Outlines of a course of dissections, for the use of the students of anatomy at St. Thomas's Hospital.

Contributors

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OUTLINES

OF A

COURSE OF DISSECTIONS.

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OF A

COURSE OF DISSECTIONS.

J. M'Creery, Printer, Black Horse Court,
London.

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OUTLINES

OF A

COURSE OF DISSECTIONS,

FOR THE USE OF THE

STUDENTS OF ANATOMY

AT

ST. THOMAS'S HOSPITAL.

London:

PRINTED BY E. COX AND SON,

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INTRODUCTION.

THESE Outlines of a Course of Dissections are intended to obviate, in some degree, the difficulties which the Student has to encounter in acquiring a knowledge of Anatomy.

It is here attempted to point out all those objects which are most worthy the attention of the beginner, in a practical point of view: they do not indeed pretend to have resolved so difficult a problem, nor can they boast of novelty of design or execution, much of the form and matter having been borrowed from the writings of Burns, Colles, Rosenmüller, Bichat, and others.

Anatomy, like other sciences of experiment and observation, has become, by the

industry of its cultivators, a collection of numerous, but generally insulated facts; and our ignorance of their meaning and connexion has become apparent in proportion to their number. This condition of the science has influenced its language, and left the attention without direction in its cultivation;—names have been multiplied, which neither describe nor explain, and numerous ones have been applied, without discrimination, to single parts;—description has been exhausted, without adding to our knowledge, and without reference to the importance of structure and function. The greater part of the students, who visit the hospitals of the metropolis, can devote but little time to the acquirement of any single branch of medical knowledge, as the number of objects to which they must direct their attention is necessarily great; and besides the theoretical part, the large field of practice which an hospital affords, claims a large portion of their time. But the state of the science, and the circumstances of the student, are not perhaps the greatest bars to improve-

ment;—want of knowledge how to arrange the numerous but single facts which are offered to the mind, must be a cause far more potent why their multiplicity has left the student little improved, and have rather tended to perplex than to instruct: so that often he is obliged to be seeking for a plan during the time he is to acquire knowledge; and when prepared to arrange facts, the time allotted for his studies is expired.

Under these circumstances, the student is to seek the remedy, as far as it may be possible, in his own mind; in it he is to find the causes of failure or the surety of success, and in proportion to its conduct and activity will his end be attained. Observation and induction must be constantly alive to examine and fix those objects which will hereafter be useful to him, to illustrate in them every point of practical utility, and to connect with them every depending circumstance of importance.

In acquiring a knowledge of practical anatomy, or of the parts which compose

the body, and their relative position, to learn to arrange the details of the science, and to understand that which gives them meaning and value, it is necessary to take a general view of the subject. It is in this respect that lectures are so valuable and indispensable. In them a comprehensive idea is gained of the whole; and whilst the parts are displayed, their functions in the healthy state, and the changes which they are undergoing from morbid actions or accident, are adverted to (forming, with the anatomy, the ground-work of physiological and pathological knowledge), the importance of particular structures is distinguished.

But it must be recollected that lectures, however necessary, are only calculated to give general ideas; whereas it is required of the practitioner, that in him they should be particular: it is not sufficient that he is merely acquainted with the presence of certain parts, but he must know precisely their situation and extent. The surgeon's knife may give health or death within the space of one hair's breadth. This kind of

knowledge is to be acquired by actual dissection alone. Idleness may persuade, and the natural aversion to the disgusting sight and touch of the putrefying dead, may enforce an opinion, that anatomy is to be gained at the cheap rate of turning over the pages of an unsoiled quarto, or learning by wrote the names of muscles, arteries, or nerves, arranged in the convenient form of tables. The deception is not a little strengthened by the fallacious clearness which the art of the draughtsman and engraver have thrown in ideal beauty over those parts which the practical anatomist, more especially if a beginner, is at pains to discover, and often in vain labours to shew distinctly, much less elegantly. These means indeed may give an outline of the systems of parts, and are as such valuable; but practical anatomy aims at much more: its leading object is to gain a thorough acquaintance with Relative Position,—a knowledge, by means of which the mutual relation of all parts of the body may be at will, or as occasion shall need, pictured to the mind. It can

only be acquired by separating the coverings of important parts, by observing the manner in which they lie embedded in the surrounding softer parts, the prominent points which mark their situation, whether seen in the living state, or viewed by dissection. The parts must be seen as connected with one another; not as at a lecture, where the body being generally prepared to shew some single part, and in order to render it distinct in a large anatomical theatre, every other which might render it obscure is removed.

The benefit and necessity of actual dissection does not, however, stop here: It would be well for the surgeon who intends to be a good operator, (and such, it is to be hoped, all do who undertake the profession), that he should dissect, in order to attain that dexterity essential to most, and praiseworthy in all operations. Minute dissection is frequently despised, or at best thought only necessary for those who profess anatomy: it certainly is to be deprecated if excluding more important occupation, or if the preference be given to

the tracing of a minute fibril of a nerve, or ramification of a blood-vessel, while the relative position of their trunks is neglected; but barring the consideration that no part of the body is unimportant, minute dissection is of advantage in giving to the hand facility of motion and exact correspondence with the will. Slovenly dissection appears to be the more frequent and more exceptionable fault. Those so erring, should recollect that the diligence of the dissector is not to be estimated by the quantity dissected, but by the quantity of knowledge carried away; and that, in the necessarily slow and tedious process of dissection, it will be commensurate with the quantity of examination and the degree of observation and activity of the mind. The simple circumstances of handling the body, of feeling the hard parts through their coverings, of observing the form and motion of joints in this state, have been, as it would seem, too much neglected; but their advantages may be appreciated by those who have felt the difficulty of detecting unnatural conformation

or figure from disease or injury. They may be practised on the living body, and lead obviously to the ready discovery of the effects of injury or disease. An extensive opportunity, which should be cultivated by every means, is afforded in the dissecting-room of inspecting bodies, of learning therefore to discriminate between the appearances of health and disease, and of ascertaining the changes which disordered functions or morbid actions produce in the form, colour, and texture of organs. Of the advantages which result from such observations to our knowledge of the causes, signs, seats, and treatment of disease, it is not here the place to treat. These then are the chief benefits which are to be expected from dissection; and whilst the lectures give a comprehensive view of the subject, with the mutual relation and connexion of all its parts, and their application to practice, it is alone by dissection that such views become essentially our own, or that we dare give them the name of knowledge. Lectures and dissections are then equally important,

and the one is inadequate without the other.

But the student, who should indiscriminately direct his attention to all the parts which are successively treated of in lectures or in books on anatomy, misled by the necessary practice of describing all parts with equal minuteness, will find, from insufficiency of time, that notwithstanding all the efforts he may have used, he is deficient in points which are essential in practice, whilst he has gained others for which he has no application. There is necessarily a choice of subjects to be made, as well as a plan to be pursued in their investigation: and although it is not meant that there are any parts of the body which are unworthy consideration, yet it is recommended that the leading points should be first mastered; and that afterwards, as time and opportunity may permit, the less important should be added. For this purpose the Public Demonstrations should be attended, which are given in order to point out those subjects, and by displaying them, to assist the young

anatomist in the manner of investigating them. With this view, the parts more essentially connected with important function, disease, or injury, become successively the subjects of inquiry.

Thus the bones are particularly described: They are, as it were, the groundwork of relative position; they form a frame-work to all the softer parts; and in giving them figure and support, constitute the form of the body. From their unyielding texture, they may be readily distinguished by the touch, although hidden to the sight when surrounded by the softer parts; they therefore serve as a guide to these in the neighbourhood. The form of the ends of bones, with their means of adaptation to each other, is perhaps the most essential part of their study. An accurate knowledge of these assists greatly in the diagnosis of the often obscure fractures about joints, and is indispensably requisite in that of dislocations. It requires particular attention to their figure, more especially when surrounded by the soft parts, to the prominent points which

may be felt under such investments, to their capability of motion, to the strength of their articulation, as depending upon the form of the bones or cartilages, and the strength, number, and disposition of the ligaments. These circumstances, together with a knowledge of the muscles, explain the manner in which displacements are taking place, and the means of their reduction.

The muscles are considered as assisting in giving form and contour to the body; they are giving the inequalities to its surface, by the prominences of their fleshy bellies and the depressions between them. They are forming likewise between them beds for the reception of vessels and nerves; they therefore point out the course of these, and assist in their ready discovery. An attention to these organs is practically important, as they are exerting their influence on the bones and joints, in preventing pain, deformity, and failure in the treatment of fractures and dislocations. These considerations render it ne-

cessary that their situation, attachments, and relative position should be examined.

The organs situated within the large cavities of the body are treated of. Their situation and extent require, in the anatomical examination, particular attention, as they may have injury communicated to them from without, which must be often determined in a great measure from situation alone. Their appearance should be observed, and its shades of difference discriminated, that health and disease may be recognized under every form.

The generative organs, both in the male and female, demand attention, perhaps above all others, in a surgical point of view; the latter especially, as relating to midwifery: they are extensively connected with diseases, whose treatment involves a variety of operations, from the simplest to the most complicated; all of which require an intimate knowledge with their structure and relative position, and in which the health and safety of the patient are intimately concerned.

In the description of the arteries, particular regard is had to their relative position; the parts therefore are enumerated in the neighbourhood of which they are taking their course, and their situation with respect to them shewn. It is to be studied where compression may be easily employed; with this view the points must be sought where they are running over bone, where deeply embedded betwixt muscles, or where they are superficially placed. Their chief anastomoses are to be pointed out, that the power of preserving life in a part, by their enlargement, may be estimated, when the principal trunk supplying it has become obliterated. Their situation is important in the planning and the executing of operations. The accidents to which they are liable, should be considered, together with the ready way of getting at them; for without a previous knowledge of their exact position, the obscurity occasioned by hæmorrhage at the time of their injury, renders their discovery doubly perplexing. These are the points which chiefly interest the practical

anatomist in the dissection of these parts. It will be obvious that the larger branches are those which particularly claim attention; for however by the dissection of the minute ramifications, the industry of the student may be displayed, or by learning their names by rote, he may astonish those who delight rather in the semblance than the reality of knowledge,—yet as empty acquirements of little or no practical utility, they are rather to be deprecated than recommended.

The nerves, regarded in the same anatomical, and less obvious point of view, that we have considered the before mentioned parts, deserve attention, that they may be preserved from injury, and avoided by the knife. By examining their distribution, we gain likewise more accurate notions of disease, by acquiring a knowledge of the means by which sympathies are knitting together distant parts, and contributing to the general harmony of the animal œconomy.

These then are the parts which should be investigated as systems, or traced

throughout the body:—They are the elements as it were of anatomical knowledge. But when these are known, another mode of enquiry ought to be resorted to, that of examining the blending and interlacement of these parts together, as they are entering into the composition of the different portions of the body. It is from understanding this grouping of parts, that we are enabled to plan and foresee all the steps of an operation, or note the reasons why it may not be undertaken; whereas without this investigation of them as a whole, our acquaintance with the individual and insulated systems can neither give us confidence, nor the knowledge essential to the practice of surgery. The chief inducement indeed for undertaking these outlines, has been to clear away some of the difficulties from this part of anatomy; —it has been strengthened by observing the perplexity and inability of students to determine the objects of their enquiry,—by feeling the necessity but impracticability otherwise of fixing and explaining a plan, and the impossibility of particular

oral instruction to so many. With this view, the second part of these outlines has been dedicated to the explanation of those parts, which are most importantly connected with surgical practice: A short notice is given of each, with the mutual relation of all and the particular points of practice, in which their consideration may be useful.

Thus the above enumerated subjects, form the series of public demonstrations, and are recommended to become the principal objects of the student's study and attention. They are to be considered by him as the points, without a knowledge of which by actual dissection [compleated by the general information that the lectures afford,] he is not fitted for the practice of his profession.

The determination of the method of investigation, is the next important and necessary step in the advancement of knowledge, after having fixed the objects of enquiry. To this end the following considerations, are recommended to the attention of the beginner:—He must de-

pend for success entirely on his own exertions; and guard against the common error of supposing that his acquirements will be proportionate to the lessons of his teachers, if he give even attentive ear, without activity of mind: for he must recollect that the mind is by no means passive in the acquirement of knowledge, and that, to use the common but apt metaphor, before we have digested what is presented to our perception, we can on no account call it experience.—Every mind has something individual in its mode of receiving instruction, and of stamping form upon it. That which is presented to the mind, must be rendered consonant with it, assimilated, or in other words reduced to principle, before it can become an understood fact, or a fit maxim for conduct or judgment. In the eagerness for knowledge, he must be careful not to overburthen the mind, by heaping fact upon fact, without examination or principle, for it cannot retain more than it can arrange.

He should have a general idea of parts before he proceeds to their particular ex-

amination; he should not therefore attempt to dissect those parts which he has not seen displayed in the lectures or demonstrations. If invention were a quality frequently to be met with, such a rule might be dispensed with; but, fortunately or unfortunately, man is the creature of imitation and education: he may therefore lose his time, from groping in the dark, when he might have carried a light to the enquiry; and from his attempts having been repeatedly foiled, he may become tired and disgusted with his employment. A general idea is to the young anatomist what a map is to a traveller in a strange country, he knows how to direct his steps to the most essential parts, as he knows where to find them all.

He is to perform a certain series of dissections, of which the following is a sketch:—

Before beginning them a perfect knowledge of the bones is to be gained.

The muscles of the upper extremity are then to be dissected, and the joints examined.

The muscles and joints of the lower extremity [it may be taken before the upper, if more convenient].

The head, neck, chest, and upper extremities. The viscera are to be studied, the dissection of muscles repeated, and the course of the trunks of vessels, and nerves without attention to their branches may be observed.

The abdomen, pelvis, and lower extremities.

The upper extremity injected, for the distribution of the arteries.

The lower extremity injected.

A small subject injected. [In the dissection of the extremities and small subject, besides the arteries, the course and distribution of the nerves may be examined: The latter may afterward be removed, and the arteries preserved for preparations.]

A course of chirurgico-anatomical views, or those parts which are connected with operations or important practical points.

