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ENGRAVINGS

OF

THE ARTERIES.

BY J. P. HOPKINSON, M. D.

DEMONSTRATOR OF ANATOMY IN THE UNIVERSITY OF
PENNSYLVANIA, &C. &C.

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TO
WILLIAM E. HORNER, M. D.
PROFESSOR OF ANATOMY IN THE UNIVERSITY OF
PENNSYLVANIA, &c. &c.

MY DEAR SIR,

The great interest you evince in anatomical pursuits, and the indefatigable exertions, for the instruction of your pupils, that characterize your course of lectures, induce me to hope that any effort to facilitate the progress of the student of anatomy, will meet with a favorable reception at your hands. This little production, however, advances another claim to your kind attention, since the "*Special Anatomy*" has been assumed, mainly as a guide in its composition. Should the former be found worthy to attend the latter, the great object in its construction must be accomplished.

With assurances of the highest esteem and personal regard,

I remain your's sincerely,

J. P. HOPKINSON, M. D.

Philadelphia, January 1, 1833.

ADDRESS TO THE AMERICAN STUDENT OF MEDICINE.

IN putting forth this collection of drawings, illustrating the distribution of the arterial system, it is to you that I now address myself, as it is for you that the work was undertaken. Numerous as are the treatises on the subject of the arteries, accurate and elegant as may be the engravings accompanying them, they are generally much too expensive to find a place on the table of the medical student, whose means (often limited,) should be most ample, to meet all the demands made upon them, during the course of a medical education.

Such engravings, too, being more calculated to revive particulars which had only escaped the memory, than to impress them originally, are better placed in the hands of a graduate who once knew them, than of a student who has yet to learn them. Being executed on a grand scale, and with much pretension, the difficulty of reference is exactly so much the greater. The more perfect and complete the work, in fine, the less is it calculated to render assistance to a beginner in the study, who requires simplicity and conciseness of description, and facility of reference. This is not said with a view to detract from the merit of any such work, but rather as an apology for offering a production, in many respects so inferior to its predecessors.

Since I have been engaged in teaching anatomy, I have constantly remarked the great difficulty encountered by the student in learning the arterial ramifications, and how easily he forgot them. This, I believe, has arisen from the improper mode in which he undertook to learn them: I will therefore offer a remark on this subject.

There are two ways in which the arteries are studied: The one consists in committing to memory, merely, the names of the main trunks—the branches that come off from them, and the order of their succession: This is book anatomy. The other is the dissecting and tracing out the arteries in connection with the muscles, nerves, &c. that surround them: This constitutes surgical anatomy. The first prepares, simply, for an examination: the second for actual practice. Now it unfortunately happens, in the usual course of instruction, that the latter mode, if ever pursued at all, is made to precede the former. Thus, during the first winter, the student goes through his dissecting campaign, and gets some general ideas of anatomy—*seldom more*. The second winter arrives, and he is a candidate!—He has no time to dissect now: the time is too *precious* for that: he must read over the lectures—anatomy among the rest. Now it is, that he pores over the muscles—the nerves—the arteries &c. and perhaps commits them to memory. Upon this he graduates, and commences the practice of surgery!—Is not this an occurrence of every year, and is it not to be regretted? I will not here urge upon you the importance of dissections, but merely suggest a plan, by which you may acquire a more useful knowledge of the vascular and nervous systems, at least. Suppose you reverse the order generally adopted, and

study them first, learning them by rote, if you will, (since this seems so essential,) so that you can enumerate all the principal branches, as they come off in succession; you may then proceed to the dissection, with more ability to trace them, and a better chance of recollecting them, in their most important relations to other parts.

Generally, the main object of pursuit with the young anatomist, is the muscular system, because it is less difficult, and affords more employment to the hands and knife; and seldom does he finish his first subject, with more than a general knowledge of the muscles, and the contents of the great cavities. If, however, you endeavor from the very commencement, to learn somewhat of the arteries and nerves, while engaged in dissecting the muscles, or can accomplish so much, as once to know them well in this way, all the associations of this first dissection, will be easily revived by the book;—and thus it will assist you, which is, perhaps, all that it can do. Now, it is with the hope of facilitating the accomplishment of both these objects, in relation to the arterial system, that this work has been undertaken, of which I shall next say a few words.

The plan adopted, consists in a duplicate representation of the arteries. In the one, the outline only is presented, with a view of assisting the memory, in retaining the order of their origin from the principal trunks, and of imparting some preparatory knowledge. In the other, as much of the vessels as can be seen in their relative position to the muscles, is displayed in a representation of the part of the body to which they are distributed. In neither of these is perfect accuracy made an object, and much less in the former than in the latter. Preciseness is often made subordinate to the more important consideration, of avoiding confusion, as actual dissection is all essential, and will easily correct such inaccuracies.

