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A Brief synopsis of

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A BRIEF SYNOPSIS
OF SOME OF THE
LECTURES ON ANATOMY

GIVEN BY

PROF. C. L. FORD, M. D.,

UNIVERSITY OF MICHIGAN.

1883.

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A WORD OF EXPLANATION.

I have been in the habit for years of placing on the black-board a synopsis of each lecture.

The requests to have these printed have been so frequent, that I have decided to comply with that wish, and try the experiment of enabling each student to have at hand a copy, in the hope of aiding to follow, and more readily review, the lectures afterwards.

If, in this respect, my hopes seem to be realized, I will at another time extend the series more nearly to embrace the topics discussed in the entire course.

While these notes by no means include all matters considered, they indicate the general plan pursued, in displaying parts by dissection in the lecture room.

DISSECTION OF THE ABDOMEN.

What to study on the abdomen.

Mode of preparing it for dissection; objects.

Boundaries of zones, imaginary lines: where?

Perpendicular lines, where drawn, regions.

Reasons for thus dividing the surface.

Umbilicus, what is it? where is it? appearance.

Blood-vessels in and beneath the skin, where?

What nerves, and from what source derived?

Where do the lymphatics of the region pass?

Structure next beneath the skin, nature.

Fascia, composition, what layers? fleshy, thin.

Muscles of the abdomen to be studied:

I. Lateral group of muscles on the abdomen.

1. External oblique,
2. Internal oblique,
3. Transversalis,
4. Quadratus lumborum.

II. Anterior group of muscles.

1. Pyramidalis,
2. Rectus abdominis.

Regions demanding special attention-

Principally two, umbilical and inguinal.

IMPORTANT SURGICAL REGIONS.

Inguinal region; location ?

Inguinal hernia. What is hernia ?

Parts to be studied on the cadaver.

Muscles involved in permitting hernia.

External oblique,

Internal oblique,

Transversalis.

Cause and nature of weakness of the parts.

Obliquity of passage an element of safety.

What and where is Poupart's ligament ?

In what structure is the external abdom. ring ?

Where is ring situated; distance from centre ?

What is the size and shape of the opening ?

How can we examine it during life ?

What are the boundaries of the ring ?

Nature of external and internal pillars.

Inter-columnar fascia; what and where ?

Structure passing the opening; size of cord.

What conceals the opening at first ?

What its relation to spine of the pubis ?

Important to distinguish hernia and varicocele.

How trusses may do injury to one.

HERNIAL REGION, Continued,

Review the parts studied yesterday.

Inguinal canal, occupied by cord.

Its length, one and a half to two inches.

Direction upwards and outward.

Size varies with the cord. Results of fat.

Boundaries of the inguinal canal, what?

Anteriorly: tendon of external oblique m.

Superiorly: internal oblique and transversalis.

Inferiorly: Poupart's ligament; shape.

Posteriorly: transversalis fascia & conj. tend.

Internal ring; its location; appearance.

In what structure? How arranged?

How are the rings protected against hernia?

Internal epigastric artery; where found.

Its origin, direction, distribution, size?

Ordinary coverings of Hernia:

DIRECT.

OBLIQUE.

1. Skin.	1. Skin.
2. Superficial fascia.	2. Superficial fascia.
3. Intercolum, fascia.	3. Intercolumnar fascia.
4. Conjoined tendon.	4. Cremasteric fascia.
5. Transversalis f.	5. Infundibuliform f.
6. Peritoneum.	6. Peritoneum.

ABDOMINAL WALLS, Continued.

Dissection of abdominal muscles.

1. External oblique; origin, insertion, action.
Its surrounding relations; interdigitations.
Direction and termination of its fibres.
Its aponeurosis—meaning of the term.
2. Internal oblique; its location. O. I. A.
Arrangement of its tendon—how united.
Fan-shaped arrangement of fibres. Where?
3. Transversalis; parts in contact. O. I. A.
Its fibres; how arranged and united.
Its tendon; contribution to sheath of rectus.
4. Pyramadalis; location; not constant. O. I. A.
5. Rectus abdominis; location. O. I. A.
Sheath in which it is enveloped; thickness.
Formation of its front layer. How?
Its relations to the linea transversæ.
Relation of posterior sheath to muscle.
Linea transversæ; nature, number, use.
Linea semilunaris. Where? How formed?
Linea alba. How formed? Meaning?
Nature of opening in it. How closed?
What surgical interest has it? When?

OPENING ABDOMINAL CAVITY.

Structures outside of peritoneum.

Fascia transversalis; nature, use.

Fascia interna. Cooper's fascia. Why?

Where relatively most important? Why?

Remains of urachus. What and where?

Remains of umbilical arteries. Where?

Remains of umbilical vein. Where?

Peritoneum; appearance as opened.

Objects presented at first view. What?

Objects seen without displacing any.

Peritoneum; nature, extent, object.

General character of serous membranes.

Its numerous reflections. Names.

Omentum majus. Gastro-colic omentum.

Epiploon. Purpose of it. Location.

Gastro-splenic omentum. Where? How?

Mesentery. What it contains. Uses.

Meso-cæcum; meso-colon; meso-rectum.

Boundaries of abdominal cavity; shape.

Contents of different regions. Exhibit.

Attachment and mobility of organs.

Modified by peritoneal adhesions.

ALIMENTARY CANAL, DEFINE.

Its successive portions. Eleven.

1. Mouth. Its extent and general purpose.
2. Fauces. Location; boundaries.
3. Pharynx. Location; connections.
4. Œsophagus. Commencement; ending.
5. Stomach. General character; object.
6. Duodenum. Its location; extent.
7. Jejunum. Commencement; character.
8. Ileum. Meaning; location; termination.
9. Cæcum. Location; appendix vermiformis.
10. Colon. Commencement; course; ending.
11. Rectum. Location; shape; ending.

Total length of intestines: great variation; 30 ft.

General structure of this canal, involuntary.

General purpose which it serves.

What are the accessory organs? Where?

Salivary glands. Name and location.

Buccal glands. Labial glands. Where?

Tonsils. Location; structure; object.

Pharyngeal glands. Location; use.

Œsophageal glands. Location; extent.

To be considered in another connection.

ABDOMINAL VISCERA.

Stomach. Its nature and purpose.

Its universal presence in animals; necessity.

Its immense variety of modifications.

Required by great variety of food.

Its simplicity in man; in carnivora.

Its complexity in herbivora—sheep.