The details of the dissection of these parts, with the order and method of in-

vestigation, form the subject of these outlines, and will be found in the following pages. But to render the instruction compleat, the Demonstrator will attend in the dissecting-room at certain hours, to give further directions to those who may be inclined to submit to the plan above proposed, to hear them demonstrate, or ask them questions upon the parts they may have prepared. The compleat execution of this design must depend upon circumstances: he will however endeavour to draw in such of the students as may have advanced further in their studies, to coincide with his plans, and to assist in their performance.

It is recommended to the student, that having compleated the series of dissections, he should provide for keeping up his anatomical knowledge by making some few preparations. They should consist at least of a set of separate bones; an upper and a lower extremity injected, and a preparation of the blood vessels; side-views of the male and female pelvis wet;—[to

shew, besides the relative position of the contents of the pelvis, the parts of inguinal and crural hernia.]

To these may be added a small subject, to shew the distribution of the nerves, and preparations of particular parts, as of the lacrymal sac and duct, &c. These consulted as occasion may require, with the help of anatomical works, [although a work of anatomical reference is still in a great measure a desideratum,] may keep up a competent knowledge of anatomy.

Such is the sketch of these outlines of a course of dissections;—but it is again repeated, that individual exertion can alone render them adequate to the views of him, who would become a practical anatomist. Such a one must neither be frightened with labours, dispirited by occasional failure, nor disgusted by sights and employments which mankind naturally abhor. The pleasures of the ends of the profession, under the imagination of which he may have undertaken the acquirement of the necessary skill, and which indeed are real, must not make him neglect the only sure

means of becoming a proficient. Into the dissecting-room he must bring his imagination and judgment ever awake;—he must in the dead structure presented to him by their means, read its appropriate function; —he must call to mind the diseases and accidents to which the parts are liable which lie before him;—he must consider and examine their appropriate treatment. —Thus he shall learn to know the value and meaning of the human structure.

PART THE FIRST.

In describing the relative position of parts, the body is considered erect, the arms placed in such a situation that the palms of the hands are turned forwards, and the lower extremities, with the knees and toes, directly in front. The terms, by which relative position is commonly denoted, are used in the usual sense, thus: superior and inferior, as signifying higher or lower with respect to the summit of the head; anterior and posterior are applied to parts as they shall be situated near to the fore or hinder surface of the body; laterally to the right or left, as they shall approach the one side or the other.

Inner and outer denote a relation to an imaginary plane, which anatomists have considered to bisect the body into lateral halves, passing through the middle of the head and trunk between the inferior extremities. Thus inner denotes an approach to, and outer a remove from, this imaginary plane. The terms external and internal, without and within, are used only in speaking of cavities.

This part is divided into three sections. The first contains the outline of the dissection of the muscles on the extremities, arranged in regions in the order of dissection. The second includes the outline of the dissection of the head, neck, chest, abdomen, and extremities. The parts to which the attention is to be directed, are put down in the order of dissection. To these is added, an enumeration of those morbid appearances which are most likely to be met with, and should be looked for. The third consists of tables of those arteries and nerves, to which the attention should be confined in examining the distribution of those systems. For the de-

scription of these parts, the student is referred to Fyfe's "Compendium of the Anatomy of the Human Body," 3 vols. 8vo., or to the notes which he may have made at lecture, and which are preferable, as they have been taken during the inspection of the parts.

SECTION I.

OUTLINE OF THE DISSECTION OF THE MUSCLES AND JOINTS OF THE UPPER EXTREMITY.

THE *muscles of the upper extremity*, distributed into regions on the shoulder, arm, fore-arm, and hand.

On the shoulder;—a. The external scapular, containing the: 1. Deltoides. b. The posterior scapular, containing the: 1. Supra spinatus.—2. Infra spinatus.—3. Teres major.—4. Teres minor. c. The anterior scapular, containing the: 1. Subscapularis.

On the arm:—a. The anterior brachial, containing the: 1. Coraco brachialis.—2. Biceps flexor cubiti.—3. Brachialis internus. b. The posterior brachial, containing the: 1. Triceps extensor cubiti.

On the fore-arm;—The aponeurosis.—a. The anterior superficial region of the fore-arm, containing the: 1. Palmaris longus.—2. Pronator radii teres.—3. Flexor carpi radialis.—4. Flexor carpi ulnaris.—5. Flexor sublimis perforatus. [These muscles are attached more particularly to the inner chondyle.] 6. The anterior deep, containing the: 1. Flexor profundus perforans.—2. Flexor longus pollicis.—3. Pronator radii quadratus. c. The posterior superficial, containing the: 1. Extensor digitorum communis.—2. Anconeus.—3. Extensor carpi ulnaris. [These muscles, together with the extensor carpi radialis, arise from the outer chondyle.] d. The posterior deep, containing the: 1. Extensor ossis metacarpi pollicis.—2. Extensor primi internodii.—3. Extensor secundi internodii.—4. Indicator. e. The radial, containing the: 1. Supinator radii longus.—2. Supinator radii brevis.—3. Extensor carpi radialis longior.—4. Extensor carpi radialis brevior.

On the hand;—a. The middle palmar, containing the: 1. Annular ligament.—2.

Aponeurosis palmaris.—3. Lumbricales. b. The outer palmar, containing the: 1. Flexor brevis pollicis.—2. Flexor ossis metacarpi pollicis.—3. Adductor pollicis.—4. Abductor pollicis.—5. Abductor indicis. c. The inner palmar, containing the: 1. Palmaris brevis.—2. Abductor minimi digiti.—3. Adductor minimi digiti. —4. Flexor parvus minimi digiti. d. The interosseal, containing the: Interossei.

Dissection of the joints:—1. Shoulder-joint: — External figure. Mechanism with respect to strength:—composed of scapula and os humeri.—The parts connected with the joint are: the glenoid cavity — acromion — coracoid process — head of os humeri.—Ligaments: 1. Capsular.—2. Tendon of long head of biceps. —Cartilages: 1. Of glenoid cavity.—2. Of head of os humeri. Mechanism with respect to motion. The parts to be felt, when surrounded by the soft parts, are: the acromion—coracoid process—head of os humeri. The *fractures* connected with this joint are: Of the acromion—neck of the scapula—neck of the os humeri. The *dislocations*:—Of the os humeri, into the

axilla—under the clavicle—on to the dorsum of the scapula.

Elbow joint:—External figure. Composed of: Os humeri—radius—ulna.—The parts connected with the joint are: Of the os humeri the two chondyles, the double articular surface, the anterior and posterior depressions.—Of the ulna, the olecranon, the coronoid process, the sigmoid cavity.—Of the radius, the head.—Ligaments: 1. Brachio-radial.—2. Brachio-cubital.—3. Capsular.—Cartilage. Mechanism with respect to motion. Parts to be felt: Olecranon—coronoid process—chondyles—head of radius. *Fractures:* Of the chondyles—of the os humeri—olecranon. *Dislocations:* Of the radius and ulna before chondyles of os humeri—of the radius and ulna to inner or outer side (partially) of the radius and ulna backwards—of radius only—of the extremity of os humeri between radius and ulna.

Radio-cubital articulation (of radius with ulna);—Ligaments:—1. Coronary.—2. Oblique.—3. Interosseous.—4. Sacciform. Cartilage.

Wrist joint:—External figure. Composed of radius—ulna—bones of carpus. —The parts connected with the joint are: Of the radius, the articular surface for the scaphoid and lunar bones, the styloid process, the articular surface for ulna.—Of the ulna, the styloid process, the articular surface for radius.—Of the scaphoid and lunar, articular surfaces for radius—surface of cuneiform bone.—Ligaments; 1. Capsular.—2. The two lateral.—Cartilages: 1. Of the articular surfaces.—2. The interarticular. Mechanism for motion. Parts to be felt: styloid process of radius —styloid process of ulna. [All the parts superficial.] *Dislocations* of carpus:—backwards—forwards.

Junction of the metacarpal bones with the first phalanx of the bones of the thumb and fingers:—Form of the heads of the metacarpal bones and of the bases of the finger-bones.—Ligaments:—1. Capsular: 2. Two lateral. Actual situation of the joint connected with external appearance. *Dislocations* of the thumb. Form of the junction of the bones of the first and second, second and third phalanges.

OUTLINE OF THE DISSECTION OF THE MUSCLES AND JOINTS OF THE LOWER EXTREMITY.

THE *muscles of the lower extremity*, distributed into regions about the pelvis, the thigh, the leg, and the foot.

About the pelvis;—a. The lumbar, containing the: 1. Psoas magnus.—2. Psoas parvus.—3. Iliacus.—4. Quadratus lumborum. b. The gluteal, containing the: 1. Gluteus maximus.—2. Gluteus medius.—3. Gluteus minimus. c. The ischiadic, containing the: 1. Pyriformis.—2. Obturator externus.—3. Obturator internus.—4. Gemini.—5. Quadratus—6. Coccygeus.

On the thigh;—a. The external crural, containing the: 1. Tensor vaginæ.—2. Fascia lata. b. The anterior crural, containing the: 1. Sartorius.—2. Rectus.—3. Crureus.—4. Vastus internus.—5. Vastus externus. c. The internal crural, containing the: 1. Pectineus.—2. Gracilis.—3. Adductor brevis.—4 Adductor longus.—5.

Adductor magnus. d. The posterior crural, containing the: 1. Semimembranosus. —2. Semitendinosus.—3. Biceps flexor cruris.

On the leg;—The aponeurosis.—a. The anterior of the leg, containing the: 1. Tibialis anticus.—2. Extensor proprius pollicis.—3. Extensor longus digitorum.—4. Peroneus tertius. b. The posterior superficial, containing the: 1. Gastrocnemius externus.—2. Plantaris.—3. Gastrocnemius internus.—4. Popliteus. c. The posterior deep, containing the: 1. Flexor longus digitorum.—2. Tibialis posticus.—3. Flexor longus pollicis.—d. The fibular, containing the: 1. Peroneus longus.—2. Peroneus brevis.

On the foot;—a. The dorsal, containing the: 1. Transverse ligament.—2. Extensor brevis digitorum. b. The middle plantar, containing the: 1. Aponeurosis plantaris [extending into the lateral regions.]—Flexor brevis digitorum.—3. Flexor accessorius.—4. Lumbricales. c. The internal plantar, containing the: 1. Adductor pollicis.—2. Flexor brevis pollicis.—3. Ab-

ductor pollicis.—4. Transversalis. d. The external plantar, containing the: 1. Abductor minimi digiti.—2. Flexor brevis minimi digiti. e. The interosseal, containing the interossei.

Dissection of the Joints:—1. Hip-joint: External figure. Mechanism with respect to strength:—composed of: ilium—ischium—pubis [the three bones meeting in the acetabulum.]—The parts connected with the joint are: Of the os femoris, the head, neck, trochanter major and trochanter minor—acetabulum.—Ligaments: 1. Capsular.—2. Ligamentum teres.—3. Cartilaginous ligament surrounding the brim of the acetabulum.—Cartilages: 1. Of acetabulum.—2. Of head of os femoris. Mechanism with respect to motion. Parts to be felt: Trochanter major. The *fractures* connected with this joint are: Of the acetabulum—of the neck of the os femoris [within the capsular ligament]—of the os femoris through the trochanter major. The *dislocations:* On to the dorsum of the ilium—into the ischiatic notch—into the obturator foramen—on to the os pubis.

Knee-joint: — External figure. Composed of os femoris—tibia—patella.—The parts connected with the joint are: Of the os femoris, its chondyles, their articular surfaces, the depression between them.—Of the tibia, its head, the two articular surfaces, tubercle.—Of the patella, its articular surfaces.—Ligaments: 1. Of patella.—2. Internal lateral.—3. External lateral (long).—4. External lateral (short).—5. Posterior.—6. Capsular.—7. The two alar.—8. Anterior crucial.—9. Posterior crucial.—10. The two ligaments of the interarticular cartilages.—Cartilages: Of the articular surfaces—the two interarticular. Mechanism with respect to motion. Parts to be felt: Patella—chondyles of os femoris—head of tibia—tubercle of tibia. *Fractures:* Of the patella. *Dislocations:* Of the tibia, forwards—backwards — inwards — outwards.—Of the patella—of the interarticular cartilages.

Ankle-joint: — External figure. Composed of tibia—fibula—astragalus. The parts connected with the joint are: The malleolus externus—the malleolus internus—

the articular surfaces of the tibia and fibula —the pulley-like articular surface, and the lateral articular surfaces of the astragalus. —Ligaments: 1. Anterior.—2. Posterior.—3. Perpendicular—4. Deltoid.—5. Capsular.—Cartilages: Of the articular surfaces. — Mechanism with respect to motion. Parts to be felt: Malleoli. *Dislocations:* —Inward—outward—forward.

Junction of the metatarsal bones with the first phalanx of the bones of the toes.

Junction of the phalanges.

SECTION II.

OUTLINE OF THE DISSECTION OF THE HEAD, NECK, CHEST, AND UPPER EXTREMITIES.

Cranial Region:—1. Occipito frontalis. —2. Aponeurosis of the temporal muscle. —3. Temporalis.

Contents of cranium:—Membranes of brain: 1. Dura mater—texture—surfaces —processes—sinuses.—2. Tunica arachnoidea.—3. Pia mater. Cerebrum: Hemispheres—Circumvolutions—Corpus callosum—Cortical and medullary substance —Centrum ovale—Lateral ventricles—cornua—contents. Septum lucidum—Fornix —Opening of communication between the lateral ventricles—Commissures—Third ventricle—Iter a tertio ad quartum ventri-

culum—Pineal gland—Tubercula quadrigemina. Cerebellum: Circumvolutions—Appendices vermiformes. Under surface of the brain: Origin of nerves—Infundibulum—Pituitory gland—Corpora albicantia—Pons varolii—Crura cerebri—Crura cerebelli—Medulla oblongata—corpora pyramidalia — corpora olivaria. Fourth ventricle—Arbor vitæ.

