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THE EDINBURGH STEREOSCOPIC ATLAS OF ANATOMY

EDITED BY

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SECTION II

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NOTE TO SECTION II

THE views in this Section illustrate the position and relation, as well as the shape, and in some cases the structure of the abdominal and some of the pelvic viscera.

It has not been found possible to include in this Section the illustrations of the anatomy of the female pelvis, and they are therefore held over to another Section, in which room will be found to include an adequate number of views of that important region. The enormous differences which are found in the position and relations of many of the abdominal viscera in different individuals, and which are of so great importance to the practical physician and surgeon, rendered the task of selecting what may be considered typical examples one of some difficulty, and it has been considered advisable to include some views which illustrate different conditions of several organs, such as the stomach, spleen, and bladder, etc. The extreme condition of the stomach in a female, illustrated in two views, will be of great interest to clinicians, since the history of the case which was supplied to me states that there were at no time symptoms pointing to any morbid change in the alimentary canal, but it may be stated that the condition is almost identical with that described by Arthur Keith, as a case of enteroptosis, or Glenard's disease, produced by tight-lacing.

It is hoped that this series of views, illustrating the anatomy of the inguinal region will prove of special use to surgeons in connection with operative work for the cure of inguinal hernia.

DAVID WATERSTON.

ABDOMEN.

ABDOMINAL WALL.—No. 1.

SUPERFICIAL FASCIA.

The skin has been removed from the lower part of the abdominal wall and upper part of the thighs, and also, on the right side, the superficial fascia.

The SUPERFICIAL FASCIA on the lower part of the anterior abdominal wall consists of two layers, a superficial fatty, and a deeper, more membranous layer.

The former is continuous with the fatty superficial fascia of adjacent regions; the latter, in the region of the pubes, is carried down over the spermatic cord, and becomes one of the layers of the wall of the scrotum. Outside this, it passes over Poupart's ligament, and blends with the fascia lata of the groin. This union limits the spread of extravasated urine downwards to the thighs.

Between the two layers are found some superficial vessels and cutaneous nerves.

Above the symphysis pubis, there is a strong band of elastic tissue which passes down to be connected with the root of the penis and its suspensory ligament (5).

CUTANEOUS NERVES are seen emerging through the aponeurosis of the external oblique muscle, the ilio-inguinal with the spermatic cord, through the external abdominal ring, the ilio-hypogastric a short distance above it, and the anterior branches of the lower intercostal nerves pierce the sheath of the rectus higher up.

The figures indicate—

LARGE NUMERALS:—

1. Superficial layer of the superficial fascia.
2. Deeper layer " "
- 3 and 4. External oblique muscle and aponeurosis.
5. Elastic tissue collected into a strong band.
6. Spermatic cord.

SMALL NUMERALS:—

1. Ilio-hypogastric nerve.
2. Ilio-inguinal nerve.
3. Superficial epigastric vessels.
4. " circumflex iliac vessels.
5. " External pudic vessels.

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ABDOMEN.

ABDOMINAL WALL—No. 2.

THE APONEUROSIS OF THE EXTERNAL OBLIQUE MUSCLE.

ON THE RIGHT SIDE, THE DEEP FASCIA, AND ON THE LEFT, SOME SUPERFICIAL STRUCTURES OF THE GROIN ARE SEEN.

The aponeurosis of the external oblique muscle terminates in its lower part in Poupart's ligament. This ligament runs in a curved line from the anterior superior spine of the ilium to the spine of the pubis. The deep fascia of the thigh is attached to it, and it lies at the bottom of a depression. The superficial inguinal vessels are seen running in different directions, the superficial circumflex iliac towards the anterior superior spine, the superficial epigastric over Poupart's ligament, and the superficial external pudic over the spermatic cord towards the scrotum. The superficial inguinal glands are shown on the right side, with the long saphenous vein. On the left, that vein has been divided and turned aside, to show its termination in the femoral vein.

The figures indicate—

- | | |
|---|---|
| 1. Muscular part of External oblique. | 9. Cribriform fascia. |
| 2. Aponeurosis of " and arcuate fibres. | 10. Long saphenous vein. |
| 3. Poupart's ligament. | 11. Femoral vein. |
| 4. Linea alba. | 12. Femoral lymph gland. |
| 5. Pubic part of fascia lata. | 13. Inguinal " |
| 6. Iliac " " | 14. Elastic tissue of superficial fascia of abdominal wall. |
| 7. Fascia covering Sartorius muscle. | |
| 8. Spermatic cord, and ilio-inguinal nerve. | |

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ABDOMEN.

ABDOMINAL WALL—No. 3.

The external oblique muscle and aponeurosis are displayed, with cutaneous nerves on one side.

The *external oblique* is a wide flat muscle, which takes origin from outer surfaces and lower borders of the lower eight ribs, interdigitating with the serratus magnus above and with the latissimus dorsi below. The *aponeurosis* extends in a vertical direction from the ensiform cartilage above to the crest of the pubis below, and between these points it is inserted into the linea alba, the fibres decussating with those of the opposite side.

The aponeurosis is very wide below, where it occupies the whole of the lower part of the anterior abdominal wall, as the muscular fibres do not extend below the level of the anterior superior iliac spine, and the pectoralis muscle takes origin from the upper part of the aponeurosis.

The *cutaneous nerves* which are seen piercing the aponeurosis of the muscle are the small terminal branches of the lower five intercostal nerves, and the ilio-hypogastric lower down, while some lateral cutaneous branches of the intercostal nerves are seen piercing the muscle.

The anterior cutaneous nerves, after piercing the aponeurosis, pass in an outward direction.

The figures indicate—

- | | |
|---|---|
| 1. Lower costo-sternal fibres of pectoralis major muscle. | 5. Aponeurosis of the external oblique muscle. |
| 2. Slip of pectoralis major muscle, arising from aponeurosis of external oblique. | 6. Inner pillar of the external abdominal ring. |
| 3. Digitation of the serratus magnus muscle. | 7. Lower portion of the mammary gland. |
| 4. Digitation of the external oblique muscle. | 8. Anterior cutaneous nerves. |
| | 9. Lateral cutaneous nerves. |

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ABDOMEN

ABDOMINAL WALL.—No 4.

INTERNAL OBLIQUE, TRANSVERSALIS, AND RECTUS ABDOMINIS MUSCLES.

The external oblique muscles have been reflected, and the internal oblique muscle of the left side, as well as the anterior wall of the sheath of the rectus in nearly its whole extent.

The *internal oblique* muscle arises from the outer half of Poupart's ligament, from the middle lip of the anterior two-thirds of the crest of the ilium and from the lumbar aponeurosis, and the fibres are seen passing mainly upwards and inwards to their insertion.

The lower intercostal nerves and blood-vessels lie between this muscle and the transversalis abdominis.

The course of the rectus abdominis muscle is intersected by transverse bands of fibrous tissue, usually three in number, but, as in this specimen, occasionally more numerous, and placed at the costal margin, opposite the umbilicus, and midway between these two points. These are called the lineal transversal.

The interval between the muscles of opposite sides constitutes the *linea alba*, and is composed of fibrous tissue. It is widest above the umbilicus, and, below that level, the muscles of opposite sides gradually approach one another and come into contact, so that difficulty may be experienced in finding the interval between them.

The figures indicate—

- | | |
|--|---|
| 1. Pectoralis major muscle. | 8. Anterior sheath of rectus, divided. |
| 2. Rectus abdominis. | 9. Divided edge of internal oblique. |
| 3. Insertion of rectus. | 10. Transversalis abdominis muscle. |
| 4, 5, 6, and 7. Tendinous intersections of the rectus. | 11. Round ligament of uterus in the inguinal canal. |

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ABDOMEN.

INGUINAL REGION—No. 1.

SUPERFICIAL DISSECTION.

The *superficial structures* include vessels, nerves, and two sets of lymphatic glands; a *femoral* set, placed along the line of the internal saphenous vein, which receive the lymphatic vessels from the lower limb, and an *inguinal* group, along the line of Poupart's ligament, which receive the lymphatic vessels from the genitals, perineum, and the surface of the abdomen below the umbilicus. The latter set of glands is affected in venereal infection of the external genitals.

The efferent vessels from these glands pierce the fascia lata, or the cribriform fascia, and so pass through the saphenous opening to deeper lymphatic vessels.

The internal saphenous vein is seen to receive a large posterior branch and to pass through the saphenous opening, after receiving the superficial inguinal veins.

The spermatic cord is seen emerging from the external abdominal ring.

The figures indicate—

1. Spermatic cord and coverings.
2. Internal pillar of the external abdominal ring.
3. External " "
4. Ilio-inguinal nerve.
- 5-6. Inguinal lymphatic glands.
7. Femoral lymph gland.
8. Junction of internal saphenous vein with its posterior tributary.
9. Cribriform fascia covering the saphenous opening.

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ABDOMEN.

INGUINAL REGION—No. 2.

SAPHENOUS OPENING AND EXTERNAL ABDOMINAL RING.

This view shows the apertures through which femoral and inguinal herniae appear.

The *Saphenous opening* is an oval aperture in the deep fascia of the thigh, one inch long, and half an inch wide, or slightly larger, situated about an inch and a half below and external to the spine of the pubis. The outer edge, which is strong, and is called the falciform process, passes upwards to join Gimbernat's ligament, while the inner edge lies on a posterior plane, and passes behind the femoral vessels. The internal saphenous vein and lymphatic vessels pass through the opening to join the deeper vessels. The thin cribriform fascia, which covers the opening, has been removed.

The fascia on the inner side covers the pectineus muscle, and is called the pubic fascia; that on the outer side is the iliac fascia.

The *external abdominal ring*, the outlet of the inguinal canal, is a triangular aperture in the aponeurosis of the external oblique muscle of the abdomen, which, in the male, transmits the spermatic cord and its coverings, and the ilio-inguinal nerve; and, in the female, the round ligament. The margins are united by some thin transverse fibres, called the intercolumnar fibres, which have been removed, in order to show the ring as an aperture.

The figures indicate—

- | | |
|--|--------------------------------|
| 1. Arcuate fibres of the external oblique aponeurosis. | 5. Falciform edge. |
| 2. Poupart's ligament. | 6. Fascia of pectineus muscle. |
| 3. External pillar of the external abdominal ring. | 7. Spermatic cord. |
| 4. Internal pillar of the external abdominal ring. | 8. Femoral vein. |

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ABDOMEN.

INGUINAL REGION.—No. 3.

The aponeurosis of the external oblique has been divided and turned down, to show the spermatic cord lying in the inguinal canal.

The **Inguinal Canal** is an oblique, flattened passage through the abdominal wall, measuring about an inch and a half in length, and extending from the internal to the external abdominal ring, above the inner half of Poupart's ligament. In shape, it is a groove formed by the union of Poupart's ligament and the fascia transversalis.

It is described as having an anterior and a posterior wall, a roof, and a floor.

The *anterior wall* of the inguinal canal is formed by the aponeurosis of the external oblique muscle, and also by the internal oblique in the outer part.

The internal oblique arches over the canal, and forms a roof for it.

The external spermatic fascia was divided at the external abdominal ring, and is seen forming a covering for the spermatic cord as it passes to the scrotum. The ilio-inguinal nerve is seen joining the cord near the internal ring, and the ilio-hypogastric nerve lies higher up.