Essentially a dilatation of alimentary canal.

General form of the human stomach.

Its orifices, cardiac and pyloric; location.

Its curvatures, greater and lesser; where?

Its surfaces, anterior and posterior; change.

Its length, depth, and thickness; 12, 6, 3.

Its coats, *serous*, *muscular*, *cellular*, *mucous*.

Its alveoli on internal surface; nature.

Immense number. Peptic glands; peptic cells.

Arteries: gastric, gastro-hepatic, gastro-splenic.

Its veins: location; destination of its blood.

Its nerves: pneumogastric and ganglionic.

Structure at pyloric orifice; object.

Its connection with the duodenum.

The aggregate extent of the inner surface.

Stomach 100 square inches; variation great.

INTESTINES. SUBDIVISIONS.

General attachment and mobility.

Their coats. *Peritoneal*. Extent; attachment.

Muscular: Arrangement of layers; order.

Cellular: Location; different names; why?

Mucous: General properties; epithelium.

Valvulæ conniventes: Nature, extent.

Villi: Extent; confined to small intestines.

Their structure, shape, size; number, 4,000,000.

Lacteal: Commencement, destination, use.

Number, variation—4 to 10 millions; extent.

Follicles of small intestines; nature; where.

Number estimated as high as 35 millions.

Duodenal or Brunner's glands; where found.

Solitary, or glandulæ diffusa; where?

Peyer's, or glandulæ aggregata; where?

Follicles of large intestines; numerous.

Mesenteric glands, 130 to 150. Name.

Shape, size, location, structure, use.

Lacteal vessels. Location, structure, use.

Origin and termination, like lymphatics.

Thoracic duct; relation to lymphatics.

Location of receptaculum chyli; where?

STUDY OF INTESTINES, Continued.

Primary division into small and large.

Duodenum. Its shape; direction of its parts.

Opening of ducts into it. At what part?

Its structure above and below the ducts.

Valvulæ conniventes: where they commence,

Duodenal, or Brunner's glands, where?

Villi, in what part of duodenum found?

Jejunum. Where does it commence?

Parts found within; general arrangement.

Its length and changes as we descend.

Ileum. Reason of the name. Where?

Structures found in the intestines.

Glandulæ aggregata, or Peyer's glands.

Their general arrangement—20 to 30 patches.

Valvulæ conniventes. Arrangement. Where?

Their distribution—from 600 to 800.

Villi. Their structure and shape.

Vessels in them. Muscular fibre. Epithelium.

Lacteal. Their origin and course.

Their final destination and arrangement.

Glands which their fluid must pass.

Square inches of small intestines, 1,400.

INTESTINAL CANAL, Continued.

Total length, 30 feet. Not uniform.

Length of each subdivision. Repeat.

Small intestines already considered.

Cæcum. Its relations to ileum and colon.

Ilio-cæcal valve. Its structure and object.

Appendix vermiformis. Location, length, size.

Glandular character of its inner surface. Use.

Colon. Subdivisions. Location of each.

Peculiarities of the sigmoid flexure—what?

Its appearance. Arrangement of muscular coat.

Structures found on its inner surface—what?

Total surface of alimentary canal, 2,000 s. in.

Stomach, 100 sq. in. for vascular absorption.

Small intestines, 1,400 for 2 kinds absorption.

Large intestines, 500, for vascular absorption.

Total, 2,000 sq. in. for vascular absorption.

1,400 square inches for lacteal absorption.

Trace the course of chyle to the heart.

Trace material absorbed by vessels to the heart.

Through what structures does each pass?

Clearly distinguish the two plans of absorption

Also the two routes to the heart.

GLANDULAR ORGANS.

Liver. Position. Relation to diaphragm.
Length, 10 to 12 inches. Transverse in body.
Breadth, 5 to 8 inches, antero-posterior.
Thickness, 1 to 3 inches. Thickest part, where ?
Surfaces, convex and concave. Contact.
Notches in borders, where ? Appearance ?
Structures covering liver, what ? Describe.
Capsule of Glisson, where ? Nature ?
Ligaments, 5. U. F. C. R. L. Use ?
Lobes, 5. R. L. S. C. Q. Where ?
Fissures, 5. U. P. G, b. D, v. V, c. Show.
Vessels, 5. H, a. P, v. H, v. H, d. Lymphatics.
Peculiarities of portal vein. Describe.
Vessels uniting to form vena porta, what ?
Nerves supplying the liver. Source.
Gall bladder. Location; size; use.
Its structure. Cystic duct. Hepatic duct.
Ductus choledochus. Length; termination.
Size of duct. Biliary calculi, where ?
Channels for portal blood to the heart.
General purpose of portal circulation.
By what forces is portal blood moved ?

GLANDULAR ORGANS, Continued.

Spleen. Its location and connections.

Its general presence in the animal kingdom.

Its length, breadth, and thickness, 5, 2, 1, in.

Its weight, 4 to 8 oz. 15 to 20 lbs. Even 40.

Its investments, its trabeculæ, where ?

Its vessels; entrance and exit; hilus.

Destination of its blood; direction.

Very large size of its vessels; inference.

Great elasticity of its veins. Use. Dilate.

Nerves supplied to the spleen. Source.

Various offices assigned to the spleen.

Pancreas. Location; general direction.

Its relation to the duodenum; its head.

Its length, width, and thickness, 6, 2, 1.

Its weight, 3 to 6 oz. Little prone to change.

Duct. Location, size, termination. Where ?

Conglomerate gland. Abdom. salivary gland.

Arteries supplying it; source, location.

Veins; location. Destination of blood.

Nerves; source; how supplied to it.

General presence in vertebrata.

Remarkable freedom from disease.

FUNCTIONS TRIBUTARY TO DIGESTION.

I. *Prehension*, and prehensile apparatus.

Mouth, lips, tongue, suction apparatus.

Sucking power of mammalia, human.

Hands and all modifications of extremities.

Hands of quadrumana; differ from man.

Forearm and hand of carnivora; use.

Rodentia: handy use of anter. extremity.

Proboscis of elephant, 40,000 muscles.

Tongue of giraffe; of ant-eater; of ox.

Birds: long bill, numerous modifications.

Tongue long, barbed, to transfix prey.

Hyoid apparatus, for protruding tongue.

Reptiles: prehensile jaws, recurved teeth.

Orifice for receiving food, large. Snake.

Insects: long, flexible tube. Suctoria.