Morbid appearances within the cranium. *Processes of bone from the cranium.* Of the Membranes: *Inflammation—Adhesion—Effusion—Suppuration—Ulceration—Gangrene—Excrescences—Hydrocephalus externus—Ossification of dura mater—Thickening of tunica arachnoidea—Ossification of pia mater.* Of the Brain: *Effusion of blood or serous fluid into its substance—Effusion of serous fluid into ventricles—Hydrocephalus internus—Tumours in Brain—Abscesses—Substance of brain very soft or very firm. Hydatids of plexus choroides.*

Facial Region:—1. Orbicularis palpebrarum.—2. Orbicularis oris.—3. Buccinator.

Maxillary Region:—1. Masseter.—2. Insertion of temporalis.—3. Pterygoideus internus.—1. Pterygoideus externus.

Superficial cervical Region:—1. Platysma myoides.—2. Sterno-cleido-mastoideus.

Superior hyoideal Region:—1. Digastricus.—2. Stylo-hyoideus.—3. Mylo-hyoideus.—4. Genio-hyoideus.

About one half of the lower jaw removed. Lingual Region:—1. Genio-hyoglossus.—2. Hyo-glossus.—3. Lingualis.—4. Stylo-glossus.

Inferior hyoideal Region:—1. Omo-hyoideus.—2. Sterno-hyoideus.—3. Sterno-thyroideus.

Course of vessels:—On each side of the neck with the sterno-mastoid muscle rising up behind the inferior maxilla.

Pharynx:—Stylo-pharyngeus. Extent, attachments, connexions, termination, and muscular structure of the pharynx.

Anterior thoracic Region:—1. Pectoralis major.—2. Pectoralis minor.—3. Subclavius.

Lateral thoracic Region:—1. Serratus magnus.

Dorso-lumbar Region: Trapezius. 2. Latissimus Dorsi.

Dorso Cervical Region: 1. Rhomboideus. 2. Levator scapulæ.

Contents of the thorax:—[The extremity should be removed.] 1. Portion of the pleura shewn by dissecting off the cartilages of the six superior ribs. Anterior Mediastinum — direction — contents. Pericardium:—visceral portion — reflected portion. Situation of the heart —situation of the eight primitive vessels: 1. Pulmonary artery.—2. Aorta.—3. Vena cava superior.—4. Vena cava inferior. —5. The four pulmonary veins. Situation of lungs—Trachea. Reflexion of pleura. Posterior mediastinum:—[The ribs should be sawed through where they turn forward, and removed.] Aorta—Thoracic duct:—termination of vena azygos—Æsophagus: length — course through thorax — structure.

Lungs:—Figure when inflated—lobes; difference between right and left lung—Lobuli—Air cells. Trachea:—course—division into the two Bronchi—structure:

cartilaginous rings—connexion—muscular coat—lining membrane—Bronchial glands.

Dissection of the heart:—External division. Cavities:—Right auricle,—appendix Parietes—lining membrane—appearance of surface—openings: 1. superior cava.—2. Inferior cava.—3. Coronary vein.—4. Opening of communication with ventricle—Tuberculum Loweri—situation of Foramen ovale—Valves: Valvula nobilis Eustachi:—semilunar valve. Right ventricle: — figure—Parietes — lining membrane— appearance of internal surface—openings: 1. Of pulmonary artery.—2. Of communication with auricle — Valves: 1. Tricuspid valve, composed of carneæ columnæ, cordæ tendineæ, and the cortina tendinea.—2. The three semilunar valves with their corpora sesamoidea. Left auricle:—appendix—parietes—lining membrane—appearance of internal surface: Openings: 1. Those of the four pulmonary veins.—2. Opening of the communication with the left ventricle—situation of foramen ovale—septum auricularum. Left ventricle:—figure—parietes—internal

surface—lining membrane—openings: 1. Of aorta.—2. Of communication with the left auricle—valves: 1. Bicuspid, composed of carneæ columnæ, cordæ tendineæ, cortina tendinea.—2. The three semilunar valves of the aorta, with their corpora sesamoidea—origin of the coronary arteries—septum ventriculorum.

Morbid appearances within the chest:—OF THE PLEURA:—*Inflammation—Adhesions—Empyema—Hydrothorax—Ossification.* OF THE PERICARDIUM:—*Inflammation—Adhesion—Suppuration—Dropsy—Deposits of bony matter.* OF THE HEART: — *Enlargement — Malformations of the heart, ex. gr. foramen ovale open, deficiency of the septum ventriculorum, aorta arising from both ventricles, aorta arising from right ventricle, and pulmonary artery from left ventricle, pulmonary artery nearly impervious, &c. — Rupture — Aneurism — Polypus — [False polypus]* SEMILUNAR VALVES:—*thick and opake—Ossification* —VALVES BETWEEN AURICLES AND VENTRICLES:——*thick and opake—Ossification —Ossification of* CORONARY ARTERIES—*Aneurism of the* ARCH OF THE AORTA. OF

THE LUNGS: — *Inflammation — Solidity from interstitial deposit—Abscess—Tubercles—Earthy concretions—Air cells and ramifications of bronchia filled with mucous fluid.* OF THE BRONCHIAL GLANDS: — *Inflammation—Suppuration—Deposits of earth.* OF THE TRACHEA: —*Inflammation —Effusion of coagulable lymph—Rings ossified.* OF THE THORACIC DUCT: *Obstruction from tumours externally or diseases of valves.* OF THE PHARYNX: *Ulcers.* OF THE ŒSOPHAGUS: —*Inflammation—Stricture.*

Extremity: The dissection of the muscles and joints may be repeated according to the outline given in the preceding section; but during their examination, the course of the principal vessels may be observed: They are placed on the anterior part of the arm, more especially to the inner side of the biceps muscle, as far as the bend of the elbow; at this part a division takes place, and during the greater part of the rest of their course, they become situated on either side of the fore-arm, in the region of the radius and ulna.

OUTLINE OF THE DISSECTION OF THE ABDOMEN, PELVIS, AND LOWER EXTREMITIES.

Division of the Abdomen externally into regions:—a. Epigastric—subdivided into: 1. Scrobiculus cordis.—2. Right hypochondriac.—3. Left hypochondriac.—b. Umbilical, subdivided into: 1. Umbilical.—2. Right iliac.—3. Left iliac.—4. Lumbar.—c. Hypogastric, subdivided into: 1. Pubic.—2. Right inguinal.—3. Left inguinal.

Abdominal region of muscles:—1. Obliquus externus descendens.—2. Obliquus internus ascendens.—3. Transversalis.—4. Rectus.—5. Pyramidalis.

Parietes of abdomen. Contents of the Abdomen:—Portion of peritoneum dissected—remains of the umbilical arteries and vein. Appearance of contents of abdomen on cutting open parietes, [four parts seen: liver, gall-bladder, stomach, and omentum.] Situation of Liver with the gall-bladder—

Stomach — Omentum — Small intestines —Large intestines. Division of the intestinal canal into: small intestines, subdivided into: 1. Duodenum.—2. Jejunum. —3. Ilium.—b. Large intestines, subdivided into 1. Colon.—2. Cœcum.—3. Rectum. Course and situation of the intestines. Peritonæum:—Division into: 1. Visceral portion.—2. Reflected portion—Extent—Processes: 1. Glisson's capsule with the foramen of Winslow.—2. Omentum minus; formation. — 3. Omentum; formation and structure. Situation of Pancreas, situation of Spleen. Contents of Glisson's capsule: 3. Ductus hepaticus.—4. Ductus cysticus.—5. Ductus communis choledochus.—1. Hepatic artery; its division.—2. Vena portæ.

Structure of the alimentary canal within the abdomen, [the stomach and intestines except rectum removed]:—Stomach: figure—external division—structure—cardia—pylorus. Small intestines: figure—structure—valvulæ conniventes—Duodenum; termination of ducts of liver and pancreas—Jejunum—Ilium—Valvula ilii:

—structure. Large intestines:—figure—size — structure — pouches — appendices epiploicœ—Cœcum,—appendix cœci—Colon—longitudinal bands—Rectum.

Liver: — Ligaments: 1. Round. — 2. Suspensory.—3. Coronary.—4. The two lateral—extent of situation—[to be removed] figure—division into lobes: 1. Right lobe.—2. Left lobe.—3. Lobulus spigelii.—4. Lobulus quadratus.—5. Pons hepatis.—Depressions: 1.—Great fissure. 2. Porta.—3. For right kidney.—4. For gall-bladder.—5. For vena cava inferior—structure—Pori biliarii—Hepatic veins. Gall-bladder: figure—division—situation structure.

Spleen:—figure—depressions—fissures —structure.

Pancreas:— figure — division — attachment—structure—duct. Pancreas minus —duct.

Morbid appearances of the chylopoietic viscera, &c.:—

Of the Peritonæum:—*Inflammation —Adhesion—Effusion of coagulable lymph — Ascites — Granulated appearance.* Of

THE STOMACH:—*Part dissolved by the gastric juice— Inflammation—Ulcers— Schirrus and Cancer—Circumscribed schirrous tumours—Fungous tumours.* OF THE INTESTINES:—*Inflammation—Intussusceptio —Imperforate or defective portion — Diseased change in Dysentery—Stricture — Ulcers of rectum—Worms—Piles.* OF THE MESENTERIC GLANDS:—*Scrophula—Bony deposit.* OF THE LIVER:—*Inflammation—Abscess—Hydatid—Unusual firmness—Unusual softness—Tubercles—Fungus hæmatodes—Ossification of peritonæal coat.* OF THE GALL-BLADDER:—*Calculi—Dilatation of the biliary ducts—Opening from gall-bladder into duodenum.* OF THE SPLEEN:—*Enlargement—Extreme smallness, or several—Inflammation—Abscess—Scrophula—Unusual hardness—Unusual softness—Peritonæal covering cartilaginous or ossified.* OF THE PANCREAS:—*Abscess —Schirrus—Calculi.*

Diaphragm:—disposition—attachments —openings: 1. For vena cava inferior.—2. For œsophagus.—3. For aorta; its course, division and subdivision in the pelvis.

Kidney:—situation—figure—structure: coverings — cortical substance — tubular substance—mammillary processes—infundibula—pelvis—ureter. Renal gland.

Perineum:—Genital region: Muscles in the male, 1. Erector penis.—2. Accelerator urinæ.—3. Transversus perinei.—4. Transversus perinei alter.—In the female: 1. Transversus perinei. 2. Erector clitoridis. 3. Sphincter vaginæ. Anal region: 1. Sphincter ani.—2. Levator ani.

Testicle, &c. Scrotum: cellular membrane. Tunica vaginalis: 1. Testis.—2. Reflexa—Testicle—situation — structure —epididymis. Spermatic cord:—cremaster muscle—tunica vaginalis—vas deferens; course.

Side view of the pelvis:—[The one os innominatum should be removed with the extremity on that side, by detaching it at the symphisis pubis, and at the sacro-iliac symphisis; the contents of the pelvis being turned to the opposite side.] In the male: —situation of the: Membranous part of the urethra—Prostate gland—Bulb of the penis — Bladder — Rectum — Vesiculæ

seminales—Vasa deferentia—Ureters. Reflexion of the peritonæum within the pelvis. Bladder:—figure—division—structure. Prostate gland: division into lobes—structure—Vesiculæ seminales: structure. Cowper's glands. Urethra: Dilatations—Contractions—Caput gallinaginis—Termination of the ducts of the vesiculæ seminales and vasa deferentia—Ducts of the prostate—Duct of Cowper's gland—Lacunæ: lacuna magna. In the female: The situation of the: Vagina—Rectum—Bladder—Meatus urinarius: [its termination in vagina—thick substance surrounding it—follicles] Plexus reteformis—Uterus and its appendages. Reflexion of Peritonæum. Structure of vagina. Uterus:—figure—division—structure—ligaments: 1. Ligamentum rotundum.—2. The two broad. Ovaria. Fallopian tubes.

Morbid appearances of the urinary and generative organs:—Of the Kidney:—*Abscess—Calculi—Hydatid—Scrophula—Fungus hæmatodes—Original varietes.* Of the Bladder: *Ulceration—Thickening—Fungous excrescences—Polypi—*

Cysts communicating with bladder—Contraction at one part—Calculi. PROSTATE GLAND: *Enlargement—Abscess—Calculi in the ducts—Valvular projection at orifice of urethra.* OF THE URETHRA: *Inflammation — Abscess — Fistula — Calculi — Stricture.* OF THE TESTICLES AND SPERMATIC CORD:—*Varicocele Hydrocele—Hydrocele of spermatic cord—Adhesions of the tunica vaginalis — Hæmatocele — Testicle hard from preceding inflammation—Abscess —Scrophula—Schirrus—Fungus hæmatodes—Hydatid*—UTERUS:—*Inflammation —Schirrus and cancer—Polypus—Prolapsus.* OVARIA:—*Inflammation of peritoneal covering—Scrophula—Dropsy—Hydatids—Hair in them.* FALLOPIAN TUBES: —*Inflammation—Adhesion to the surrounding parts—Dropsy—Scrophula.*

Extremity:—The dissection of the muscles and joints may be repeated according to the outline given in the preceding section.

The principal vessels of the lower extremity take their course for some way on the anterior part of the thigh; they then

descend along the inner part of the thigh, covered by the sartorius muscle, to the posterior part, and are situated in the ham: At the lower edge of the popliteus muscle, they divide, — one set is placed on the anterior part of the leg near to, and on the outer side of the tibia; those posteriorly take the course of each side of the leg, situated in the regions of the tibia and fibula, and terminate ultimately in the toes.

SECTION III.

TABLES OF THE ARTERIES AND NERVES.

TABLE OF THE ARTERIES.

1. From the arch of the aorta:—
   a. The innominata divided into:—
      α. The right common carotid.
      β. The right subclavian.

   b. The left common carotid.
   c. The left subclavian.

The common carotid divides into:
   a. The external carotid; its branches are:—
      1. The superior thyroideal, giving off:
         α. The laryngeal.
         β. The thyroideal.
      2. The lingual, giving off:

α. The sublingual.
β. The ranine.