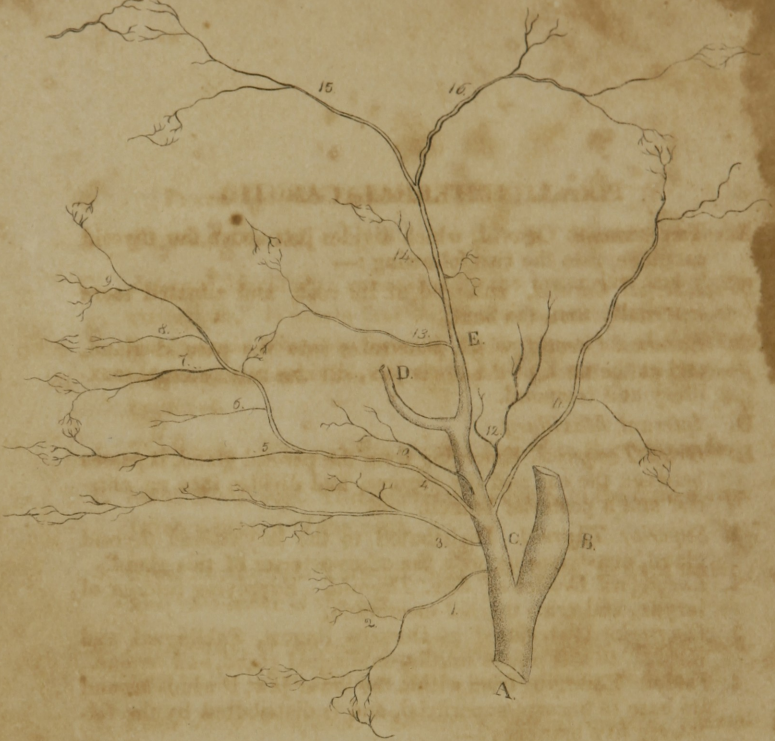
In the *outline* representing the arterial ramifications only, my object has been to represent what may be considered *the first lesson*, in which every thing is sacrificed to clearness of comprehension.

These are, in fact, merely copies from my common place book; of the diagrams, I have long been in the habit of using in my lectures, and of the utility of which, I am able to adduce from experience, the strongest evidence. One addition has been made, to which I would specially invite attention. The various anastomoses of the arteries, constitute so important a part of their history, particularly in relation to surgical operations, where sometimes the regular channel is interrupted, and the blood obliged to find a new route, that I have introduced from authorities all the principal anastomoses and communications, existing among the branches. This will be useful, by becoming at any moment an easy reference on that point.

Such as it is, this work has been made for you, and not for the author. Every unnecessary expense, and all useless display, have been avoided, to place it within the reach of every one, and to make it the student's companion in the dissecting room.

That these anticipations may not be unfounded, is the hope of
your Friend,

THE AUTHOR.



J.F.H. del.

Brown's Lith.

PLATE I. EXTERNAL CAROTID.

- ✓ A. *THE common Carotid*, which divides just above the thyroid cartilage, into the two following :—
- ✓ B. *Internal Carotid*, enlarged at its root, and situated more externally than the next.
- ✓ C. *External Carotid*, which penetrates into the parotid gland, and at the neck of the lower jaw, divides into internal maxillary and temporal.
- ✓ D. *Internal Maxillary*.
- ✓ E. *Great Temporal*. Emerging from the parotid gland, it passes between the ear and the zygoma, and divides into an anterior and a posterior branch.
 - ✓ 1. *Superior Thyroid*. Distributed to the larynx and thyroid gland, anastomosing with the other arteries of this gland.
 - ✓ 2. *Laryngeal Branch of Sup. Thyroid*. Supplying interior of larynx, and crico thyroid membrane.
 - ✓ 3. *Lingual*. Distributed as Dorsalis linguæ, Sublingual and Ranina, to soft palate tonsils, sublingual gland, and tongue.
 - ✓ 4. *Facial*. Emerging from within the lower jaw, it winds around its base to become superficial, and is distributed by the following five branches :—
 - ✓ 5. First, *Submental*, to the muscles inserted into the chin ; anastomosing with its fellow, inferior coronary, &c.
 - ✓ 6. Second, *Inf. Labial* : To the middle of the chin, sometimes wanting.
 - ✓ 7. Third, *Inf. Coronary* : To the lower lip and the chin, anastomoses with its fellow.
 - ✓ 8. Fourth, *Sup. Caronary* : To the upper lip, and anterior naris ; anastomoses with its fellow.
 - ✓ 9. Fifth, *Nasal* : To the ala nasi. The facial terminates at the internal canthus, anastomosing with the ophthalmic.
 - ✓ 10. *Inf. Pharyngeal*. To the muscles and mucous lining of the pharynx.
 - ✓ 11. *Occipital*. Deeply situated beneath the muscles of the mastoid process. Goes to back of head : anastomoses with the vertebral posterior temporal and its fellow.
 - ✓ 12. *Post. Auricular*. To the external ear, and side of the head.
 - ✓ 13. *Transverse of the Face*. To the muscles, on the side of face ; anastomoses with facial and infra orbital.
 - ✓ 14. *Middle Temporal*. Passes over zygoma, penetrates temporal aponeurosis, and anastomoses with deep seated temporals.
 - ✓ 15. *Anterior Temporal*. To superior and anterior portion of cranium, anastomoses with the ophthalmic and with its fellow.
 - ✓ 16. *Posterior Temporal*. To superior and posterior portion of cranium, anastomoses with the occipital and other temporals.