II. *Mastication*. Where performed.

Muscles of mastication in man, what?

Teeth; their uses in mastication.

Their adaptation to different foods.

Motion of jaws in different animals.

Articulation of jaw to this end.

Carnivorous and rodent jaw contrasted.

TRIBUTARY FUNCTIONS, Continued.

III. *Insalivation.* Meaning of the term.

Sources of this secretion in man.

Salivary glands. Number; name; location.

Their general presence in animals.

Their absence in fishes. Reason for this.

General character of their secretion.

Importance of thorough insalivation.

IV. *Deglutition.* Apparatus concerned.

Passage of food through fauces. Tongue.

Relation of tonsils to food passing.

Pharynx, its extent and connections.

Motions of soft palate in deglutition.

Upper part of pharynx closed off. How?

Agency of the tongue in moving food.

Closure of the glottis, how effected.

Constrictor muscles of pharynx; action.

What part of act of deglutition voluntary?

Conditions required to secure the act.

Agency of glosso-pharyngeal nerve in it.

Action of œsophagus in deglutition.

Passage of food into the stomach.

Structure of the œsophagus. Describe.

PERINEUM. Parts to be studied.

Osseous boundaries, modified by ligaments.
Greater and lesser sacro-sciatic notches.
Greater and lesser sacro-sciatic ligaments.
Division into triangles. Boundaries.
Anterior, or genito-urinary triangle.
Posterior, rectal, or anal triangle.
Penis: location; parts composing it.
Corpora cavernosa. Crura. Attachment.
Their structure. Septum pectiniforme.
Corpus spongiosum urethra—where?
Prepuce. Glans penis- Corona glandis.
Adherent prepuce. Cause of trouble.
Neck. Structure covering glans, frenum.
Glandular apparatus. Secretion.
Meatus urinarius. Size, shape.
Fossa navicularis. Size, shape.
Urethra. How enclosed, relative size, bulb.
Spongy, membranous, and prostatic portions.
Structure: muscular, fibrous, mucous.
Arteries of penis—from what source derived.
Veins; location and termination.
Nerves; their source and distribution.

DISSECTION OF PERINEUM.

Anterior triangle; parts within it.
Superficial fascia, its connections—where ?
Superficial perineal fascia—where ?
Muscles covered by it. Its relations to them.
Accelerator urinæ; location, O. I. action.
Erector penis; erector clitoridis- Where ?
Transversalis perinei; irregularity; O. I. ac.
Bulb of urethra. How covered, shape.
Arteries of the region; origin, distribution.
Veins of the region; their distribution.
Deep perineal fascia; triangular ligament.
Opening for passage of urethra—where ?

Posterior triangle.

Superficial sphincter ani; location.
Arrangement of fibres; origin, insertion.
Internal sphincter ani; nature, extent.
Its location, its width, action.
Structure of the two sphincters. Use.
Ischio-rectal fossa; structures occupying it.
Levator ani; its shape, origin, insertion, use.
Arteries: their source and distribution.
Veins: peculiarities, termination.

SCROTUM, TESTES, Etc,

1. Skin; its character, raphe, hairs.
2. Dartos; its position, nature, use.
3. Inter-columnar or spermatic fascia.
4. Cremasteric fascia; its nature, use.
5. Fascia propria of cord; whence derived.
6. Tunica vaginalis reflexa; nature.
7. Tunica vaginalis propria, where ?
8. Tunica albuginea; mediastinum testis.
9. Tunica vasculosa; pia mater testis.

Of proper gland structure and ducts.

1. Tubuli seminiferi, $\frac{1}{16}$ of inch in diameter.
2. Lobuli testis, 300x16 feet—Monroe.
3. Vasa recta, 20 to 30, $\frac{1}{8}$ of inch in diameter.
4. Rete testis—where situated, nature.
5. Vasa efferentia, 15 to 20, where located.
6. Coni vasculosi, 15 to 20, 6 inches long.
7. Globus major and globus minor, what ?
8. Epididymis, location, 20 feet—doubt.
9. Vas deferens, structure; $\frac{1}{8}$ of an inch.

Course to termination, 2 feet—where ?

Vesiculæ seminales; ejaculatory duct.

Course and termination of duct.

URINARY ORGANS.

Kidneys, 4 inches long, 3 wide, 1 thick.
Location, investment, color, shape.
Supra renal capsules, location, shape.
Size at different ages. Supposed use.
Hilus of kidney, location, shape, use.
Vessels of kidney, artery, arrangement.
Vein, termination, quality of blood.
Ureter, location, size, termination, use.
Coats of this canal—muscular, fibrous, mucous.
Pelvis of kidney—shape, structure, location.
Infundibuli—number, nature, where ?
Calix, papillæ, Malphigian pyramids.
Cortical and medullary portion, where ?
Tubuli uriniferi: arrangement, termination.
Malphigian bodies or corpuscles, where ?
Arrangement of vessels in these bodies.
Arrangement of veins among tubuli uriniferi.
Cells lining the tubuli uriniferi—use.
An immense secreting or eliminating surface.
Termination of ureters in bladder, where ?
Oblique or valvular mode of opening.
Size of orifice in bladder. Results.

BLADDER AND ASSOCIATED PARTS.

Its location and shape, vary with age.

Fundus, body, base, location of each.

Peritoneal covering: where and how much ?

Muscular coat: arrangement of layers.

External, detrusor urinæ; plan.

Circular, irregular, oblique vary.

Sphincter vesicæ: structure, location.

Influence of elastic tissue in sphincter.

How is the orifice of the urethra opened ?

Closed by reflex nervous influence.

Prostate gland: general shape and location.

Structure of prostate, largely muscular.

Its glandular element, follicular pouches.

Prostatic sinus: openings into sinus.

Sinus pocularis: location, size, direction.

Veru montanum or caput gallinaginis.

Uterus masculinus: reason for the name.

Ejaculatory ducts opening near it.

Homology of this arrangement, trace.

Lobes of prostate gland; number.

Views concerning the third lobe.

Its great pathological importance.

DISSECTION OF HEAD AND FACE.

1. Muscles above the orbit :

Occipito, frontalis; location, O. I. action.

Pyramidalis nasi; formation, action.

Orbicularis palpebrarum, O. I. action.

Corrugator supercilii; location, O. I. ac.

II. Muscles between orbit and mouth.

Orbicularis palpebrarum, location.

Levator labii sup. et alæ nasi, location.