3. The facial, giving off:—
   α. The submental.
   β. Branches to muscles, glands, &c.
   γ. Inferior labial.
   δ. Inferior coronary.
   ε. Superior coronary.
   ζ. Branches to the nose, corner of the eye, forehead.
4. The ascending pharyngeal.
5. The occipital, giving off:—
   α. Branches to muscles and glands about angle of jaw.
   β. Posterior auricular.
   γ. Branches to muscles of the neck.
6. The temporal, giving off:—
   α. The transverse of the face.
   β. The deep temporal.
   γ. The anterior auricular.
   δ. The temporo-frontal.
   ε. The temporo-occipital.
7. The internal maxillary giving off the:—
   α. Spheno-spinal.
   β. Inferior maxillary.

γ. Branches to the muscles of the lower jaw and cheek.
δ. Alveolar.
ι. Infra orbitar.
ζ. Palato maxillary.
η. Lateral nasal.

6. The internal carotid; its branches are the:—

1. Ophthalmic.
2. Anterior of cerebrum giving off the:—
   α. Transverse.
   β. Artery of corpus callosum.
3. Middle of cerebrum.
4. Communicating [with the basilary.]

The subclavian; its branches are the:—

1. Vertebral, giving off the:—
   α. Posterior meningeal.
   β. Posterior artery of spinal marrow.
   γ. Anterior artery of spinal marrow.
   δ. Inferior artery of cerebellum.

The vertebrals unite and form the basilar artery, which gives off the:—

α. Superior artery of cerebellum.
β. Posterior of cerebrum.

γ. Communicating branch [with internal carotid].

2. Inferior thyroideal.
3. Anterior cervical.
4. Posterior cervical.
5. Superior dorsal of the scapula.
6. Internal mammary, giving off the:—
   α. Thymic.
   β. Mediastinal.
   γ. Pericardiac.
   δ. Musculo-phrenic.
   ε. Epigastric.
7. Superior intercostal.

The axillary; its branches are the:—

1. Superior thoracic.
2. Long thoracic.
3. Humeral thoracic.
4. Alar thoracic.
5. Subscapular, giving off the:—
   α. Internal scapular.
   β. Inferior dorsal of the scapula [anastomoses with the superior dorsal].
6. Anterior circumflex.
7. Posterior circumflex [anastomoses with the posterior circumflex].

The brachial; its branches are the:—

1. To the triceps, biceps, &c.
2. Profunda, giving off the:—
   α. Profundo radial.
   β. Profundo ulnar.
   γ. Muscular branches.
3. Profunda minor.
4. Large anastomotic [anastomoticus magnus].

The radial; its branches are the:—

1. The recurrent radial, [anastomoses with profundo radial].
2. To the muscles about the radius.
3. Superficial of the palm [superficialis volæ].
4. Dorsal.
5. Large artery of the thumb [arteria magna pollicis].
6. Radial of the fore-finger [radialis indicis].
7. Deep palmar [forms the deep palmar arch].

The ulnar; its branches are the:—

1. Recurrent ulnar, [anastomoses with

profunda minor, or ramus anastomoticus].

2. Interossea posterior, [anastomoses with the recurrent arteries and branches from the brachial].
3. Interossea anterior.
4. Lateral to the muscles of fore-arm.
5. Dorsal, [joins with the anterior interosseous and radial arteries at the back of the hand].

Forms the superficial palmar arch, which gives off the:—

α. deep ulnar, [assists in forming the deep palmar arch].
β. Digital branches.
γ. Branch to the little finger.

From the thoracic portion of the Aorta descendens:—

1. Right bronchial, [more frequently from the uppermost aortic intercostal].
2. Common bronchial.
3. Left bronchial, superior and inferior.
4. Esophogeal.
5. Intercostals, nine or ten pair.

From the abdominal portion of the Aorta descendens:—

1. Cæliac; its branches are the:—
   1. Superior gastric.
   2. Hepatic, giving off the:—
      α. Right gastric, which sends branches to the duodenum, pancreas, epiploon, stomach.
      β. Pyloric branches.
      γ. Right hepatic, which sends out the:—
         Cystic.
      δ. Left hepatic.
   3. Splenic, giving off the:—
      α. Pancreatic branches.
      β. Left gastric, [joins with right].
      γ. Vasa brevia.
      δ. Splenic branches.

2. Superior mesenteric; its branches are the:—
   1. Left branches.
   2. Ilio-colic.
   3. Right colic [communicates with ilio colic].
   4. Middle colic [communicates with

the right colic and the inferior mesenteric].

3. Inferior mesenteric; its branches are the:—
   1. Ascending [communicates with the middle colic].
   2. Left colic, [communicating with the ascending branch].
   3. Internal hæmorrhoidal.
4. Diaphragmatic.
5. Emulgent.
6. Spermatic.
7. Lumbar [four pair].
8. Middle sacral.
9. Common iliacs; they divide into:—
   α. Internal iliac,
   β. External iliac.

The internal iliac; its branches are the:—
1. Umbilical, gives off the:—
   α. Vesical.
2. Uterine.
3. Vaginal.
4. Pudic, giving off the:—
   α. External hæmorrhoidal.

β. Perineal.
γ. Artery of the bulb.
δ. Profunda penis.
ι. Dorsalis penis.

5. Ilio lumbar.
6. Lateral sacral.
7. Gluteal, giving off the:—
   α. Superficial branch.
   β. Deep branch.
8. Obturator.
9. Vesicalis ima.
10. Middle hæmorrhoidal.
11. Sciatic [communicates with obturator and pudic].
   α. Branches to the muscles about the hip.

The external iliac; its branches are the:—
1. Epigastric [anastomoses with the internal mammary].
2. Circumflex of the ilium.

The Femoral; its branches are the:—
1. External pudic.
2. Profunda, giving off the:—

α. Internal circumflex, [anastomoses with the obturator and sciatic], branches to triceps, &c.

β. External circumflex.

Branches to glutæi, anastomosing with gluteal.

Branches to muscles. Descending branch to knee.

γ. First perforant, [anastomoses with the circumflex and sciatic].

δ. Second perforant, [anastomoses with the first perforant and circumflex].

3. Large anastomotic branch, [communicating with the external circumflex.]

4. Perforant branches to the muscles.

The Popliteal; its branches are the:—

1. Superior inner articular [anastomosing with branches of the femoral].

2. Superior outer articular, [anastomosing with the superior inner articular and descending branch of external circumflex.]

3. Inferior inner articular [anastomosing with superior inner articular].

4. Inferior outer articular [anastomosing with inferior inner articular and superior outer articular].
5. Middle articular.
6. Surales.

The anterior Tibial; its branches are the:—

1. Anterior recurrent [anastomosing with the inferior articular].
2. Lateral to the muscles,
3. To parts about the ankle joint and dorsum of the foot.
4. Anterior.
5. Posterior or deep anastomotic communicating with the arcus plantaris.

The posterior Tibial; its branches are the:—

1. Fibular, giving off the:—
   α. muscular branches,
   β. anterior fibular,
   γ. posterior fibular.
2. To the muscles, &c.
3. Inner plantar, giving off the:—
   α. branches to muscles &c.

β. branches to great toe and toe next it.

γ. branch anastomosing with arcus plantaris.

4. Outer plantar, giving off the:—

α. branches to muscles of sole, &c.

forms the Arcus plantaris which gives off

α. branches to muscles, &c.

β. branch to little toe,

γ. digital branches.

TABLE OF THE NERVES.

1. NERVES FROM THE BRAIN.

First pair, Olfactory; numerous branches to the schneiderian membrane.

Second, Optic; forms the retina.

Third, Motores oculorum; it gives branches:—

1. To each muscle within the orbit, except the abductor and superior oblique.
2. To the ophthalmic ganglion.

Fourth, Pathetici; to the superior oblique muscle.

Fifth, Par trigeminum; forms the semilunar ganglion, and is divided into three branches, viz.

a. Ophthalmic, its branches are:—

1. Supra-orbitar.
2. Nasal.
3. Lachrymal.
4. To the ophthalmic ganglion [formed by the ophthalmic branch of the fifth, and branches of the third pair of nerves. The ciliary nerves arise from it].

b. Superior maxillary, its branches are:—

1. Spheno-palatine, giving off:—
   - α. a branch to join the sympathetic.
   - β. a reflected branch to join the portio dura.
2. Palato-maxillary, giving off:
   - α. branches to the superior maxilla.
3. Infra-orbitar.

c. Inferior maxillary, giving off:—

- α. Branches to the muscles of the lower jaw.
- β. Lingual.
- γ. Dental.

Sixth, Aducentes; to abductor oculi and give one Branch to form the Grand Sympathetic.

Seventh, { Portio mollis, to labyrinth of ear.
Portio dura, its branches are :—

1. Chorda tympani.
2. Temporal.
3. Superior facial.
4. Inferior facial.
5 Middle facial.
6. Descending.

Eighth, { Glosso-Pharyngeus, its branches are :—
1. To the pharynx.
2. To the tongue.
Pars Vaga, its branches are:—

1. Laryngeus.
2. Cardiac.
3. Recurrent.
4. Anterior pulmonary plexus.
5. Small œsophogeal plexus.
6. Post pulmonary plexus.
7. Great œsophogeal plexus.
8. Branches to hepatic plexus.
9. Coronary plexus.

Ninth, Sub-lingual, its branches are:—

1. Descendens noni.
2. Joining with lingual branch of fifth pair.

Nervi accessorii ad par octavum.

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2. Nerves from the Spinal marrow:—

Sub-occipital.—*Cervical*, twelve pair:

First cervical, its branches are:—

1. Occipital.
2. To the second cervical.

Second cervical, its branches are:—

1. To third cervical.
2. Cutaneous.
3. Posterior auricular.
4. To diaphragmatic nerve.

Third cervical:

1. To fourth cervical.
2. To diaphragmatic nerve.

Fourth cervical.
Fifth.
Sixth.
Seventh.
First dorsal.
} form the Axillary plexus.

Diaphragmatic nerve formed by filaments from the second, third and fourth cervical nerves.

Branches from the axillary plexus, viz :—

1. To muscles about shoulder.
2. External thoracic.
3. Scapularis.
4. Articularis.
5. Cutaneus.
6. Cutaneus minor internus.
7. Musculo-cutaneus.
8. Spiralis, giving off.
   - α. Branches to triceps, extensors and supinators of hand.
   - β. Branches to muscles and integuments on back of fore-arm and hand.
   - γ. Superficialis divided into. { Volar branch. Dorsal branch.
   - δ. Profundus.

9. Median; giving off:—
   α. Branches to the pronators and flexors of the hand.
   β. Branches to the muscles of the thumb.
   γ. Branches to the thumb, forefinger, middle finger, ring finger.
10. Ulnar giving off:
   α. Branches to the muscles.
   β. Dorsal.
   γ. Superficial palmar to ring finger and little finger.
   δ. Deep palmar.

Dorsal or Intercostal, twelve pair; their branches are:—

1. To the muscles near the spine.
2. To the intercostal muscles.
3. Intercosto-humerales.
4. To skin of thorax, mamma, serratus magnus, abdominal muscles, &c.

Lumbar, five pair; communicate and form lumbar plexus.

First Lumbar, its branches are;—

1. To lumbar muscles.
2. To skin on fore part of pelvis.

Second Lumbar, its branches are:—

1. Spermaticus externus.
2. Cutaneus externus.

The other branches from the lumbar nerves, are:

1. The Obturator [from the second, third, and fourth;] giving branches to the muscles at the inner part of the thigh.
2. The Crural [from the four upper] giving off:
   α. Branches to iliacus and psoas.
   β. Cutaneus medius.
   γ. Cutaneus anterior.
   δ. Cutaneus internus.
   ε. Branches to the extensors and adductors.
   ζ. Saphænus.

Sacral, five pair, composed of:

a. Posterior trunks, which communicate.
b. Anterior; these likewise communicate, their branches are:

1. Gluteal [from first sacral and last lumbar.]
2. To the muscles and ligaments about os coccygis and hypogastric plexus, from the fourth.
3. To parts about the anus from the fifth.
4. Pudic [from the roots of the sciatic.]
5. Sciatic, [from the first, second and third with the fourth and fifth lumbars] its branches are:
   - α. To the rotators.
   - β. Cutaneus superior posterior.
   - γ. To the flexors of the leg and adductor magnus.
   - δ. To the integuments.

Nervus Popliteus continuation of the sciatic in the ham, divides into:—

a. Fibular, its branches are:—

α. Superficial
β. Deep.
} to the upper part of the foot and muscles of the four and outer part of the leg.

b. Tibial, its branches are:—
   - α. Communicans tibiæ.
   - β. To the muscles at the back of the leg.

γ. Internal plantar, giving off: — branches to the three first toes and inner side of fourth toe.

δ. External plantar, giving off branches to the fourth and fifth toes.

The great Sympathetic Nerve formed by a branch from the Spheno-palatine division of the fifth pair of nerves, and by branches from the sixth pair. It communicates with the eighth and ninth pair of nerves.

In the neck it forms:—

1. Superior cervical ganglion; from it pass branches:
   α. To the sub-occipital nerve.
   β. To the first and second cervical nerves.
   γ. Superficialis cordis.
2. Inferior cervical ganglion; from it pass branches:
   α. To the second, third, and fourth cervical nerves.
   β. To the recurrent nerves.

γ. To the cardiac nerves.

In the chest it forms:

1. Superior thoracic ganglion; from it pass branches:
   α. The cardiac, which with the other cardiac branches of the sympathetic and those of the eighth pair, form the cardiac plexus.
2. Dorsal ganglia; from them pass branches:
   α. Which communicate with the intercostal nerves.
   β. Splanchnic from the sixth, seventh, and eighth dorsal ganglia.
   γ. Accessory splanchnic from the nine and tenth ganglia.

In the abdomen, it forms:—

1. Lumbar ganglia; from them pass branches:
   α. To the lumbar nerves.
   β. To the aortic plexus.
2. Sacral ganglia; from them pass branches:

α. To the sacral nerves.

β. To the hypogastric plexus.

3. Semilunar and cœliac ganglia from the splanchnic branches; from them pass:—

a. The Solar plexus, forming the:—

α. Hepatic plexus, giving branches to the liver, gall-bladder, diaphragm, stomach, duodenum, pancreas.

β. Splenic plexus, giving branches to the spleen and pancreas.

γ. Superior mesenteric plexus, giving branches to the mesentery, small intestines, colon.

