Examinations in anatomy, physiology, practice of physic, surgery, materia medica, chemistry, and pharmacy : for the use of students, who are about to pass the College of Surgeons, or the medical or transport board / by Robert Hooper, M.D.

EXAMINA[illegible]

IN

ANATOMY, PHYSIOLOGY,

PRACTICE OF

PHYSIC, SURGERY, MATERIA MEDICA,

CHEMISTRY, AND PHARMACY,

FOR THE USE OF

STUDENTS,

WHO ARE ABOUT TO PASS THE

COLLEGE OF SURGEONS, OR THE MEDICAL OR TRANSPORT BOARD.

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TO THE

GENTLEMEN STUDYING MEDICINE,

AND

PREPARING FOR THEIR EXAMINATION;

THIS LITTLE WORK

IS DEDICATED,

AS A MARK OF THE AUTHOR'S ATTENTION

TO

THEIR INTEREST AND WELFARE.

EXAMINATIONS

IN

ANATOMY, PHYSIOLOGY, SURGERY,

PRACTICE OF PHYSIC, MATERIA MEDICA,

CHEMISTRY AND PHARMACY;

FOR THE INSTRUCTION OF STUDENTS.

ANATOMY.

1. Q. HOW many bones compose the cranium?

A. Eight: namely, os frontis, two ossa parietalia, os occipitis, two ossa temporalia, os ethmoides, and the os sphænoides.

2. Q. What is the union of the bones of the skull termed?

A. Suture.

3. Q. Describe the situation of the sphænoidal bone.

A. The sphænoidal bone is situated in the middle of the basis of the cranium, extending underneath, from one temple across to the other.

4. Q. Into how many portions is the temporal bone distinguished?

A. Generally into two portions, viz. a squamous portion and a petrous portion.

5. Q. In what bone is the organ of hearing situated?

A. In the petrous portion of the temporal bone.

6 Q. How many tables have the bones of the cranium?

A. Two: an external and an internal.

7. Q. What is the name of the substance which unites the two tables of the cranium?

A. It is called Diploë, and meditullium.

8. Q. What is the name of the suture which connects the frontal with the parietal bones?

A. The coronal suture.

9. Q. By what suture is the occipital bone united to the parietal bones?

A. By the lambdoidal suture.

10. Q. What name is given to the suture which connects the parietal bones?

A. It is called the sagittal suture.

11. Q. How many species of sutures are there?

A. Two: viz. the true and false.

12. Q. What bones are united by the false sutures?

A. The temporal bones are united to the parietal bones, by the false or squamous suture.

13. Q. Through what foramina do the olfactory nerves pass out of the cranium?

A. Through the foramina cribosa, which are in the upper part of the ethmoid bone.

14. Q. Where is the foramen magnum occipitale situated?

A. In the occipital bone, at the inferior part between the condyles and behind the basilary process.

15. Q. To what bone does the crista galli belong?

A. To the ethmoid bone; it forms the projecting process within the cranium, to which the falciform process of the dura mater is attached.

16. Q. To what bone does the sella turcica belong?

A. To the sphænoid bone; it is placed in the middle, and projects into the cavity of the cranium.

17. Q. Describe the frontal bone.

A. The frontal bone has some resemblance to a cockle-shell; it is placed in the anterior part of the skull, and forms the fore-head and upper-part of the orbits. It receives the anterior lobes cerebri, forms a notch for the ethmoid bone, is externally convex, internally concave, and has several elevations and depressions.

18. Q. Where is the os æthmoides situated?

A. The os æthmoides is situated at the root of the nose, in a notch between the orbitar plates of the frontal bone.

19. Q. What bone separates the ethmoid from the occipital bone?

A. The os sphænoideum.

20. Q. To what bone does the mastoid process belong?

A. It is a part of the temporal bone.

21. Q. How many bones compose the orbit?

A. Seven: viz. os frontis, os æthmoidale, os sphænoidale, os lachrymale, os jugale, os palati, and the os maxillare superius.

22. Q. How many bones compose the lower jaw?

A. One, in the adult, which is called the inferior maxillary bone.

23. Q. What bones form the septum narium?

A. The azygos process of the ethmoid bone, and the vomer.

24. Q. To what bone do the superior turbinated bones, as they are called, belong?

A. To the ethmoid bone, of which they are a part.

25. Q. In what bone is the antrum of Highmore situated?

A. In the superior maxillary bone, immediately behind the cheeks.

26. Q. What separates the antrum of Highmore from the orbit?

A. The orbitar process, or plate, of the superior maxillary bone.

27. Q. Is there any communication between the orbit and the nostril?

A. Yes: by the ductus ad nasum, in which there is a membranous canal, in the fresh subject, to convey the tears into the nose.

28. Q. How many bones are there in the tympanum?

A. Four: the incus, stapes, malleus, and os orbiculare.

29. Q. To what bone of the cranium does the styloid process belong?

A. To the temporal bone.

30. Q. What bones form the foramen lacerum in basi cranii?

A. The temporal and occipital bones.

31. Q. What are the processes of the sphænoid bone called, which form the sides of the posterior nostril?

A. The pterygoid processes.

32. Q. What passes through the foramen lacerum in basi cranii?

A. The jugular vein and par vagum.

33. Q. Do the ossa palati form any part of the orbit?

A. Yes: a portion of the palate-bone rises into the orbit, and forms a part of the posterior and inferior part of it.

34. Q. Where is the vomer situated?

A. In the centre of the nostrils, having the sphænoid and ethmoid bones at its upper part, and the superior maxillary and palatine bones at its lower part, and the cartilaginous septum of the nose on the anterior part.

35. Q. Point out the situation of the zygomatic processes on the face.

A. It forms the lateral and superior part of the cheek, extending anteriorly from the extremity of the ear.

36. Q. Where is the os unguis situated?

A. The os unguis is situated in the orbit, at the internal angle, immediately underneath the meeting of the eye lashes.

37. Q. What is the name of the portions of the os æthmoides, which hang down into the nostrils?

A. The superior turbinated bones and azygos process.

38. Q. What is the shape of the os malæ?

A. It is of a quadrangular shape.

39. Q. What are the bones called which compose the spine?

A. Vertebræ, of which there are twenty-four.

40. Q. Describe the spine.

A. The spine is a long, bony, and cartilaginous, hollow column, consisting of twenty-four bones, or vertebræ, and extending from the occipital bone to the os sacrum.

41. Q. What is there peculiar to the second vertebra?

A. It has an odontoid process at the upper part of its body.

42. Q. How would you distinguish a dorsal vertebra from the rest?

A. The bodies of the dorsal vertebræ are larger than the cervical, and less than the lumbar; they are more flattened at the sides, more convex before, and more concave behind, than any of the other vertebræ; the spinous process terminates in a round tubercle; the transverse processes are very thick; they have no foramen, as in the cervical; there is an articulating surface on the side of the body, and a superficial one in the points of the transverse processes.

43. Q. Where is the os hyoides situated?

A. It is situated at the root of the tongue, between it and the larynx.

44. Describe the scapula.

A. The scapula is a triangular bone, situated at the lateral and upper part of the back. It has three margins, a spine, the acromion and coracoid process, and an articular cavity for the head of the os humeri.

45. Q. What bone is fixed to the acromion scapulæ?

A. The clavicle, or collar-bone.

46. Q. How many bones has the fore-arm?
A. Two: the ulna and radius.
47. Q. Where is the ulna situated?
A. When the hand is supine, it is situated at the under and inner part of the fore-arm, between the humerus and carpus.
48. Q. On what bone do we lean when on our elbow?
A. The ulna.
49. Q. How many bones compose the shoulder-joint?
A. Two: the scapula and the os brachii.
50. Q. What is the process called on which we lean?
A. The olecranon.
51. Q. What bone unites the arm to the thorax?
A. The clavicle, or collar-bone.
52. Q. How many bones compose the carpus?
A. Eight: viz. os scaphoides, os lunare, os cuneiforme, os orbiculare, os trapezium, os magnum, and os unciforme.
53. Q. What receives the head of the os femoris?
A. The acetabulum, or cup-like cavity of the os innominatum.
54. Q. Where is the os tincæ situated?
A. The os tincæ, or mouth of the womb, is situated at the top of the vagina and inferior part of the uterus.
55 Q. What bone supports the leg?
A. The astragalus, on which the tibia rests.
56. Q. How many bones compose the tarsus?

