæ.
2. Comes nervi phrenici.
3. Pericardiaca.
4. Mediastinæ.
5. Mammariæ.
6. Epigastrica anastamotica

† *There are chiefly two branches, the right and left, by one trunk from the fore part of the aorta. There are many varieties.*

§ *The æsophageal arteries are very irregular; some come from the bronchial arteries.*

Aa THYROIDEA INFERIOR.

1. Transversalis humeri†. Supra scapularis.
2. Transversalis colli.
3. Thyroidea ascendens.
4. Thyroidea propri.

Aa INTERCOSTALIS§.
Aa VERTEBRALIS||.
Aa CERVICALIS PROFUNDA.

To the muscles *scaleni* and *longus colli*, viz. deep on the side of the neck.

Aa CERVICALIS SUPERFICIALIS.

To the brachial plexus, the scaleni, the trapezius, skin, &c.

N. B. The branches of the subclavian artery have more variety than any other in the system.

† *This is an artery of great size and of considerable importance when it is prolonged into the supra scapular artery. The supra scapular artery is often an independent branch of the subclavian.*

§ *This artery supplies the two superior intercostal spaces; it sends branches to the scaleni and the muscles on the fore part of the vertebræ, to the œsophagus. Branches pierce also to the muscles of the back.*

|| *See Arteries of the Brain.*

ARTERIES ABOUT THE SHOULDER AND OUTSIDE OF THE CHEST.

AXILLARIS.

THORACICA Superioir.
——————Longior.
——————Humeraria.
——————Alaris.

ARTERIES OF THE ABDOMEN.

ABDOMINAL AORTA.

Ive Branches.

I. PHRENICA DEXTRA†, } To the diaphragm, in-
II.——————— SINISTRA, } osculating with the mamariæ, irregular branches to the pancreas, to the membranes of the liver and spleen.

† *These arteries are very irregular in their origin; they sometimes come off in one trunk, sometimes in two, or from the cœliac artery.*

III. CŒLIACA.

2dary Branches.

1. Aa†. CORONARIA VENTRICULI SUPERIOR.

3nary Branches.

Superior division.

1. To the stomach.
2. Ascending on the Æsophagus.
3. Diaphragm and omentum minus.

Inferior division.

On the lesser curvature of the stomach, viz.

4. Pylorica superior.

2. Aa HEPATICA.

3nary

Aa Ha dextra a‡.
——cysticæ.
——sinistra.
(Sometimes) a coronara dextra.
Duodeno-gastrica.

4ternary.

a *Pylorica inferior.*
b *Pancreatica duodenalis.*
c *Gastro epiploica dextra.*
d *Pancreaticæ and epiploicæ.*

† N. B. *When this artery gives off the left hepatic artery, it is termed gastro hepatica sinistra.*

‡ *It rises rarely from the superior mesenteric artery.*

3. Aa SPLENICA.

3nary.
1. Pancreaticæ.
2. Gastro-epiloica sinistra.
3. Vassa brevia.

IV. MESENTERICA SUPERIOR.

Distributed to the whole of the small intestines, and in these branches of the great intestines, viz.

2dary.
1. Ileo-colica.
2. Colica dextra.
3. Colica media†.

V. MESENTERICA INFERIOR.

2dary.
Colica sinistra.
Hæmorrhoidalis interna§.

VI. CAPSULARES. To the renal capsule.

VII. RENALIS DEXTRA,
———— SINISTRA, ‖ } To the kidney.

†The enumeration of the lesser branches of this artery can serve no useful purpose.

§ The extreme branch inosculating with the haemorrhoidea media, and vesicalis ima.

‖ The arteries to the renal capsule come from various sources, viz.

Capsulares phrenicæ.
———— aorticæ.
———— renales.

The lesser branches are
1. Capsulares.
2. Phrenicæ.
3. Adiposæ and mesocolicæ.
4. Spermatica.
5. To the ureter.

VIII. SPERMATICA SINISTRA§
——————— DEXTRA.

Besides its proper destination, the testicle, the spermatic artery gives to the duodeum, mesocolon, peritoneum and lumbar glands. In the female it has two divisions of branches, 1. to the *ovarium*, 2d. to the *falopian tube* to the *uterus* and round ligament.

IX. UNDER THIS ENUMERATION WE HAVE A NUMEROUS CLASS OF LESSER ARTERIES TO THE FAT, URETERS, &c.

X. LUMBALES.

To the vertebræ and nerves spinales ; to the muscles, posteriores, and anteriores ; irregularly to the diaphragm ; to the abdominal muscles, peritoneum, &c.