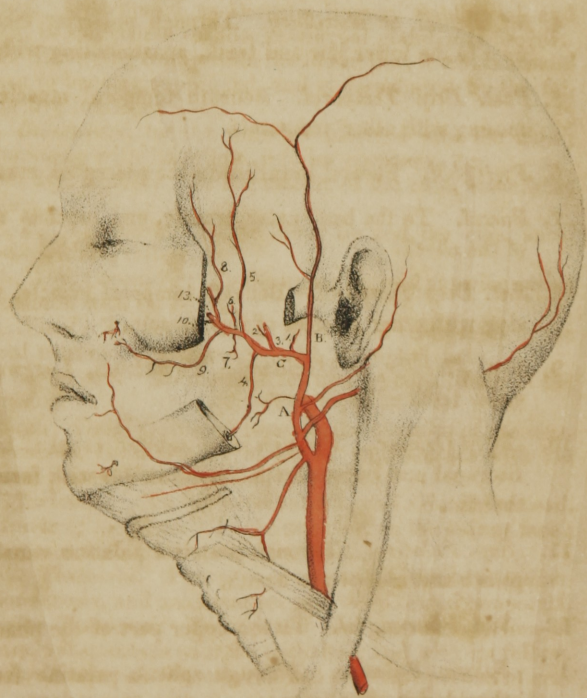
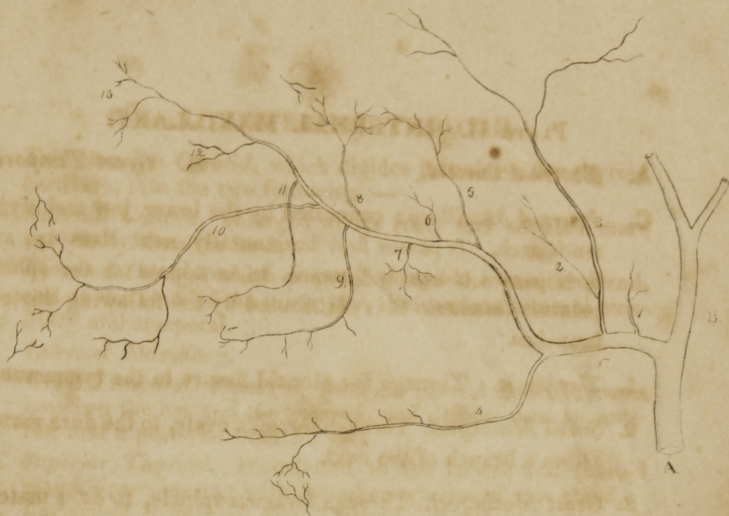
PLATE II. INTERNAL MAXILLARY.

A. *External Carotid.*

B. *Great Temporal.*

C. *Internal Maxillary*: concealed by the lower jaw and zygomatic arch. It passes first horizontally, next rises up, and then passes obliquely forward, to terminate at the sphenopalatine foramen. It is distributed by the following thirteen branches.

1. *Tympanic.* Through the glenoid fissure to the tympanum.
- ✓ 2. *Small Meningeal.* Through foramen ovale, to the dura mater. Often a branch of the next.
- ✓ 3. *Great Meningeal.* Through foramen spinale, to dura mater; also to interior of the ear.
- ✓ 4. *Inf. Dental, or Maxillary.* Through posterior mental foramen to the lower jaw and teeth, anastomosing with facial.
- ✓ 5. *Post. Deep Temporal.* Beneath temporal muscle, anastomosing with other temporals.
- ✓ 6. *Pteregoid.* Several branches to the pteregoid muscles.
- ✓ 7. *Buccal.* To the buccinator muscle, and mucous membrane of the cheek.
- ✓ 8. *Ant. Deep Temporal.* Beneath temporal muscle, anastomosing with other arteries of this muscle.
- ✓ 9. *Sup. Alveolar, or Maxillary.* To antrum. Large and small molar teeth of upper jaw.
- ✓ 10. *Infra Orbital.* Through infra orbital canal: to antrum. Bicuspid and incisor teeth: anastomoses with facial and orbital.
- ✓ 11. *Sup. Palatine.* Through posterior palatine canal: to soft palate and roof of the mouth.
- ✓ 12. *Sup. Pharyngeal.* To the upper part of the pharynx.
- ✓ 13. *Spheno Palatine.* Through sphenopalatine foramen, to schneiderian membrane.