A. Seven: viz. astragalus, os calcis, os naviculare, os cuboides, and the three cuneiform bones.

57. Q. Where is the trochanter major situated?

A. It forms the great projection at the superior and external part of the thigh-bone.

58. Q. On what bone is the linea aspera situated?

A. On the back part of the os femoris.

59. Q. What are the processes on the lower end of the os femoris called?

A. They are called condyles.

60. Q. How many bones compose the knee-joint?

A. Three: viz. the patella, the os femoris, and the tibia.

61. Q. What are the bones of the leg called?

A. Tibia and fibula.

62. Q. What is the shape of the tibia?

A. It is long and triangular; larger above than below.

63. Q. What bone forms the inner ankle?

A. The inner ankle is formed of a projection from the lower part of the tibia.

64. Q. What bone forms the outer ankle?

A. The lower end of the fibula forms it.

65. Q. What are the names of the bones of the pelvis?

A. They are four in number, viz. the two ossa innominata, one os sacrum, and one os coccygis.

66. Q. How would you distinguish a male from a female pelvis?

A. In the female pelvis, the os sacrum is shorter and broader than that of the male, the ossa ilia are more expanded, the brim of the pelvis is nearly of an oval shape, it is wider from side to side than from the symphisis pubis to the os sacrum; whereas, in man, it is rounder, and everywhere of less diameter; the os sacrum is narrower, and the os coccygis more firmly connected.

67. Q. Into how many portions is the os innominatum distinguished?

A. Into three, viz. the iliac, the pubic, and ischiatic portions, which, in the fœtus, are three distinct bones, and become one in the adult.

68. Q. What separates the ossa innominata from each other behind?

A. The sacrum.

69. Q. Is there any bone between the ossa innominata anteriorly?

A. No: the pubic portions of each meet together to form the pubes.

70. Q. Where is the os coccygis situated?

A. At the lower part, or apex, of the os sacrum.

71. Q. What is the name of the cavity that receives the head of the os humeri?

A. The glenoid cavity.

72. Q. To what bone does the acetabulum belong?

A. It belongs to the os innominatum.

73. Q. What bones form the hip-joint?

A. The head of the os femoris and the acetabulum of the os innominatum.

74. Q. Where is the tuberosity of the ischium situated?

A. At the inferior part of the os innominatum; we sit upon it.

75. Q. Of what bone is the ascending ramus of the pubes a part?

A. It is a part of the os innominatum.

76. Q. What bones form the thorax?

A. Twelve dorsal vertebræ, the sternum, and twelve ribs; in all twenty-five bones.

77. Q. What is the use of the periosteum?

A. To allow an attachment for muscles, and to afford a bed for the ramification of vessels to nourish the bone.

78. Q. What is the situation of the common carotid artery in the neck?

A. The common carotid artery lies on the side of the trachea, between it and the internal jugular vein.

79. Q. What parts of the body are free from adipose structure?

A. The skin of the scrotum, penis, and eyelids, have no adipose structure.

80. Q. What are the muscles the subclavian artery passes between, in going over the first rib?

A. The subclavian artery, as it passes over the first rib, goes between the anterior and middle scalenus muscles.

81. Q. Where is the Eustachian tube situated?

A. It passes from the tympanum of the ear obliquely forwards and inwards, and opens in

the fauces, near the opening of the posterior nostril.

82. Q. What are the names of the valves at the origin of the aorta?

A. They are called the semilunar valves, and are three in number.

83. Q. What are the differences between the fœtal and adult heart?

A. In the fœtal heart, an opening exists between the auricles in the septum auricularum, called the foramen ovale; this is closed in the adult heart. An artery also passes from the pulmonary artery obliquely to the ascending aorta in the fœtus, which is called canalis arteriosus; this becomes a ligament in the adult.

84. Q. Where does the excretory duct of the parotid gland open?

A. The excretory duct of the parotid gland, or Steno's duct, passes obliquely over the outside of the masseter muscle, and perforates the cheek, opening near the second molaris.

85. Q. What is the name of the excretory duct of the sub-maxillary gland, and where does it open?

A. The excretory duct of the sub-maxillary gland, is called ductus Wartonii; it passes between the genio-glossus and mylo-hyoideus muscles, and opens on the side of the frænum linguæ.

86. Q. How many arteries has the thyroid gland?

A. The thyroid gland has four arteries, namely, the two superior thyroideal and the two inferior thyroideal.

87. Q. Where is the ductus arteriosus situated, in the fœtus?

A. It passes obliquely from the ascending aorta to the pulmonary artery.

88. Q. What viscera are contained in the abdomen?

A. The omentum, the stomach, the large and small intestines, the liver and gall-bladder, the mesentery, the lacteal vessels, the thoracic duct, the spleen, the pancreas, the kidneys and supra-renal capsules, part of the aorta descendens, and vena cava ascendens.

89. Q. What is the membrane called, that lines the cavity, and covers the viscera of the abdomen?

A. The peritonæum.

90. Q. Are the kidneys completely enveloped in the peritonæum?

A. No: only their anterior surfaces.

91. Q. Where is the external cutaneous nerve situated at the bend of the arm?

A. The external cutaneous nerve is situated at the bend of the arm, under the cephalic and the median cephalic veins.

92. Q. What is the situation of the internal cutaneous nerve at the bend of the arm?

A. The internal cutaneous nerve is situated under the median basilic nerve; it frequently sends a small twig over the vein.

93. Q. What is the insertion and origin of the ligamentum nuchæ?

A. The ligamentum nuchæ arises from the spine of the occipital bone, and is fixed to the spinous processes of all the cervical vertebræ.

94. Q. Describe the stomach.

A. The stomach is a membranous receptacle, placed in the left hypochondriac region, composed of three membranes. It has a superior orifice called cardia, and an inferior orifice called pylorus; a lesser and greater curvature, and two surfaces distinguished into anterior and posterior.

95. Q. What viscera are attached to the great curvature of the stomach?

A. The large omentum, the spleen, and transverse arch of the colon.

96. Q. Describe the liver.

A. The liver is the largest abdominal viscus, placed in the right hypochondriac region, and partly in the epigastric region. It is distinguished into three lobes, is suspended by five ligaments, and is composed of arteries, veins, nerves absorbents, excretory ducts, and cellular membrane, and is covered by the peritonæum.

97. Q. Where is the prostate gland situated?

A. It lies directly under the symphysis pubis; it embraces the neck of the bladder and rests upon the rectum.

98. Q. What forms the anterior crural nerve?

A. The three or four superior lumbar nerves.

99. Q. What are the suprarenal capsules?

A. The suprarenal capsules are flat bodies, of a dark yellow colour: they rest upon the kidneys; they contain a dark-coloured fluid, and are larger in the fœtus than in the adult.

100. Q. What is the use of the liver.

A. To secrete bile.

101. Q. What are the excretory ducts of the liver called?

A. Pori biliarii.

102. Q. How would you distinguish the small from the large intestines?

A. The large intestines have three longitudinal bands, running on their surface; they are lobulated, and have the portions of fat adhering to them, called appendiculæ epiploicæ; which circumstances are not to be noticed in the small intestines. There are the valvulæ conniventes in the small intestines, which do not exist in the large.

103. Q. What are the branches of the superior mesenteric artery?

A. The superior mesenteric artery gives off, on the right side, three branches. The iliocolica, whose branches go to the cæcum, and to a portion of the ileum; the colica dextra, which supplies the right side of the colon; and the colica media, which divides on the mesocolon, and sends one branch to the right side and another to the left, that inosculates with the branch from the inferior mesenteric artery.

104. Q. How are arteries distinguished from veins?

A. The arteries are distinguished from veins by their coats being whiter and more dense; also more elastic. Their apertures gape in the living body, and they pulsate. The arteries and veins of the lower extremity are very similar in regard to the thickness of their coats; the popliteal artery and vein both gape.

105. Q. What is the tunica conjunctiva?

A. The tunica conjunctiva is a reflection of the inner membrane of the eye-lid, over the surface of the eye; it prevents extraneous bodies passing deep into the socket.

106. Q. What gives the whitish blue colour to the bulb of the eye?

A. The whitish blue colour of the bulb of the eye is occasioned by the expanding tendons of the muscles shining through the transparent tunica conjunctiva.

107. Q. Describe the situation and course of the colon.

A. The colon ascends on the right side to the liver; passes under the liver and stomach to the left side, where it descends, by a sigmoid flexure, to the pelvis, and ends in the rectum.

108. Q. What is the excretory duct of the kidney called?

A. The ureter.

109. Q. Describe the uterus.

A. The uterus is a spongy hollow receptacle, of a pear shape, placed in the pelvis between the urinary bladder and rectum, divided into fundus, cervix and orifice or os tincæ; it has four ligaments, two fallopian tubes, two ovaria, and the vagina hanging from its cervix.

110. Q. Through what tube does the ovum pass from the ovarium into the uterus?

A. Through the fallopian tube.

111. Q. Where are the vasa vorticosa situated?

A. The vasa vorticosa are situated on the

choroid coat of the eye; they are formed by a contortion of the veins of that membrane.