Levator labii sup. proprius, connections.

Levator anguli oris, location, direction.

Zygomaticus major and minor, where ?

Depressor labii superioris, its location.

Orbicularis oris and buccinator, where ?

III. Muscles between mouth and chin :

Orbicularis oris and buccinator, extent.

Depressor anguli oris, shape, location.

Depressor lab. inferioris, and lev. lab. inf.

Vessels, artery, branches & anastomoses.

Vein, commences, ends, location on face.

Nerves, facial, where distributed—use.

Trifacial, its three places of exit on face.

Distribution and power imparted by it.

DISSECTION OF NECK.

Boundaries of quadrilateral—what ?

Division into primary triangles—how ?

Important operations performed in neck.

In median line, Laryngotomy, Tracheotomy.

In carotid triangle, ligature of arteries.

In subclavian triangle, in occipital triangle.

Parts to be displayed by dissection, landmarks.

Removal of integument. Elasticity. Utility.

Superficial fascia, nature, extent, connections.

Platysma-myoid muscle; its character, extent.

Its relation to deep structures, attachments.

External jugular vein; commence, terminate.

Anterior jugular vein; location, irregular.

Deep cervical fascia; nature, extent, covers.

Sterno-cleido-mastoid muscle; its description.

Relation of its deep surface, and its borders.

Parts concealed by it. What overlapped by it.

Omo-hyoid muscle; origin, direction; etc.

Obliquely	{	Platysma myoid—action.
Ascending		Sterno-cleido-mastoid—action.
Group of M.		Omo-hyoid—action.

DISSECTION OF NECK, Continued.

Salivary glands. Three, relative size.

Parotid; location, reason of the name.

What structures cover the gland; thick

Its extent, superiorly, and inferiorly, where ?

Its extent anteriorly and posteriorly, where ?

Relation of its deep parts, with what ?

Effect upon the gland by opening mouth.

Excretory duct of gland; begin and end.

Its structure, and location on the face; rule.

Vessels entering and leaving the gland below.

Vessels entering and leaving it above, where ?

Structures leaving it in front; what ?

Nerves associated with this gland.

Facial ; its exit from the cranium; where ?

Its arrangement in the gland—plexus.

Branches from it, what and where. Direction.

Muscles supplied by this nerve. Location.

Auricularis magnus nerve joining; where ?

Relation of Facial and Trifacial nerves.

What is the real seat of Neuralgia ?

Lymphatic glands in parotid region.

Diseased lymphatic and parotid confounded.

DISSECTION OF NECK, Continued.

Directly { Sterno-hyoid.
Ascending { Sterno-thyroid.
Group of M. { Thyro-hyoid.

Origin, insertion and action of each one.

Their relation to each other. Shape, ribbon.

Parts or organs lying beneath them.

Operations made between them, where?

Laryngotomy. Where made. What divided.

Crico-thyroid space, membrane. Thickness.

Vessels found on the membrane, what?

Its source distinction, danger of irregularity.

Tracheotomy; parts involved in the operation.

In what part of trachea? What decides?

Parts covering trachea in front; depth; fascia.

Thyroid gland; of what parts composed.

Its location, connection, size of different parts.

Arteries supplying the gland; their source.

Veins from it; location, place of termination.

Direction of trachea; size, appearance.

Œsophagotomy; where made, dangers.

Parts requiring attention. What to avoid.

Reasons for selecting the left side.

DISSECTION OF NECK, Continued.

Change in location of parts by stretching.

Submaxillary triangle; boundaries.

Digastric muscle; location, origin, insertion.

Direction of its bellies: shape of each, action.

Submaxillary gland: shape, size, vessels.

Parts covering the gland; lymphatic glands.

Its excretory duct. Wharton, termination.

Supra-Hyoid	{	Mylo-hyoid.
group		Genio-hyoid.
of muscles		Genio-hyo-glossus.
Four.		Hyo-glossus.

Mylo-hyoid: shape, location, action, use.

Forms floor of mouth, attachments. Where?

Genio-hyoid: origin, insertion, direction, action.

Genio-hyo-glossus: shape, action of diff. parts.

Hyo-glossus: location, size, action.

Branches of external carotid artery: where?

Superior thyroid: location, direction, branches

Lingual: origin, direction, branches.

Facial: origin, course below the jaw.

Its relation to submaxillary gland.

Branches in neck: variation in origin.

MUSCLES OF MASTICATION, ETC.

Masseter, size, shape, how covered, O. I. A.

Temporal: relation to temporal fascia, O. I. A.

Internal pterygoid, origin, direction, action.

External pterygoid, origin, direction, action.

Nerve supplying these muscles; source.

Muscle at upper part of neck; where.

Obliquely descending group, Four.	{	Digastric. Stylo-hyoid. Stylo-glossus. Stylo-pharyngeus.
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Digastric, direction of bellies and tendon.

Stylo-hyoid, direction; how pierced.

Stylo-glossus, its action on the tongue.

Stylo-pharyngeus, relation to constrictors.

Nerves displayed in this dissection.

Hypo.glossal, exit, direction, distribution.

Descendens noni, name, distribution, use.

Glosso-pharyngeal, direction, distribution.

Occipital-artery, origin, direction, distribution.

Posterior auricular, distribution, size.

Internal carotid artery; course up the neck.

Its relation to internal jugular vein.

MOUTH AND ASSOCIATED PARTS.

Mouth: Its boundaries, lining membrane.
Soft palate; structure, attachments.
Muscles associated with it, and how.
Palato-glossus: palato-pharyngeous; size.
Levator palati: circumflexus, or tensor palati.
Fauces: location, boundaries, extent.
Parts circumscribing fauces. Tonsils, size.
Pharynx: extent, shape of cavity, location.
Openings into pharynx: posterior nares.
Eustachian tube: size, direction of passage.
Openings from pharynx: glottis, where?
Its communication with Œsophagus.
Structure of pharynx: muscles, number.
Constrictors: stylo-pharyngeous; pal.-pharyn.
Vessels: their source, size, carotid artery?
Nerves: whence derived, special use.
Pharyngeal glands: location, use.
Tongue: muscles associated with it.
Palato-glossus; stylo-glossus; hyo-glossus.
Genio-hyo-glossus: lingualis; shape.
Nerves supplied to the tongue: what?
Papillæ of tongue; three varieties.

APPENDAGES OF THE EYE.