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Subclavian & Axillary



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PLATE III. SUBCLAVIAN AND AXILLARY.

- A. *Aorta*. From its origin at the heart.
- B. *Innominate*. The root of the right carotid and right subclavian.
- C. *Left carotid*. Arising directly from the aorta.
- D. *Left Subclavian*. The next trunk, coming from the aorta.
- E. E. *Axillary*. The continuation of the subclavian.
 - 1. *Vertebral*. Passing to the foramen, in the transverse process of the sixth cervical vertebra. Ascends to the brain.
 - 2. *Inferior Thyroid*. Sending off the ascending cervical, and then passing beneath the carotid and jugular, to the thyroid gland, there anastomosing freely.
 - 3. *Superior Intercostal*. To the two upper intercostal spaces.
 - 4. 4. *Internal mammary*. To the diaphragm and abdominal muscles. It anastomoses with the intercostal arteries, and with the epigastric. *
 - 5. *Post. Cervical*. Crosses the neck, to the muscles of the scapula, above.
 - 6. *Sup. Scapular*. From axillary : to back of scapula. Anastomoses with scapular artery.
 - 7. *Sup. Thoracic*.
 - 8. *Long Thoracic*.
 - 9. *Acromial Thoracic*.
 - 10. *Axillary Thoracic*.
- 11. 11. *Scapular*. To the muscles of the scapula : Teres : subscapular, &c.
- 12. *Dorsal Branch*. To back of scapula : anastomoses with superior scapular.
- 13. *Anterior Circumflex*. Surrounds neck of humerus in front : to deltoid and shoulder joint : anastomoses with scapular and the next.
- 14. *Posterior Circumflex*. Passing posteriorly around neck of humerus, to shoulder joint and deltoid : anastomoses with anterior circumflex, and scapular arteries.

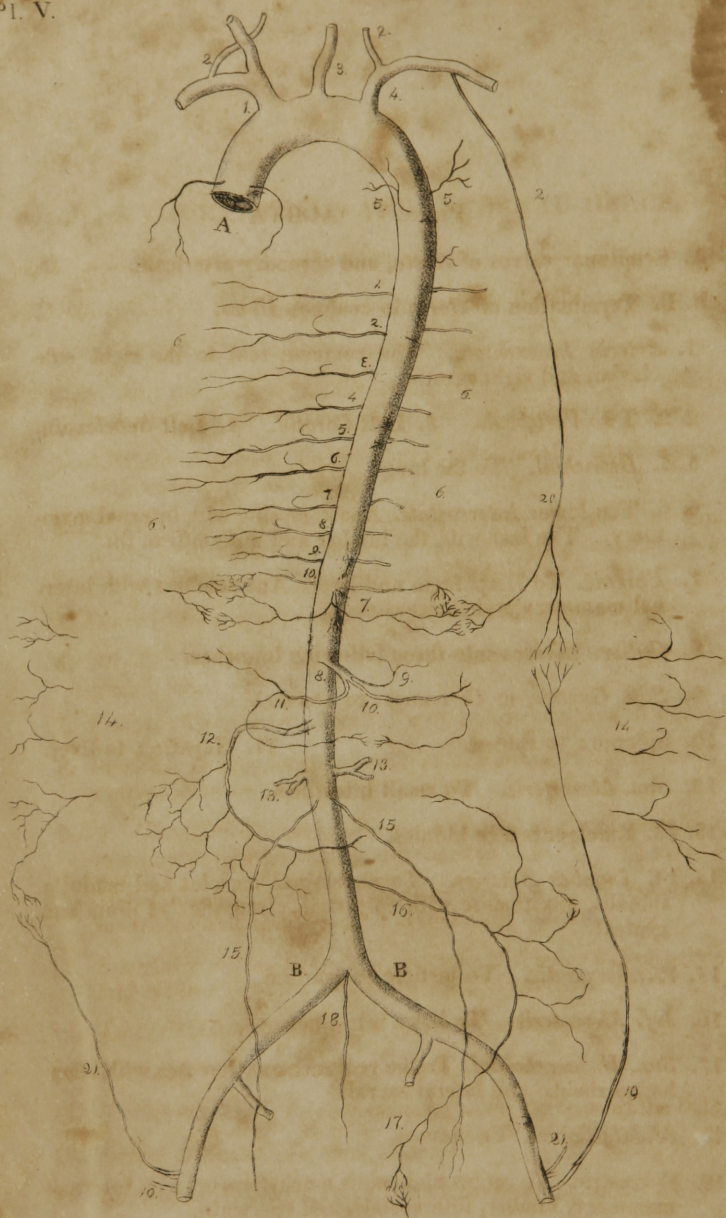
* *Internal mammary gives* { 1. *Anter. mediastinal*
2. *Sup. Diaphragmatic*

PLATE IV. ARTERIES OF THE ARM AND HAND.