112. Q. What are the nerves that form the lenticular ganglion of the eye?

A. The lenticular ganglion is formed by a branch from the third and fifth pair of nerves.

113. Q. Which is the largest viscus of the abdomen?

A. The liver.

114. Q. What do the openings of the veru montanum belong to?

A. The orifices found on the veru montanum belong to the vesiculæ seminales and prostate gland.

115. Q. Where are Cowper's glands to be found?

A. Cowper's glands are situated near the bulb of the urethra before the prostate gland.

116. Q. Where is the torcular of Herophilus to be found?

A. The torcular of Herophilus is to be found in the junction of the falx and the tentorium.

117. Q. What artery forms the superficial palmar arch?

A. The superficial palmar arch is chiefly formed by the ulnar artery.

118. Q. Of what kind of structure is the outer surface of the peritonæum?

A. The outer surface of the peritonæum is cellular.

119. Q. What forms the scrotum?

A. The scrotum is formed by a continuation of the common integuments.

120. Q. What is the excretory duct of the testicle called?

A. The excretory duct of the testicle is called vas deferens.

121. Q. What is the proper juice of the stomach called?

A. The gastric juice.

122. Q. Where is the spleen situated?

A. It is situated in the left hypochondrium, near the fundus of the stomach under the ribs.

123. Q. Describe the eye.

A. The eye is divided into external and internal parts. The external parts are the supercilia, the palpebra, the cilia, lachrymal gland, lachrymal caruncle, nasal duct, and muscles of the bulb, and the tunica conjunctiva. The internal parts are the sclerotic coat, the cornea, the choroid coat, iris, uvea, retina, hyaloid membrane, capsule of the lens and vitreous humours, three humours and two chambers.

124. Q. How many coats has the eye?

A. It is generally considered to have eight coats, but many anatomists consider it to have but three: viz. the tunica sclerotica, the tunica choroides, and the retina.

125. Q. Where is the urethra most dilated?

A. The urethra is most dilated at that part which is surrounded by the prostate gland.

126. Q. What part of the vagina is covered by the peritonæum?

A. The upper and posterior part.

127. Q. What length is the urethra in females.

A. The urethra in females is about an inch in length.

128. Q. What secretes the pigmentum nigrum of the choroid membrane?

A. The pigmentum nigrum of the choroid membrane is secreted by the arteries of that membrane.

129. Q. How many chambers has the eye?

A. Two: an anterior and a posterior chamber.

130. Q. What separates the anterior from the posterior chamber?

A. The curtain formed by the iris and uvea.

131. Q. What is contained in the capsule of the crystalline lens?

A. The crystalline lens and a little water.

132. Q. What artery nourishes the crystalline lens?

A. The arteria centralis retinæ.

133. Q. Where is the pigmentum nigrum of the eye situated?

A. Upon the uvea, behind the iris and upon the surface of the tunica choroidea.

134. Q. How many muscles are there that arise from the trunk, and are inserted into the scapula?

A. The muscles that are inserted into the scapula are six in number, viz. trapezius, levator scapulæ, pectoralis minor, rhomboideus, serratus magnus, and subclavius.

135. Q. What are the muscles that arise from the shoulder joint, and are inserted into the forearm?

A. They are six in number, viz. trapezius,

levator scapulæ, pectoralis minor, rhomboideus, serratus magnus, and subclavius.

136. Q. Where is the lachrymal sac situated.

A. In the superior part of the lachrymal groove, or the commencement of the ductus ad nasum behind the tendon of the orbicularis.

137. Q. What is situated in the groove at the lower internal edge of each rib?

A. The intercostal artery, vein, and nerve.

138. Q. What difference in situation is there between the right and left kidney?

A. The right kidney is much lower than the left, occasioned by the liver occupying so much space.

139. Q. What are the ducts that enter the duodenum?

A. The ductus communis choledochus, and the ductus pancreaticus.

140. Q. How many muscles arise from the shoulder, and are inserted into the fore-arm?

A. The muscles that are attached to the shoulder and fore-arm are two in number, viz. biceps flexor cubiti, and the long head of the triceps.

141. Q. How many muscles arise from the arm to be inserted into the fore-arm?

A. The muscles that arise from the arm and are insertedin to the fore-arm, are six in number, namely, the anconeus, the short heads of the triceps extensor cubiti, the brachialis internus, supinator radii longus, supinator radii brevis, and pronator radii teres.

142. Q. Where are the testicles situated in the fœtus?

A. The testicles in the fœtus before the sixth month are in the abdomen, they receive a covering of peritonæum, and are placed at the lower part of the kidneys.

143. Q. In what intestines are the valvulæ conniventes found?

A. In the small intestines, chiefly in the duodenum and jejunum.

144. Q. What is the name of the duct leading from the pelvis of the kidney to the bladder?

A. The ureter.

145. Q. What forms the linea alba?

A. The meeting of the flat tendons of the abdominal muscles.

146. Q. How many openings has the right auricle of the heart.

A. Four, viz. the opening of the vena cava superior, that of the vena cava inferior, that of the coronary vein, and ostium venosum.

147. Q. Where do the ostia of the lacteals open?

A. Upon the internal surface of the small intestines.

148. Q. What muscles arise from the scapula, and are inserted into the humerus?

A. The muscles which arise from the scapula, and are inserted into the humerus, are the subscapularis, teres major, teres minor, supraspinatus, infraspinatus, coraco-brachialis, and the deltoides.

149. Q. Where does the mesentery begin?

A. The mesentery begins about the termination of the duodenum.

150. Q. What forms the profundal palmar arch?

A. The profundal palmar arch is chiefly formed by the radial artery.

151. Q. How many openings has the left auricle of the heart?

A. Five, viz. those of the four pulmonary vessels and the ostium venosum.

152. Q. What is the true organ of vision?

A. The retina.

153. Q. What is the general division of the internal ear?

A. The internal ear is divided into the tympanum and labyrinth which consists of the cochlea, vestibulum, and semicircular canals.

154. Q. What nerves form the great sympathetic?

A. A branch of the sixth pair of nerves with a recurrent twig of the second branch of the fifth pair of nerves.

155. Q. Do the olfactory nerves supply the nose with the sense of feeling?

A. No, but branches from the fifth pair do.

156. Q. What are the vessels surrounded by the capsule of Glysson?

A. The vessels surrounded by the capsule of Glysson are the vena portæ, the hepatic artery, the hepatic veins, the excretory ducts, and some absorbents.

157. Q. How many dilatations are there in the urethra?

A. There are generally three dilatations to be found in the urethra of men; one at the point of the glands, penis, another at the bulb of the urethra, and a third in the prostate gland.

158. Q. What muscles are divided in amputation of the thigh ?

A. The muscles divided in amputation of the thigh, are the biceps flexor cruris, semi-tendinosus, semi-membranosus, gracilis, sartorius, vastus externus, vastus internus, rectus femoris, and the long tendon of the abductor magnus.

159. Q. How many arteries are there?

A. Two: viz. the aorta and pulmonary artery; all the other arteries are branches of these two.

160. Q. What are the arteries called which supply the kidneys?

A. The renal or emulgent arteries.

161. Q. What is the name of the vessels which nourish the heart?

A. Coronary arteries.

162. Q. What are the arteries of the stomach called?

A. Coronary—they are four in number, viz. coronaria, gastrica dextra, gastrica sinistra, and pylorica. The veins are called gastric.

163. Q. How are the trunks of arteries nourished?

A. The arterial trunks are nourished by the vasa vasorum, which arise from the nearest small branches, and are every where dispersed on their surface.

164. Q. What change do the collateral arteries undergo when a large arterial trunk is tied?

A. The collateral arteries, after a large arterial trunk is tied, dilate, their coats become stronger, and acquire an additional strength; they are also found to become tortuous.

165. Q. What forms the phrenic nerve?

A. The phrenic nerve is formed by the third and fourth cervical, it also receives a filament from the second.

166. Q. Where is the popliteal artery situated?

A. In the ham, between the condyles of the os femoris, hamstrings, and heads of the gastrocnemius externus.

167. Q. What arteries are given off from the arch of the aorta?

A. Three branches: viz. the arteria innominata, the left carotid, and the left subclavian.

168. Q. What is the course and distribution of the epigastric artery?

A. It arises from the femoral artery, just as it is about to pass under Poupart's ligament, it passes upwards and inwards at the upper and outer part of the abdominal ring, behind the spermatic cord, running along the edge of the transversus in an oblique manner to the pyramidales; it then ascends under the middle of the rectus, furnishing branches to the abdominal parietes, and terminates above the umbilicus, anastomosing with the mammary.