The figures indicate—

- | | |
|--|-------------------------|
| 1. Aponeurosis of external oblique muscle. | 5. Root of penis. |
| 2. Aponeurosis of internal oblique muscle. | 6. Fascia of Scarpa. |
| 3. Spermatic cord lying in the inguinal canal. | 7. Ilio-inguinal nerve. |
| 4. External spermatic fascia. | |

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ABDOMEN.

INGUINAL REGION—No. 4.

The external and internal oblique muscles have been reflected, and a portion of the spermatic cord cut away to show the posterior wall of the inguinal canal.

This *posterior wall* is formed, from within outwards, by the triangular fascia, the conjoined tendon, and transversalis fascia. Through an opening in the transversalis fascia the deep epigastric vessels are seen running upwards in the inner side of the internal ring.

The *triangular fascia* is a membranous structure, continuous with the aponeurosis of the external oblique of the opposite side, and forming an insertion for it into the crest of the pubis and the ilio-pectineal line.

It lies behind the inner pillar of the external abdominal ring.

The *internal abdominal ring* lies half an inch above, and to the inner side of the middle of Poupart's ligament.

It is the inlet for the inguinal canal, and at this point the transversalis fascia gives off a pouch-like process, which envelopes the spermatic cord.

The figures indicate—

- | | |
|---|-----------------------------|
| 1. Aponeurosis of external oblique muscle, divided. | 5. Triangular fascia. |
| 2. Internal oblique muscle, divided. | 6. Spermatic cord, divided. |
| 3. Transversalis abdominis muscle. | 7. Fascia transversalis. |
| 4. Conjoined tendon. | 8. Deep epigastric vessels. |
| 9. Root of penis. | |

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ABDOMEN.

INGUINAL REGION—No. 5.

In addition to the previous dissections, the sheaths of the recti muscles have been opened, and a portion of the rectus abdominis muscle removed on the right side, to show the posterior wall of the sheath.

The sheath of the rectus is a membranous structure, derived from the aponeurosis of the flat abdominal muscles.

The aponeurosis of the internal oblique enters into the formation of both the anterior and posterior walls of the sheath, and the aponeurosis of the external oblique passes into the anterior lamella, and that of the transversalis into the posterior.

In the sheath are seen the rectus and pyramidalis muscles, the deep epigastric vessels, and the terminal branch of some of the lower intercostal nerves.

The *semilunar fold of Douglas* is the lower free margin of the posterior wall of the sheath, which stops at a point midway between the umbilicus and the pubis, and below this level, the rectus is in contact with the fascia transversalis (7).

This view also shows the relation of the conjoint tendon to the sheath of the rectus.

The figures indicate—

- | | |
|-------------------------------------|------------------------------------|
| 1. Aponeurosis of external oblique. | 7. Transversalis fascia. |
| 2. Aponeurosis of internal oblique. | 8. Deep epigastric vessels. |
| 3. Conjoined tendon. | 9. Transversalis abdominis muscle. |
| 4. Linea alba. | 10. Spermatic cord, divided. |
| 5. Rectus abdominis muscle. | 11. Semilunar fold of Douglas. |
| 6. Pyramidalis muscle. | |

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ABDOMEN.

INGUINAL REGION—No. 6.

DISSECTION OF THE INGUINAL CANAL AND ADJACENT REGIONS ON BOTH SIDES OF THE BODY.

The aponeurosis of the external oblique has been reflected on both sides, and that of the internal oblique on the right, and the right spermatic cord has been divided and partly removed.

An ascending branch of the deep circumflex iliac artery is seen on the right side, running between the internal oblique and transversalis muscles. This vessel is a useful guide to the interval between these two muscles, indicating the depth to which the abdominal wall has been divided.

The figures indicate—

- | | |
|--|---|
| 1. Aponeurosis of external oblique muscle. | 8. Situation of external abdominal ring. |
| 2. Aponeurosis of internal oblique muscle. | 9. Divided ends of spermatic cord. |
| 3. Transversalis abdominis muscle. | 10. Root of penis. |
| 4. Conjoined tendon. | 11. Ascending branch of deep circumflex iliac artery. |
| 5. Triangular fascia. | 12. Deep epigastric vessels. |
| 6. Spermatic cord (left side). | 13. Ilio-inguinal nerve (left side). |
| 7. Transversalis fascia. | 14. Fascia of Scarpa continued into the scrotum. |

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ABDOMEN.

ABDOMINAL CAVITY—No. 1.

The anterior abdominal wall has been removed, and the costal margin exposed.

The usual subdivision of the abdominal cavity into nine regions by two horizontal and two vertical planes is shown by wires. The vertical wires extend upwards from the middle of Poupart's ligament. The lower horizontal ones extend between the tubercles on the outer lip of the crest of each ilium, and the upper ones pass between the lowest points of the tenth costal arches. The position of the umbilicus is indicated by the letter U.

The *great omentum* is a double fold of peritoneum, attached to the greater curvature of the stomach on the one hand, and passing downwards for a variable distance. It then turns upwards, and envelopes the transverse colon, and is continued on to the posterior abdominal wall as the transverse meso-colon.

A portion of the transverse colon comes into view in this specimen, on account of the contraction of the stomach and the distension of the colon, but in many cases, the transverse colon is not at once seen when the abdominal cavity is opened.

The general disposition of the omentum and viscera is seen. In this subject the stomach is empty and contracted, and the transverse colon, which is distended, passes upwards in front of the stomach and conceals it from view.

The superficial contents of the different regions are seen to be as follows.—

- | | |
|--|---|
| 1. Right hypochondrium—hepatic flexure. | 6. Left lumbar—omentum covering small intestine and descending colon. |
| 2. Epigastric region—liver, transverse colon covering the stomach and omentum. | 7. Right iliac—caecum. |
| 3. Left hypochondrium—splenic flexure. | 8. Hypogastric—pelvic colon and bladder. |
| 4. Right lumbar—ascending colon. | 9. Left iliac—iliac colon. |
| 5. Umbilical—omentum covering coils of intestine. | |

The figures indicate:—

- | | |
|--|------------------------------|
| 1. Ligamentum teres. | 5. Hepatic flexure of colon. |
| 2. Lower margin of liver. | 6. Upper part of caecum. |
| 3. Transverse colon in front of the stomach. | 7. Apex of urinary bladder. |
| 4. Omentum. | U. position of umbilicus. |

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ABDOMEN.

ABDOMINAL CAVITY—No. 2.

The great omentum has been removed, to show the arrangement of the coils of intestine.

The usual sub-division of the abdominal cavity into nine regions is shown by the wires laid on the surface. The positions occupied by different parts of the alimentary canal vary greatly, and no definite arrangement can be laid down applicable to all cases. The principal factors which produce these changes in position are the distension and contraction of the hollow viscera, and constriction of the abdominal wall, as well as the position of the body, respiratory movements, etc.

In this subject, the stomach is empty, the small intestine is well filled, and the large intestine distended in certain parts, especially the caecum, ascending colon, transverse colon, and pelvic colon. To ascertain the arrangement of the intestine, several coils were numbered, and the distances of the different coils so numbered from the duodenum were measured after removal of the intestine.

There is no definite arrangement of these coils, but it may be stated generally that the proximal coils lie in the upper and left segment of the abdominal cavity, and pass thence down towards the right and lower part of the cavity.

The loop indicated by 2 was $4\frac{1}{2}$ feet from the duodeno-jejunal flexure, 3 was 3 feet further on, 4 was 2 feet beyond 3, 5 was $2\frac{1}{2}$ feet beyond 4, 6 was $1\frac{1}{2}$ foot beyond that, and from 6 to the end of the ilium was 4 feet.

The distended pelvic colon—indicated by 7 and 8—occupies the greater portion of the lower segment of the abdomen.

The figures indicate—

- | | |
|--|-------------------------------|
| 1. Transverse colon. | 10. Ascending colon. |
| 2-6. Loops of small intestine. | 11. Hepatic flexure. |
| 7-8. Loops of pelvic colon, greatly distended. | 12. Loop in transverse colon. |
| 9. Upper part of caecum. | |

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ABDOMEN.

ABDOMINAL CAVITY.—No. 3.

The small intestine has been removed, and the mesentery divided close to its root.

This view illustrates the regions of the abdomen occupied by the small intestine when the stomach is empty, and the large intestine is distended.

From the posterior abdominal wall a double fold of peritoneum, the mesentery, passes off along a line extending from the left side of the second lumbar vertebra downwards into the right iliac fossa. This fold divides the lower part of the abdominal cavity into a right and a left half.

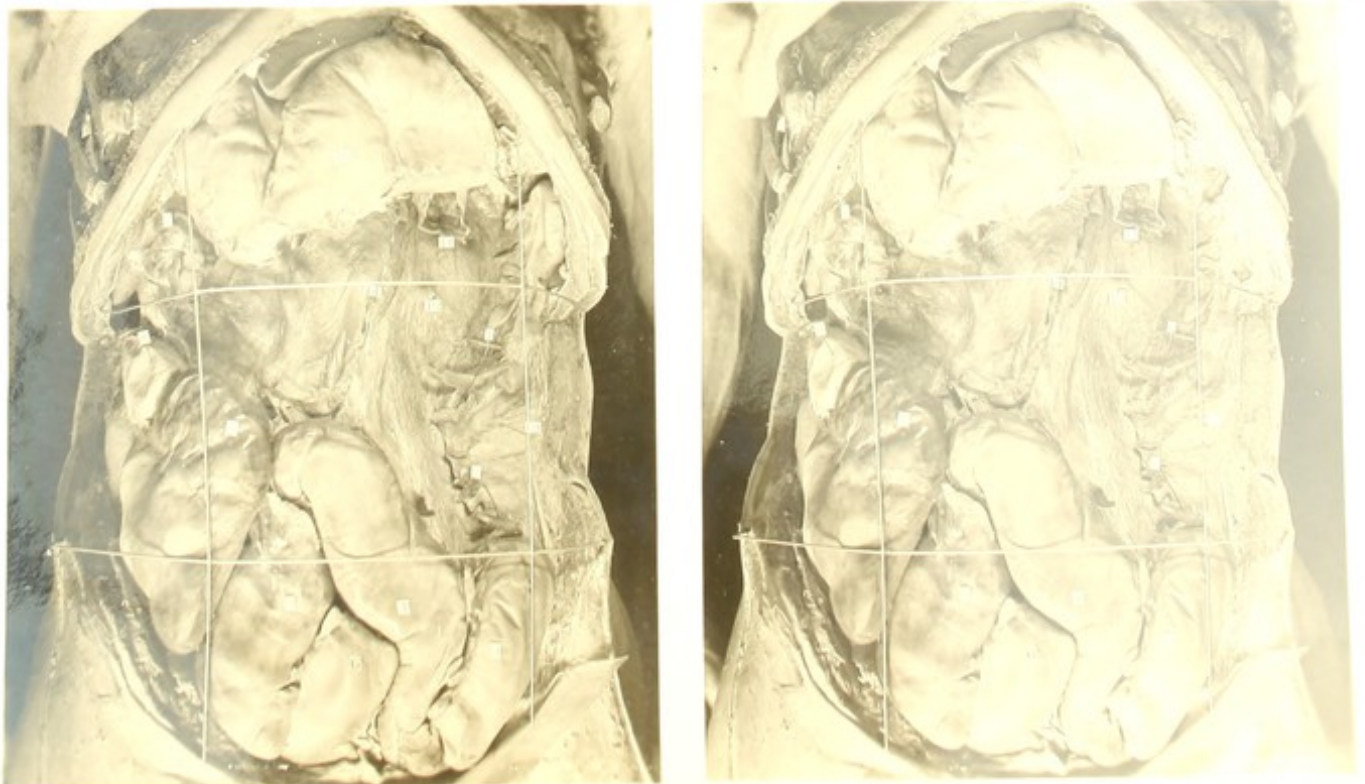
In this specimen, the greater part of the small intestine was pushed upwards and to the left, by the distended pelvic colon, and was enabled to pass upwards on account of the contracted state of the stomach.