δ. Renal plexus, giving branches to the kidney, capsula renalis.

b. The Aortic plexus, forming the:—

α. Inferior mesenteric plexus, giving branches to the colon, rectum.

β. Hypogastric plexus, giving branches to the rectum and bladder; to the spermatic vessels in the male; to the uterus and vagina in the female.

PART THE SECOND.

CHIRURGICO-ANATOMICAL VIEWS.

THIS Part is divided into three Sections. The first contains the dissection of the head and neck;—the second that of the chest and upper extremities;—the third that of the pelvis and lower extremities.

SECTION I.

DISSECTION OF PARTS ABOUT THE HEAD AND NECK.

Lateral Parts of the Neck.

A THIN layer of pale and disgregated muscular fibres, called the platysma myoides, covers the whole of the lateral parts of the neck. These fibres are placed obliquely, and extended some way above the inferior maxilla and below the clavicle. Under them and connecting them is a tough membranous substance, particularly described by late anatomists in this and in other parts under the names of aponeurosis, superficial fascia or condensed cellular membrane. It seems to exist more or less in all parts of the body, and to be nothing more than the common

reticular membrane which is stronger and thicker in particular parts, from original conformation, motion or pressure, for the purposes of support or resistance. It is probably found strongest in those who have become thin after a state of obesity. A knowledge of it has justly been deemed important in explaining the progress and growth of tumours, the course and burrowing of pus, &c.—

The lateral parts of the neck deserve particular notice. From their vicinity to important organs, they contain numerous vessels and nerves, intricately disposed: These, embedded in cellular membrane, are received in hollows between the muscles and more solid parts. Such excavations are found throughout the body for the reception of essential and delicate parts. Thus in the extremities the larger vessels and nerves are placed in the bend of the joints; where, surrounded by fat in a loose cellular membrane, no hinderance is offered to their respective functions, even under strong and continued muscular action. The accurate knowledge of the

situation, form, extent, and contents of these, interests especially the Surgeon.

The *side of the neck* comprehends a hollow space, bounded behind and to the outer side by the spine, muscles attached to it, and the muscles of the back of the neck; before, by the air tube and its appendages; above, by the inferior maxilla, the cranium and parts attached to them; below, by the clavicle and upper part of the chest. It is *divided into two triangular spaces* by the sterno-cleido-mastoideus muscle in the oblique course which it is taking between its attachments.

Lower Space.

The lower space is comprehended between the clavicle, the outer edge of the sterno-mastoid muscle, and the outer edge of the trapezius muscle. In the bed formed by these, bounded behind by parts of the spine and muscles attached to them, and by the upper part of the chest below, the nerves and vessels supplying the upper extremity are lodged. It is diminished in height and increased in depth by the elevation of

the clavicle; therefore by the depression of the clavicle the parts situated within are brought nearer to the surface, whilst the space itself is rendered longer.

Before the dissection the arm should be depressed as much as possible, in order to bring down the clavicle. In order to display the parts, a triangular flap of integuments corresponding to the figure of the space is to be turned back; it may be made by carrying an incision along the outer edge of the sterno-mastoid muscle, and another to meet it along the upper edge of the clavicle. The fibres of the *platysma myoides* and the *aponeurosis* are to be turned back in the same way; processes of the latter will be seen to dip in between the contained parts. The bed of *cellular membrane* next presents itself. This is to be removed, dissecting out with care the several larger *cutaneous veins*, *branches of arteries*, and *twigs of nerves;* the last coming from the cervical nerves. The *external jugular vein* is crossing obliquely the sterno-mastoid and this space, to terminate behind the clavicle in the

subclavian vein. Continuing the dissection behind the level of the sterno-mastoid, several *absorbent glands* will be found, as at the outer edge of the last named muscle, in the neighbourhood of the axillary plexus. The *omo-hyoideus muscle* traverses the space obliquely, and passes behind the sterno-mastoid; a line, drawn from a point on this muscle about two inches above the sternum to the junction of the clavicle with the scapula, marks its course. The *Scalenus anticus* and *medius muscles* are deeply seated behind and a little to the outer side of the sterno-mastoid. From between these behind the omo-hyoideus the *four inferior cervical* and *first dorsal nerves* are passing outwards and downwards to between the subclavian muscle and first rib, to form the axillary plexus: two or three of these are situated above the omo-hyoideus. The *Subclavian Vein* is seated behind the sternal portion of the clavicle; it passes outwards and downwards from before the scalenus anticus behind the clavicle. Somewhat above it and more posteriorly from the intervention

of the scalenus anticus muscle, is the *Subclavian artery*, the large arterial trunk which supplies the shoulder and upper extremity. In examining the relative position of this artery on the right and on the left side, some difference will be found, caused principally by the difference of origin. The aorta, in forming its arch, passes obliquely backwards and to the left; the vessels therefore, which are arising from it, are placed in an oblique plane, the arteria innominata being the most anterior and to the right, the left subclavian artery, which arises immediately from the aorta, the most posterior and to the left. The arteria innominata, having passed the trachea, [therefore after a course of about one inch,] divides into the right subclavian and right common carotid arteries.

The subclavian arteries differ in consequence on the right and left sides in: α. Situation, the right being more superficial, the left deeply hid [arising farther back from the arch of the aorta]: β. Length, the right being shorter by the length of the

arteria innominata: γ. Direction, the right passing immediately upwards and outwards in the space of the scaleni, whilst the left passes first vertically upwards, then suddenly bends outward between the scaleni: δ. Relative position, the right being placed more anteriorly, on the outer side near to the summit of the [right] lung, and behind separated from the vertebral column and longus colli, to which it corresponds; the left being covered from its origin by the corresponding lung, separated from the first rib and clavicle, and closely applied to the longus colli. Their course, after having gained the space between the scaleni, becomes the same: They pass transversely between these muscles, are inclined downward and outwards, become placed between the axillary plexus and clavicle, pass the latter at an acute angle, being covered by it and the subclavian muscle, and change their name to that of the axillary arteries. In the space between the scaleni and clavicle they have behind them and to their outer side the nerves of the axillary plexus, and to the inner side

the first rib. Upon the first rib and before they have passed it, the pleura, as it rises somewhat above the level of the rib, is immediately adjacent to them.

The *cervical arteries*, with some of their branches, are commonly seen in this space.

The parts contained in space have reference amongst others to the following points of practice:—*Compression of the subclavian artery, so as to prevent the flow of blood to the upper extremity. Aneurismal tumours of the subclavian artery.—The operation of taking up the subclavian artery.—The opening of the external jugular vein.—Exostoses from the vertebræ.—The progress, symptoms, and extirpation of glandular and other tumours.*

Upper Space.

THE upper space of the side of the neck is before the sterno-mastoid muscle, and

like the lower space, of a triangular form. It is circumscribed: above, by the lower jaw and parotid gland; before, by the muscles attached to the os hyoides; behind, by the inner edge of the sterno-mastoid muscle. It is deepened by the projection of the larynx and trachea and by its continuation behind the lower jaw. In order not to lay bare too many parts at once, this division of the neck may be conveniently *subdivided into two parts* by a line drawn horizontally from the os hyoides [at which part the common carotid divides into the external and internal carotid arteries] to a corresponding point on the sterno-cleido-mastoideus.

Lower Subdivision of the upper Space.

The lower subdivision contains the common carotid artery, going to supply the head, as it passes by the side of the air tube, accompanied by the internal jugular vein, important nerves, &c.

The contained parts may be displayed by making an incision, through the skin,

platysma myoides and aponeurosis, along the inner edge of the sterno-mastoid, and another to meet its outer extremity in the direction of the line which forms the upper boundary of this subdivision: Then by turning back this triangular flap and dissecting away the cellular membrane. The *omo-hyoideus* will be seen continued from behind the sterno-mastoid crossing it nearly opposite to the upper margin of the cricoid cartilage. The place, at which the decussation takes place, may be ascertained by stretching a thread between the anterior part of the mastoid process of the temporal bone and the centre of the upper bone of the sternum, to mark the course of the inner edge of the sterno-cleido-mastoideus; and another, for the direction of the omo-hyoideus, between the side of the body of the os hyoides and the centre [nearly] of the clavicle. Behind the point of intersection the common carotid is commonly placed. Next to the omo-hyoideus is the *sterno-hyoideus;* but more anteriorly, inferiorly and less oblique. To these muscles small twigs are given off from the

descendens noni, a nerve which is descending superficially on the common carotid, said to be sometimes enclosed within the sheath of that artery: It is united to twigs from the upper cervical nerves, and is ultimately distributed to the above mentioned muscles and the sterno-thyroideus. Of *the common carotid artery* a small portion [about an inch] only is seen where rising above the omo-hyoideus, and corresponding to the edge of the sterno-mastoid muscle; below being covered by the omo and sterno hyoidei. Behind, the carotid is separated from the vertebral column, to which it corresponds, by the rectus capitis, anticus major and longus colli muscles, and the inferior thyroideal branch of the subclavian: Before, it is separated from the skin, platysma myoides and aponeurosis by the projection of the sterno-mastoid and parts about the larynx: to the inner side, it corresponds to the larynx, trachea, thyroid gland, which is sometimes continued partly over it, and to the asophagus, which is placed nearer somewhat to the left than the right trunk. On the outer

side the *internal jugular vein*, and the *nervus vagus* situated between it and the carotid, take their course: the nerve, the vein and the artery are enclosed within a sheath of cellular membrane.

Behind the jugular vein, but exterior to the sheath, is placed the *sympathetic nerve*. In the course of the carotid is a chain of *absorbent glands*, [glandulæ concatenatæ] which receive lymphatics from the head and neck.

A small nerve, [the nervus superficialis cardiacus] formed from the superior cervical ganglion and internal laryngeal nerve, is passing along the inner edge of the carotid.

[Practical Points.] *Aneurism of the carotid artery.—The operation of securing the carotid artery.—Bronchocele [extent of]—Glandular and other tumours.—*

Space behind the Sterno-mastoid Muscle.

In order to gain a view of the situation,

course, and connexion of the carotid and subclavian arteries nearer to the trunk, as well as their relation to other important parts, the dissection may be prosecuted by raising cautiously the attachment of the sterno-mastoid muscle to the clavicle and sternum. In the narrow space behind this muscle the subclavian artery, before it has passed the scaleni muscles, is connected with the nervus vagus, the recurrent laryngeal, sympathetic and phrenic nerves, the subclavian vein, on the left with the termination of the thoracic duct, the carotid artery and internal jugular vein.

Of the course and relative position of the *subclavian artery* has been already spoken, in the description of the lower space of the side of the neck. At this part it will be seen passing behind the scalenus anticus muscle after the passage of about an inch. At the edge of that muscle it is giving off *the cervical arteries:* The inferior thyroideal artery is passing upwards and inwards behind the carotid artery: Branches of the anterior cervical are seen in the space above the

clavicle. At the origin of the subclavian it is crossed anteriorly behind the sternal extremity of the clavicle by the *nervus vagus*. That nerve, in its passage before it, gives off *the recurrent laryngeal nerve;* which on the right side hooks round the subclavian artery, but on the left passes around the arch of the aorta, and then takes its course upwards and inwards by the side of the sympathetic nerve, to the posterior and lateral parts of the trachea. Opposite to the nervus vagus, but behind the subclavian, is the *sympathetic nerve*, with its *lower cervical ganglion*. The *subclavian vein* lies anterior to the artery, in its collapsed state seems lower, and passes the clavicle in a more horizontal direction, and nearer to its sternal extremity: The direction of the nerves forming the axillary plexus is more oblique than that of the artery, and their situation nearer to the scapula. The *internal jugular vein* cotes the margin of the scalenus and joins with the subclavian vein below: It is at this junction on the left side, that the *termination of the thoracic duct* after coming from

behind the jugular vein may be traced. To the outer and fore part of the scalenus anticus, the *phrenic nerve* is placed, which continues its course into the thorax between the subclavian artery and vein.

The removal of the omo-hyoidei, sterno-thyroidei, and sterno-hyoidei, displays the course of *the common carotids* at the root of the neck. The right given off from the arteria innominata after it has passed the trachea, the left from the arch of the aorta; they diverge on each side of the trachea, and as they separate from each other are inclined backwards. The left is somewhat longer than the right, and is covered at its origin by the left subclavian vein and clavicle. Of the rest of their relative position has been already spoken.

[Practical Points.] *Projection of aneurismal tumours from the arch of the aorta, or arteria innominata.—Practicability of passing a ligature around the arteria innominata.—Wry neck.*

Upper Subdivision of the upper Space.

Of the lateral parts of the neck, the upper subdivision of the space before the sterno-mastoid muscle alone remains to be described. The parts which circumscribe it have been already spoken of; and it has been mentioned that it became larger than at first appeared, from being lengthened upwards behind the lower jaw. It is bounded behind by the spine and muscles attached to it.

In describing the relative position of the contained parts, the basis of the cranium will be considered as horizontal. In this position the surface of the teeth in the upper jaw will be nearly in the same plane as the foramen magnum of the os occipitis. Between the vertebræ and internal surface of the lower jaw is a considerable vacuity, so that, together with the concavity of the roof of the mouth, space is left for the tongue, some large vessels, nerves, and important glands. Between the mastoid process of the temporal bone, and the as-

cending plate of the maxilla inferior, the meatus auditorius externus is placed. The ascending plate is about two inches in length, and the angle of the jaw about one inch anterior to the cervical vertebræ. A little before the root of the mastoid process, but nearer to the centre of the base of the skull, the styloid process begins; its extremity in the adult, in whom the lower jaw is furnished with teeth, is hidden by the ascending plate of the jaw bone. In this position of parts, when the muscles are not in action, the pharynx is flattened; on its posterior side, which is in contact with the vertebral column, the larynx rests. The os hyoides is nearly as high as the lower margin of the jaw bone; hence the posterior belly of the digastric muscle has only a slight declination, whilst the anterior runs straight forward.