169. Q. What is the first ganglion, formed by the intercostal nerve, called?

A. The cervical ganglion.

170. Q. What forms the chorda tympani?

A. The chorda tympani is formed by the portio dura, it is a reflected twig of that nerve, which passes between the long processes of the malleus and incus, and over the membrana tympani.

171. Q. What is the most elastic substance in the body?

A. The most elastic substance in the body is cartilage.

172. Q. Are tendons elastic?

A. No; they are inelastic, otherwise the effect of muscles would be greatly diminished.

173. Q. What is the course of the femoral artery?

A. The femoral artery passes over the head of the os femoris down into a hollow at the upper and inner part of the thigh, with the rectus and sartorius muscles upon the outside, and the adductor on the inner side; it descends along the inside of the thigh between the vastus internus and triceps, it then gradually bends backwards till it reaches the ham to become the popliteal.

174. Q. What are the terminations of the arteries?

A. One termination is in veins, another in secreting extremities, a third in glands, a fourth in cells, as in the penis, and a fifth termination is in anastomoses.

175. Q. What is the valve of Eustachius formed by?

A. The Eustachian valve is formed by a fold of the inner membrane of the right auricle.

176. Q. What arteries nourish the pancreas?

A. The arteries which nourish the pancreas are derived from the pylorica, duodenalis and splenica.

177. Q. Have the veins of the dura mater any valves?

A. No, they have none.

178. Q. What are the arteries of the dura mater?

A. The arteries of the dura mater are the anterior, middle, and posterior meningeal.

179. Q. Where does the anterior meningeal artery arise?

A. The anterior meningeal artery arises from the carotid.

180. Q. From whence does the middle meningeal artery arise?

A. The middle meningeal artery arises from the internal carotid artery.

181. Q. What are the veins at the flexure of the arm?

A. The cephalic, the median-cephalic, the basilic, and the median-basilic.

182. Q. What muscles are inserted into the patella?

A. The rectus femoris, the vastus externus, the vastus internus, and cruræus.

183. Q. What are the names of the muscles which are inserted into the os calcis?

A. Gastrocnemius externus, gastrocnemius internus, and plantaris.

184. Q. What is the name of the tendon formed by the gastrocnemius externus, and soleus?

A. The tendo Achillis.

185. Q. Do the external condyles of the humerus give origin to the extensor or flexor muscles of the fore-arm?

A. To the extensors.

186. Q. What plexus of nerves surround the axillary artery?

A. The brachial plexus.

187. Q. What forms the first arch of the palate?

A. The constrictor isthmii faucium, covered by the skin of the mouth.

188. Q. What are the vessels which form the vena portæ?

A. The superior and inferior mesenteric vein, and the splenic vein.

189. Q. What are the glands called situated at the root of the lungs?

A. Bronchial glands; they are of a dark colour.

190. Q. What muscles are attached to the coracoid process of the scapula?

A. The coraco-brachialis, the pectoralis minor, and the short head of the biceps flexor cubiti.

191. Q. Where is the diaphragm situated?

A. Between the thorax and abdomen, forming a vaulted arch or septum attached to the lower borders of the ribs.

192. Q. What are the muscles of the abdomen?

A. The obliquus externus, obliquus internus, transversalis abdominalis, and pyramidalis, forming five pair.

193. Q. Where is the longest crus of the diaphragm situated?

A. On the left side of the fore-part of the loins.

194. Q. What tendon passes through the shoulder-joint?

A. The long tendon of the biceps flexor cubiti.

195. Q. On which side of the aorta is the longest emulgent artery situated?

A. On the right, in consequence of the vena cava being placed on that side, and the artery having to pass behind that vessel.

196. Q. What forms the capsule of Glysson?

A. A reflection of the peritonæum, which, with a quantity of cellular substance, surrounds the vessels and nerves of the liver just before they enter that viscus.

197. Q. What bones form the lachrymal groove, or ductus ad nasum, and where does it terminate?

A. The lachrymal bone, the superior maxillary bone, and the inferior spongy bone. It terminates at the lower and lateral parts of the nose, at the inner and fore-part of the antrum maxillare, under the os spongiosum inferius, in a straight line with the second dens molaris.

198. Q. What are the salivary glands called?

A. They are the parotid gland, the sublingual glands, the submaxillary glands, the glands of the cheek, the labial glands, and molar glands.

199. Q. Where is the thyroid gland situated?

A. Upon the trachea, lying on the cricoid cartilage, and horns of the thyroid cartilage.

200. Q. Where is the pituitary gland situated?

A. In the sella turcica, a cavity in the sphænoid bone.

201. Q. Where is the lachrymal gland situated?

A. In a depression of the orbitar process of the frontal bone within the orbit.

202. Q. What is the extent of the peritonæum covering the bladder?

A. The peritonæal coat extends over the fundus, sides and back part to near the termination of the ureters.

203. Q. From what artery does the inferior thyroid arise?

A. The inferior thyroid artery arises from the subclavian.

204. Q. How many branches does the axillary artery send off?

A. The axillary artery generally gives off four arteries, viz. thoracica longior, thoracica superior, thoracica humeraria, and thoracica alaris.

205. Q. What are the most important fasciæ of the body?

A. The fascia covering the temporal muscle; that given off from the biceps covering the forearm; that covering the abdominal muscles and back; the fascia of the lower extremities, and the plantar and palmar fascia.

206. Q. What are the ligaments about the shoulder joint?

A. The capsular ligament of the head of the os brachii, the triangular ligament which extends from the coracoid process to the acromion, the coroid and trapezoid ligaments that extend from the clavicle to the coracoid process.

207. Q. What is the name of the ligament that connects the os femoris to the bottom of the acetabulum?

A. The ligamentum teres.

208. Q. On what vertebra is rotation of the head performed?

A. The head rotates upon the second cervical vertebra, by the intervention of the atlas.

209. Q. Where is the female urethra situated?

A. The female urethra is situated under the symphisis of the pubes, between the nymphæ and below the clitoris, just above the entrance of the vagina.

210. Q. What are the branches which the subclavian artery gives off?

A. They are six in number; viz. arteria mammaria interna,—thyroidea inferior—intercostalis,—vertebralis,—cervicalis profunda, and cervicalis superficialis.

211. Q. What are the ligaments of the pelvis?

A. The long and short sacro-ischiatic ligaments, the ligamentum obturans; the ligamentum poupartii; the transverse ligaments, going from the spinous processes of the ilium to the fourth and fifth lumbar vertebræ, the annular ligament of the ossa pubis; the ligamenta vaga, which pass from the ilium to the sacrum; and the lacertus ligamentosus, that runs from the last lumbar vertebra along the ridge of the os innominatum to the pubes; besides these, there are the capsular and longitudinal ligaments of the sacrum and os coccygis.

212. Q. What are the bursæ mucosæ, and their use,

A. The bursæ mucosæ are small bags placed under muscles and tendons that are frequently brought into action, they contain a fluid similar to synovia, the use of which is to lubricate the muscles and tendons.

213. Q. Where do the corpora cavernosa penis arise?

A. The corpora cavernosa penis arise from the edge of the ramus of the ischium and os pubis.

214. Q. What vessels does the right pulmonary artery pass, in going to the lungs?

A. The right pulmonary artery passes behind the aorta and superior cava.

215. Q. What parts do the external and internal carotid artery supply?

A. The external carotid artery supplies the face and external parts of the head; the internal carotid artery supplies the brain.

216. Q. What does the cœliac artery supply?

A. The cœliac artery supplies the stomach, liver, and spleen.

217. Q. What is the course of the external maxillary artery over the jaw-bone?

A. The external maxillary artery passes before the edge of the masseter over the middle and lateral part of the jaw-bone.

218. Q. Between what tendons does the radial artery lie at the wrist?

A. The radial artery lies (at the wrist,) between the tendons of the flexor carpi radialis and supinator longus.

219. Q. What are the arteries given off from the thoracic aorta?

A. The thoracic aorta gives off the bronchi-

al, the œsophageal, and the inferior intercostal arteries.

220. Q. What nerve supplies the tongue for the organ of taste?

A. A branch of the fifth pair, which is termed the gustatory nerve.

221. Q. Where does the posterior meningeal artery arise?

A. The posterior meningeal artery arises from the vertebral.

222. Q. How is the pia mater nourished?

A. The pia mater is nourished by arteries from the brain.

223. Q. What is the use of the adeps?

A. The adeps guards against the effects of pressure, it lessens the specific gravity of the body, fills up the interstices of muscles, and is a reservoir of nourishment of the body.