§ *Very often from the renal, sometimes from the capsularis.*

ARTERIES OF THE NECK AND HEAD.

COMMON CAROTID ARTERY

DIVIDES INTO THE

EXTERNAL CAROTID AND INTERNAL CAROTID.

EXTERNAL CAROTID.

BRANCHES OF THE FIRST ORDER.

I. THYROIDEA SUPERIOR.

1. Thyroidea propria.
2. Laryngea, to the epiglottis, and muscles of the arytenoid cartilage†.

Superficiales, musculares, viz. to the sternocleido mastoideus, to the sternohyoideus and thyroideus, to the thyro-hyoideus.

II. LINGUALIS.

1. Sublingualis.
2. Dorsalis linguæ.
3. Ranina.
4. Irregularly to the muscles of the tongue aud pharynx.

† *This branch generally goes betwixt the thyroid and cricoid cartilage accompanying the nerve here over the thyroid cartilage.*

III. FACIALIS.

1. Palatina ascendens.
2. To the glands and muscles of the tongue.
3. Tonsilaris.
4. Submentalis.
5. To the masseter.
6. Coronaria labii. inferioris
7.——————— superioris
   a Nasalis lateralis.
   b Angularis.

IV. PHARYNGEA INFERIOR.

1. Three internal pharyngeæ.
2.———posterior to the muscles, to the sympathetic nerve, and jugular vein, to the glands; enters the foramen lacerum posterius.

V. OCCIPITALIS.

1. Meningea§.
2. Cervicalis descendens||.
3. Auricularis.
4. Occipitalis ascendens†.

VI. AURICULARIS POSTERIOR.

1. Branches to the parotid gland, biventer, and mastoid muscles.
2. To the meatus externus and membrane of the tympanum.
3. Stylomastoidea, entering the tympanum, supplying the parts there and the mastoid cells.
4. Ascending behind the ear to its muscles and cartilage.
5. Ascending on the temple.

§ *Viz. with the jugular vein through the foramen.*
|| *An internal branch inosculates with the vertebralis.*
† *The foramen mastoideum posterius receives a brane to the dura mater.*

VII. TEMPORALIS.

1. A small deep branch, and branch to the masseter.
2. Transversalis faciei, comes ductus salivæ.
3. Temporalis media profundæ.
4. Auriculares.
5. Temporalis anterior.
6. ——————— posterior.

VIII. MAXILLARIS INTERNA,
(Being in the order of the branching.)

1. Auricularis.
2. Meningea media.
3. ——————parva, viz. to the pterygoid muscles, and finally piercing the foramen ovale.
4. Maxillaris inferior.
5. Temporales profundæ maxillaris.
6. Alveolaris.
7. Infra orbitalis.
8. Palatina maxillaris.
9. Pharyngea.——————
10. Nasalis, enters the foramen spheno palatitum.

INTERNAL CAROTID.

1. Whilst in its transit through the bones, these branches

To the pterygoid canal and cavity of the tympanum.
To the cavernous sinus and pituitary canal.
To the fourth, fifth, and sixth pairs of nerves. To the dura mater.

(Within the cranium, and having emerged from the dura mater.)

II. OPHTHALMICA CEREBRALIS.

Passing into the orbit by the foramen opticum gives these branches.

1. To the dura mater and sinus.
2. Lacrymalis, which goes to the gland after giving many branches to the periosteum, opticnerve, &c.
. Ciliares.
Three or four arteries dignified with the distinction of *inferiores, anteriores, breves, longiores.*
4. Supra orbitalis.
5. Centralis retinæ.
6. Æthmoidales.
7. Palpebrales.
8. Nasalis.
9. Frontalis.

III. SEVERAL LESSER BRANCHES TO THE PITUITARY GLAND, OPTIC NERVE, INFUNDBULUM AND PLEXUS CHOROIDES.

IV. Aª COMMUNICANS.

Constituting part of the circle of Willis.

V. Aª CEREBRALIS ANTERIOR.

1. Irregular branches to the first and second pair of nerves.
2. Lesser irregular branches to the anterior lobe.
3. Anterior communicans (completing the circle of Willis anteriorly.)
4. Arteria corporis callosi.

VI. Aª CEREBRALIS MEDIA.

Entering the fossa silvii, it is minutely distributed to the substance of the middle lobe.

VERTEBRAL ARTERY.

I.