On removing the coverings of this subdivision [which it has in common with the rest of the neck,] the inferior portion of the parotid gland will be seen to project below the inferior maxilla behind its angle, and to rest on the sterno-mastoid opposite

that part. Near to the chin is the anterior belly of the *digastricus*. A small portion of the *submaxillary gland*, which is situated within the jaw, appears below it: It is lodged in a considerable cavity between the jaw bone and the tongue, which appears when the gland is cut away. The roof of this hollow toward the chin is formed by the mylo-hyoideus, and nearer to the angle of the jaw by the hyo-glossus; the latter is intersected by the stylo-glossus. In this position of the head, the submaxillary gland is almost entirely covered by the body of the jaw bone; it is received between the two bellies of the digastric muscle and that bone. In this cavity besides the submaxillary are lodged *absorbent glands*, likewise the facial artery and vein, together with the branches sent off from them, before they mount on to the face. The *facial artery* at its origin is concealed by the jaw, passes under the stylo-hyoideus and tendon of the digastricus, and before its passage over the jaw is embedded in the substance of the submaxillary gland. The *facial vein* descends

along the side of the gland nearest to the ear, generally about this part joins with the temporal vein, and these together are forming the *external jugular vein.* Situated more under the anterior portion of the tongue between the mylo-hyoideus and genio-glossus is the *sublingual gland.*

By bending the head back, the relative situation of these parts is altered, particularly of the submaxillary gland, the facial artery and vein. By the elevation of the chin the cavity between the maxilla, and mylo-hyoideus becomes reduced in size, and those parts, which in the usual position of the head lie retired behind the jaw, are exposed.

This position is favorable for the continuation of the dissection, which may be prosecuted by removing the inferior portion of the parotid gland, so as to lay bare the anterior margin of the sterno-mastoid and the posterior edge of the ascending plate of the jaw bone: The parts situated about the angle may then be conveniently examined. The posterior belly of the digastricus and the stylo-hyoideus muscle

are seen extended obliquely towards the os hyoides. The disposition of the other parts may be displayed by commencing at the back part, and continuing the dissection forwards. An incision along the anterior margin of the upper extremity of the sterno-mastoid will expose the *nervus accessorius ad par octavum;* it appears between the transverse process of the atlas and the internal jugular vein; lower down it is covered by the sterno-mastoid muscle which it perforates to reach the trapezius. Nearer to the angle of the jaw than the accessory nerve, but in contact with it, is the *internal jugular vein;* next to it the *lingual nerve;* and then the *internal carotid artery,* which is deeper seated than the *external carotid.* The *lingual nerve* appears between the internal carotid and jugular vein, a little lower than the line of the lower jaw; at the origin of the occipital artery it turns forward to cross over both carotids, and at this place sends off the *ramus descendens noni;* it continues its course behind the termination of the facial vein, but before the external carotid artery;

nearer to the os hyoides it passes behind the digastricus and stylo-hyoideus, lying between them and the stylo-glossus. The lingual nerve is in contact with the *lingual artery*, until it has reached the side of the tongue, but at that part the hyo-glossus muscle becomes interposed. Till the artery arrives at the junction of the cornu with the body of the os hyoides, it is covered by the skin, platysma myoides, aponeurosis, the lingual nerve, and hyo-glossus muscle: It may therefore be laid bare by dividing these parts, guided by the cornu of the os hyoides. It then turns forward and divides into branches to the substance of the tongue. The branch called the *ranina* is situated with respect to the frænum of the tongue just above its attachment. The *occipital artery*, arises generally from the external carotid, a little lower than the angle of the jaw, in its course it slants upwards and outwards, and traverses the internal carotid, the nervus vagus, the lingual nerve, and the internal jugular vein; it then passes behind

the digastric muscle, and around the root of the mastoid process just above the transverse process of the atlas. Above the hyo-glossus muscle the *gustatory nerve* [the lingual branch of the third division of the fifth pair of nerves] runs towards the tongue.

The *glosso-pharyngeal nerve* makes its appearance from between the carotids just at the origin of the stylo-pharyngeus, and is as well as that muscle sunk behind the jaw bone.

Behind the cavity of the submaxillary gland, the *tonsil* lies deep seated, sunk in the recess formed by the pillars of the fauces, situated in the angle between the stylo-glossus and stylo-pharyngeus, and covered by the palato-pharyngeus.—The external carotid is nearly opposite to the tonsil, the internal a little behind it.

[Practical Points] *Glandular and other tumours—their removal connected with parts behind the angle of the jaw—Ranula —Calculi in sublingual gland [removal of] — Puncturing tonsil — Extirpation of Tonsil.—*

Fore part of the Neck.

On the fore part of the neck, the relations of the larynx, trachea, and parts connected with them, remain to be studied. They are received between the diverging bellies of the sterno-mastoid muscles. Their situation may be ascertained, without removing their coverings; and should be practised in the living person. In the adult, when the base of the skull is placed horizontally, the *os hyoides* will be felt a little lower than the level of the edge of the jaw. Under it is the *thyroid cartilage* at some little distance, the part called the pomum adami with its notch distinctly projecting: Its prominent edge on the anterior part may be traced downwards, as it somewhat recedes. Below the thyroid is the *cricoid cartilage*, with a small intervening space betwixt them. The *transverse portion of the thyroid gland* may be generally next perceived by its soft inelastic feel. The trachea occupies the angular hollow formed by the approximation of the sterno-

mastoid muscles above the upper bone of the sternum.

If the head be turned back, the relative situation of these parts will be altered, so that they are more separated from each other, and a larger portion of the trachea becomes situated in the neck. In this position the parts may be laid bare; but the dissection should be proceeded in with caution so as to shew the situation and extent of the *thyroid gland*, with its relation and connexion to the surrounding parts. Its two lobes will be seen placed at the under and lateral parts of the larynx, covered by the sterno-hyoidei, and sterno-thyroidei, descending a little way on the trachea and æsophagus, and connected by a cross portion on the fore and upper part of the trachea. The gland is supplied by the four *thyroideal arteries;* the two superior are descending upon its upper margin from their origin at the beginning of the external carotid; the two inferior arise from the subclavian, and are ascending on each to the inferior part of this gland. The *inferior thyroideal*

veins, arising on the left from the subclavian vein, on the right from the superior cava, are placed on each side the trachea, but on its fore part are forming an arch from which branches are passing off to the gland.

In the young subject, the relative distances of the parts situated between the chin and sternum are differing from the adult structure. This difference is the result of the non-evolution of the lower jaw and larynx. When the alveolar processes are not formed, and the ascending plate and angle of the inferior maxilla are not developed, the bifurcation of the carotid will be found at a greater distance from the angle, and the primary branches of the external carotid exposed, which are concealed in a great measure in the adult by the lower jaw. Before the developement of the larynx, which does not take place in the male till puberty, and not all in the female, there will be proportionably a greater length of trachea, and hence a greater distance between the thyroid gland, and the sternum. The projection of the

thymus gland above the sternum, is also a peculiarity of early age.

In old age, a new change from the structure of the adult as above described, is taking place when the teeth fall out, and the alveolar processes become absorbed. The newly assumed position of parts approaches the character of infancy in these circumstances, but acquires a peculiar character from having conjoined with them, that of the length of the ascending plate of the jaw-bone, which remains the same. Thus in age, when the mouth is closed, the chin becomes raised and projected forwards, and the angle of the jaw removed from the mastoid process, in consequence of which the styloid process is uncovered, and the large vessels and nerves are exposed. By bringing the jaws in contact, the mylo-hyoideus is put on the stretch, and the submaxillary gland becomes almost entirely protruded below the margin of the lower jaw: In this respect resembling the adult with the head thrown back.

[Practical Points]. *The most advan-*

tageous part for the performance of bronchotomy—difficulties of the operation—Extent and consequences of bronchocele.—Practicability of extirpating the thyroid gland.—

Side of the Face.

Amongst the circumstances which demand attention on the side of the face, the superficial extent of the *parotid gland* may first be displayed. It reaches from the zygomatic arch downwards to below the angle of the jaw, covers a portion of the masseter, and occupies the space between the ascending plate of the jaw-bone and mastoid process. Embedded within the substance of the gland the *portio dura* of the seventh pair passes through it, and crosses the external carotid artery. Before following the deep seated connexions of the parotid, the course of the portio dura should be traced: After quitting the foramen stylo-mastoideum it is directed downwards and forwards, and becomes

situated in a hollow behind the parotid gland, continuing its course in an undivided trunk for about half an inch. At this part it may be cut down upon by beginning an incision at the root of the mastoid process, and continuing it along the anterior margin of the sterno-mastoid muscle; then prosecuting the dissection the nerve will be found after cutting through a part of the glandular substance of the parotid: The arteria posterior auris and one of the branches of the cervical to the ear will necessarily be divided. Soon after quitting the foramen stylo-mastoideum it enters the parotid, and divides into branches which are passing upwards, forwards and downwards to be distributed to the face and throat. About midway between the ascending plate of the jawbone and the mastoid process it is opposite to the external carotid artery. The attachments of the parotid gland may now be traced: To understand its real extent it must be followed to the root of the meatus auditorius externus, behind the angle of the jaw adhering to the internal pterygoid muscle, folded over the poste-

rior edge of the masseter muscle and deep seated between the ascending plate of the jaw-bone and mastoid process. The *external carotid* after passing up from behind the stylo-hyoideus and digastricus is likewise buried in the substance of this gland; it continues its course upwards, and whilst connected with the parotid, gives off the *posterior aural*, the *transverse facial*, and the *internal maxillary* arteries. It is crossed within the gland by the portio dura about one inch above the angle of the jaw. Some *absorbent glands* are connected with the exterior of the parotid gland. The *duct of the parotid* is arising from the anterior margin of the gland: Its course may be marked generally by a line drawn from the junction of the lobe of the ear with the pinna to the root of the nose. It receives often a small duct from a corresponding glandular process situated above it on the masseter—the *glandula accessoria* of Haller, of the same structure as the parotid. The duct continues its course in the just described direction over the anterior margin of the masseter muscle,

and enters a *hollow space*, which extends from the masseter, between the projecting part of the superior maxillary bone above, and the inferior maxilla below, to the corner of the mouth, the side of the nose, and the inner angle of the eye; whose bottom is formed by the buccinator muscle and upper jaw, and which is lengthened to the articulation of the lower jaw and the space covered by the zygoma by a sinus formed by the buccinator muscle and upper jaw behind and the masseter and lower jaw before. In this space the duct is lodged in a mass of fat which is interposed between the masseter and buccinator, perforates the latter and terminates in the mouth opposite to the second molar tooth. The duct is accompanied by the *arteria transversalis faciei*, which is given off from the external carotid whilst within the substance of the parotid, is inclined upward and becomes situated between the parotid duct and zygoma. It is accompanied likewise by *branches from the portio dura* the largest of which takes its course some little way above it. Near

to its termination it is crossed by the *facial vein;* but the artery is inclined considerably nearer to the mouth, having quitted the vein after their passage over the lower jaw at the edge of the masseter. *The facial vein* is begun by the veins of the forehead; as it descends it is close to the tendon of the orbicularis palpebrarum; it then takes its course obliquely backwards as far as the anterior margin of the masseter muscle, having traversed the infra orbitar nerve at its passage from the foramen of the same name. Along its whole extent the vein is nearer to the ear than the artery and at some distance from it, but whilst passing over the inferior maxilla they run parallel and close together. Besides the termination of the parotid duct, the facial artery and vein, there are lodged in the space above described twigs of the facial and sub-orbitar nerves. The situation of the *infra orbitar nerve* may be ascertained by drawing a line from the internal angular process of the os frontis obliquely across the orbit to the centre of the os malæ, and another perpendicular

with it nearly an inch from the inner angle of the eye; the latter will cross the orifice of the sub-orbitar foramen a quarter of an inch below the inferior edge of the orbit.

The *dental nerve* issues from the mental foramen below the posterior bicuspides, and may be cut down by dividing the lining membrane of the mouth between the gum and muscles at that part. The *supra-orbitar branch of* the *ophthalmic nerve* may be found on the superciliary ridge about one inch from the nose outwards.

The *lachrymal sac* is situated about one eighth of an inch within the margin of the orbit behind the tendon of the orbicularis palpebrarum, being received into a groove formed by the os unguis behind and the nasal process of the superior maxillary bone before. The sac tapers and gradually forms the *nasal duct*, which is opening under the inferior turbinated bone about half an inch behind the margin of the superior maxillary bone where assisting to form the nostril.

[Practical Points.] *In cases of tic dou-*

loureux the division of the portio dura or its branches, of the supra-orbitary, dental or sub-orbitary nerves.—Glandular tumours about the parotid gland—Tumours in various situations, as, between the buccinator and masseter muscles, at inner canthus of eye, connected with the parotid duct, &c.—Practicability of extirpating the parotid gland.—Division of the parotid duct.—Obstruction of nasal duct —passing a probe into it.—Fistula lachrymalis, and operation for it.

Section of the Head.

Having attended to those points which interest the practical anatomist in the dissection of the side of the face, it will be proper to make a section of the head in order to display some of the internal cavities and openings connected with the head and face. For this purpose the one half of the lower jaw should be removed, and in so doing it should be carefully detached from the parts connected with it.

The next object will be to cut out a suitable portion of the bones of the head and face: It may be done [after having removed the brain] by applying the saw to one side of the crista galli, on a line drawn from the os frontis to the sella turcica, then sawing perpendicularly through the frontal sphenoid and ethmoid bones into the cavity of the nose on the same side: the bony palate and palatine bone are then to be sawed through from below in the same direction. The saw is next to be applied at a point on the parietes of the cranium corresponding to the anterior edge of the glenoid cavity, and a cut is to be made which shall meet the first at the sella turcica, and is then to be carried perpendicularly through the basis of the cranium. These cuts will insulate a triangular portion of the bones of the head and face. Their removal will give an opportunity of examining several parts connected with practice, viz.—*The extent and form of the cavities of the nose.—The openings into it from the lachrymal sac, the antrum maxillare, the frontal, ethmoidal and sphenoi-*

dal sinuses—The passage of the fauces with its pillars and uvula, the situation of the tonsils, and the mechanism of the velum pendulum palati—The extent and form of the pharynx with the situation and relation of the openings into it from the nose, mouth, ears [*Eustachian tube,*] *larynx and æsophagus—The form of the posterior part of the tongue—The mechanism and situation of the epiglottis.*

[Practical Points.] *Situation, growth and removal of Polypi from the nose.—Diseases of the antrum maxillare.—Passing a probe into Eustachian tube.—Extraneous bodies lodged about glottis. Introduction of a pipe* [*as in suspended respiration*] *into the æsophagus or opening into the larynx—Passing bougies into the æsophagus—Extirpation of Tonsils.*

SECTION II.