224. Q. What forms the common integuments?

A. The common integuments are formed by the cuticle, rete mucosum, cutis, and adipose substance.

225. Q. What are the branches of the fifth pair of nerves?

A. The branches of the fifth pair of nerves are the ophthalmic, the superior maxillary, and the inferior maxillary.

226. Q. What are the papillæ minimæ, and papillæ mediæ of the tongue formed by?

A. The papillæ minimæ and mediæ, are formed by the extremities of nerves surrounded by a lace-work of blood vessels.

227. Q. Describe the contents of the cranium.

A. The cranium contains the cerebrum, cerebellum, and medulla oblongata; the dura mater, the pia mater, and tunica arachnoides; nine pair of nerves, the accessory nerves of Willis; the several sinuses, the arteries that nourish the brain and its membranes, and the veins that return the blood into the sinuses; and also absorbent vessels.

228. Q. What membrane nourishes the internal table of the skull?

A. The external lamina of the dura mater.

229. Q. What does the falciform process of the dura mater separate?

A. It separates the hemispheres of the brain from each other.

230. Q. What vessel runs in the falciform process of the dura mater?

A. The superior longitudinal sinus is the principal vessel.

231. Q. Where is the tentorium situated?

A. Between the cerebrum and cerebellum.

232. Q. How many lobes has the brain?

A. Six; viz. two anterior, two posterior, and two middle or inferior lobes.

233. Q. How many hemispheres has the cerebrum?

A. Two; viz. the right and the left.

234. Q. What are the cavities in the brain called?

A. They are called ventricles.

235. Q. What separates the lateral ventricles from each other.

A. The septum lucidum.

236. Q. From what part of the brain does the pineal gland arise ?

A. From the thalamus nervi optici on each side by peduncles.

237. Q. From what part of the brain do the optic nerves arise ?

A. They arise from the thalami nervorum opticorum.

238. Q. What nerves pass through the foramen lacerum orbitale superius ?

A. The third, the fourth, the first branch of the fifth and sixth pair of nerves.

239. Q. Through what foramina do the fifth pair of nerves pass out of the cranium ?

A. Through the foramen lacerum orbitale superius, foramen rotundum, and foramen ovale, in separate branches.

240. Q. Does the arm receive nerves from the brain, or from the spinal marrow ?

A. From the spinal marrow.

241. Q. What nerve supplies the nose for the sense of smelling ?

A. The olfactory, or first pair.

242. Q. What nerves supply the diaphragm ?

A. The phrenic, or diaphragmatic nerves.

243. Q. Where do the great sciatic nerves arise ?

A. From a plexus of nerves formed by the

fourth and fifth lumbar nerves, jointed by the first, second, and third sacrals.

244. Q. What is the name of the ganglion in the abdomen which supplies most of the abdominal viscera?

A. The semilunar ganglion.

245. Q. What does the foramen magnum occipitale transmit?

A. The spinal marrow, the vertebral arteries, and the accessory nerves of Willis.

246. Q. How many membranes has the brain?

A. Three; viz. the dura mater, the pia mater, and the tunica arachnoides.

247. Q. What are the processes of the dura mater called?

A. They are three in number; viz. the falciform process, the tentorium, and the septum cerebelli.

248. Q. What are the viscera of the thorax?

A. The pleura, the lungs, the thymus gland (in children,) the œsophagus, the ductus thoracicus, the arch of the aorta, branches of the venæ cavæ, the vena azygos, the pericardium, the heart, the par vagum, and the great intercostal nerves.

249. Q. How many lobes has the left lung?

A. It has two lobes.

250. Q. What separates the chest into two cavities?

A. The mediastinum, which is formed by the pleura.

251. Q. What are contained in the posterior mediastinum?

A. The œsophagus, the bronchiæ, the large vessels of the heart, the par vagum, great intercostals, and thoracic duct.

252. Q. What is there in the anterior mediastinum that disappears towards adult age?

A. The thymus gland.

253. Q. Describe the heart?

A. The heart is a hollow muscular viscus, situated in the pericardium, in the cavity of the thorax, resting upon the diaphragm.

254. Q. Do the auricles of the heart communicate before birth?

A. Yes, by the foramen ovale.

255. Q. Where is the Eustachian valve situated?

A. At the entrance of the inferior cava, within the right auricle of the heart.

SURGERY.

256. Q. WHAT are the symptoms of compressed brain?

A. The person is mostly insensible; an apoplectic stertor of the breathing soon comes on; loss of voluntary motion; tremors, and convulsions. The pupil is contracted, or dilated; and, if the person can be roused from his stertorous sleep, he complains of giddiness and dimness o sight. Often there is hæmorrhage from the nose eyes, and ears; and the fæces and urine are dis-

charged involuntarily; and as the compression is generally produced by fractured skull, the finding a portion of skull depressed from the blow is sufficient. The pulse is irregular and slow.

257. Q. What are the symptoms of concussion of the brain?

A. The patient is first in a state of insensibility, and the extremities usually become cold; there is a great tendency to sleep, but the sleep is unattended by stertor. If the concussion be not very great, the patient soon becomes more sensible, but vomiting takes place; he is at times delirious; the pulse irregular and quick; and phrenitis often succeeds the concussion. Should, however, the concussion be very great, the insensibility of the patient increases.

258. Q. How would you distinguish a fissure of the cranium from a suture?

A. By the course of the fissure, by its appearance not being zigzag, and by the pericranium not adhering to it in the way it does to a suture.

259. Q. What practice would you adopt to relieve concussion of the brain?

A. The most approved practice is to bleed according to circumstances; to administer saline purges; to put the patient on the antiphlogistic regimen. Should symptoms of phrenitis come on, large and repeated blood-letting is to be had recourse to, and blisters are to be applied to the head, or neck, in order to reduce the inflammation of the brain.

260. Q. When a portion of the cranium is depressed, what would you do to alleviate it?

A. Apply the trephine.

261. Q. When a portion of the cranium is depressed, where would you apply the trephine to raise it?

A. On a part of the skull which would include a portion of the depressed bone, that the elevator may be introduced so as to raise the depressed portion.

262. Q. What do you mean by an exomphalos?

A. An umbilical hernia or protrusion of the intestines or omentum through the umbilical ring.

263. Q. What is a bubonocele?

A. It is an inguinal hernia, formed by a protrusion of intestine through the abdominal ring.

264. Q. What do you mean by hydrocele?

A. A collection of serous fluid in the tunica vaginalis testis.

265. Q. What are the symptoms of strangulated intestine?

A. The patient is seized with sickness, and a vomiting of fœcal matter; obstinate costiveness comes on; synochal fever takes place. The rupture remains stationary, and no effort can return it; the tumour of the part becomes very painful, and the pain extends to the abdomen, attended with a general tension.

266. Q. Describe the operation for strangulated inguinal hernia.

A. Having shaved off the hair from the tu-

mour, and the patient being placed in a suitable situation for the operation, an incision should be made about an inch above the ring, which, if the tumour be not very large, should extend to the most depending part of the swelling, so that the skin and cellular membrane covering the sac will thus be cut through. Perhaps the external pudical artery, that crosses the sac near the abdominal ring, will also be cut through, if so, it will be necessary to secure this artery before we proceed, to prevent further bleeding. Then, with a pair of forceps, a part of the fascia must be raised and divided, to allow the introduction of a director, on which instrument the fascia is to be divided upwards, to within an inch of the abdominal ring, and downwards, to the bottom of the tumour. The next thing to be attended to, is the division of the stricture: with this view, the finger is to be passed into the sac, as far as the stricture, which will be found either at the abdominal ring, or about an inch and a half from this aperture, inclining upwards and outwards, or in the mouth of the sac. If the stricture be at the ring, the finger is to be passed as far as the stricture, and then a probe-pointed bistoury must be conveyed over the front part of the sac into the ring, which is next to be divided in a direction upwards, opposite the middle of the sac, and to extend just sufficient to allow the protruded parts to be returned into the abdomen. By this division of the ring, the epigastric artery is not wounded, nor are the transverse tendinous fibres

cut through that cross the upper part of the ring, by which the aperture of the ring is not so much weakened. The stricture being thus removed, the protruded parts are to be returned into the cavity of the abdomen. Should the intestine be gangrenous, it is not to be returned. The intestine may, however, have dark discolourations, and may be returned without harm; these states should be carefully distinguished. If the omentum be gangrenous, the dead part should be cut off, and the other part returned, if hæmorrhage is not likely to occur from its surface. When the omentum is indurated, the indurated portion may be cut off. The parts are now to be dressed in the usual way.

267. Q. How would you treat a violent ophthalmia?

A. Bleed locally, and generally according to the age of the patient. If there be great inflammation of the tunica conjunctiva, carefully scarify it; apply soft emollient poultices to the eyes, renewing them often; give saline purges and diaphoretics; keep the eyes shaded; and, as the chronic stage succeeds, alter the remedies in some degree, according to circumstances; apply astringent sedative lotions to the eyes, leaving off the poultices. Make use of the thebaic tincture, dropping in two or three drops twice or thrice a-day, between the eyelid and ball.