A. *Brachial.*B. *Radial.*C. *Ulnar.*

- ✓ 1. *Sup. Deep Humeral*, (Profunda major.) Winds around back of the arm, to get to exterior condyle : anastomoses with radial recurrent.
- ✓ 2. *Inf. Deep Humeral*, (Profunda minor.) Inner side of arm and internal condyle.
3. *Nutritious Artery*. Through medullary foramen, to os humeri.
4. *Anastomotic*. Upon internal condyle, to anastomose with ulnar recurrent.
- ✓ 5. *Radial Recurrent*. Around exterior condyle, to anastomose with profunda major.
- ✓ 6. *Superficial Branch to Ball of the Thumb*. (Superficialis Volæ.)
7. Dorsal branch to the carpus. (Dorsalis Carpi.)
8. *Great Artery of the thumb*. (Magna pollicis.) Along the palmar surface of the thumb.
9. *Radial Branch of fore finger*, (Radialis Indicis.) Along outer side of fore finger.
- ✓ 10. *Deep seated Arch*. (Arcus Profundus.) Situated beneath flexor tendons.
11. *Ulnar Recurrent*. Around external condyle. Anastomoses with the anastomotic.
12. *Interosseal*. On interosseous ligament. Divides into anterior and posterior branches.
13. *Recurrent Branch of Interosseal*. To back of elbow, anastomosing with radial recurrent and deep humeral.
- ✓ 14. *Dorsal Brach*, to back of the hand. (Dorsalis Manus.)
15. *Deep Ulnar branch*. (Cubitalis manus profunda.) To join arcus profundus.
- ✓ 16. *Superficial Arch*. (Arcus Sublimis.) Situated between palmar aponeurosis and flexor tendons.
- ✓ 17. 17. *Digital Branches*. To sides of fingers. Anastomose freely at their extremities.





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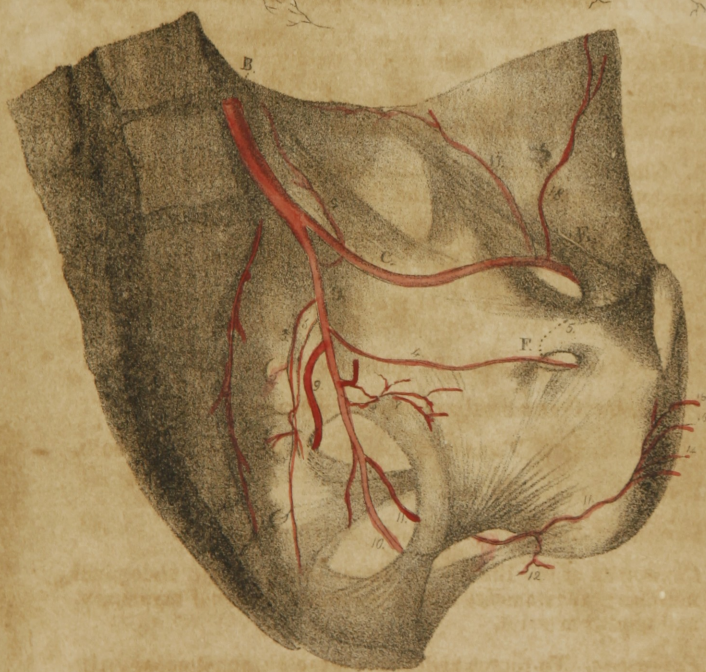
PLATE V. AORTA.

- A. Semilunar valves of *Aorta*, and coronary arteries.
- B. B. Termination of *Aorta* in common *Iliacs*.
1. *Arteria Innominata*. The common root to the right subclavian and right carotid.
 2. 2. Two *Vertebrals*. 3. Left *Carotid*. 4. Left *Subclavian*.
 5. 5. *Bronchial*. To the lungs.
 6. 6. Ten lower *Intercostals*. Anastomosing with internal mammary. The last with the lumbar and circumflexa ilii.
 7. *Phrenic*. To Diaphragm and liver. Anastomoses with internal mammary and intercostals.
 8. *Cæliac*. Divides into three following branches.
 9. *Sup. Gastric*, or *Coronary* : to stomach.
 10. Splenic : to spleen. 11. Hepatic : to liver.
 12. *Sup. Mesenteric*. To small intestines.
 13. 13. Emulgents : to kidneys.
 14. 14. *Lumbar Arteries*. To abdominal muscles and medulla spinalis, anastomose with epigastric, circumflex of ilium and gluteal.
 15. 15. *Spermatic*. To testicle or ovarium.
 16. *Inf. Mesenteric*. To large intestines.
 17. *Sup. Hæmorrhoidal*. To the rectum : anastomoses with other hæmorrhoidal and lateral sacral.
 18. *Middle Sacral*. To sacrum.
 19. Epigastric. To rectus abdominis : anastomoses with internal mammary, lumbar, intercostals, and spermatic.
 20. Internal Mammary : anastomoses with phrenic, intercostal, and epigastric.
 21. Circumflex of Ileum : anastomoses with ileo lumbar, internal mammary, lumbar, and intercostal.