The descending colon is, as usual, firmly contracted, and the peritoneum on either side of it is raised into transverse folds. To its inner side, at the upper part, is seen the projection of the left kidney, crossed by a branch of the inferior mesenteric artery, and the splenic flexure lies well under cover of the left costal margin. The arrangement of the coils of the pelvic colon when distended is clearly seen, and the consecutive loops are numbered.

The figures indicate—

1. Descending colon.
2. Iliac colon.
- 3, 4, 5, and 6. Consecutive loops of the pelvic colon.
7. Caecum.
8. Ascending colon.
9. Lies below the hepatic flexure.
10. Transverse colon.
11. Commencement of the jejunum, divided.
12. Branch of inferior mesenteric artery behind the peritoneum.
13. Folds of peritoneum passing from the descending colon.

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ABDOMEN.

ABDOMINAL CAVITY—No. 4.

The small intestine and the pelvic colon have been removed, and the caecum opened, and the peritoneum has been removed from the front of the descending portion of the duodenum.

The peritoneum, covering the posterior abdominal wall, is seen; and also the root of the mesentery, passing from the duodeno-jejunal junction, on the left side of the second lumbar vertebra, downwards and to the right.

The root of the transverse meso-colon is seen, from which that mesentery projects forwards, dividing the abdominal cavity into a *supra-mesocolic* and an *infra-mesocolic* compartment. The latter passes upwards as a deep recess below the stomach, and behind the left costal margin.

The V-shaped attachment of the pelvic meso-colon should be noticed.

In the interior of the caecum, the orifice of the ileum is seen, and it may be noted that in this specimen the terminal part of the ileum enters the caecum practically at a right angle, and not in the usual oblique manner from below upwards.

The *vermiform appendix* arises from the inner and back part of the caecum, and in this specimen it is directed upwards and inwards, towards the umbilicus. It has a mesentery, derived from the lower part of the mesentery of the ileum.

The small orifice of the appendix is here guarded by a small crescentic fold resembling a valve.

The figures indicate—

- | | |
|--|--|
| 1. Pylorus. | 9. Opening of appendix into the caecum. |
| 2. Duodenum and reflection of transverse meso-colon. | 10. Vermiform appendix. |
| 3. Second part of duodenum. | 11. Terminal part of pelvic colon. |
| 4. Root of the mesentery. | 12. and 13. Pelvic meso-colon. |
| 5. Ascending portion of duodenum. | 14. Iliac colon. |
| 6. Peritoneal fold for appendix. | 15. Peritoneum covering left kidney. |
| 7. Termination of ileum. | 16. Branch of the inferior mesenteric artery crossing the left kidney. |
| 8. Opening of ileum into the caecum. | |
| 17. Duodeno-jejunal flexure. | |

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ABDOMEN.

ABDOMINAL CAVITY.—No. 5.

VISCERA IN A FEMALE SUBJECT.

The arrangement of the movable viscera within the abdominal cavity shows a great amount of variation in different individuals, depending upon several conditions, such as, the amount of distension of different parts of the alimentary canal, and in the female, upon the constriction of the lower part of the thoracic wall which occurs in tight-lacing. The specimen seen here illustrates a condition which is found in a certain number of such cases, and illustrates some of the changes which apparently may be produced by such constriction. The principal alterations are that the liver has been pushed downwards by the constriction of the thoracic wall, and there has been a descent of the pyloric region of the stomach, and a shifting of the whole body of the organ to the left so that the lesser curvature is vertical in position, and lies a considerable distance from the under surface of the liver.

The first part of the colon is greatly distended, and the first part of the transverse colon passes up in front of the lower border of the liver, and then along the lesser curvature of the stomach. The remaining part was firmly constricted, and passed along the greater curvature of the stomach, upwards to the left hypochondriac region. The coils of small intestine were almost entirely displaced down into the cavity of the pelvis. Abdominal symptoms were entirely absent during life in this case, and this view has been included in order to show an extreme degree of a condition of the stomach which may exist without special symptoms, and, it may be added, almost any intermediate condition may also be found.

The figures indicate—

1. Falciform of the liver ligament.
2. Anterior surface of the stomach.
3. A loop of small intestine.
4. Caecum, considerably dilated.
5. Transverse colon.

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ABDOMEN.

ABDOMINAL CAVITY.—No. 6.

FROM THE SAME SUBJECT AS THE PRECEDING VIEW.

The small intestine has been removed, and also a portion of the colon, and the caecum opened.

The positions of the pyloric portion of the stomach and of the pyloric orifice are seen, and also the interior of the caecum.

The **pyloric orifice** has moved downwards and to the left, and the duodenum has been thrown into a loop.

This view shows in a very typical manner the structure of the ileo-caecal orifice, and the retinacula which pass round the interior of the caecum. The vermiform appendix is seen passing down into the pelvis.

The anterior surface of the liver shows the groove which contained the first part of the transverse colon.

The figures indicate—

- | | |
|-------------------------------------|---|
| 1. Anterior surface of the stomach. | 6. Cut edge of the mesentery. |
| 2. Pyloric portion of the stomach. | 7. Vermiform appendix. |
| 3. Pyloric orifice. | 8. On a retinaculum, above the ileo-caecal orifice. |
| 4. First part of the duodenum. | 9. Orifice of the vermiform appendix. |
| 5. Second part of the duodenum. | 10. Pelvic colon. |

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ABDOMEN.

ABDOMINAL CAVITY—No. 7.

GENERAL VIEW OF THE POSTERIOR ABDOMINAL WALL AND OF THE VISCERA RESTING ON IT.

This view illustrates a large number of important anatomical relationships, and attention may be directed to the abdominal aorta lying in front of the bodies of the vertebræ, with the psoas muscle lying on each side. A number of structures lie in relation to these muscles, such as the inferior vena cava, the inferior mesenteric vessels, the ureters, spermatic vessels, and the branches of the lumbar plexus.

The pancreas and duodenum are seen lying mainly in the epigastric region. The duodenum overlaps the front of the right kidney, while the pancreas passes in front of the left. The right kidney lies at a somewhat lower level than the left, and the branches of the inferior mesenteric artery should be noticed crossing in front of the left kidney.

The greater part of the pelvic colon has been removed, leaving only the termination, which is distended, and which is seen, in this case, to be on the right side of the pelvis.

The figures indicate—

- | | |
|---------------------------------|---------------------------------|
| 1. First part of duodenum. | 9. Left kidney. |
| 2. Second part of duodenum. | 10. Right kidney. |
| 3. Third part of duodenum. | 11. Aorta. |
| 4. Duodeno-jejunal flexure. | 12. Inferior vena cava. |
| 5. Head of pancreas. | 13. Right spermatic vessels. |
| 6. Superior mesenteric vessels. | 14. Inferior mesenteric artery. |
| 7. Tail of pancreas. | 15. Ureter. |
| 8. Spleen. | 16. Inferior mesenteric vein. |

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ABDOMEN.

VISCERA—No. 1.

STOMACH, LIVER, AND DUODENUM

(From a young subject.)

The STOMACH is seen to lie nearly horizontally, in the left hypochondriac and epigastric regions. The pyloric orifice lies near the mesial plane of the body, and its position is indicated by an annular constriction. From this point, the FIRST PART of the DUODENUM passes backwards, and comes into contact with the neck of the gall-bladder; the SECOND PART passes downwards, between the head of the pancreas and the hepatic flexure of the colon, and, in this specimen, in front of the right kidney; and the THIRD PART passes to the left and then upwards, in front of the body of the third lumbar vertebra.

The positions of the hepatic and splenic flexures of the colon should be noticed, lying far back, and in contact with their areas on the liver and spleen respectively.

The figures indicate—

- | | |
|-----------------------------------|---|
| 1. Body of the stomach. | 7. Hepatic flexure of the colon. |
| 2. Antrum pylori. | 8. Right kidney. |
| 3. Pylorus. | 9. Spleen. |
| 4. First part of duodenum. | 10. Pancreas and superior mesenteric vessels, cut across. |
| 5. Ligamentum teres of the liver. | 11. Splenic flexure of colon. |
| 6. Gall bladder. | |

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ABDOMEN.

VISCERA—No. 2.

THE STOMACH BED.

View of the last specimen after removal of the stomach.

The STOMACH lies in a chamber under cover of the left lobe of the liver and left cupola of the diaphragm, and this chamber is bounded by the gastric surface of the spleen, the left crus of the diaphragm, the left supra-renal capsule and a varying amount of the left kidney, the upper surface of the pancreas, the transverse mesocolon, and the transverse colon.

The transverse colon and mesocolon have been removed, leaving the splenic flexure in position, and showing the flattened upper surface of the pancreas. The left crus of the diaphragm lies above and internal to the left supra-renal body.

The second and third parts of the duodenum are seen as in the last view.

It will be noticed how close the termination of the duodenum lies to the under surface of the stomach, the transverse mesocolon alone intervening, and hence the intestine can easily be fixed to this surface of the stomach, as in the operation of posterior gastro-enterostomy.

The figures indicate—

- 1-5. Ligamentum teres of liver.
6. Gall bladder.
7. Hepatic flexure of the colon.
8. Right kidney.
9. Spleen.
10. Head of the pancreas and superior mesenteric vessels.
11. Splenic flexure of the colon.
12. Left crus of the diaphragm.

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ABDOMEN.

VISCERA.—No. 3.

THE STOMACH VIEWED FROM ABOVE AND SOMEWHAT IN FRONT.

The form and position of the stomach are greatly influenced by the amount of its distension, as well as by the condition of adjacent viscera. The specimen seen here is in a condition of considerable distension, and its general shape is that of a pyriform figure, somewhat bent upon itself.

The FUNDUS is the dilated portion lying to the left of the orifice of the oesophagus, rounded in outline, and extending upwards and backwards.

The PYLORIC portion is the narrow, somewhat cylindrical portion near the pyloric orifice, and the dilated part immediately to the left is the antrum pylori. The position of the pyloric orifice is indicated upon the surface by an annular constriction, and it should be noticed that in distension the antrum pylori lies to the right of the orifice.

The anterior or upper surface of the stomach is, in this condition, in contact with the under surface of the left lobe of the liver, the vault of the diaphragm, and the anterior abdominal wall.

The figures indicate—

1. Oesophageal opening.
2. Fundus.
3. Lesser curvature.
4. A projection, which passed from under the liver.
5. Antrum pylori.
6. Pyloric sphincter.

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ABDOMEN.

VISCERA—No. 4.

THE STOMACH VIEWED FROM BEHIND AND BELOW.

The inferior or posterior surface of the stomach, practically entirely invested by peritoneum, forms part of the anterior wall of the lesser peritoneal cavity, and is, therefore, separated by a double layer of peritoneum from the structures with which it is in immediate relation. The only exception is a small triangular area near the cardiac orifice which is in immediate contact with the diaphragm.