1. A class of small branches to the muscles attached to the cervical vertebræ.
2. To the theca and spinal marrow.
3. Given oft as it turns under the occiput to the muscles of the neck.
4. Within the skull to the dura mater, viz. *meningeæ posteriores.*

Before the union of the vertebral arteries to form the basilar, these, viz.

II. POSTERIOR CEREBELLI.

Viz. to the medulla oblongata, to the spine, the first and second spinal nerves, to the inferior and posterior surface of the cerebellum.

From the basilar artery.

III.

Lesser and irregular branches to the tuber annulare. The lower surface of the cerebellum, and the nerves.

IV. ANTERIOR CEREBELLI.†

It encircles the crus cerebri.

V. POSTERIOR CEREBRI.||

VI. A^a COMMUNICANS.

Uniting with internal carotid, (p. 14. v. iii.) and forming the *circle of Willis.*

† *Profunda cerebelli.* || *Profunda cerebri.*

ARTERIES OF THE ARM.

AXILLARY ARTERY.

I. THORACICA SUPERIOR§.

BRANCHES TO THE CHEST.

Place, the second rib, and betwixt the serratus magnus and pectoralis minor.

II. THORACICA LONGIOR.

Viz. Mammaria externa. To be known from its greater length.

III. THORACICA HUMERARIA.

Passes off by the upper edge of the pectoralis minor, lies betwixt the *pectoralis minor* and *deltoides*.

IV. THORACICA ALARIS.

To the glands, scaleni muscles, the subscapularis, &c.

V. SUBSCAPULARIS.

1. To the axilla and glands.
2. To the subscapular muscles.
3. Infra scapular branch, viz. to the muscles of the back.
4. To the dorsum scapulæ, viz. circumflexa scapularis.

§ *Even before this first thoracic artery, the axillary gives off a branch to the scaleni muscles.*

VI. CIRCUMFLEXA POSTERIOR.

Passes off betwixt the subscapular and the great teres muscles: round the neck of the humerus, and supplies the heads of the triceps, the coraco brachialis, the subscapularis, lower surface of the deltoides, and the capsule.

VII. CIRCUMFLEXA ANTERIOR.

A much smaller artery from nearly the same point with VI. or a branch of it. To the periostium and capsule chiefly.

BRACHIAL OR HUMERAL ARTERY.

Viz. That portion of the trunk extending from the edge of the teres major to the division below the elbow joint.

A class of lesser branches to the muscles, cellular membrane, nerves, &c. These are given off irregularly at intervals down the whole arm, and one of them is the *nutritia humeri*.

III. PROFUNDA HUMERI SUPERIOR.

Passes off opposite the lower edge of the teres major,|| branches to the neighbouring muscles in ascending and descending branches; the *radialis communicans* to the external condyle; branches to the back of the elbow joint, inosculating with the recurrens interossea, and radialis.

IV. PROFUNDA HUMERI INFERIOR.

Branches to the brachialis internus and the biceps muscles: to the external condyle and supinator, to the ulnar nerve and back of the elbow joint.

V. aANASTAMOTICA.

The principal branch of this artery passes round the inner condyle; but sends a branch anterior to it, then branches to the muscles arising from the inner condyle and inosculates with the ulnaris and interossea.

|| *Called also collateralis magna: it is sometimes a branch of the subcapular artery.*

DIVISION OF THE BRACHIAL ARTERY

AT THE ELBOW JOINT,

OR LESSER BRANCHES WHICH PLAY AROUND THE JOINT.

A^a HUMERALIS*.	Ulnaris.	To the pronator teres, Interossea. *Recurrens interossea*†. *Recurrens Ulnaris anterior*‡.———*posterior*‖.
	Radialis.	*Recurrens radialis anterior*§. After which there are no branches of note till it reaches the wrist.

† *Inosculating with the anterior branch of the anastamotica.*

‡———————*the posterior branch of the anastamotica and with the profunda inferior.*

‖———————*the posterior branch of the anastomica and with the communicans radialis of the profunda superior.*

§———————*the radialis communicans of the profunda superior.*

ARTERIES OF THE FORE ARM AND HAND.

ULNAR ARTERY.

1. To the pronator teres and origin of the flexors.
2. A branch which perforates betwixt the bones and goes to the back of the joint.
3. Recurrens ulnaris. } Anterior. Posterior.
4. *Interossea.*
5. Irregular branches to the flexor muscles.
6. Aa Dorsalis manus comes off at the head of the ulna.
7. To the muscles of the little finger.
8. *Palmaris profunda*†.
9. May be said to terminate in the *superficial palmar arch.*

N. B. The palmar arch gives these.

In the palm, while lying under the aponeurosis and above the tendons. } Ulnaris minim i digiti, digitales 1. 2. 3. ulnares Rs Anastamoticus.