268. Q. How would you treat gangrene in general?

A. With tonics, stimulants, and a generous diet.

269. Q. When a locked jaw arises from an injury of the great toe, how would you endeavour to relieve it?

A. By making a free division of the injured part; and if this did not succeed, by amputating the bone. Antispasmodics, as opium and ether, must be given internally.

270. Q. When a ball is lodged in the calf of the leg, and it is necessary to make an incision upon it, in what direction would you make that incision?

A. In a perpendicular direction.

271. Q. How does the complete division of a punctured artery (as the temporal) stop the hæmorrhage?

A. By the retraction of the extremities of the artery.

272. Q. What is the cause of the cold sensation and numbness of the leg and foot, generally felt from an aneurism of the popliteal artery?

A. Pressure upon the popliteal nerve, which supplies the leg and foot with nervous influence; it is also caused by obstructed circulation, the popliteal artery losing part of its power, and containing a quantity of coagulum.

273. Q. If necessary to take up the brachial artery, near the flexure of the arm, how will the circulation be carried on?

A. By the two profundals chiefly, which inosculate with the recurrents of the ulnar and radial arteries.

274. Q. How is amputation of the shoulder-joint performed?

A. As there is no room for the application of the tourniquet, in this operation, the subclavian artery is to be compressed by an assistant, by means of a pad, just where it passes over the first rib; or, to render the operation more safe, it is preferred to take up the axillary artery at once; then, with a large common bistoury, a semicircular incision is to be made with its convexity downwards across the integuments covering the deltoid muscle, about four inches below the acromion. The skin should not be detached, but the muscle is to be cleared from the bone quite up to the joint; then the tendons passing over the joint are to be cut through, also the capsular ligament, so as to allow the bone to be dislocated from the joint. Having done this, the skin, and other parts, underneath the joint, are to be divided with one stroke of the knife; after this, the circumflex, or any small vessel that may bleed, should be secured and tied. The flap of the deltoid muscle is next to be laid down, so that its edge will meet the margin of the wound below. The operation is then finished by dressing.

275. Q. How many species of white swelling are there?

A. Two: the scrofulous and the rheumatic species.

276. Q. What muscles are cut through in the operation of lithotomy on the male?

A. The transversalis perinæi, and generally a part of the accelerator urinæ, and sometimes a part of the levator ani.

277. Q. What are the peculiarities of a gun-shot wound?

A. Great contusion and laceration, which produce a deadened state of the fibres immediately surrounding the wound, that require to be thrown off in the form of a slough, before the wound can heal; they also frequently contain pieces of cloth, or bullets.

278. Q. How is an aneurismal tumour distinguished from other tumours?

A. By its pulsating, and by its receding, upon pressure, and soon returning again to its usual bulk.

279. Q. What is the substance generally found in aneurismal sacs?

A. The coagulable part of the blood, which is usually found in layers.

280. Q. How is amputation below the knee to be performed?

A. Having placed the patient in a proper position, and applied the tourniquet to compress the artery, one assistant is to support the leg, while the other pulls up the integuments; a circular incision is then to be made round the leg, to divide the integuments: when these are divided, a portion of them is to be dissected back from the muscles, by means of a scalpel, sufficient to cover the stump; these being kept back, another circular incision is to be made by the knife, some way higher up than the first incision; by this incision, the soft parts are divided quite to the bones. The interosseous ligament is then to be thoroughly divided by the

scalpel, or the catlin; the soft part should be properly retracted, and the saw should next be applied, to divide the bones; after which, the spiculæ left by the saw, are to be removed by the pincers. The vessels are next to be secured by ligatures, slackening the tourniquet from time to time, lest any vessel should not be secured. To discover this, it is always necessary to sponge away the clotted blood from the wound. After these precautions are taken, the edges of the wound are to be brought together, by drawing the integuments over the surface of the wound; the ligatures are to be left out, and the wound covered with lint and cloth.

281. Q. What are the consequences that generally arise from wounded nerves?

A. Locked jaw, convulsions, and inflammation of the part.

282. Q. What is meant by a compound fracture?

A. It is a fracture of the bone, attended with an external wound of the soft parts.

283. Q. What takes place when a bone is denuded of its periosteum?

A. Generally exfoliation, to a certain degree.

284. Q. What bone is perforated in operating for fistula lachrymalis?

A. The os unguis.

285. Q. Why are luxations of the shoulder-joint more frequent than luxations of the hip-joint?

A. Because the glenoid cavity is very superficial to allow of extensive motion to the head

of the os brachii, which is very large. The joint is also more exposed to unguarded blows, or accidents, than any other joint; and the surrounding muscles have no effect in strengthening the joint. The hip-joint, on the contrary, is confined as to motion; the acetabulum is also very deep in the fresh subject, so as to almost cover the head of the os femoris; and thus this joint is rendered very strong.

286. Q. Under what circumstances is amputation of an extremity necessary?

A. Where the bone becomes much diseased; where great laceration from gun-shot wounds have been produced; where great destruction of parts have taken place in compound fracture; and where, from other causes, the operation is required.

287. Q. What forms the sac in femoral hernia?

A. The fascia of the thigh, and the peritonæum.

288. Q. In what direction is Poupart's ligament to be divided, if necessary, to liberate strangulated femoral hernia?

A. That recommended by Mr. Hey, is to introduce a director within the crural ring on that side of the intestine, or omentum, which is nearest to the symphysis of the pubes, and to make the incision directly upwards. Gimbernat recommends the incision to be carried directly towards the symphysis pubis.

289. Q. How many ways are there of punc-

turing the bladder, to relieve suppression of urine?

A. First, from the perinæum;—secondly, above the os pubis;—thirdly, through the rectum in the male, and vagina in the female; fourthly, by dilating the meatus urinarius in the female.

290. Q. On what part of the arm is pressure to be made before amputation of the fore-arm?

A. As high up as convenient; placing the pad at the inner edge of the biceps, so as to compress the artery against the bone.

291. Q. At what part of the aorta do aneurisms most frequently occur?

A. At the arch of the aorta, just as it is about to descend.

292. Q. What are the unfavourable circumstances in compound fracture, that require the extremity to be amputated?

A. When the wound of the soft parts is large and lacerated, and the bone, or bones, very much splintered, together with a violent degree of contusion of the neighbouring muscles, amputation is necessary; but a prompt decision, in many cases of compound fracture, requires great discernment on the part of the surgeon, whether to amputate or not.

293. Q. What are the signs of a fractured cranium?

A. A depression of a part of the skull, and the symptoms of pressure on the brain, as coma, stertorous breathing, loss of voluntary motion, convulsions, tremours, involuntary discharge of

the urine and fæces, dilatation of the pupil, irregular pulse, and sometimes hæmorrhage from the nose, eyes, and ears.

294. Q. What is the cause of stupor or coma, in fracture of the cranium?

A. Pressure upon the brain.

295. Q. What is the medical treatment in fractures of the skull?

A. Bleed repeatedly, give saline purges, and order a low diet, the patient should be kept on the antiphlogistic regimen for near a month, to guard against subsequent inflammation of the brain.

296. Q. Why are fistulæ generally dilated?

A. To produce a new action in those ulcers, by which granulations take place from their bottom.

297. Q. How is the radical cure of hydrocele performed?

A. By evacuating the fluid, and afterwards exciting such a degree of inflammation of the tunica vaginalis and testicle as will cause adhesion to take place, and consequently an obliteration of the cavity; this is either done by caustic, seton, incision, or by injection.

298. Q. Where does a psoas abscess generally point?

A. In the groin, at the internal part of the thigh, and the loins.

299. Q. What are the signs of a wounded artery?

A. Effusions of florid blood, and its being thrown out by jerks from the vessel.

300. Q. What are the general terminations of inflammation?

A. Resolution, suppuration, and mortification.

301. Q. What method is to be taken after a cannon ball has torn off the limb?

A. To amputate the stump; sometimes it is necessary to perform the amputation above the nearest joint.

302. Q. What are the circumstances that prevent the dilatation of gun shot wounds to extract the extraneous substance?

A. When it is likely to create a great irritation of the wound without gaining any advantage; when the ball enters far into the substance of a bone; where it enters any of the large cavities; where the ball cannot be discovered; and where the foreign bodies are less likely to create inflammation than their extraction.