Eye-lids: internal and external canthus.
Tarsal cartilages: shape, location, attachments.
Cilia: their location, use; prominent bulb.
Meibomian glands: location, shape, use.
Conjunctiva: nature, extent, connections.
Plica semilunaries: caruncula lachrymalis.
Lachrymal apparatus: general purpose.
Lachrymal gland: shape, size, location.
Lachrymal ducts: place of opening; number.
Lachrymal papillæ: location, size, appearance.
Lachrymal canals: open., direction, termination
Lachrymal sac: location, shape, size, bones.
Nasal duct: direction, size, termination.
Muscles within the orbit eight, outside, one.
Muscles acting on the eyelids: two; name.
Muscles acting on the eye-ball: six; name.
Recti: general arrangement; action of each.
Oblique: their arrangement and action.
Arteries within the orbit: origin, distribution.
Nerves to the orbit; how many pairs.
Motor oculi: muscles supplied by it.
Fourth and sixth nerve: muscles supplied.

DISSECTION OF EYE-BALL.

Its form and general division.

Sclerotic coat; location, structure, use.

Cornea; structure, union with sclerotic.

Choroid; its location and connections.

Its external layer—*venæ vorticosæ*.

Its middle layer—*tunica Ruyschiana*.

Its internal or pigmentary layer—use.

Ciliary ligament, and ciliary processes.

Retina; location, formation, termination.

Its external layer, or Jacob's membrane.

Its middle, granular, nummular.

Its internal or nervous layer, contact.

Membrana limitans, what and where?

Arteria centralia retinae, arrangement.

Chambers of the eye, how occupied.

Anterior and posterior, how connected.

Iris; location, structure, object, action.

Crystalline lens; location, structure, use.

Capsule of lens; its connection, structure.

Vitreous humor, or vitreous body, where?

Vessels to the eye-ball, their source.

Nerves supplying iris, their source.

THORAX AND CONTENTS.

First, the study of their location.
Mode of opening thorax to secure views.
Boundaries of thorax: in what manner.
Superiorly: first rib and fascia; shape.
Inferiorly diaphragm: shape; structure.
Posteriorly: vertebræ and ribs; shape.
Laterally: ribs and intercostal muscles.
Anteriorly: sternum and costal cartilages.
Depth of thorax: anteriorly, laterally, poste.
Division: pleural cavities; mediastinum.
Reflections of pleura: space between.
What immediately behind the sternum ?
Position of heart: base, apex.; where ?
Its relation to median line of body: show.
Projection from median line, each side.
Where does the apex of the heart present ?
What is between the sternum and heart ?
Relation of lung to the heart; inflate.
Structures in thorax above the heart.
Thymus gland in foetal life; where ?
Appearance of vessels there exposed ?
Membrane enveloping the heart; inflate.

RESPIRATORY APPARATUS.

Trachea: commencement; termination.
Its structure: rings; their investment.
Where incomplete: structure uniting them.
Bronchial tubes: length, direction, size.
Structure throughout the lungs; purpose.
Cartilage: plan of arrangement; use.
Muscular structure: agency in respiration.
Mucous membrane: ciliated epithelium.
Lungs: lobes in each; division; pleura.
Their general shape; apex, base, edge.
Lobules: number of cells in each.
Estimated number of air cells; size.
Estimated surface for respiration; vary.
Arrangement of capillaries: where?
Parenchyma of lungs: elasticity.
Blood-vessels to nourish lungs: source.
Pulmonary artery, and pulmonary veins.
Nerves: pneumogastric, pulmonary plexus.
Persistent air; Residual air 100 C. I.
Supplemental air, 100; Tidal air, 25.
Complemental air, 100 cubic inches.
Thickness of membrane between air & blood.

CHANNELS FOR CIRCULATING FLUIDS.

1, Arteries; 2, veins; 3, capil.; 4, lymph.; 5, lac.

1. *Arteries*: reason of the name; old views.

Their general character and uses: action.

Direction of the circulation, forces.

2. *Veins*: structure compared with arteries.

Direction of the blood current.

Valves: formation and uses.

Arteries and veins: relative capacity.

3. *Capillaries*: general character.

Their size, length, arrangement.

Their function in regard to tissues.

4. *Lymphatics*: peculiarities; where.

Their general structure; valves.

Material circulated; its source.

5. *Lacteals*: where found; appearance.

Commencement; mode of origin.

Destination of the fluid they contain.

All these channels closed tubes.

How do fluids enter and leave?

Forces that move the fluids.

Ceaseless motion of circulating fluids.

Do blood discs pass through walls of vessels.

CIRCULATORY APPARATUS.

Heart: central organs; location.
Its general shape when distended.
Primary division: right and left.
The pulmonic and systemic heart.
Reason of name: respective use.
Division into auricle and ventricle.
No communication between sides.
General use of each cavity of heart.
Harmonious action of right and left.
Course of blood through the heart.
Right auricle: location at base of heart.
Its general shape and appearance.
Appendix auriculæ: where situated.
Vessels opening into right auricle.
Superior vena cava: where seen.
Inferior vena cava: place of opening.
Coronary sinus: where situated.
How formed; source of its blood.
Coronary valve: its location and use.
Foramina thebesii: what are they ?
Musculi pectinati: what ? where ?
Tuberculum Loweri: where seen; use.

RIGHT SIDE OF HEART, Continued.

Fossa ovalis: where is it situated ?
How caused and what does it show ?
Annulus ovalis: its appearance.
Where does foramen ovale exist ?
When and in what manner closed ?
Eustachian valve: where and why ?
Opening from right auricle: where ?
Ostium venosum: size; appearance.
Tricuspid valve: its appearance.
What is seen within right ventricle ?
Columnæ carneæ: their appearance; use.
Chordæ tendineæ: their attachment.
Closure of the valve: how and where ?
Opening from right ventricle: where ?
Conus arteriosus: what and where ?
Pulmonary artery: origin, direction.
Its length; division, direction of each.
Valve at its commencement; name.
Shape of semilunar valve: closure.
Sinus of Valsalva: where ? appearance.
Corpuscle of Arantius: where ? use.
Show action of valves with blow-pipe.

HEART, Continued. LEFT SIDE.

Left auricle; its position.

Vessels opening into it; number.

General plan of arrangement, show.

How can the left auricle be seen ?

What between left and right auricle in front ?

What between the two posteriorly ?

Where do the pulmonary veins originate?

Peculiarities of pulmonary veins.

Opening from left auricle, where ?

Valve closing the opening; name.