Aa INTEROSSEA COMMUNIS.

1. To the muscles, ligaments of the joint, &c.

† *Which, inosculating with a branch of the radial, orms the deep arch.*

2. *Perforans superior*,
   a Ramus descendens.
   b Recurrens interossea.
3. Branches to the flexor profundus, and flexor policis, and sometimes to all the flexors.
4. *Perforans inferior* passes by the edge of the pronator quadratus, and divides into branches on the back of the wrist.
5. Anterior articular artery of the wrist||.

RADIAL ARTERY.

1. To the supinator muscle.
2. *Recurrens radialis.*
3. In succession, branches to the supinator, the pronator, the flexor muscles.
4. *Superficialis volæ*§.) Before turning from the fore part of the wrist.)
5. Irregular small branches to the wrist.)
6 *Dorsalis Pollicis.*
   There are often two.
7. *Dorsalis carpi.*
   Dorsalis metacarpi, 1s. 2s. 3s†.

|| *Viz. Interrossea volaris anterior.*

§ *Sometimes this is very large, and forms the arch in the palm with the ulnar artery, and sends off the arteries to the thumb.*

† *Dorsalis carpi is often large, and sends off a considerable interosseal branch.*

8. *Magna pollicis.*
Ramus ad indicem.
9. *Radialis indicis*†.
10. The DEEP PALMAR ARCH:
This inosculates with the R^s *anastamoticus ulnaris* under th tendons of the palm:
It gives off the *interossia.*

ARTERIES OF THE PELVIS.

ILIACA COMMUNIS.

ILIACA INTERNA.—ILIACA EXTERNA.

THE ILIACA INTERNA SUE HYPOGASTRICA,
gives off these, viz.

I. ILIO-LUBALIS.
II. SACRÆ LATERALES.
III. UMBILICALIS.—
1. Vesicales, often vesicales imæ.
IV. OBTURATOR.
(Within the pelvis,) 1. muscular branches to the *psoas* obturator internus. 2. A branch proceeding forward towards the back of the pubis.

† *There is a branch to the fore finger from the A. magno pollicis: it is sometimes, so large as to deserve the name of radialis indicis; but more commonly it is small, while this (No. 9.) is a larger artery: indeed this radialis indicis sometimes takes a course towards the interstice of the metacarpal bone of the fore and middle fingers, and supplies both fore and middle fingers, and gives off a considerable anastamosing branch.*

(In the thigh,) branches to the obturator pectinalis, and triceps.

V. GLUTEA.

Passes out of the pelvis over the edge of the pyriformis, and betwixt two of the roots of the great ischiadic nerve.

1. Muscular branches within the pelvis and at its exit.
2. Rs. Superficialis: viz. under the gluteus maximus.
3. Rs. Ascendens: viz. under the gluteus medius.
4. Rs. Transversus; viz. under the gluteus medius, and forward.

VI. ISCHIADICA.

Within the pelvis and in its passage out branches to the bladder, rectum, and neighbouring muscles: *on the back of the pelvis*, to the glutei, to the great nerve, to the lesser muscles of the thigh bone, in many profuse branches.

VII. PUDENDA COMMUNIS.

Passes out of the pelvis by the edge of the pyramidalis betwixt the sacro ischiadic ligament, and the great nerve.

2dary.

(Before passing out,)

1. Often the *Haemorrhoidea media*§.
2. Branches to the bladder, to the levator ania, and obturator internus, (whilst on the outside and under the pyriformis,)
3. To the nerve, gemini, and pyriformis muscles.

(On entering the pelvis again.)

4. Hæmorrhoideæ externæ; irregular branches to the muscles and ligaments.
4. Perinea superficialis†.

(Where it is lying by the side of the tubera ischii these.)

5. *Transversalis perinei arteria communis.*
6. *Profunda perinei penis.*

From 6 the profdunda these 3nary.

1. Lesser branches to the bulb and membranous part of the urethra; to the prostate gland and erector penis, &c.
2. *Dorsalis penis.*
3. *Profunda propria penis*||.

§ *The haemorrhoidea media is often considered as a division from the internal iliac of the first class.*

† *This is the artery which is found coming out of the angle which the crus penis forms with the spongy body of the urethra, and then climbs on the side of the penis.*

|| *This is the great tortuous artery which enters the bulb of the urethra, and afterwards comes along the cellular texture of the urethra and body of the penis.*

ARTERIES OF THE THIGH.