303. Q. What is the treatment of gun-shot wounds?

A. First, when the wound is in any extremity to determine for or against amputation, which in many cases require great judgment. The amputation should be performed before inflammation arises, or a disposition to gangrene takes place in the limbs; should, however, amputation be deferred for a day or two, and the wound in a high state of inflammation, the wound is to be brought to a state of suppuration, at which period amputation, if needful, should be performed, weighing in mind the

constitution of the patient and other circumstances. Extraneous substances are generally to be extracted, particularly when they press upon an important viscus or a considerable nerve; if hæmorrhage take place from a large artery, it is to be exposed and tied, the external wound often requires dilating, but sometimes dilatation is improper.

Counter openings are sometimes to be made, as when the ball lodges under contused skin that will probably slough, but if the skin remain uninjured, and the ball is scarcely perceptible to the feel, this operation is improper, as the wound heals better when it is left alone. When sloughing takes place on the surface of a wound, its removal is favoured by a plentiful suppuration.

The rest of the treatment is similar to contused wounds.

304. Q. What is the treatment of contused wounds?

A. To prevent a high degree of inflammation, which often terminates in grangrene; this is to be effected by a strict antiphlogistic regimen, topical bleeding by leeches, &c. The formation of pus is to be promoted by emollient poultices; should gangrene succeed the inflammation, warm, stimulating applications are to be applied, and the patient is to take bark, wine, and a nourishing diet.

305. Q. What are the terminations of erysipelas?

A. Resolution, grangrene, and suppuration.

306. Q. Under what circumstances is an artificial anus to be formed?

A. Where absolute gangrene of an incarcerated intestine has taken place.

307. Q. How is gastroraphe performed?

A. Gastroraphe is employed to unite wounds of the abdomen in the following way: two needles are placed on the same ligature, and introduced through both lips of the wound from within outwards, including peritonæum, muscles, and integuments.

308. Q. How is emphysema produced from a wound of the thorax?

A. By the lungs being wounded, and the consequent escape of air into the cellular membrane.

309. Q. What is the treatment of wounds of the joints?

A. The admission of air into their cavities is to be obviated, as this causes a high degree of inflammation to take place. If the capsular ligament is much torn, amputation becomes necessary; in other respects the joint is to be considered as under a high degree of inflammation, and the antiphlogistic regimen is to be adopted; if suppuration take place in the cavity of the joints, the pus should be carefully evacuated so as not to allow the air to enter.

310. Q. What is meant by spina ventosa?

A. A disease affecting a bone, in which it becomes spongy and suppurates; and the pus escapes by several openings.

311. Q. What is the prognosis in wounds of the abdominal viscera?

A. Generally bad.

312. Q. How may an abscess of the liver rupture?

A. First, externally, by the liver forming an adhesion to the parietes of the abdomen, and the abscess pointing on its external surface. Secondly, by adhesive inflammation taking place between the liver, diaphragm, and lungs, and the abscess evacuating itself into the lungs. Thirdly, by adhesion taking place between the liver and colon, and the abscess making its way into the intestine. Fourthly, into the cavity of the abdomen.

313. Q. What symptoms accompany wounds of the abdominal viscera?

A. Profuse hæmorrhage from the external wound; the escape of the contents of particular viscera, attended with a small, feeble, and contracted pulse, pallid countenance, coldness of the extremities, great debility, hiccough, vomiting, spasm, and tension of the abdomen.

314. Q. How is the hip-disease distinguished from an affection of the knee-joint, as the forerunning symptoms of the hip-disease are generally pains about the knee, and no evident affection of the hip?

A. By a diminution of the circumference of the leg and thigh of the affected side; an elongation of the limb, and pressure upon the acetabulum exciting pain.

315. Q. In taking up the brachial artery,

what nerve are you to avoid including in the ligature?

A. The median nerve which accompanies the brachial artery.

316. Q. What are granulations?

A. They are exudations of coagulable lymph from the vessels of the exposed surface, which soon become organized, possessing blood-vessels, nerves, and absorbents.

317. Q. What forms the boundaries or cyst of an abscess?

A. A deposit of coagulable lymph, which becomes organized so as to form a cyst.

318. Q. What is meant by a furunculus?

A. A circumscribed inflammatory tumour, which usually attains the size of a small walnut; it imperfectly suppurates, and the matter is contained in a cyst.

319. Q. What is the cause of piles?

A. Pressure upon the vessels of the anus which prevents the return of blood to the heart: as that from a gravid uterus, costiveness, tumours; and from long sitting; which last allows the abdominal viscera to press upon the blood-vessels.

320. Q. How is the operation for fistula lachrymalis performed?

A. First an opening is to be made at the most depending part of the tumour, by means of a lancet, which will discharge the sac of its contents; a probe is then to be passed forward in the natural passage with moderate force; should this be impracticable, an artificial open-

ing is to be cautiously drilled on the anterior part of the os unguis by a trocar, or any other sharp instrument in an oblique direction. When this has penetrated a sufficient depth, which may be ascertained by the want of resistance, and the discharge of blood by the nose, the perforator is to be removed, and a silver tube introduced into the opening, where it should remain till the edges of the wound become callous. After this is effected, the tube is to be withdrawn, and the external wound heals readily.

321. Q. What are exostoses?

A. They are tumours of bone formed upon bone.

322 Q. What is meant by sphacelus?

A. It is a complete mortification of a part whereby it loses its natural colour, and becomes black and soft.

323. Q. What is meant by sarcocele?

A. A scirrhous enlargement of the testicle.

324. Q. What are the causes of fistulæ in ano.

A. They are caused by the formation of abscesses about the anus, which spread among the intestines of the muscles, and between the integuments; these abscesses are produced originally by inflammation. There are also other causes giving rise to fistulæ, condylomatous tumours, &c.

325. Q. If the carotid artery should be wounded, and assistance should be obtained in time to take up the vessel, what nerve are you to avoid including in the ligature?

A. In taking up the carotid artery the eighth pair of nerves which runs close to the artery should not be included in the ligature?

326. Q. In a transverse wound of the trachea how is reunion effected?

A. The union of a transverse wound of the trachea is best effected by bringing the patient's head downwards and forwards to the sternum; the head should be maintained in this position, and the edges of the wound should be kept in contact until they have grown together. Ligatures are not recommended, as they create irritation in the trachea.

327. Q. What are the vessels generally divided when a person cuts his throat?

A. When suicide is attempted by cutting the throat, the vessels cut through are either the external maxillary, the lingual, or the theroideal artery: the trunk of the carotid artery is seldom cut.

328. Q. How does a false aneurism take place?

A. A false aneurism is occasioned by an aperture of an artery allowing the blood to rush into the cellular structure.

329. Q. How is amputation of the fingers or toes accomplished?

A. In amputating the fingers or toes a small semilunar incision is to be made on the back of the finger or toe, which should extend, forming a convexity about half an inch in front of the joint; the flap is next to be raised and reflected; having effected this, the skin in front of the finger over the joint is to be divided, and

this incision must extend across the finger or toe, and meet the two ends of the first semilunar incision, then bending the finger the capsular ligament is to be divided, which will allow the head of the bone to be dislocated. Should the digital arteries bleed much, they may be secured, but the hæmorrhage often stops without having recourse to ligature: the flap is to be brought over the wound, and the edges of the wound kept together by adhesive plaster.

330. Q. How is emphysema distinguished from anasarca.

A. Emphysema is distinguished from anasarca by the crackling noise produced upon pressure, and by the rapidity of the swelling.

331. Q. What is the general division of strictures?

A. The general division of strictures is into:—spasmodic, which depends upon a spasmodic contraction of a part of the urethra:—and permanent stricture, which is caused by a partial narrowness of the urethra, forming a ridge. There is also another kind of stricture, which depends upon a permanent contraction and an occasional spasmodic affection.

332. Q How is the introduction of the male catheter effected?

A. The introduction of the male catheter is performed in the following manner. The penis should be drawn upwards and held by the left hand; having oiled the catheter, it is to be introduced into the urethra with its concavity towards the abdomen, pressing its point down-

wards until it reaches the bulb of the urethra; when this has happened, the beak of the instrument has passed under the arch of the pubis; the handle of the instrument is then to be gradually brought forwards between the patient's thighs, and during this action the beak of the instrument becomes elevated and slips into the bladder. The operation may be performed either when the patient is standing, sitting, or on his back.

333. Q. What is the character of a scorbutic ulcer?

A. A scorbutic ulcer is one that affords a fœtid, sanious, and bloody discharge, the edges are of a livid colour, and the surface is covered by a loose spongy flesh; there are generally other symptoms which establish its nature, such as loose spongy gums, and livid spots of the skin.

334. Q. What is the treatment of a fractured rib?

A. In a case of fractured rib the action of the chest is to be confined, and the ends of the fractured ribs are to be kept as nearly as possible in apposition, which may be effected by surrounding the body with a wide roller. It may also be necessary to bleed the patient, and adopt the antiphlogistic regimen, to guard against inflammation.