PLATE VI. EXTERNAL AND INTERNAL ILIACS.

- A. *Aorta.* B—B. *Common Iliacs.* ✓ C. *Ext. Iliac.*
 ✓ D. *Int. Iliac.* E. *Poupart's Ligament.* F. *Foramen Ovale.*
- ✓ 1—1. *Middle Sacral.* Down middle of sacrum to coccyx.
 - ✓ 2—2. *Ileo Lumbar.* To iliacus and quadratus muscles : anastomoses with circumflexa ilii and lower lumbar arteries.
 - ✓ 3—3. *Lateral Sacral.* To interior of spinal canal : anastomoses with middle sacral.
 - ✓ 4—4. *Obturator.* Passes through obturator foramen to hip joints, and to muscles on inner side of thigh : anastomoses with ischiatic, and surrounds obturator foramen.
 5. Dotted line ; representing obturator arising from epigastric.
 - ✓ 6. *Middle Hæmorrhoidal.* To lower part of rectum, prostate gland, &c.
 - ✓ 7. *Vesical.* To bladder. From root of umbilical artery of fœtus.
 - ✓ 8. *Uterine.* In female, to uterus : anastomoses with arteries of uterus, ovarium, and fallopian tubes.
 - ✓ 9—9. *Gluteal.* Through ischiatic foramen, to glutei muscles : anastomoses with ischiatic and femoral.
 - ✓ 10—10. *Ischiatic.* Through sacro-sciatic notch, to hamstring muscles : anastomoses with branches of femoral.
 - ✓ 11. *Internal Pudic.* Branch of preceding. Passes out of pelvis and returns between two sacro-sciatic ligaments.
 - ✓ 12. *Lower Hæmorrhoidal.* To sphincter ani muscle.
 - ✓ 13. *Perineal.* Transversely across the perineum.
 - ✓ 14. *Urethro-Bulbar.* To corpus spongiosum urethræ, at the bulb.
 - ✓ 15. *Dorsal Branch.* To back of penis.
 - ✓ 16. *Cavernous Artery.* To cellular structure of penis.
 - ✓ 17. *Circumflex of the Ilium.* To iliacus internus, and abdominal muscles ; anastomoses with ileo-lumbar, internal mammary, and lumbar arteries.
 - ✓ 18. *Epigastric.* To rectus abdominis muscle : anastomoses with interior mammary, lumbar, and lower intercostals.

Iliads.



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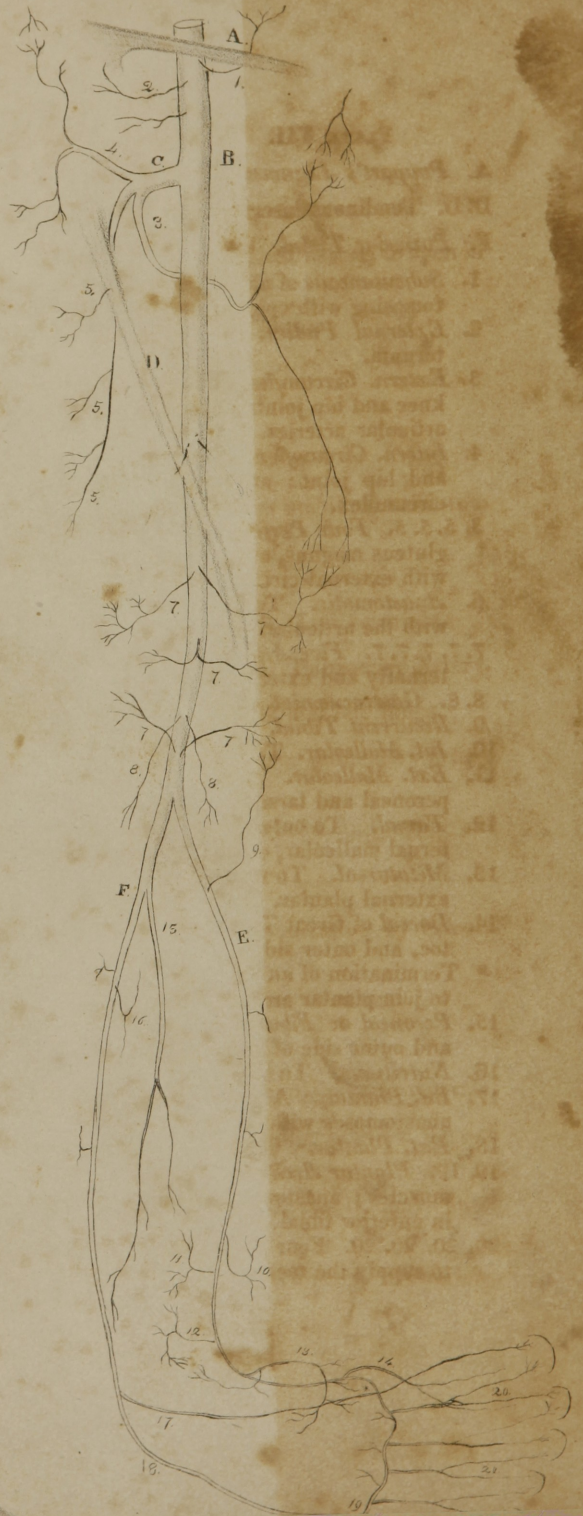