The remainder of this surface is in relation with the gastric surface of the spleen, the anterior surface of the left kidney and supra-renal capsule, the pancreas, transverse meso-colon and transverse colon.

The body of the pancreas where it is in front of the vertebral column, causes a marked indentation of this surface, situated near the lesser curvature.

The narrow character of the pyloric orifice should be noted, and also the acute angle which the termination of the oesophagus makes with the stomach.

The figures indicate—

- | | |
|-----------------------|---|
| 1. Oesophagus. | 6. Pyloric orifice. |
| 2. Fundus. | 7. Pancreatic impression. |
| 3. Antrum. | 8. Impression for the transverse meso-colon. |
| 4. Lesser curvature. | 9. Area for the terminal part of the pancreas |
| 5. Greater curvature. | |

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ABDOMEN.

VISCERA—No. 5.

ABDOMINAL PORTION OF THE OESOPHAGUS AND PART OF THE LIVER-BED.

(From the same subject as Abdominal Cavity, Nos. 5 and 6.)

The liver has been removed.

The *intra-abdominal* portion of the oesophagus is short, and is seen to join the stomach so as to form with it an acute angle, which is rather exaggerated in this specimen.

This portion of the oesophagus lies in contact with the posterior surface of the liver, and is accompanied by the pneumogastric or vagi nerves, the left one lying in front and the right behind.

The figures indicate—

1. Oesophagus and left vagus nerve.
2. Right crus of the diaphragm.
3. Two pointers inserted into the cut ends of the inferior vena cava.
4. Points to the divided portal vein, as it emerges from the pancreas. The duodenum has been displaced downwards.

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ABDOMEN.

VISCERA—No. 6.

SPLEEN, PANCREAS, KIDNEY, AND UNDER SURFACE OF THE STOMACH, FROM THE LEFT SIDE AND BELOW.

The tail of the pancreas passes across the front of the left kidney towards the spleen, below the under surface of the stomach. The splenic vessels accompany it, and are seen entering the spleen at the hilum.

The stomach here is empty, and comes into contact with only a small portion of the gastric surface of the spleen, the remainder of that surface was in contact with the splenic flexure of the colon.

The kidney is seen to be related in front to the pancreas and spleen, while the branches of the inferior mesenteric artery cross in front of it, and, with the peritoneum, separated it from the small intestine.

The descending colon passes downwards along its outer border.

The anterior margin of the spleen shows a distinct notch.

The figures indicate—

1. Under surface of the stomach.
2. Splenic vessels.
3. Tail of pancreas.
4. Upper part of left kidney.
5. A portion of the phrenico-colic peritoneal ligament, supporting the spleen.
7. The seventh rib.

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ABDOMEN.

VISCERA—No. 7.

The *head* of the pancreas lies in the hollow formed by the descending and transverse parts of the duodenum. The superior mesenteric vessels lie in a notch in it, and the portion below this notch is the *uncinate process*. The *head* is in relation, above, with the body of the gland, the pyloric region of the stomach, and the first part of the duodenum, and it lies in front of the bodies of the first and second lumbar vertebræ, from which it is separated by the aorta, inferior vena cava, and part of the diaphragm. The pancreatico-duodenal vessels ramify on its surface and between it and the duodenum. The portal vein is formed in front of it, and the common bile duct passes down behind it.

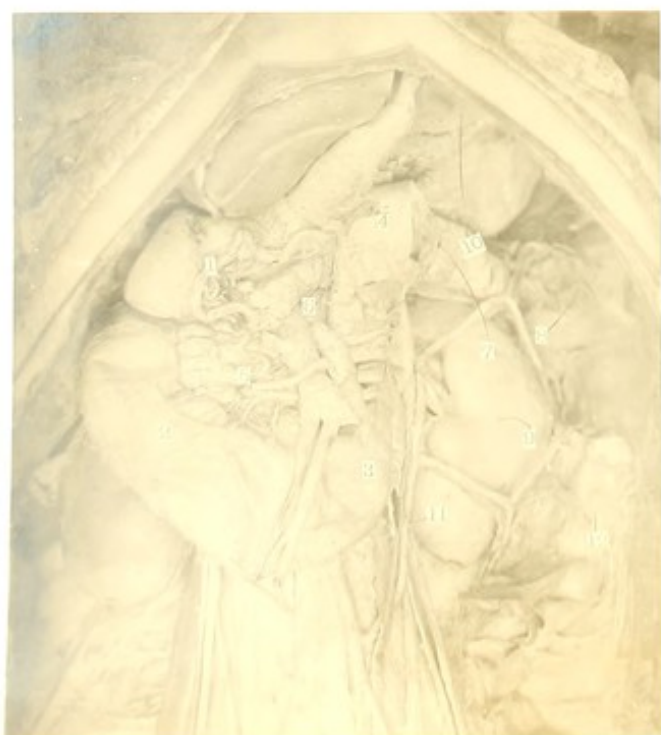
The *body* of the pancreas is somewhat triangular in shape. The anterior surface is curved to receive the posterior surface of the stomach, and the posterior surface rests on the posterior abdominal wall, with the splenic vein intervening, while the inferior surface is in contact with the duodeno-jejunal flexure, and the colon. The *tail* of the organ passes to the spleen.

Relation to peritoneum.—The anterior and inferior surfaces are covered by peritoneum, and the root of the transverse colon crosses the head and lies along the lower border of the body, while the root of the mesentery commences at the lower part of the head, thus creating a small area destitute of peritoneum.

The figures indicate—

- | | |
|--|---------------------------------------|
| 1. Gastro-epiploic artery, and first part of the duodenum. | 7. Tail of the pancreas. |
| 2. Second part of the duodenum. | 8. Spleen. |
| 3. Third part of the duodenum. | 9. Left kidney. |
| 4. Duodeno-jejunal flexure. | 10. Under surface of stomach (empty). |
| 5. Inferior pancreatico-duodenal vessels. | 11. Inferior mesenteric vessels. |
| 6. Superior mesenteric vessels. | 12. Descending colon. |

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ABDOMEN.

VISCERA—No. 8.

DUODENUM, PANCREAS, AND BILE-DUCTS.

The greater part of the head of the pancreas has been removed, so as to show the terminal part of the common bile-duct.

The second and third parts of the duodenum are seen forming a loop, in which the head of the pancreas lay, and terminating at the duodeno-jejunal flexure.

The superior mesenteric vessels have been cut across as they emerged from the pancreas, and the superior pancreatico-duodenal and right gastro-epiploic arteries are seen to their right side. The *common bile-duct* is seen posteriorly, running along the side of the duodenum and terminating by piercing its walls at the end of the second part. This duct was joined by the principal pancreatic duct, shortly before entering the wall of the duodenum; but, as is occasionally found, there is an accessory duct from the pancreas in this case, which terminates in the duodenum a little above this point. The inferior vena cava is seen lying in a still more posterior plane.

The figures indicate—

1. Second part of the duodenum.
2. Common bile-duct.
3. Inferior vena cava.
4. Ascending part of duodenum.
5. Superior mesenteric vein, with the artery on its left side.

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ABDOMEN.

ABDOMINAL VISCERA—No. 9.

THE LIVER VIEWED FROM ABOVE.

The parietal surface of the liver, in contact with the diaphragm, is divided into right and left lobes by the attachment of the **falciform ligament**, a double fold of peritoneum which runs upwards on this surface and then divides into two parts.

The lateral parts of this surface are convex, and are in relation to the base of the lung on each side, while the central part is flat and is related to the heart and pericardium.

The posterior part seen in this view is directed backwards, and forms the **posterior surface** of the organ.

The diverging limbs of the falciform ligament form, on the right, the upper layer of the coronary ligament, and, on the left the upper layer of the left lateral ligament. The **coronary ligament**, consisting of an upper and a lower layer, encloses the bare area of the liver, a surface destitute of peritoneal covering in contact with the under surface of the diaphragm. The meeting of the two layers to the right forms the small **right lateral ligament**.

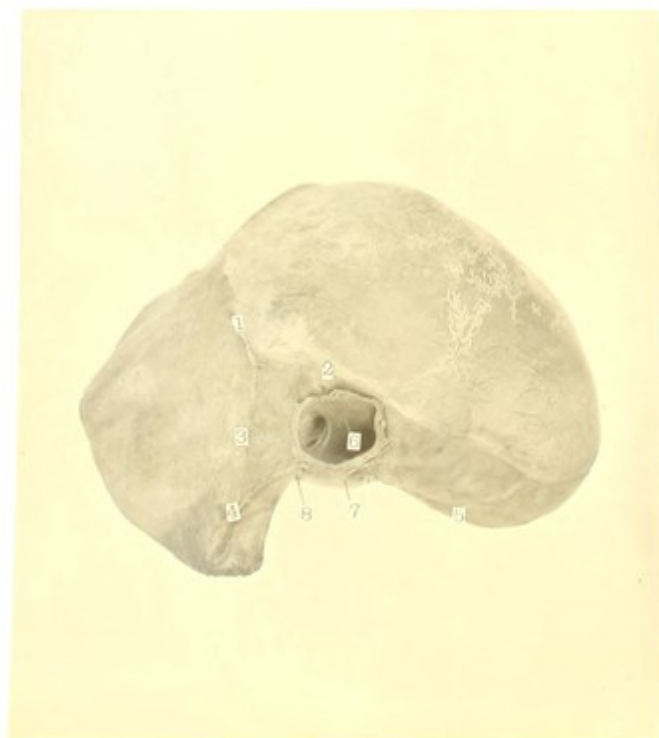
On the posterior surface are seen, from left to right, the groove for the oesophagus, the Spigelian lobe, the groove for the inferior vena cava, and the bare area, with a portion of the surface for the right suprarenal body.

In the lumen of the inferior vena cava are seen some orifices of the **hepatic veins**, by which the blood is returned from the liver.

The figures indicate—

- | | |
|---|---------------------------------|
| 1. Upper end of the falciform ligament, | 5. Bare area. |
| 2. Upper layer of the coronary ligament. | 6. Lumen of inferior vena cava. |
| 3. Left layer of falciform ligament going to form the | 7. Spigelian lobule. |
| 4. Left lateral ligament | 8. Oesophageal groove. |

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ABDOMEN.

VISCERA—No. 10.

THE LIVER VIEWED FROM BEHIND AND BELOW.

This view shows the visceral or inferior surface, and the back part of the parietal surface.

The *inferior surface* of the liver is divided into a right and a left portion by the umbilical fissure and by the fissure for the ductus venosus. To the left of this line is the *left lobe*, on which is seen an impression for the upper surface of the stomach and an elevation called the *tuber omentale*, in contact with the lesser omentum.

The portion lying to the right of the umbilical fissure is subdivided by the *fossa for the gall-bladder* into two portions. To the left of the gall bladder, lies the *quadrate lobe* in contact with the pylorus, and, in this specimen, greatly indented by the colon in front, while the area to the right shows a *colic*, a *renal*, and a *duodenal impression*, indicated by numbers. Behind the *transverse fissure* lie the *caudate lobe* and the *Spigelian lobe*. This fissure is a transverse cleft, by which the hepatic artery, portal vein, and the hepatic plexus of nerves enter, and the hepatic ducts and lymphatic vessels leave the liver.