DISSECTION OF PARTS ABOUT THE CHEST AND UPPER EXTREMITIES.

Cavity of the Chest.

THE *diaphragm* is a plane of muscular fibres, which together with its middle tendon is forming the separation between the thorax and abdomen. It is formed into a vault, rising up from its inferior attachments as high as the level of the fourth rib, in consequence of which it is applied closely to the lower ribs. Its anterior attachments are considerably higher than the posterior; so that the capacity of the chest with respect to height is considerably greater at the back than at the forepart, and the lungs at that part are sinking down behind the abdominal viscera.

The upper end of the chest is forming an opening, but of contracted dimensions from the conical figure of the cavity. It is occupied laterally by the upper ends of the pleura and lungs, which rise a little above the level of the first rib. Several important parts are passing through it, but their description has been anticipated in speaking of the lower parts of the neck: In order to examine compleatly their relative position a good view may be had by separating the head from the trunk between the fourth and fifth cervical vertebræ.

Situation of the Large Vessels.

Behind the upper part of the sternum are situated the large vessels which are immediately connected with the heart. On raising the sternum the left subclavian vein will be seen after its junction with the internal jugular, taking its course obliquely downwards to the right side to form with the opposite subclavian the vena cava superior, and crossing the great arteries from

the arch of the aorta. Somewhat below and behind the vein is the arch of the aorta, which as it passes to the left side is crossing the trachea just before its bifurcation into the bronchiæ.

Axilla.

In order to understand the connexion of the lower and lateral parts of the neck with the axilla, as well as the course of the vessels and nerves between them and within the latter, it will be proper to begin the dissection on the fore part. A view of the important parts may be gained through a triangular space formed by the clavicle above, by the edge of the deltoid muscle to the outer side, and by the inner edge of the sternal portion of the pectoralis major to the inner side; that portion of the pectoralis major, which arises from the clavicle, covers the space and conceals the parts which are to be displayed. Having ele-

vated the shoulder somewhat with the elbow close to the side so as to relax in a degree the pectoral muscle, the dissection is prosecuted between the deltoid and pectoral muscles, turning the latter carefully on one side. At this part the *cephalic vein* is taking its course between those muscles and behind the pectoral towards the axillary vein; and the *humeral thoracic artery* is seen winding up to the deltoid. Deeper than the above mentioned muscles the space is circumscribed by the subclavian and pectoralis minor muscles above and below, but it retains the same lateral boundaries: It is crossed on the upper part by a *ligamentous production* from the under part of the clavicle to the root of the coracoid process. Posteriorly at the edge of the pectoralis minor, and partly covered by it, the *axillary vein* will be seen passing outwards and downwards. Above, behind, and partly hid by it, the *axillary artery* is taking the same course. The *axillary plexus* is situated still more posteriorly; part is situated above, and part is hidden by the artery. The relative position of

these parts will be altered by the state of the shoulder:—If elevated, the pectoralis major becomes relaxed, [if much, the pectoralis minor becomes stretched,] and the space of the artery will be more exposed: —If the shoulder be depressed, the space will be straightened from side to side.

The axilla may be considered as a pyramidal cavity, whose sides are formed by the pectoralis major and minor on the fore part, by the scapula subscapularis and latissimus dorsi on the back part, by the ribs and serratus magnus to the inner side; whose apex is the coracoid process, and whose base is determined by the edges of the pectoralis major and latissimus dorsi. It is occupied by blood-vessels, nerves, absorbent glands embedded in fat and cellular membrane. The view of the contained parts must be gained from below. For this purpose the arm is to be turned up towards the side of the head; the triangular form of the base will then become apparent, the pectoralis major and latissimus dorsi muscles having been put on the stretch. The dissection is then to be begun at the

edge of the pectoralis major: On removing the fat and cellular some *superficial nerves* and *absorbent glands* will be displayed. The *axillary vein* will then be seen mounting upwards and outwards from under the edge of the pectoral muscle. Above it is the *axillary artery*, nearer to the os humeri it becomes covered by the axillary plexus, after which it becomes situated close to the head of the bone. Before it has passed the plexus it is behind the edge of the pectoralis minor, and afterward opposite to the head of the humeral bone. If the arm be brought to the side, these important parts become placed behind the pectoralis major. The course of the *thoracic* and *subscapular arteries* with their *accompanying veins* should be examined. Other *absorbent glands* will be found in different parts of the cavity.

The *axillary artery* in its course through the axilla: *Anteriorly*, is first covered by the clavicle, which it crosses at an acute angle, and the subclavius muscle: Lower it corresponds to the pectoralis major and minor: It is accompanied by the axillary

vein, which opposite to the head of the humerus sinks rather below it; and at that part the axillary plexus passes before it. *Posteriorly*, it has the axillary plexus, but lower the fat and cellular membrane filling up the space between the serratus magnus and subscapularis. To the *inner side* it is near to the second rib and serratus magnus; the artery is then inclined outwards from the parietes of the thorax, becomes separated from them by fat, cellular substance and absorbent glands. To the *outer side*, whilst passing between the clavicle and coracoid process, it is covered by the axillary plexus, and is afterward close to the capsular ligament of the shoulder joint.

[Practical Points]. *Compression of axillary artery—Taking up the artery below the clavicle—Amputation at shoulder joint —Removal of steotomatous and other tumours from the hollow of the axilla—Extirpation of diseased glands—Ascertainment of contamination of axillary glands in schirrous breast.*

Relative Position of the Brachial Artery.

The *brachial artery* passes from the axilla to the bend of the elbow: During the greater part of its course it is situated to the inner side of the arm. As it descends it is placed more superficially and anteriorly: At the elbow it occupies the middle of the articulation.

Anteriorly, it is covered by the coracobrachialis muscle, but separated from it by cellular membrane. In the rest of its course it corresponds and is nigh to the inner edge of the biceps muscle. At the bend of the elbow it is covered by the aponeurosis, the basilic median vein, by cellular membrane and the common integuments.

Posteriorly, it is separated from the triceps muscle by fat and cellular membrane; but lower it is passing upon the brachialis internus.

To the inner side, it is immediately adjacent to the brachial vein and median

nerve. It is separated from the integuments by fat and cellular membrane.

To *the outer side* it is only separated from the os humeri by the tendon of the coraco-brachialis; as it descends it corresponds to the biceps and brachialis internus, near its termination to the tendon of the biceps.

It is therefore only above the attachment of the brachialis internus that it is close to a bony surface.

[Practical Points]. *Compression of the brachial artery—Taking up the brachial artery—Relation of the basilic median vein in venesection.*

SECTION III.

DISSECTION OF PARTS ABOUT THE PELVIS AND LOWER EXTREMITY.

BEFORE the dissection of the parts situated within and about the pelvis, it is proper to take a review of its bony structure. Without an accurate knowledge of its form, dimensions, and relative position, as well as the situation and size of its openings, no just idea can be formed of the relative position of the organs contained within, of the manner in which they are protected from external injury, or the modes of access to them.

Remarks on the Bony Structure of the Pelvis.

The pelvis is of an indeterminate but symmetrical figure. Its *upper part* forms

an oval cavity, which is rendered more capacious laterally by the hollows of the ilia. It communicates by an *oval-like opening* [which is the upper opening of the pelvis] with an *inferior cavity:* This is a kind of canal, large in the middle, and contracted at its extremities, the inferior of which forms an opening called the *outlet of the pelvis.* It is in this inferior cavity that the pelvic viscera are chiefly contained, and in a practical point it is their relation to the outlet [or inferior opening of the pelvis] which is the most important. The *axis of the pelvis,* or a line which is carried through the middle of the inferior cavity, forms a considerable angle with the axis of the spine; so that when the body is in the erect posture the anterior and superior spinous processes of the ilia and the most prominent point of the pubes are nearly in the same perpendicular plane, the sacrum and posterior parts of the ilia become proportionably elevated, the superior opening faces upwards and forwards, and the outlet is turned downward and backward: In sitting, the body is sup-

ported on the anterior part of the tuberosities of the ischia. But in the different postures of the body, the relation of the axis of the pelvis to that of the vertebral column becomes considerably altered: In the horizontal posture the angle is more acute, and when the thighs are completely bent upon the trunk, as in placing a patient for the operation of lithotomy, the line of the axis of the pelvis and that of the spine will be parallel. It is to be borne in mind that the pelvic viscera will be materially influenced in position by these changes of posture.

The *outlet of the pelvis* is occupied in both sexes by a part of the genital organs. It forms three eminences and three depressions. The eminences are the two tuberosities of the ischia on the fore part, and the os coccygis behind, which does not descend nearly so low as the other eminences from circumstances that have been already explained. Of the depressions one, the arch of the pubes, is situated anteriorly. The other two depressions are comprehended between the ilia, ischia, sacrum and os

coccygis; the two sacro-sciatic ligaments are dividing each into three parts,—a superior through which the pyramidalis muscle and the sciatic, pudic and gluteal vessels and nerves pass,—a middle, smaller than the first, for the passage of the tendon of the obturator internus and the pudic vessels and nerves,—and an inferior part containing chiefly the fat and cellular membrane which is surrounding the extremity of the rectum.

The *organs contained within the pelvis* are protected by the peculiar form and disposition of the bones, assisted at the sides by the thick muscles at that part, and the parts of the femoral bones about their articulation, especially the trochanters; at the back part by the muscular mass attached to it and the posterior projections of the ilia.

The *dimensions of the pelvis* in the male are greater in a perpendicular direction than those in the female; as may be seen in the measurement of the distance between the tuberosity of the ischium and the brim of the pelvis or anterior and su-

perior spinous process of the ilium, &c. In the female on the contrary the horizontal dimensions preponderate; thus the cristæ of the ilia, the tuberosities of the ischia, &c. are more widely separated, the distance is greater between the sacrum or sacro-iliac symphisis and pubes, &c., and the angle of the arch of the pubes is more obtuse.

Dissection of the Parts of Inguinal Hernia.

The *parts concerned in Inguinal Hernia* (which are next to be described) are chiefly the spermatic cord and the parts connected with it in its passage from the abdomen to the scrotum.

The relative position of these parts will be best seen if the contents of the abdomen have been removed without injuring the lower portions of the abdominal muscles.

The dissection is to be begun by making

an incision in the course of the linea alba from the pubes to opposite the anterior and superior spinous process of the ilium, and another transversely to meet it from that process; the integuments are then to be turned back as far as the groin: This will bring into view a layer of that kind of cellular membrane before described, which has been named the *aponeurosis of the external oblique;* in tracing it downwards it will be observed to extend over the groin and to adapt itself to the spermatic cord in passing down upon it, and if a blowpipe be inserted under it at that part the air thrown in will be found to diffuse itself over the cellular membrane of the surface of the scrotum. In order to display the *lower portion of the external oblique*, a flap of the aponeurosis like that of the integuments is to be dissected back as low down as *Poupart's ligament:* This termination of the external oblique muscle will be seen stretched between the *spinous process of the os pubis* and the *anterior superior spinous process* of the ilium; the edge which it forms at this part is however indistinct, as

will be hereafter explained. Above and a little to the outer side of the spinous process of the os pubis the fibres of the tendon of the external oblique, interlaced as it were by other tendinous fibres, separate to form an opening which is called *the abdominal ring* [or to distinguish it from another opening presently to be spoken of, the *external* abdominal ring]; it is however neither to be considered round, nor as appearing an opening, for it is occupied in some measure by the cellular membrane which is filling up all interstices. Through it the *spermatic cord* is passing from the parietes of the abdomen to the scrotum, and becoming invested at this part as before described by the aponeurosis of the external oblique.

The next part of the dissection is for the purpose of tracing the oblique course of the cord from its leaving the abdomen to the part where it is making its appearance externally. It is to be done by carrying an incision from a little above the external abdominal ring in a somewhat semicircular direction outwards to opposite and

near the anterior superior spinous process of the ilium. Detaching then the tendon from the parts behind, above and below, the lowest fibres of the *internal oblique* will be seen, particularly those neither numerous nor strong which are passing from the outer half of Poupart's ligament to the pubes. Beneath its under edge the spermatic cord is obliquely passing to the external opening and acquiring a part of its muscular covering, as some fibres of the *cremaster muscle* are given off from the internal oblique. An incision through the internal, like that through the external oblique, shews the *transversalis muscle* disposed much in the same way as the internal oblique, its fibres few and weak, where arising from Poupart's ligament and becoming tendinous towards the pubes behind the external opening. The rest of the cremaster not furnished by the internal oblique is derived from the transversalis. It will be evident from the foregoing that if a blunt instrument be passed through the external abdominal ring it will be prevented from passing into the abdo-

men by the interposition of the tendon of the transversalis muscle. The fibres of the transversalis are now to be cautiously raised, beginning near to the spinous process of the ilium and cutting through the cremaster: A fascia will then be found to line its posterior surface, apparently attached to Poupart's ligament, of considerable thickness near to the ilium, but becoming thinner and more like cellular membrane towards the pubes: *This is the fascia transversalis.* In tracing the spermatic cord towards the abdomen, it seems to disappear about mid-way between the spinous process of the pubes and ilium; by insinuating a blunt instrument along the cord, and detaching the cellular membrane from around it, it will be found to pass through an opening in the fascia above described, which has been called the *internal abdominal ring.* This opening is lined posteriorly by the peritonæum, and it is here that the spermatic cord is formed, the vas deferens passing down into the pelvis, whilst the spermatic vessels and nerves are derived from above.

The relation then of the internal abdominal ring to the external opening is that whilst the latter is situated at the spinous process of the pubes, the former is placed midway between the spinous process of the pubes, and the anterior superior spinous process of the ilium, at the distance of an inch and a half from it, and above a line which is drawn from the top of the external opening horizontally outwards. The space between the two openings is called the *inguinal canal.* Consequently the *direction of the spermatic cord* within the canal will be inwards, downwards and somewhat forwards; in its course passing under the edges of the internal oblique and transversalis muscles deriving from them its muscular covering the cremaster, and receiving after it has passed the external opening, a further covering from the aponeurosis of the external oblique.