Resemblance to what other one ?

Name the parts associated with it.

What is the size of the ostium arteriosum ?

Course of blood from ventricle.

Location of aorta: where ? size ?

What valve at its commencement ?

Sinus of Valsalva: what ? where ?

Corpuscle of Arantius; their use.

Columnæ carneæ: where ? use ?

Lining membrane of ventricle.

Septum ventriculorum, plan.

Illustrate action of valves by blow-pipe.

REGION OF FEMORAL HERNIA.

Its proximity to inguinal hernia.

Sex most common—why ? Diagnosis.

Superficial fascia: nature, extent; where ?

Superficial vessels: what ? where ? size ?

Inguinal glands: location, number.

Fascia lata: extent, attachments; illustrate.

Iliac and pubic portions: why ? where ?

Saphenous opening: size, shape, location.

Falciform border: attachments, tension.

Cribriform fascia: its nature; where ?

Crural arch: how formed, shape, size.

Structures passing beneath it—where ?

Their relative position; weak point.

Femoral canal; what and where is it ?

Femoral sheath: how formed, nature.

Femoral ring: location, boundaries, size.

Its crural septum: what and how formed.

Seat of stricture in hernia; position to relax.

Obturator artery: usual place; irregular.

Coverings of hernial tumor in order.

1, skin; 2, sup. fascia; 3, cribriform; 4, sheath of vessels: 5 septum crurale, 6 peritoneum.

ANTERIOR FEMORAL REGION.

What to study. Surgical landmarks.
Superficial fascia: its character.
Inguinal glands: their location.
Superficial vessels of the region, what ?
Arteries: number, names, destination.
Veins: source, location, destination.
Fascia lata: attachments, extent.
Its general character, subdivisions.
Scarpa's triangle: its boundaries.
Parts contained within it; covered.
Structures passing under Poupart's ligament.
Femoral vein: location, change of relation.
Femoral artery: branches arising from it.
Origin of profunda-femoris, where ?
Its location and principal branches.
Circumflex and perforating, where ?
Anterior crural nerve: location.
Its formation and distribution; branches.
Artery in middle of the thigh; where ?
Muscle covering it, how arranged.
Where does artery disappear from front ?
Hunter's canal: where ? formation ? use ?

MUSCLES ON FRONT OF THIGH.

I. *Superficial Group.* Three muscles.

1. Tensor vaginæ femoris: location, use.

Its relations to fascia lata, origin, insertion.

Fascia lata: relations to thigh; to knee.

Thick, thin, reflexions, attachments.

2. Sartorius: length, location, coverings.

Change of relation in descending; O. I. A.

3. Gracilis: location, shape, origin, insertion.

Its relation to adductor group of muscles.

II. Group of muscles. Adductors. Four.

1. Pectineus: location, shape, direction; O.I.A.

Structures lying on and passing over it.

2. Adductor longus: gen. shape, posit., O.I.A.

Its relation to other adductors; tendon.

3. Adductor brevis: its position, O. I. action.

Nerves and vessels passing over it.

4. Adductor magnus: relative size; where ?

Parts in contact and perforating it.

General blending of adductor group.

Vessels perforating these—where ? what ?

Nerves supplying these muscles.

Have these muscles more than one action ?

FRONT OF THIGH, Continued.

III. Flexor muscles of thigh: three.

1. Psoas parvus: location, irregularity.

Reasons for placing in this group.

2. Psoas magnus: location, covering, O.I.A.

Relation to lumbar plexus of nerves.

Place and mode of blending with iliacus.

3. Iliacus internus: location, shape, O. I. A.

Its relations to capsular ligament.

A bursa beneath; its relation to hip joint.

Union with psoas; direction to insertion.

Anterior crural nerve: location, formation.

Branches of distribution; gen. direction.

Branches of femoral artery; their course.

IV. Muscles on front of thigh—four.

Rectus femoris: location, shape, O. I. A.

Vastus internus: shape, location, O. I. A.

Vastus externus: size, location, O. I. A.

Crureus: its relation to the vasti muscles.

Its relation to femur, blending, O. I. A.

Relation of these four to knee joint.

Relations to patella; they envelop femur.

Vascular supply—whence derived?

DISSECTION OF GLUTEAL REGION.

I. Group of thigh extensors—three.

Gluteus maximus: location, shape.

Arrangement and direction of fibres, O.I.A.

Its relations to trochanter major; bursa.

Its relations to fascia lata; aponeurosis.

2. Gluteus medius: shape, location, O. I. A.

Direction of fibres of anterior portion; use.

3. Gluteus minimus: location, shape, O. I. A.

Secondary action of glutei muscles, as

Abductors, and internal rotators. Show.

What portion can cause the latter motion ?

What muscles perform abduction ? Illust.

II. External rotator group—six.

1. Piriformis : its location, direction, action.

2. Gemellus superior: origin, insertion, direc.

3. Obturator internus: location, shape, O.I.A.

4. Gemellus inferior : relation to obturator.

5. Obturator externus: location, how exhibit.

6. Quadratus femoris: location, shape, action.

Arteries of this region, source, distribution.

Nerves: greater and lesser sciatic, where ?

Place of exit from the pelvis; formation. ?

POSTERIOR PART OF THIGH.

I. Flexor muscles of the leg—four.

1. Semitendinosus; shape, location, O. I. A. ?
2. Semimembranosus; arr. of tendon O. I. A.
3. Biceps flexor cruris; relation to others O.I.A.
4. Popliteus; its location, peculiarity O. I. A.

Which are the hamstring muscles ?

Boundaries of the popliteal space; shape.

Structures passing behind the knee; what ?

Popliteal nerve; whence derived, where ?

Popliteal vein; where located ? size.

Popliteal artery; location, depth, size.

Its relation to the bone in the space.

Branches of the popliteal artery; what ?

Relation of the artery to gastrocnemius, M.

Relation of popliteal nerve to the same, M.

Peroneal nerve; whence derived ? location.

Its important surgical relation; where ?

Vein empty. into popliteal; whence ? name.

Course of great sciatic nerve from pelvis.

Branches supplied in the thigh.

Arteries supplying posterior of thigh; what ?

Anastomoses, ligature of popliteal.

DISSECTION OF LEG.