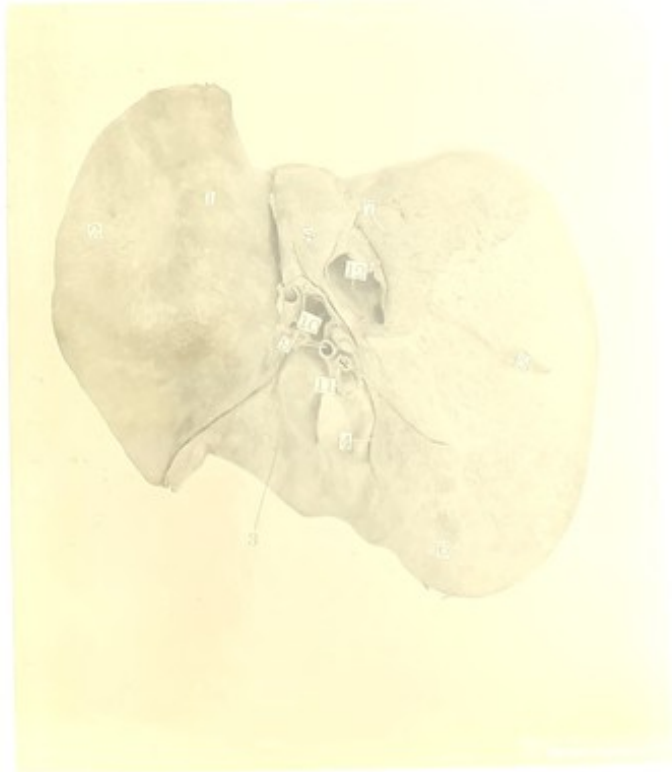
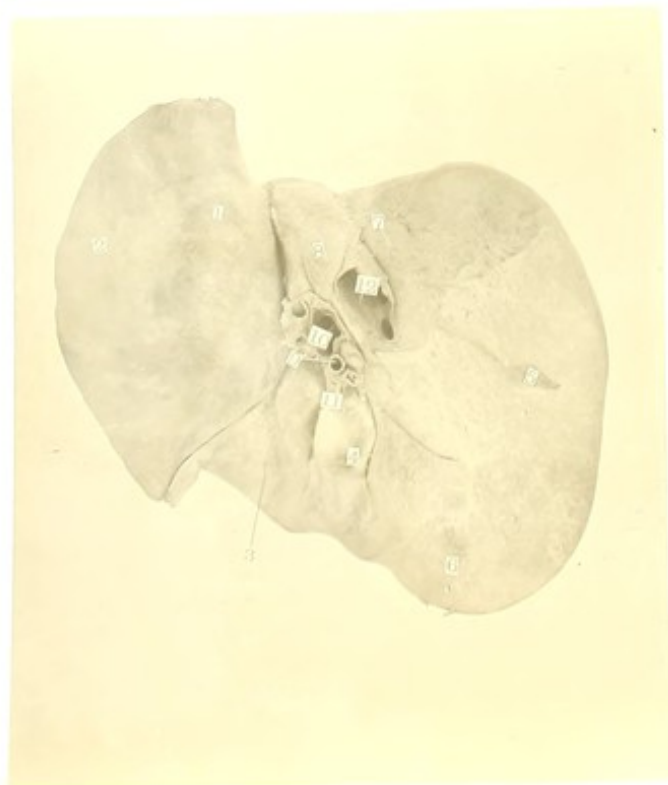
An enlarged lymphatic gland is seen, which is liable to exercise pressure upon these structures.

The *posterior part* of the *parietal surface* shows on the right, a portion of the bare area, and to the left of this, are seen the supra-renal impression, the fossa lodging the inferior vena cava, the Spigelian lobe, and the groove for the oesophagus.

The figures indicate—

- | | |
|------------------------|-------------------------|
| 1. Tuber omentale. | 7. Supra-renal surface. |
| 2. Gastric area. | 8. Spigelian lobe. |
| 3. Quadrate lobe. | 9. Hepatic artery. |
| 4. Fossa for duodenum. | 10. Portal vein. |
| 5. Renal surface. | 11. Bile duct. |
| 6. Colic area. | 12. Inferior vena cava. |

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ABDOMEN.

VISCERA—No. 11.

THE LIVER BED.

The liver has been removed, to show its relations.

The liver occupies a chamber, under cover of the diaphragm, in the right hypochondriac and epigastric regions.

The stomach, pylorus and first part of duodenum form the lower boundaries on the left side.

The diaphragm, right supra-renal capsule, right kidney and the hepatic flexure (removed) compose the other walls.

The figures indicate—

1. Right inferior phrenic vessels.
2. Impression for Spigelian lobe of liver.
3. Right supra-renal.
4. Cut end of inferior vena cava.
5. Upper end of right kidney.
6. Posterior part of diaphragm.

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ABDOMEN.

VISCERA—No. 12.

TWO SPLEENS, VIEWED FROM THE FRONT.

The shape of the spleen is largely determined by the condition of distension of adjacent organs, and especially of the stomach and splenic flexure of the colon, and also by the state of the organ itself, whether it is distended or contracted.

The two specimens figured here illustrate two different forms which it may assume. The spleen on the right is elongated, and was in contact with a stomach in a state of distension, while that on the left is a more usual form, and was in relation to a stomach practically empty.

The **visceral surface** which is shown here, is divided into three areas by three borders which radiate from a blunted eminence called the internal basal angle. Of these areas, the **gastric surface**, which is the largest, is concave and lies in contact with the fundus of the stomach. On this surface is an elongated slit, called the **hilum**, by which the nerves and vessels enter the substance of the spleen. Behind the lower part of the hilum, is a small surface for the tail of the **pancreas**.

The **renal surface** lies to the back, and is flat. The remaining surface, called the **basal surface**, is related to the **splenic flexure** of the colon, and the **costo-colic ligament**.

The **anterior border** is notched in a characteristic manner.

The figures indicate—

- | | |
|-------------------------|--|
| 1. Anterior margin. | 5. Basal surface. |
| 2. Gastric surface. | 6. Splenic vessels, entering at the hilum. |
| 3. Intermediate border. | 7. Anterior basal angle. |
| 4. Renal surface. | 8. Pancreatic surfaces. |

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ABDOMEN.

VISCERA—No. 13.

CAECUM.

Interior of the caecum in situ from the front.

The caecum lies in the right iliac fossa, immediately above the outer half of Poupart's ligament. The terminal part of the ileum opens on its inner and posterior aspect about two and a half inches above its lower end, and the vermiform appendix opens a short distance lower down. The caecum is usually completely invested by peritoneum, and lies upon the right ilio-psoas muscle.

The *ilio-caecal valve* is formed by the invagination of a portion of the ileum into the cavity of the large intestine. The orifice therefor comes to lie at the top of a double fold of the wall, the upper fold being horizontal and the lower more or less vertical, with a horizontal slit between them. From these folds two bands pass off, called *retinacula*, and extend round a considerable portion of the interior of the caecum.

The valve so formed is usually competent.

The vermiform appendix is here seen lying to the upper and inner side of the caecum, and bent upon itself at an acute angle, while the terminal part of the ileum is in this specimen at a higher level than usual, having been displaced upwards by the distended pelvic colon.

The figures indicate—

1. Terminal part of ileum.
2. Ilio-caecal aperture.
3. Aperture of the vermiform appendix
4. Vermiform appendix.

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ABDOMEN.

VISCERA—No. 14.

MUCOUS MEMBRANE OF THE INTESTINE.

The character of the mucous membrane of the alimentary canal presents marked differences in different portions.

In the upper part of the jejunum, the wall of the intestine is thick and fleshy, the inner surface is velvety, from the presence of villi, and shows numerous well-defined transverse ridges, called *valvulae conniventes*.

Further down, these characters become less distinct, until, near the end of the ileum, the coats are thinned, the ridges are few and irregular, and the diameter is diminished.

In this region may be seen the characteristic Peyer's patches, which are oval masses of lymphoid tissue, situated opposite the mesenteric attachment, and with the long axis lying along the line of the intestine. One of these is seen on an elevation in fig. 3.

The large intestine shows irregular sacculations, and the surface is smoother, as there are no villi.

Appendices epiploicae project from the peritoneal surface, and are merely small pads of fat covered by peritoneum.

The pieces of intestine shown are:—

1. Upper end of jejunum.
2. Middle of small intestine.
3. Lower end of ileum.
4. Large intestine.

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ABDOMEN.

VISCERA.—No. 15.

KIDNEYS VIEWED FROM THE FRONT, THE UPPER PAIR FROM A YOUNG SUBJECT, THE LOWER FROM AN ADULT.

The shape of the kidneys is characteristic, and each possesses an upper and a lower pole, two surfaces, and two borders.

The upper pole is broad but thin, and lies nearer the middle line than the lower, which is narrower but thick. The outer border is convex, and on the inner border is an oblong fossa, the hilum, in which the ureter and the blood-vessels are lodged.

The middle part of the anterior surface is raised up so that this part of the kidney is thick, and the surface slopes away towards each pole, forming two planes of pressure.

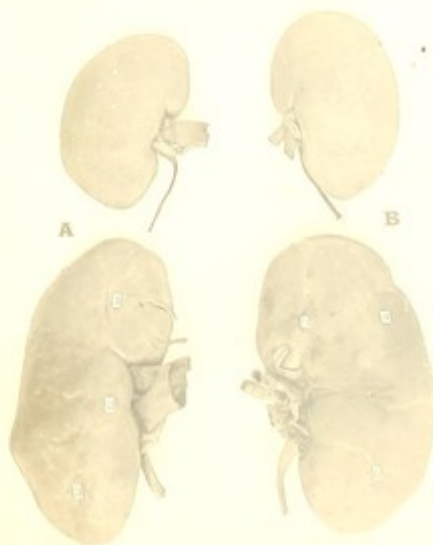
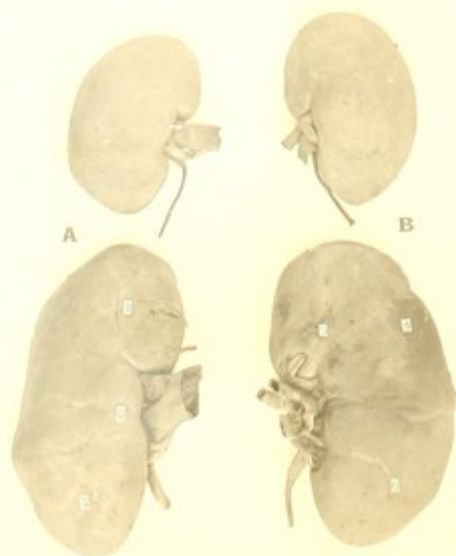
In contact with the upper plane of the right kidney is the liver, and with the lower the colon, while the duodenum lies in front of a variable area near the hilum.

The left kidney, on the other hand, is in contact above with the stomach, spleen, pancreas, and suprarenal capsule, while below it is in contact with the coils of intestines, and the descending colon lies along its outer border.

The figures indicate—

- | | |
|-------------------|---------------------|
| 1. Hepatic area. | 4. Splenic area. |
| 2. Duodenal area. | 5. Pancreatic area. |
| 3. Colic area. | 6. Intestinal area. |

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ABDOMEN.

VISCERA—No. 16.

KIDNEYS VIEWED FROM BEHIND, THE UPPER PAIR FROM A YOUNG SUBJECT, THE LOWER FROM AN ADULT.