The *epigastric artery*, in taking its course from its origin at the external iliac, inwards and upwards to the rectus, is situated a little to the inner side of the internal

ring, and is placed behind, and to the inner side of the cord as it crosses it at a right angle.

The parts of Inguinal Hernia in the Female.

In the female the *round ligament* is occupying the place of the spermatic cord of the male in the inguinal canal. From being smaller the parts through which it passes are more contracted.

[Practical Points]. *The reduction of inguinal hernia—The adaptation of trusses —The operation for strangulated inguinal hernia.*

Dissection of the parts of Crural Hernia.

The *parts concerned in Crural Hernia,* are chiefly those which are connected with the passage of the vessels at the groin.

The study of this part of anatomy should be begun by examining the manner in which the thigh is separated from the abdomen, and the means by which they are

communicating. The peritonæum is to be removed from the lower part of the abdomen; then behind and below Poupart's ligament [which has received the name of the *crural arch*] the *opening* may be perceived by which the iliac vessels are passing from the posterior part of the abdomen to the upper and anterior part of the thigh. This opening is chiefly occupied by the *femoral artery*, and on its pubic side by the *femoral vein;* to the inner side of the vein one or more *absorbent glands* will be found. The space around the opening between the body of the os pubis and Poupart's ligament is filled up:—Behind by the *psoas* and *iliacus muscles* and the fascia covering them: This the *fascia iliaca* is attached to the inner labium of the crista of the ilium, is extending behind the iliac vessels and to their inner side to be attached to the linea ilio-pectinea, is found particularly firm where assisting to shut up the abdomen at the outer part of the iliac vessels behind the crural arch, and is sending a *portion with the femoral vessels* into the thigh—Before by the *fascia trans-*

versalis, which has been already spoken of as forming the internal abdominal ring, in describing the parts connected with inguinal hernia. After lining the posterior part of the abdominal muscles and being closely attached to the crural arch, it unites on the outer side with the fascia iliaca between the anterior superior spinous process of the ilium, and the iliac vessels, the place of their junction being marked by a white line; on the inner it is extending to the pubes, but becoming thinner and less distinct, and it is sending out a *process* which descends behind the crural arch and passes before the femoral vessels into the thigh. The portion of the fascia iliaca which is passing with the femoral vessels from behind, and the portion of the fascia transversalis which is passing with them from before, appear by their union at the sides to form the *femoral sheath;* this at the beginning is of a funnel shape which is flattened from before to behind, it becomes contracted a little below the crural arch.

By detaching the sheath from its connexions on the pubic side, it will be found

that to the inner side the space behind the crural arch is narrowed by a horizontal portion of tendon of a triangular figure extending from the arch to the opposite part of the os pubis, and presenting a sharp edge towards the femoral vein: It is called *Gimbernat's ligament* or the third insertion of the external oblique muscle.

The dissection is to be prosecuted by examining the relation and connexion of these parts with those situated *externally*. After removing the integuments, that which has been called the *aponeurosis of the external oblique* may be traced extending over the groin and descending upon the thigh: It covers the *inguinal glands*, which are clustered together at this part, and portions of it are dipping in between them. The aponeurosis may now be dissected back to display the *fascia lata*, which will be seen attached to *Poupart's ligament* rendering its rounded edge indistinct. But the fascia lata may be said to be composed of two portions at the upper part:—an outer and more dense one attached to nearly the whole extent of Poupart's ligament, which

covers the muscles at the fore part of the thigh, and in a great measure the femoral vessels, but over them terminates in a more or less distinct *crescent-shaped edge* [sometimes called the falciform process]; —and an inner, deeper-seated and thinner portion attached to the pubes, which covers the muscles at the inner part of the thigh, seems to pass behind the femoral vessels, and unites with the outer portion some little way below the crural arch. Through this *opening of the fascia lata*, thus formed by its two portions, a part of the sheath of the femoral vessels may be perceived; and the *vena saphæna major*, which rises up from the inner part of the thigh, may be traced to its termination at the femoral vein. When the absorbent glands are removed which are seated about this part, the inner side of the femoral sheath will be found to have numerous perforations; this *cribriform structure* allows of the communication between the inguinal absorbent glands and those situated within the sheath, but renders the fascia forming the sheath weaker at this part.

[Practical Points]. *The reduction of crural hernia—The adaptation of trusses—The operation for strangulated crural hernia.*

Dissection of the Outlet of the Pelvis.

Some *parts situated at the outlet of the pelvis* are next to be considered. The integuments are to be first carefully raised in that part of the perineum which is before the anus and bounded laterally by the rami of the ischia and pubes. A layer of *aponeurosis* more or less distinct will come into view, of the same kind as has been already described: In tracing its extent it will be found to be attached to the rami of the pubes and ischia; and if a blow-pipe be inserted under it, the air thrown in will insinuate itself through the cellular membrane of the scrotum as far as the groins, shewing its connexion with the aponeurosis of the external oblique. This, together with the fat occupying the space are to be

removed, and the *muscles of the perineum* may be dissected. The *arteria perinei*, a branch of the internal pudendal, will be seen entering the perineum between the sphincter ani and erector penis; it continues its course between the bulb and crus of the penis towards the scrotum, to which it is distributed, giving branches to the accelerator urinæ, erector penis, sphincter ani and cellular substance of perineum.

By separating the bulb and crus of the penis, and removing the acceleratores urinæ, it will be found that the triangular space formed by the rami of the ischia and pubes is occupied by a *ligamentous septum* attached to them, to which the *bulb of the penis* is firmly bound down, and through which the urethra, where it forms its membranous part, is passing.

The dissection is to be continued in the space behind the anus and tuberosities of the ischia, which is bounded behind by the os coccygis, and laterally by the edges of the glutæi maximi muscles, which are passing from the os coccygis behind the tuberosities of the ischia. The *extremity of the rectum* is situated in the middle of the

perineal space between the posterior parts of the tuberosities of the ischia; surrounded by the *sphincter ani*. A considerable quantity of fat is to be removed from the space betwixt the glutæi and sphincter ani muscles; the *posterior fibres of the levator ani* muscle then come into view, and the manner in which this part of the outlet is shut up may be observed: The posterior fibres of the levator ani will be seen to be directed from before obliquely backward, and attached to the os coccygis, but between it and the sphincter ani, to be united by the meeting of the fibres from the opposite sides. Connecting the fibres of that muscle and apparently attached to the *posterior sacro-sciatic ligament*, which is situated above the edge of the glutæus maximus, is a *dense membranous structure* which is assisting in supporting and defending the pelvic viscera.

Dissection of the Cavity of the Pelvis.

In order to complete the knowledge of the disposition and connexion of the con-

tents of the pelvis [of which the best general idea is gained by the side-view of the pelvic viscera, which the student is supposed to have made himself master of—] the dissection may be varied and be begun from behind.

The glutæi muscles are to be raised at the back part, and the whole posterior part of the pelvis is to be laid bare. A perpendicular section of the pelvis is then to be made by cutting through the ilia from their cristæ into the upper part of the ischiadic notch: The rectum is to be cut through about three inches above the anus, and the upper portion removed with the sacrum. By thus laying bare the cavity of the pelvis, the relative situation of its contents may be examined without that displacement which some of them undergo in making the side view of the pelvis. The form and situation of the *urinary bladder* will be well displayed, especially if it be inflated to about half its capacity: The *peritonæum* will be observed to cover its posterior surface, and afterwards to turn upon the anterior and inferior part of the *rectum*. It is to be

carefully dissected from the gut, and will be seen to leave it at the base of the vesiculæ seminales, but to be attached some little way downwards between them, ending in a semicircular line the convexity of which is anteriorly. Proceeding with the dissection between the bladder and rectum, the *vesiculæ seminales* are to be cleaned, without detaching them from their situation, and the space is to be examined which is formed between them by the attachment of the peritonæum behind and by the vasa deferentia, placed to the inner side of the vesiculæ seminales, laterally. A *triangular portion of the bladder* is thus circumscribed, between which and the rectum only a small quantity of cellular substance is interposed. The apex of this triangle is situated about two inches higher than the verge of the anus, the prostate being unenlarged. At the neck of the bladder the *Prostate gland* is placed, directly above the junction of the acceleratores urinæ with the sphincter ani: Its extent may be felt by passing the finger up the rectum, and it is displayed by

turning on each side the levatores ani at that part. From the prostate is passing the *membranous part of the urethra* under the arch of the pubes. At this part besides the *anterior fibres of the levatores ani*, processes of *dense cellular membrane* are assisting in shutting up the cavity of the pelvis.

It will be understood from the foregoing description, that the *urethra*, between the posterior part of the bulb [which is connected with the ligamentous septum of the perineum] and its commencement at the bladder, is fixed, from passing through parts which do not admit of motion. It is making likewise between the bulb and its commencement a considerable curve, rising upwards for the space of two inches. Its relation to the arch of the pubes will however be altered in proportion as the axis of the pelvis is becoming parallel with that of the vertebral column.

[Practical Points]. *Passing the catheter —Puncturing the bladder from the rectum or perineum—Abscess in perineo—Course of pus—Fistula in perineo—Operation for*

fistula in ano—Enlarged prostate—Lithotomy.

Relative Position of the Femoral Artery.

The *Femoral artery* begins at the crural arch, and is there situated nearly midway between the spinous process of the os pubis, and the anterior superior spinous process of the ilium. It takes its course downwards upon the anterior and inner part of the thigh, and about the upper part of the lowest third of the thigh passes through the tendon of the adductor magnus, and receives the name of popliteal artery.

Anteriorly:—It is first covered by the integuments, aponeurosis, inguinal glands, some fat and fascia lata, in the triangular space formed by the crural arch above, by the sartorius to the outer side, by the adductor longus and gracilis muscles to the inner side. Lower the sartorius crosses it obliquely, covering it as far as its

passage through the tendon of the adductor.

Posteriorly:—It is placed in its passage behind the crural arch on the os pubis, but is separated from it by the pectineus: To this and the adductor brevis and longus muscles, it corresponds in the rest of its course, more or less fat being interposed between it and the latter.

To the outer side:—It is contiguous to the anterior crural nerve, and the psoas and iliacus muscles. It corresponds to the sartorius at some distance. Below it is closely applied to the vastus internus, which separates it from the os femoris.

To the inner side:—It is accompanied by the femoral vein which is inclined to its posterior side. It approaches the adductor, and is close to it below.

It will be remarked therefore that the femoral artery is taking its course close to bone at two places,—at the os pubis above, behind the crural arch, and below near to the os femoris. Superiorly it has the more immediate bony support, as the moderate thickness of the pectineus muscle is alone

interposed between it and the bone: At the same time the artery is here more superficial, both from the want of muscles at this part and the projection of the os pubis. Inferiorly it is separated from the os femoris by the considerable thickness of the vastus: It is removed from the skin by the sartorius and the projection of the adductor longus and gracilis. Above it is contiguous to muscles, below it is surrounded by them, in the middle it is loosely connected to the more solid parts by much fat and cellular membrane.

[Practical Points] *Femoral aneurism—Compression of the artery—The operation for popliteal aneurism.*

Dissection of the Ham.

At the bend of the knee posteriorly, having dissected back the integuments, an *aponeurosis* [such as has been before described] must be cut through in order to display the *fascia lata* which will be found thin at this part. From the separation of the muscles, a *hollow* is formed at this

part of a triangular figure; it is bounded by the *semi-membranosus* and *semi-tendinosus* at the inner side, by the *biceps cruris* muscle at the outer. This diverging of the flexors of the leg may be observed in the living body, and the prominences which they form have been vulgarly called the ham-strings. The triangular space above described is lengthened below by the separation between the heads of the *gastrocnemii muscles*, both of which are received between the inferior extremities of the flexors. Having removed some of the fat which fills the bend of the joint, the *posterior crural nerve* will be seen at the upper part to divide into the *posterior tibial* and *peroneal nerves;* the first descends nearly vertically, whilst the latter is taking the course of the biceps. Prosecuting the dissection by penetrating deeper than the posterior tibial nerve, a little to its inner side, and partly covered by it, the *popliteal vein* will be seen, and still deeper seated in some degree to the inner side of the vein, the *popliteal artery.* Considerable *branches* are given off by the artery, the

articular, surales, &c. The *saphæna minor vein* and many *twigs of nerves* are likewise found in this space.

The *edge of the semi-membranosus* would direct an incision down to the popliteal artery.

The *course of the popliteal artery* is obliquely downwards and outwards. It begins, as before described, at the upper part of the lowest third of the thigh, and terminates at the lower part of the uppermost fourth of the leg.

Relative Position of the Popliteal artery.

Posteriorly:—It is covered in the greater part of its course by the popliteal vein and posterior tibial nerve. It corresponds at first to the edge of the semi-membranosus, but lower to the fat and cellular membrane, which occupies the popliteal space and separates it from the common coverings. At the upper part of the leg it is connected with the gastrocnemius, soleus and plantaris muscles.

Anteriorly:—It corresponds to the os

femoris, from which it is separated by fat and cellular membrane, to the articulation of the knee joint, and to the popliteus muscle.

To the outer side:—It is first contiguous to the biceps, becomes afterward separated from it by fat and cellular membrane, and is placed close to the outer head of the gastrocnemius, to the soleus and plantaris.

To the inner side:—It approaches the semi-membranosus, but is separated from it by fat and cellular membrane though not so far as from the biceps. Lower it corresponds to the tibial nerve and inner head of gastrocnemius.

From these relations it will be observed that the artery is surrounded above by muscles, though loosely connected with them; but below is firmly embraced by thick and strong muscles. In the whole of its course it is situated in fat and a loose cellular structure. In the popliteal space it is only separated from the femoral bone by fat and cellular membrane; but it will be with difficulty compressed on

account of the projection of the muscles at the sides, which separate it from the surface; and such compression must act first on the tibial nerve.

[Practical Points.] *Popliteal Aneurism —The operation of taking up the Popliteal artery.*

FINIS.

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