PLATE VII. FEMORAL AND TIBIALS.

- A. *Poupart's Ligament.* ✓ B. *Femoral.* ✓ C. *Profunda.*
 D.D. Tendinous insertion of triceps. ✓ E. *Anterior Tibial.*
 F. *Posterior Tibial.*

1. *Subcutaneous* of abdomen. (Art. ad cutem abdominis;) anastomosing with epigastric and interior mammary.
2. *External Pudics.* To penis and scrotum: or labium externum.
3. *Extern. Circumflex.* To glutei: vastus externus, cruralis, knee and hip joints; anastomoses with gluteal, ischiatic, and articular arteries.
4. *Intern. Circumflex.* To adductor and hamstring muscles and hip joint: anastomoses with obturator, and external circumflex.
5. 5. 5. 5. *Four Perforating.* Passing through triceps tendon to gluteus magnus, and flexor muscles of thigh: anastomoses with external circumflex, gluteal, and ischiatic.
6. *Anastomotic.* To inner side of knee joint: anastomoses with the articular.
7. 7. 7. 7. 7. *Five Articular.* From Popliteal to knee joint, internally and externally.
8. 8. *Gastrocnemial.* To two heads of gastrocnemius muscle.
9. *Recurrent Tibial.* To anastomose with articular arteries.
10. *Int. Malleolar.* To inner side of ankle joint.
11. *Ext. Malleolar.* To outer side of joint: anastomoses with peroneal and tarsal.
12. *Tarsal.* To outer surface of tarsus: anastomoses with external malleolar, external plantar, and metatarsal.
13. *Metatarsal.* To metatarsus: anastomoses with branches of external plantar.
14. *Dorsal of Great Toe, (Dorsalis Hallucis.)* To back of great toe, and outer side of next toe.
- * Termination of anterior tibial, passing to the sole of the foot to join plantar arch.
15. *Peroneal or Fibular.* From posterior tibial, down to ankle and outer side of foot: anastomoses with anterior tibial.
16. *Nutritious.* To the tibia.
17. *Int. Plantar.* Along inner side of foot to the great toe: anastomoses with dorsalis.
18. *Ext. Plantar.* Crosses sole of foot to outer margin.
19. 19. *Plantar Arch.* Sending perforating arteries to interosseal muscles; anastomoses with metatarsal arteries; terminates in anterior tibial.
20. 20. 20. 20. *Four Digital Arteries.* Arising from plantar arch to supply the toes.

PLATE VIII. FŒTAL CIRCULATION.

Fig. I.

A. A. The liver.

B. Vena cava, ascendens.

1. *Umbilical Vein*. Running in the umbilical fissure, to open in left branch of sinus venæ portæ.
- 2—2. *Vena Portæ*. Dividing to form the *Sinus*.
- 3—3. Left branch of sinus venæ portæ.
4. Right branch of sinus venæ portæ.
5. Left hepatic vein.
6. *Ductus Venosus*. Conveying blood from umbilical vein, into left hepatic vein, and thus into vena cava.

Fig. II.

1. Right ventricle of fœtal heart.
2. Left ventricle.
3. 3. *Aorta*.
4. Pulmonary Artery.
5. 5. Branches of pulmonary artery, to right and left lungs.
6. *Ductus Arteriosus*. Conveying blood from pulmonary artery into aorta.
7. 7. Great trunks from aorta, to supply head and upper extremities.

Fig. III.

A. A. Right auricle and ventricle, communicating by ostium venosum.

B. B. Left auricle and ventricle ; also communicating.

1. 1. *Superior and Inferior venæ cavæ*.
2. *Eustachian Valve*. Directing the blood toward the foramen ovale.
3. *Foramen Ovale*. Forming a communication between the two auricles.
4. Valve in left auricle, opposed to foramen ovale, and subsequently closing it.
5. *Pulmonary Veins*. Returning blood from lungs to left auricle.