The posterior surface of each kidney fits into an angular hollow by the side of the spine, and presents therefore a distinct vertical border which lies in the apex of this angle and divides the surface into an inner and an outer part.

The inner portion, which is narrow, is in apposition with the psoas muscle and the crus of the diaphragm, while the outer, directed backwards, rests against the diaphragm in its upper third, and the quadratus lumborum and the tendon of the transversalis in its lower two-thirds.

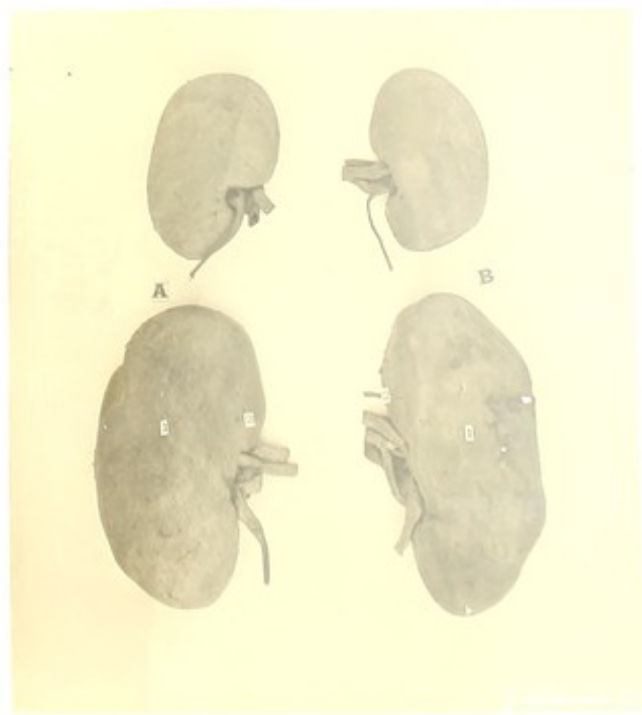
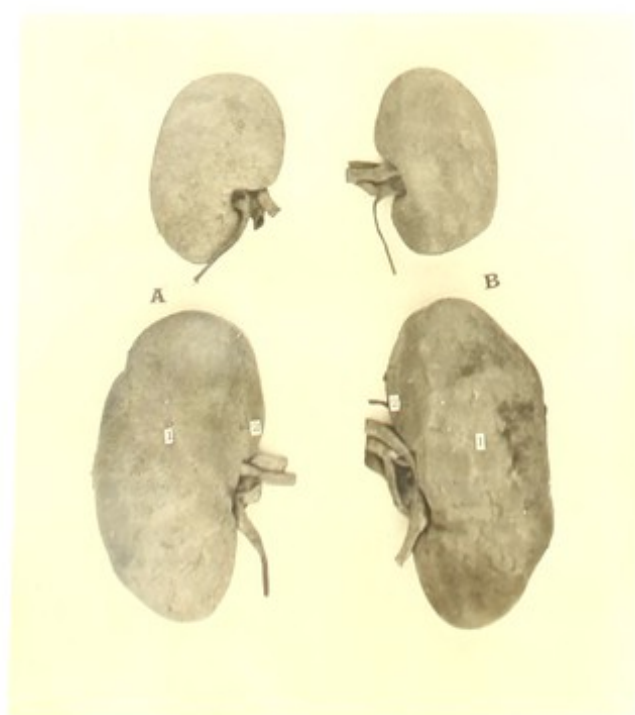
The posterior surface may also show a groove for the last rib, and dimples corresponding to the transverse processes of the first, second and third lumbar vertebræ, as well as a groove for the ligamentum arcuatum externum.

A indicates the left kidneys and B the right, and in each—

1 is the outer area of the posterior surface.

2 is the inner area of the posterior surface.

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ABDOMEN.

VISCERA—No. 17.

INNER BORDER OF THE RIGHT KIDNEY, VIEWED FROM THE INNER SIDE.

The *hilum* on the inner border of the kidney is bounded by two convex margins, irregular in outline and variable as regards their relative size.

In the hilum are lodged the branches of the renal vein and artery and the ureter, in that order from before backwards.

The *hilum* leads into a slit, called the *renal sinus*, in which lies the *pelvis* of the kidney.

As not infrequently happens, in this specimen there are several renal arteries, each accompanied by a vein.

An inferior capsular vessel is seen going to the suprarenal capsule, which lies mainly on the inner border of the kidney, a short distance above the hilum.

The figures indicate—

1. Suprarenal capsule.
2. Principal renal vein.
3. A renal artery, branching at the hilum.
4. Ureter, accompanied by an artery.
5. Anterior lip of the hilum.
6. Posterior lip of the hilum.

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ABDOMEN.

VISCERA—No. 18.

SUPRARENAL CAPSULES, VIEWED FROM THE FRONT.

The suprarenal bodies are two small flattened ductless glands, closely related to the kidneys.

The *right*, somewhat triangular in shape, rests more upon the upper pole of the right kidney, and lies between the liver and that part of the diaphragm which covers the side of the spine.

The lower part of its anterior surface is covered by peritoneum, and the upper part is in contact with the liver externally and the inferior vena cava internally.

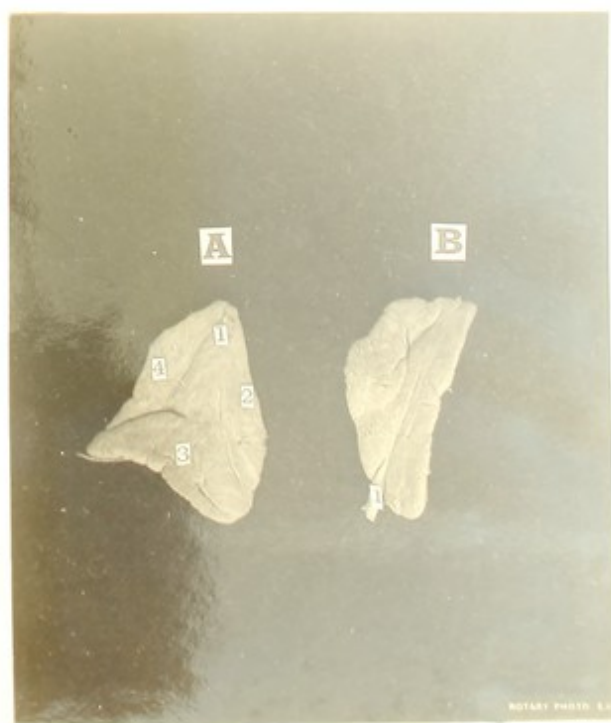
Near the apex is a small hilum, from which emerges a small vein which goes to join the inferior vena cava.

The *left capsule* is rather sickle-shaped, and lies more on the mesial border of its kidney. The upper part of the anterior surface is covered by the peritoneum forming the posterior wall of the lesser sac, and is related to the cardiac portion of the stomach, while the lower portion is in direct contact with the splenic vessels and the pancreas. The hilum is here situated near the lower end, and transmits a large vein, which goes to the left renal vein.

A indicates the right suprarenal and B the left, and the figures indicate—

1. The hilum.
2. Surface in contact with the inferior vena cava.
3. Peritoneal area of right capsule.
4. Surface in contact with the liver.

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ABDOMEN.

VISCERA—No. 19.

THE SUPRARENAL CAPSULES, VIEWED FROM BEHIND.

The posterior surface of the suprarenal capsules is in each divided into two parts, by a fairly prominent ridge.

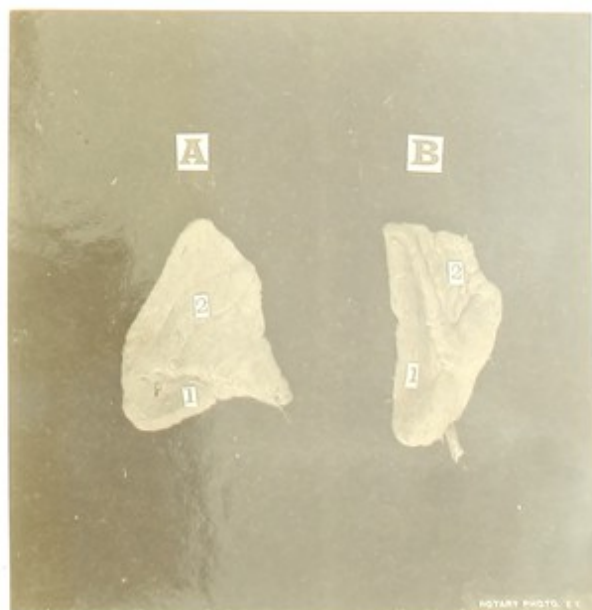
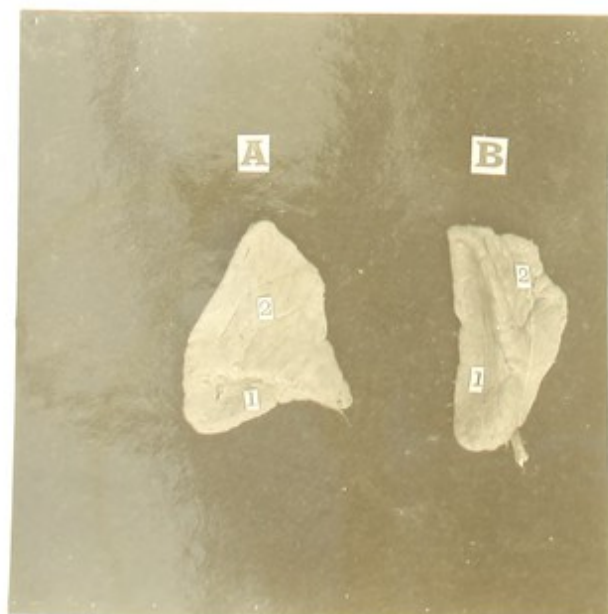
The outer and lower portion is in contact with the kidneys, and this is due to the fact that the capsule on each side rests rather on the anterior surface than on the border of the kidney.

The remaining portion of this surface is in contact with the corresponding crus of the diaphragm. There is usually a considerable amount of fat surrounding the capsules.

A is the right suprarenal and B the left, and in each the figures indicate—

1. Surface in contact with the kidney.
2. Surface in contact with diaphragm.

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ABDOMEN.

VISCERA—No. 20.

PANCREAS, BILE-DUCT AND DUCT OF PANCREAS, AND DUODENUM, VIEWED FROM BEHIND.

A shows the interior of the duodenum. A probe has been passed along the common bile-duct, and the orifice is seen to lie on the summit of a papilla.

In B, the common bile-duct is seen passing downwards behind the head of the pancreas, and is joined by the duct of the pancreas. In relation to the pancreas are seen, the origin of the *coeliac axis* artery which lies at its upper border, the *hepatic artery* passing from thence to the right and the *splenic artery* to the left along the upper border of the pancreas, the *superior mesenteric* artery and vein, and the *portal vein*.

The figures indicate—

- | | |
|--|---|
| 1. Descending part of the duodenum. | 7. Splenic artery. |
| 2. Duodeno-jejunal flexure. | 8. Superior mesenteric artery. |
| 3. Head of pancreas and pancreatic duct. | 9. Splenic vein. |
| 4. Common bile-duct. | 10. Tail of pancreas. |
| 5. Portal vein. | 11. Superior pancreatico-duodenal artery. |
| 6. Coeliac axis artery. | |

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ABDOMEN.

VISCERA—No. 21.