- . Posterior view, superficial landmarks.
 - Superficial vein, external saphenous.
 - Commencement, course, termination.
 - Internal saphenous vein; location.
 - External saphenous nerve; location.
 - Other cutaneous nerves; their source.
- I. Superficial group of muscles—three.
 - 1. Gastrocnemius; location, shape, O. I. A.
 - Vessels and nerves supplying it; source.
 - 2. Plantaris: location, its irregularity, O. I. A.
 - 3. Soleus: its location, size, shape, O. I. A.
 - Union to form tendo-Achilles; where?
 - Vessels and nerves beneath the soleus.
 - Posterior tibial artery; location, branches.
 - Position on lower half of the leg; where?
 - Posterior tibial nerve; destination.
 - Arteries from popliteal; distribution.
 - Structures on the bottom of the foot.
 - Plantar fascia; its attachments.
 - Arrangements of its three portions.
 - Its relation to the first group of muscles.
 - What vessels are superficial to fascia.

DISSECTION OF LEG. Front.

I. Anterior tibial group of muscles—three.

Fascia covering the muscles in front.

Anterior annular ligament and its use.

Its formation and attachments; strength.

1. Tibialis anticus; its location, extent.

2. Extensor longus pollicis; its relation.

3. Extensor digitorum communis; where?

Dissection and description of each.

Artery in front of the leg; its source.

Branches of anterior tibial; where?

Its origin and course to the foot.

Its branches on the dorsum of the foot.

Where and with what does it anastomose?

Nerves on the front of the leg; source.

Internal saphenous; source, distribution.

Musculo-cutaneous; source, distribution.

Anterior tibial; its course to termination.

Muscle on the dorsum of the foot.

Extensor brevis digitorum; O. I. action.

Tendons between the malleoli in front.

Their number, order and destination.

Relation of artery to these tendons.

DISSECTION LEG. Posterior Deep,

I. Posterior group of muscles—three.

1. Tibialis posticus; location, direction.
2. Flexor longus pollicis; location, direction.
3. Flexor longus digitorum; destination.

Dissection and description of each.

Exchange of tendons in the foot.

Posterior tibial artery; commencement.

Its branches; peroneal, distribution.

Its location and direction the on leg.

Its position near malleolus; where?

Posterior tibial nerve; begins where?

Its course down the leg; branches.

Its position at the ankle; where?

II. Superficial group of muscles on the foot.

1. Abductor pollicis; appearance.
2. Flexor brevis digitorum; where?
3. Abductor minimi digiti; where?

Dissection and removal; parts exposed.

Vessels and nerves under this group.

Plantar artery; arrangement, branches.

Plantar nerve; location, destination.

Arrangement of tendons in the foot.

DISSECTION LEG AND FOOT.

I. Peroneal group of muscles--three.

1. Peroneus longus: location, direction.

2. Peroneus brevis: location, length.

3. Peroneus tertius: location, blending.

Dissection and description of each.

Arrangement of tendons at the ankle.

I. Between the malleoli in front: four.

1. Tibialis anticus; 2. extensor longus pollicis.

3. Exten. long. digitorum; 4. peroneus tertius.

II. Behind the inner malleolus; three.

1. Tib. post. 2. Flex. long. dig. 3. Flex. long. pol.

III. Behind the external malleolus; two.

1. Peroneus longus; 2. Peroneus brevis.

IV. Between the malleoli, behind; one.

Tendo Achilles: three muscles united.

Second layer of muscles on the foot; five.

Musculus accessorius and 4 lumbricales.

Third layer of muscles on sole of foot; four.

1. Flex. brevis pollicis; 2. Adductor pollicis.

3. Flex. brev. min. dig.; 4. Transversalis pedis.

Plantar interossei, between bones, three.

Dorsal interossei, between metacarp. bones, four.

DISSECTION OF UPPER EXTREMITY.

Dissection of shoulder and axilla.

Pectoralis major muscle: location, shape.

Structures covering the muscle; gland.

Origin; direction of different parts.

Insertion; its relation to deltoid, vein.

What structures does this muscle conceal ?

Its relation to axillary border; shape there.

Vessels and nerves in front of shoulder.

Pectoralis minor: location, shape, direction.

Boundaries of axilla: its depth, shape.

Parts to be studied in the axilla.

Axillary glands: location, number, 10 to 12.

Course and termination of lymphatics.

Connective tissue of the axilla; nature.

Axillary vein: formation, location, ending.

Axillary artery: commencement, location.

Branches arising from it—what ? where ?

Distribution of these branches; size.

Nerves found in the axilla—where ?

Axillary plexus: how formed, size.

Nerves forming it, 5th, 6th, 7th, & 8th, & 1st d.

Nerves given off from the plexus.

DISSECTION OF BACK AND SHOULDER.

Integument covering the dorsal region.
Trapezius: its shape, location, O. I. A.
Latissimus dorsi: shape, size, location.
Its relation to axillary boundary; form.
Levator anguli scapulæ: location, O. I. A.
Rhomboid minor: shape, direction, O. I. A.
Rhomboid major: shape, direction, O. I. A.
Nerves seen in this dissection; source.
Vessels: their sources and destination, where ?
Deltoid muscle: shape, location, action.
Its relation to the head of the humerus.
What structures does this muscle conceal ?
Supra-spinatus: its location, destination.
Infra-spinatus: location, insertion, action.
Teres minor: origin, insertion, action.
Teres major: relation to latissimus dorsi.
Subscapularis: location, origin, insertion.
Vessels supplying shoulder joint; source.
Nerves distributed around the joint, what ?
Supra-scapular: source, where ? to what ?
Circumflex: origin, distribution, name.
Repeat origin, insertion and action of muscles.

ANTERIOR BRACHIAL REGION.

Importance of this region. Why ?

Accidents occurring in venesection.

1. Injury to cutaneous nerves—where ?
2. Injury to the median nerve.
3. Injury to the bicipital aponeurosis.
4. Injury to the lymphatics of the arm.
5. Injury to the brachial artery—where ?

Veins on the forearm and arm—where ?

Radial two, anterior and posterior; union.

Ulnar two, anterior and posterior; union.

Median, median cephalic, median basilic.

Brachial vein: formation, location, size.

Venæ comites of radial and ulnar artery.

Cutaneous nerves: what and where found.

Median nerve: location at elbow, destination.

Lymphatics: where found, destination, course.

Brachial artery: location, division—where ?

High bifurcation: importance—why ?

Biceps flexor cubiti muscle; describe.

Relation of vessels and nerves to the muscle.

Where is artery most superficial, in danger ?

Remaining muscles of arm—describe.