Fig 1

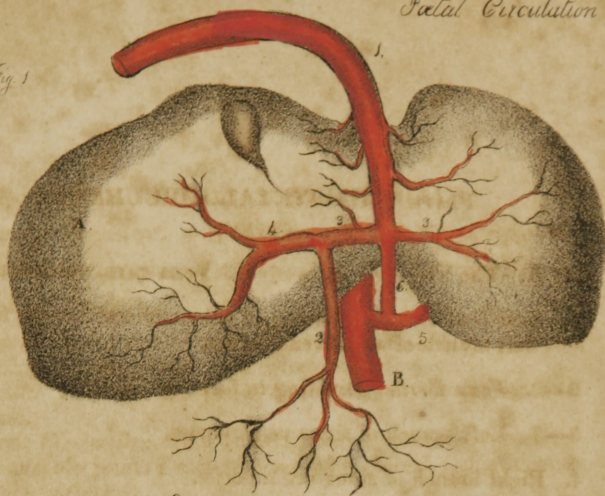


Fig 2

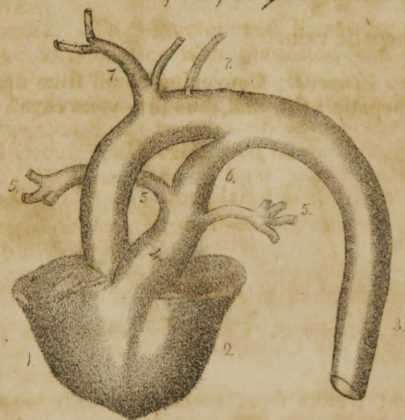


Fig 3



Colic Arteries

Fig. 2.

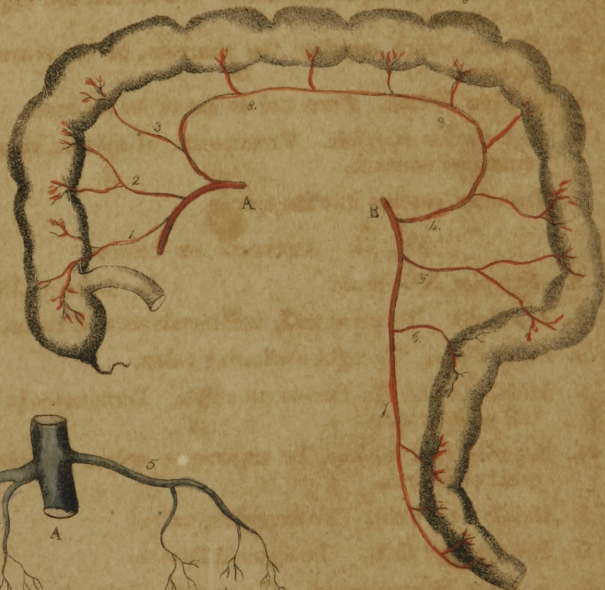


Fig. 3.
Vena Portae

PLATE IX. CÆLIAC ARTERY.

Fig. I.

1. *Cæliac Trunk.*
2. *Hepatic*, to liver and gall bladder. (Cystic to)
- ✓ 3. *Right Gastro Epiploic.* To right extremity of the stomach.
Branch of the hepatic.
4. *Superior Gastric*, or Coronary. To cardia, and upper curve of stomach.
5. *Splenic*, which supplies the pancreas, in its course to the spleen.
- ✓ 6. 6. *Vasa Brevia.* From cul de sac of the stomach.
- ✓ 7. *Left Gastro Epiploic.* Termination of splenic, to great curvature of stomach.
8. Branches passing into the spleen.

Fig. II. ARTERIES OF COLON.

- | | |
|----------------------------------|----------------------------------|
| ✓ A. <i>Superior Mesenteric.</i> | ✓ B. <i>Inferior Mesenteric.</i> |
|----------------------------------|----------------------------------|
1. *Ileo Colic.* To caput coli, and termination of ileum.
 - ✓ 2. *Right Colic.* To right ascending colon.
 - ✓ 3. *Middle Colic.* To transverse colon. Terminates in superior left colic branch.
 - ✓ 4. *Superior Left Colic.* To transverse colon, completing the great colic arch.
 - ✓ 5. *Middle Left Colic.* To ascending colon.
 - ✓ 6. *Inferior Left Colic.* To sigmoid flexure.
 - ✓ 7. *Superior Hæmorrhoidal.* To rectum. Being the termination of inferior mesenteric.
 - ✓ 8. Great Colic Arch.

Fig. III. VENA PORTÆ.

- | | | |
|----------------------|-----------------------|-----------------------------|
| A. <i>Vena Cava.</i> | B. <i>Vena Portæ.</i> | C. <i>Sinus Venæ Portæ.</i> |
|----------------------|-----------------------|-----------------------------|
1. *Superior Mesenteric Vein.*
 2. *Inferior Mesenteric Vein.*
 3. *Splenic Vein.* Receiving also those from left end of stomach, and from the pancreas.
 4. *Superior Gastric*, or Coronary.
 5. 5. 5. *Three Venæ Cavæ Hepaticæ.* From liver, opening into vena cava.