PANCREATIC AND COMMON BILE-DUCTS, SEEN FROM THE FRONT.

The ducts have been exposed by removing the greater part of the head of the pancreas, and cutting away a portion of the anterior surface of the body of the gland. The superior mesenteric vessels have also been removed.

The main duct of the pancreas or canal of *Wirsung* begins at the tail of the gland and passes along in the substance of the gland to the right. It is joined by numerous small ducts which come from the different lobules, the majority of them entering it at a right angle. Within the head of the pancreas, the duct bends downwards, lies by the side of the common bile-duct, and ends by piercing its wall and thus entering the second part of the duodenum with it. There is frequently a small accessory duct which arises in the head of the gland and enters the duodenum at a higher level independently.

The manner in which the splenic vessels enter the spleen along an elongated slit-like fissure, the hilum, should be noticed.

The figures indicate:—

- | | |
|---|----------------------------|
| 1. Formation of the common bile-duct. | 6. Gastro-duodenal artery. |
| 2. Duct of the pancreas in the neck of the gland. | 7. Splenic artery. |
| 3. Lower part of the head of the pancreas. | 8. Splenic vein. |
| 4. Descending part of the duodenum. | 9. Hepatic artery. |
| 5. Body of the pancreas. | 10. Coeliac axis artery. |

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ABDOMEN.

ABDOMINAL AORTA—No. 1.

TO SHOW THE ABDOMINAL AORTA, THE BED OF KIDNEYS, ETC.

The kidneys, the upper parts of the ureters, the ovarian vessels, and a portion of the inferior vena cava have been removed, to show the bed of the kidneys, the gangliated cord of the sympathetic, and the branches of the lumbar plexus in relation to the psoas muscles.

The three principal foramina in the diaphragm are seen, the *oesophageal* to the left side, the *aortic* in the mesial plane and lowest, while the *inferior caval opening* is to the right and is the highest of the three.

The *bed of the kidneys* is seen to be formed by the diaphragm above, the crus of the diaphragm and the psoas muscle internally, and the quadratus lumborum and tendon of the transversalis abdominis externally.

The *abdominal aorta* enters the abdomen under cover of the ligamentum arcuatum medium of the diaphragm, and runs down in front of the vertebral column as far as to the fourth lumbar vertebra, where it terminates by dividing into the two common iliac arteries. The *coeliac axis* and the *superior mesenteric* arteries are seen arising from the commencement of the aorta and, from its anterior aspect, lower down the *inferior mesenteric*. The *middle sacral* which arises from the posterior aspect of the aorta is seen between the two common iliacs. Some *lumbar* branches, which arise rather from the posterior aspect are also seen.

The figures indicate—

- | | | |
|---|--|---|
| 1. Oesophagus. | 7. Ureters crossing the common iliac arteries. | 11. External cutaneous nerve. |
| 2. Ligamentum arcuatum medium. | 8. Gangliated cord of the sympathetic. | 12. Accessory nerve to the external cutaneous nerve. |
| 3 and 4. Left and right renal vessels. | 9. Last dorsal (subcostal) nerve. | 13. Genito-crural nerve. There is a well-marked psoas minor muscle here also. |
| 5. Inferior mesenteric artery. | 10. Ilio-inguinal and ilio-hypogastric nerves. | |
| 6. Right common iliac artery crossing the left common iliac vein. | | |

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ABDOMEN.

PELVIS—No. 1.

PELVIC BRIM AND CAVITY, VIEWED FROM ABOVE AND IN FRONT.

The pelvic peritoneal cavity in the female is divided into an anterior and posterior compartment by the uterus and a transverse fold of peritoneum which runs outwards from it on either side to the side wall of the pelvis, called the *broad ligament*. The ovary lies on the posterior aspect of this fold and is concealed from view.

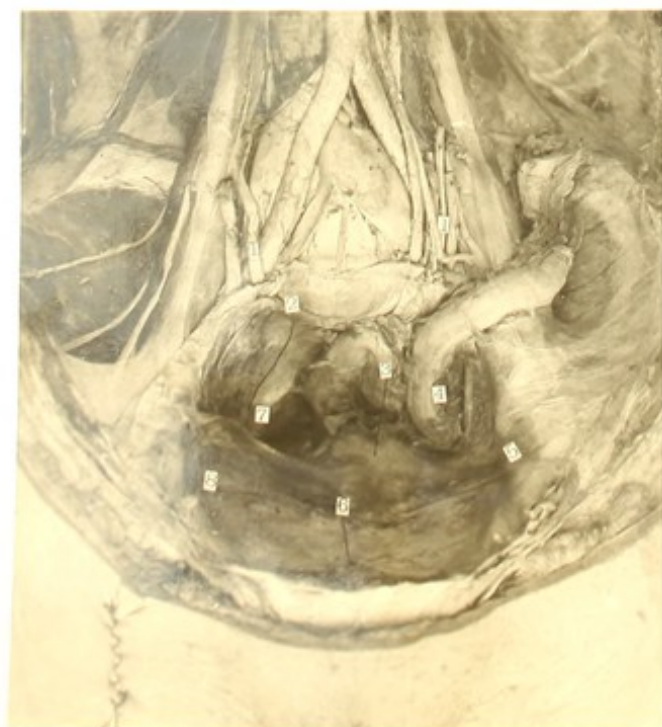
The posterior compartment or *recto-vaginal pouch*, or pouch of Douglas, is limited laterally by a fold of peritoneum which passes from the side of the uterus to the sacrum, called the *utero-sacral fold*. The uterus is, in this specimen, somewhat retroverted, and the loops of the pelvic colon fill the left part of the pouch of Douglas. In front of the uterus is the *utero-vesical* pouch of peritoneum.

On either side of the promontory of the sacrum are seen the common iliac vessels, and crossing them, the ureters and the ovarian vessels, and on the left side, the terminal portion of the inferior mesenteric artery. Still further out, is the psoas muscle, and, in this case, there is a psoas parvus muscle lying in front of it.

The figures indicate—

- | | |
|---------------------------|------------------------------------|
| 1. Ureters. | 5. Round ligament of the uterus. |
| 2. Utero-sacral ligament. | 6. Bladder beneath the peritoneum. |
| 3. Fundus of the uterus. | 7. Broad ligament. |
| 4. Pelvic colon. | 8. Obliterated hypogastric artery. |

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ABDOMEN.

PELVIS.—No. 2 (Male).

VERTICAL MESIAL SAGITTAL SECTION THROUGH THE MALE PELVIS, TO SHOW THE VISCERA AND THE PERITONEUM.

The peritoneum covering the superior surface of the bladder is continued forwards on to the anterior abdominal wall. In a backward direction it leaves the bladder, passes over the apex of the seminal vesicles and the vasa deferentia, and thence on to the front of the rectum, which it reaches about an inch above the base of the prostate gland. Laterally, the peritoneum passes on to the side wall of the pelvis. When the bladder and rectum are empty, it is raised into two folds. One of these passes as a sharp crescentic margin from the base of the seminal vesicles and the vas deferens outwards and backwards towards the sacrum, and is called the *sacro-genital* fold. It contains some fibrous and muscular tissue. In front of this, a fold is raised up by the ureter.

These folds divide the lateral pelvic peritoneal cavity into three fossae. By the side of the rectum is the *para-rectal fossa*, limited in front by the sacrogenital fold. In front of it is a middle or *genital fossa* extending forwards to the fold of the ureter, and in front of it again, by the side of the bladder, is the *para-vesical fossa*. The fold of the ureter is crossed by a ridge due to the vas deferens which lies below the peritoneum, and crosses the ureter.

The *recto-vesical* peritoneal pouch is limited below by the peritoneum between the bladder and front of the rectum.

The figures indicate—

- | | |
|---|---|
| 1. Fourth lumbar intervertebral disc. | 5. Prostate gland, and, behind it, the seminal vesicles. |
| 2. Pubic symphysis. | 6. Peritoneal fold due to the ureter, crossed here by the vas deferens. |
| 3. Apex of the bladder. | 7. Sacro-genital fold of peritoneum. |
| 4. Termination of the rectum, and commencement of the anal canal. | 8. Bulb of the penis. |

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ABDOMEN.

PELVIS—No. 3.

VERTICAL MESIAL SECTION OF THE MALE PELVIS, TO SHOW ESPECIALLY THE VISCERA.

The pelvic colon has been left undivided, in order to show its whole extent.

The *pelvic colon* is a loop of intestine, about 15-18 inches in length, attached by a peritoneal mesentery to the wall of the pelvis, from the inner border of the left psoas muscle to the third piece of the sacrum. The length of the mesentery permits considerable alterations to take place in the disposition of the loop, but it may be said that usually it first passes into the true pelvis, it then crosses the pelvic cavity from left to right, and then bends back to the middle line and becomes continuous with the rectum.

The *rectum* begins at the level of the third piece of the sacrum, and extends forwards on the front of the sacrum, coccyx, and ano-coccygeal body, adapting itself to the curve of these structures. It is usually curved from side to side, at the points of the flexures of the rectum, which are usually three in number.

It terminates about $1\frac{1}{2}$ inches in front of the tip of the coccyx, where it bends downwards and back, to form the anal canal.

The *anal canal* is the short passage through the floor of the pelvis, surrounded by the external and internal sphincter muscles, and the two levatores ani. These structures form the lateral relations of the canal, and beyond them is the ischio-rectal fossa on each side. In front are the bulb of the urethra and the base of the triangular ligament, and behind, the ano-coccygeal body.

The relations of the peritoneum to the different parts of the intestine are well seen, the upper two-thirds of the rectum having a partial investment, and the lower third being destitute of it.

The figures indicate—

- | | |
|---|-------------------------|
| 1. Disc between the fourth and fifth lumbar vertebræ. | 6. Anal canal. |
| 2. Symphysis pubis. | 7. Bladder. |
| 3. Pelvic colon. | 8. Prostate. |
| 4. Termination of the pelvic colon. | 9. Bulb of the urethra. |
| 5. Rectum. | |

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ABDOMEN.

PELVIS.—No. 4.

VERTICAL SAGITTAL SECTION OF THE MALE PELVIS SLIGHTLY TO THE LEFT OF THE MESIAL PLANE.

The peritoneum has been removed to show the vessels and nerves.

The bladder is moderately distended, and occupies the anterior half of the pelvic cavity, the apex rising up behind the symphysis pubis. A large area of the posterior or basal aspect lies in front of the rectum, the seminal vesicles intervening in the lower part. The prostate lies fixed in its sheath of fascia, and the portion of bladder wall associated with it does not change its position.

The *rectum* is distended, and is seen to receive branches of supply from the inferior mesenteric artery. The principal vessels and nerves lie on the side wall of the pelvis at a somewhat higher level than those organs, and therefore are not liable to pressure, except when the viscera are considerably over-distended.

The course of the vessels and other structures is seen in the next view.

The figures indicate—

- | | |
|---|---|
| 1. Intervertebral disc above the sacrum. | 7. Terminal branch of the inferior mesenteric artery. |
| 2. Symphysis pubis. | 8. Anterior division of the first sacral nerve. |
| 3. Bifurcation of the common iliac artery. | 9. Obturator nerve. |
| 4. Division of the internal iliac artery. | 10. Vas deferens entering the pelvis. |
| 5. External iliac vein, the artery lying on its outer side. | 11. Prostate. |
| 6. Ureter entering the pelvis. | 12. Rectum. |

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ABDOMEN.