DISSECTION OF FOREARM.

Four classes of muscles on the forearm.

Of these, 2 are on the front: pronators & flexors.

Pronators two; illustrate their action.

Pronator radii teres: origin, direction, inser.

Pronator quadratus: location, surg. interest.

Flexors of two classes, carpal and digital fl.

Short flexors inserted into metacarpal bones.

Flex. carp. rad. palmaris long. flex. carp. uln.

Illustrate origin, direction, insertion, action.

Long or digital flexors, 3; location, insertion.

Their relation to interosseous membrane.

The blending of these muscles at their origin.

Radial artery: its location and course to wrist.

How concealed where it cannot be felt.

Its branches near its origin, and downwards.

Superficialis volæ: origin, course, anastomosis.

Course of radial artery to its termination.

Formation of deep palmar arch; branches.

Ulnar artery: origin, direction, location, under.

Its branches, recurrent, interosseous; course.

Course of artery to the wrist, how concealed.

Important irregularity in course from elbow.

FOREARM, Continued.

Nerves on the forearm: what? where?

Cutaneous nerves: origin, distribution.

Ulnar nerve: location at elbow; where?

Its course towards wrist; how concealed.

Its relation to ulnar artery; where? how?

Median nerve: location at bend of arm.

Its course downwards to the wrist; trace.

Where enter the palm; in company with what?

Branches along the forearm; to what?

Radial nerve: location; from what source?

Its general distribution on forearm.

Its relations to the radial artery: where?

Supinator group of muscles: two; location.

Origin, direction, insertion, and action.

Extensor group of muscles: nine; where?

Short extensors; three; to metacarpal bones.

Long extensors; three; to digits, flat.

Oblique extensors: three; to thumb?

Common or blended origin of muscles.

Arrangements at the annular ligament.

Synovial sheath; formation of ganglion.

Anterior and posterior annular ligament.

ANATOMY OF THE HAND.

Palmar fascia: its attachments; strength.
Parts lying immediately under it.
Superficial palmar arch: location.
How formed? digital branches; where?
Branches from deep palmar arch; where?
Formation of deep palmar arch; how?
Nerves to the hand and digits; where?
Median nerve; where enter the palm?
Its position in the palm; branches; what?
Location of nerves along the digits.
What digits supplied by median nerve?
Ulnar nerve: where enter the palm?
Digits supplied by ulnar nerve.
Flexor muscles to digits: three; names.
Flexor sublimis digitorum; O. I. A.
Arrangement of tendons along digits.
Flexor profundus digitorum; O. I. A.
Arrangement of sheath for these tendons.
Lumbricales muscles: their insertion.
Arrangement of tendons on dorsum of hand.
Relation of tendons to joints of digits.
Interossei, dorsal, and palmar, location.

NERVOUS SYSTEM.

Cerebro-spinal, and ganglionic.

Cerebro-spinal: name and location.

Cerebro-spinal axis: meaning of the term.

Cerebro-spinal system: what it includes.

Mode of opening cranium: object.

Structures concerned in protecting the brain.

Hair and scalp: influence in protecting.

Cranium: thickness of bones; strength.

Its different layers: diplœ; object.

Interior of skull, everywhere arched.

Encephalon: meaning of the term.

Membranes, and blood-vessels included.

Dura-mater, arachnoid, and pia-mater.

Nature and purpose of dura-mater.

Its relations to cranium at top, and base.

Channels within it, nature and purpose.

Internal reflection, falx., tentorium, object.

Arachnoid: location, extent, character.

Its relation to pia-mater; subarachnoid space.

Pia-mater: relation to brain, extent, object.

Arteries to supply brain: place of entrance.

Arrangement in pia-mater; purpose.

NERVOUS SYSTEM, Continued.

Brain—four parts included in the term.

Cerebrum: its division into hemispheres.

Division of hemisphere into lobes—three.

Lobes made up of convolutions.

Convolutions made up of gray and white matter.

Great median fissure; where? how occupied?

Convolutured surface of brain; where found?

Depth of sulci, and arrangement of gyri.

Commissura magna, or corpus callosum.

Slice through the hemisphere; centrum ovale.

Ventricles of the brain; number, nature.

Roof of lateral ventricle; how formed?

Parts seen in floor of the ventricle.

Corpus striatum; where? appearance.

Tenia semicircularis; where? shape.

Optic thalami; where? appearance.

Lateral ventricles; how separated?

Septum lucidum; fifth ventricle between.

Fornix; its shape and location.

Choroid plexus; where, what is it?

Velum inter-positum; nature.

Venæ Galeni; direction of blood.

DISSECTION OF BRAIN, Continued.

Third ventricle; location, communications.
Foramen com. anterius or iter ad infundibulum.
Foramen com. posterius, to fourth ventricle.
Corpora quadrigemina; their location, shape.
Cornua from lateral ventricles; where end.
Fourth ventricle; location, how shown?
Relations to pons Varolii and Med. oblongata.
Removal of brain to show base and nerves.
Principle of numbering cranial nerves.
Remove and show direction of nerves to exit.
Parts shown as the brain is removed.
Cerebellum; location, how protected?
Lateral lobes; superior and inferior ver. proc.
Laminated character of surface; Arbor Vitæ.
Pons Varolii; relation to cerebellum; where?
Its structure, connection; direction of fibres.
Medulla oblongata; location, connections.
Division, crossing of its fibres, where?
Corpus pyram., connections above and below.
Corpus olivare; shape, location, grooves.
Corpus restiforme; appearance, where?
Posterior pyramidal body, bounds ventricle.

SPINAL CORD.

Provision for its protection; nature.

Its location, size, enlargements.

Its length in the infant and adult.

Its enveloping membranes; object, strength.

Theca vertebralis, relation to dura Mater.

Its relation to the bones and to the cord.

Exit of nerves from it; sheath of nerves.

Relation of this sheath to vertebræ; object.

Arachnoid, subarachnoid space, where?

Pia mater; structure, relation to cord.

Ligamenta denticulata; where? object.

General appearance and structure of cord.

Essentially a series of ganglia in line.

Median fissures of the cord, ant. and post.

Lateral partial grooves—three columns.

Anterior, lateral and posterior columns.

Origin of roots of nerves; appearance.

Direction of roots in different regions.

Place of union; where? ganglion on root.

Do these ganglia belong to sympath. system?

Arrangement of nerves as they emerge.

Divisions, cervical, dorsal, lunbar, sacral.

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