ILIACA EXTERNA.

WITHIN THE ABDOMEN.

I. IRREGULAR BRANCHES TO THE MUSCLES.

II. An *EPIGASTRICA.*

1. To the chord and cremaster muscle.
2. Towards the back of the os pubis.
3. Principal branch ascending upon the rectus.
4. Sometimes the obturator.

III. An CIRCUMFLEXA ILII§.

To the sartorius iliacus internus, to the abdominal muscles, and anastamosing with the ilio-lumbalis.

FEMORAL ARTERY.

1. RAMI INGUINALES.

1. To the glands, fat, and integuments.
2. Ramus major, viz, toward the spine of the ilium.

§ *From the circumflexa there is sometimes a very considerable branch reflected to accompany the spermatic chord. This branch is sometimes from the epigastric artery, rarely from the external iliac.*

II. A$_a$ PUDENDÆ, viz.

1. Pudenda superior.
2. ——— media.
3. ——— inferior.

III. CIRCUMFLEXA EXTERNA§.

Passes betwixt the iliacus internus and rectus under the tensor vaginæ femoris.

IV. F^{is} PROFUNDA.

1. Irregular brancnes.
2. Circumflexa interna.
   To the triceps, &c.
3. Great descending internal branch;
   aR. Perforans primus.
   b secundus.
   c tertius.
   d Sometimes quartus.
4. Great transverse division, from which,
5. A$_a$ Circumflexa externa to the gluteus medius, vastus externus and gives out the R$_s$ circumflexus proprius.
6. Ramus descendens externus, to the rectus and vastus externus.

SUPERFICIAL FEMORAL ARTERY.

I. IRREGULAR BRANCHES TO THE NEIGHBOURING PARTS.

R ANASTAMOTICUS MAGNUS.

This is the first considerable branch which the femoral artery gives off; viz. while concealed in the tendon of the triceps.

§ *Very often a branch of the profunda.*

After the artery has dipped from the fore part of the thigh, but yet has not emerged behind, nor become popliteal, it gives off branches which are improperly called perforantes. I enumerate these under the term,

III. IRREGULAR POPLITEAL BRANCHES,

To the hamstring muscles and their tendons.

POPLITEAL ARTERY.

Being that part of the trunk which lies in the cavity behind the knee joint.

I. A^a ARTICULARIS SUPERIOR EXTERNA.

1. R^s Profundus.
2. Superficialis.

II. A^a ARTICULARIS SUPERIOR INTERNA.

1. R^s Profundus.
2. Superficialis.

III. A^a ARTICULARIS MEDIA.

A branch enters under the ligament of Winslow.

IV. A^a ARTICULARIS INFERIOR EXTERNA:

1. To the muscles.
2. Deep, and passing above the head of the fibula.

V. A_a ARTICULARIS INFERIOR INTERNA. Chiefly superficial, and beautifully encircling the head of the tibia.

VI. BRANCHES TO THE GASTROCNEMII MUSCLES, VIZ. THE SURALES.

V. THE ANTERIOR TIBIAL ARTERY.

GREAT DIVISION OF THE POPLITEAL ARTERY.

VI. THE POSTERIOR TIBIAL ARTERY.

THE FIBULAR ARTERY.

ANTERIOR TIBIAL ARTERY.

Before passing betwixt the bones.	1. A small ascending branch which may be called articularis tibialis.
As it escapes from the interosseous ligament.	2. Recurrens tibialis.
	3. Successive muscular branches.
	4. Malleolaris interna.
	5. Malleolaris externa.
Before the ancle.	6. Tarsea. interosseæ.
	7. Irregular twigs.
On the foot.	8. Metatarsea. Dorsales digitorum.
	9. Dorsalis halucis.
	10. Rs. *Profundus Anastamoticus.*

POSTERIOR TIBIAL ARTERY.

1. Muscular branches, and the nutritiæ tibiæ.

2. FIBULAR ARTERY.
   - a Numerous muscular branches.
   - b Posterior fibular artery.
   - c Anterior fibular artery.

Near the ancle.

3. Calcaneæ.
4. *Plantaris externa.*

1. Transversus anastamoticus.
2. Profundæ.
3. Digitales. 4ae.
4. Interosea profundæ.
5. Anastamotica, viz. with the anterior tibial artery.
6. *Plantaris interna.*

1. Branches to the flexor tendons and to the abductor and flexor policis.
2. Profundæ, viz. interior, middle, exterior.
3. Ramus externus.

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