PELVIS.—No. 5.

(SAME AS NUMBER 4, AFTER REMOVAL OF THE RECTUM AND OF THE LATERAL PART OF THE BLADDER WALL) TO SHOW THE NERVES AND VESSELS AND THE COURSE OF THE URETER AND VAS DEFERENS.

The *ureter* enters the pelvis, crossing in front of the common iliac, or, as here, the external iliac vessels. It then passes downwards and slightly forwards to the base of the bladder, lying in front of the internal iliac artery and crossing the obturator vessels and nerve, and the obliterated hypogastric artery. It is crossed by the vas deferens, and ends by piercing the bladder wall very obliquely. The *vas deferens* pursues a curved course, first crossing the external iliac vessels, and then passing down and back by the side of the bladder, crossing the obliterated hypogastric artery, and then the ureter. It then turns inwards, and lies on the inner side of the seminal vesicle, and passes to the base of the prostate.

Behind the ureter lies the *internal iliac artery*, which divides into an anterior and a posterior division, and from them branches are seen passing in different directions.

The figures indicate—

- | | |
|---|--|
| 1. Promontory of the sacrum. | 6. Gangliated cord of the sympathetic. |
| 2. Symphysis pubis. | 7. First sacral nerve. |
| 3. Between common iliac artery and vein. | 8. Obturator nerve. |
| 4. Division of common iliac artery. | 9. Obliterated hypogastric artery. |
| 5. Ureter crossing the external iliac vein. | 10. Prostate. |

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ABDOMEN.

PELVIS—No. 6.

SIDE WALL OF THE PELVIS.

Running along the side wall of the pelvis is seen the *white line* or *arcus tendineus*, from which the levator ani takes origin, and which extends from the back of the symphysis pubis to the spine of the ischium. Above this level, the pelvis is lined by the obturator internus muscle, and at its upper margin is the notch by which the obturator vessels and nerve escape from the pelvic cavity. In this case there is an abnormal obturator artery, arising from the deep epigastric artery, and accompanied by a vein which joins the internal iliac vein. There is only a very small obturator branch from the internal iliac artery.

Below the white line, is the *pelvic diaphragm*, composed of the levator ani and coccygeus muscle on each side of the body. On the front of the sacrum lies the *pyriformis* muscle, with the anterior sacral nerves, from which some branches pass forwards to supply the levator ani muscle on its pelvic aspect.

The figures indicate—

- | | |
|--|--|
| 1. Aperture for the urethra. | 7. Pyriformis muscle. |
| 2. Anal canal. | 8. Coccygeus muscle. |
| 3. Levator ani muscle. | 9. External sphincter muscle. |
| 4. Arcus tendineus of the levator ani, or white line of the pelvic fascia. | 10. Obturator canal, for vessels and nerves. |
| 5. Obturator internus muscle. | 11. Aperture for ilio-lumbar vessels. |
| 6. Ischial spine. | 12. Anterior sacral nerves. |
| | 13. Bulb of the penis. |

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ABDOMEN.

PELVIS—No. 7.

CORONAL SECTION OF THE PELVIS, WITH THE BLADDER AND PROSTATE IN SITU.

Lining the side wall of the bony pelvis is seen the *obturator internus muscle* on the left side, with fascia on its inner and outer aspects. The fascia on its pelvic aspect gives origin to the *levator ani* muscle, and the anterior strong pillars of that muscle are seen supporting the prostate gland and passing on to blend with the wall of the anal canal. External to this muscle, on the right side of the specimen, is seen the apex of the *ischio-rectal fossa*, with the internal pudic nerve and vessels lying in its outer wall.

The *prostate* rests on the end of the rectum, and the groove between its base and the neck of the bladder was occupied by a plexus of veins and by fibrous tissue. The anal canal passes downwards and backwards from the prostate.

The vessels, nerves, and ureter lying on the side wall of the pelvis, and the vessels and nerves on the pelvic brim should be noticed.

The figures indicate—

- | | |
|---|---|
| 1. Anterior portion of the levator ani. | 8. Pelvic colon. |
| 2. Obturator internus muscle. | 9. Urachus. |
| 3. External sphincter of the anal canal. | 10. Obturator vessels and nerve. |
| 4. Prostate, with the urethra emerging from it. | 11. Ureter. |
| 5. Seminal vesicle. | 12. External iliac vessels and genito-crural nerve. |
| 6. Fascia covering obturator internus. | 13. Terminal part of the ileum, with the appendix vermiformis lying external and posterior to it. |
| 7. Apex of ischio-rectal fossa, with internal pudic vessels and nerves. | 14. Below the anterior crural nerve. |

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ABDOMEN.

PELVIS—No. 8.

SAME AS NO. 7, AFTER REMOVAL OF THE BLADDER AND PROSTATE, AND OF THE ANTERIOR WALL OF THE ANAL CANAL.

I. *Anal Canal.* In the wall of the anal canal are seen (1) the *internal sphincter*, formed by a thickening of the circular muscle fibres of the intestine, (2) the *fibres of the levator ani*, and (3) externally, the *external sphincter*. In the interior can be seen one of the vertical folds of mucous membrane, or columns of Morgagni.

II. *Rectum.* The lateral flexions of the rectum are seen, they are usually three in number, two to left and one to the right, and at these bends a fold of mucous membrane projects into the interior of the canal, forming a rectal valve.

On each side of the rectum at the back is the para-rectal peritoneal fossa, and the peritoneum as it passes forwards on the rectum is seen to pass off first from the lateral and then from the anterior surface.

The figures indicate—

- | | |
|---|---|
| 1. Levator ani muscle. | 8. Pelvic colon. |
| 2. Obturator internus. | 9. Pelvic vessels and nerves. |
| 3. Internal sphincter. | 10. Obturator vessels and nerves. |
| 4. Column of Morgagni in the anal canal. | 11. Ureter. |
| 5. Flexure of the rectum to the right. | 12. External iliac vessels and genito-crural nerve. |
| 6, 7. Apex of the ischio-rectal fossa, with internal pudic vessels and nerve, and a branch from the nerve to the levator ani. | 13. Termination of the ileum. |
| | 14. Below the anterior crural nerve. |
| | 15. Commencement of the rectum. |

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ABDOMEN.

BLADDER—No. 1.

TWO SPECIMENS OF THE BLADDER, PROSTATE, ETC., VIEWED FROM BELOW.

In A the bladder is moderately distended, and in B it is empty.

The *inferior surface* of the bladder is in contact, at the back, with the base of the prostate, and, in this region, it is called the *neck*, and contains the aperture of the urethra. From this point, the urethra passes through the substance of the prostate, and emerges from its rounded tip.

In front of the prostate, the under surface of the bladder is rounded, and it is sometimes divided into two lateral halves by a median sagittal border which passes forwards to the apex of the bladder.

The inferior surface passes almost insensibly into the basal aspect behind, and it is separated from the upper surface by the lateral borders of the bladder.

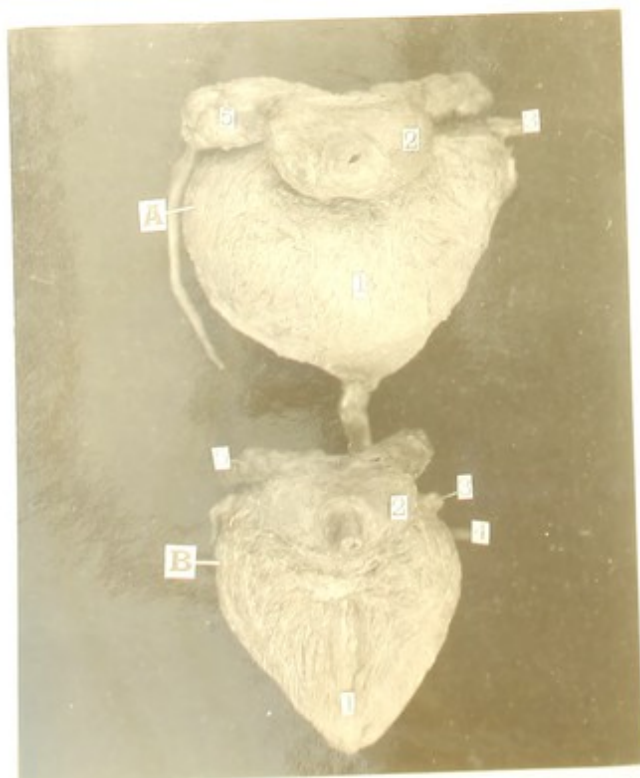
This under surface is in contact with the pubic symphysis and body of the pubis, the retro-pubic pad of fat, and the levator ani and obturator internus muscles.

As the bladder fills, this surface becomes more rounded, and is elongated, so that the apex of the bladder passes upwards above the symphysis pubis.

The figures indicate—

1. Inferior surface of the bladder.
2. Lateral surface of the prostate.
3. Termination of the ureter.
4. Vas deferens.
5. Seminal vesicle.

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ABDOMEN.

BLADDER.—No. 2.

BLADDER, PROSTATE, AND SEMINAL VESICLES, SEEN FROM BEHIND.

The *prostate* is an unpaired glandular body, of the shape of a chestnut, the rounded tip of which projects downwards.

The upper surface, or *base*, is directed upwards and forwards. It is pierced by the *ejaculatory ducts*. In front of that point it is in contact with the bladder, and, behind it, with the seminal vesicles. The *posterior surface* is flat, and is in relation to the anterior wall of the rectum.

The surface of the prostate is smooth, and is covered behind and at the sides by a sheath of connective tissue, the *fascia prostatæ*.

The *seminal vesicles* are situated above and behind the prostate. They are paired, oblong, flattened bodies, with a nodular surface. They lie along the outer side of the termination of the *vas deferens*, and the upper end touches the terminal part of the ureter. The posterior surface is covered in its upper half or third by peritoneum.

The terminal part of the *vas deferens* lies behind the bladder, and presents a spindle-shaped dilatation called the *Ampulla*. From the internal abdominal ring as far as to the middle of the ampulla, the *vas deferens* lies immediately under the peritoneum.

The figures indicate—

- | | |
|---------------------------------------|---|
| 1. Urethra. | 6. Upper surface of the bladder, covered by peritoneum. |
| 2. Posterior surface of the prostate. | 7. A small portion of the interior of the bladder, to show the urethral orifice, and the papilla which projects into the bladder behind it. |
| 3. Seminal vesicle. | |
| 4. Vas deferens. | |
| 5. Ureter. | |

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ABDOMEN.

BLADDER—No. 3.

TWO SPECIMENS OF BLADDER, PROSTATE, AND SEMINAL VESICLES VIEWED FROM THE SIDE.

In the upper specimen the peritoneum has been left, covering the upper surface, and the line of reflection is seen separating the upper from the lower surface.

Prostate. The apex points downwards and is in contact with the deep layer of the triangular ligament, and the urethra issues from it.

The posterior surface is flattened and is related to the rectum, while the lateral surfaces are rounded and are in relation to the levator ani muscle. There is no indication on the surface of any sub-division of the gland into lobes.

The figures indicate—

- | | |
|-------------------------------------|--|
| 1. Apex of the bladder and urachus. | 5. Vas deferens. |
| 2. Upper surface of bladder. | 6. Seminal vesicle |
| 3. Inferior. | 7. Prostate gland. |
| 4. Ureter. | 8. Apex of prostate and urethra issuing from it. |

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