335. Q. What is a bronchocele?

A. Bronchocele is an indolent enlargement of the thyroid gland.

336. Q. What method is to be taken if, after

liberating a strangulated intestine by operation a great quantity of irreducible thickened omentum exists ?

A. The indurated omentum is to be cut off, unless hæmorrhage, or other circumstances, forbid it; in such cases it may be left unreturned.

337. Q. What is the difference between a femoral and an inguinal hernia.

A. In femoral hernia the intestine or omentum protrudes under Poupart's ligament, and in inguinal hernia they protrude through the abdominal ring.

338. Q. What are the circumstances by which you judge the operation necessary to liberate a strangulated hernia ?

A. If reduction of the hernial contents cannot be effected by the hand aided by the position of the patient and by bleeding, cathartics, clysters, cold topical applications, the warm bath, and tobacco-smoke introduced into the rectum, each of which having been judiciously tried without effect, the operation then is imperiously demanded.

339. Q. What means would you have recourse to in order to reduce a strangulated hernia, before you judge it necessary to perform the operation ?

A. First, the patient should be placed in a suitable position with the pelvis elevated, the thigh bent and rotated inwards, and the reduction of the hernial contents skilfully attempted; should this fail, bleeding should be had recourse to; and it is recommended to take away

the blood suddenly so as to occasion fainting, at which time the taxis should again be attempted. Success not being obtained, cathartics and the warm bath should be speedily made use of. These with the taxis not having succeeded, the united effort of cold to the tumour, and tobacco, either in fume or decoction. If strangulation still continue after these means have been used, and another attempt by the hand has been ineffectual, the operation should be performed, the protraction of which beyond a certain time would endanger the patient.

340. Q. What are the symptoms of suppression of urine?

A. A swelling above the os pubis, a violent inclination to make water, tension and pain of the abdomen, cold perspirations, oppressed respiration, hiccough and fainting follow.

341. Q. How would you attempt to relieve a suppression of urine in a medical point of view?

A. Bleed copiously; apply leeches to the perinæum, or above the os pubis; exhibit opium by the mouth, and in glysters; use the warm bath, and apply fomentations to the hypogastrium and perinæum.

342. Q. When these means fail to evacuate the urine, what would you have recourse to?

A. To the catheter.

343. Q. What do you mean by a popliteal aneurism?

A. A dilation of the popliteal artery forming a pulsating tumour in the ham.

344. Q. Describe the operation for popliteal aneurism.

A. An incision should be made about two inches and a half through the skin and fascia of the thigh, on the inner edge of the sartorius muscle; as soon as the femoral artery is felt, a careful incision is to be made on each side of it, in order that the finger may be passed under it; a double ligature is then to be introduced by means of a blunt needle under the vessel, leaving out the femoral vein and the accompanying branches of the anterior crural nerve; one portion of the ligature is to be tied as high, the other as low, as the detachment of the artery will allow. The part of the vessel between the ligatures is to be divided, and after this the external wound is to be brought together and dressed in the usual way.

345. Q. What are the symptoms of a phlegmon?

A. A. phlegmon is a tumour attended with heat, redness, pain, tension, and more or less of the synochal fever.

346. Q. How would you treat a phlegmon?

A. First, by endeavouring to effect a resolution by local or general bleeding, the antiphlogistic regimen, the exhibition of saline cathartics, and diaphoretics, and applying cold, astringent, sedative applications, warm emollient poultices and fomentations according to its nature. If suppuration should commence, by giving tonics and cordials, a generous diet, and forwarding the process by poultices. If mortifica-

tion should appear likely to ensue, bark, acids and wine will be proper, and stimulating poultices of beer grounds, and fomentations with bitter decoctions and camphorated spirit.

347. Q. How are issues made?

A. Issues are made by making an opening either with a lancet, or caustic, large enough to admit a pea being introduced in it.

348. Q. What is the treatment after amputation?

A. The chief circumstances to be attended to after amputation are;—to adopt the antiphlogistic regimen; to prevent inflammation, which is to be regulated by the constitution of the patient; the first dressing ought to be removed the third or fourth day after the operation, and new dressings are to be applied as at first every day until the inflammation has entirely subsided. The ligatures are to be very gently pulled every day after the first week, until they come easily off.

349. Q. What is the treatment of hernia humoralis, or inflammation of the testicle?

A. In hernia humoralis the patient should be kept in an horizontal position; if young and plethoric, bleeding should be adopted. It is generally necessary to apply leeches repeatedly; to administer saline purgatives; fomentations and poultices, or cold lotions, are to be had recourse to, and the testicle is to be supported by a bag truss. Should there be great pain in the loins, opiates will become necessary;

if after the inflammation has subsided an induration should exist, frictions with mercurial ointment will be found beneficial.

350. Q. What are the indications of cure in mortification?

A. The indications of cure in mortification are;—to arrest the progress of the disease, and to promote the separation of the mortified part.

351. Q. How is the division of the frœnum linguæ to be effected, and what are the arteries to be avoided?

A. The liberation of the frœnum linguæ consists in dividing the frœnum as far as seems necessary with a pair of sharp scissors with blunt points;—the raninal arteries must be cautiously avoided in this operation.

352. Q. What is the general treatment of fractures?

A. In the general treatment of fractures, the limb is to be placed in such a position as will relax those muscles which tend to displace the ends of a fractured bone; this seems best effected by placing the limb in a middle state between flexion and extension: the ends of the fractured bone are to be confined in a state of apposition; this is done by the aid of splints secured by straps:—to remedy the effects of pressure from the splints, compresses of tow or other soft substances is usually placed under the splints. An eighteen-tail bandage is generally made use of in fractures of the long bones, and is applied close to the limb. When there is much inflam-

mation of the limb before the fracture is set, linen wetted with cold saturnine lotions is to be applied between the splints and limb, which should be kept cold and moist by repeatedly squeezing the lotion over the limb. It may be necessary to bleed or give opiates according to circumstances.

353. Q. How is a ganglion to be cured?

A. A ganglion may often be removed by pressure; sometimes it may be necessary to remove it by the scalpel, or to make a perforation in it, and allow its contents to escape.

354. Q. How do aneurisms terminate if not cured?

A. Aneurismal swellings, if not cured, gradually increase in size, the skin over the tumour becomes pale; the pain increases, and the skin begins to grow livid; a degree of inflammation takes place, the skin cracks, and discharges for some time a bloody serum, until at length it becomes quite gangrenous, when all of a sudden the tumour bursts, and the patient dies from hæmorrhage.

355. Q. What is a steatoma?

A. Steatoma is a tumour containing a fatty substance, and surrounded by a cyst of indurated cellular membrane.

356. Q. What is meant by atheroma?

A. Atheroma is an encysted tumour containing matter of a doughy consistence.

357. Q. What prognosis can be formed after the operation for hernia?

A. If the operation to liberate strangulated hernia is performed early, there is comparatively little danger. The danger is dependent upon the operation being delayed after necessity demands it. Mortification has ensued within twelve hours after strangulation, and in some few instances strangulation has been known to subsist for several days, and no mortification take place.

358. Q. What causes give rise to prolapsus ani?

A. The causes that give rise to prolapsus ani are costiveness, debility, hæmorrhoidal swellings, or the action of stimulative substances that increase the action of the rectum.

359. Q. What are the signs of luxation in general?

A. In luxations the shape of the joint is altered; the motion of the limb is much impaired; a certain degree of inflammation takes place; the pain attending which is sometimes so acute as to occasion convulsions, or spasmodic affections, from the compression of nerves by the displaced bone.

360. Q. How are luxations of the collar-bone to be cured?

A. Luxations of the collar-bone are easily reduced by pressure with the fingers, but there is great difficulty in keeping the bone in this situation. The arm should be raised and confined by bandages, a compress should be placed on the luxated bone to prevent the action of the muscles drawing the bone out of its place.

361. Q. How is a venereal ophthalmy to be cured?

A. In the treatment of venereal ophthalmy, mercurial frictions are to be made use of, the decoctum sarsaparillæ compositum should be taken. A collyrium of the oxy-muriate of mercury is recommended. The eyelid may be also smeared with the unguentum hydrargyri nitrati.

362. Q. In what direction do luxations of the head of the os brachii most commonly take place?

A. The dislocation of the head of the os brachii generally takes place into the axilla.

363. Q. How is dislocation of the thigh distinguished from a fracture of its neck?

A. Dislocation may be distinguished from fracture of the head of the femur by these circumstances:—In fracture the leg is much shorter; the limb can be moved in many directions; the toes mostly turn inwards; by particular motions, a grating may be perceived, and a loss of continuity. In dislocations of the thigh joint, the leg is generally much lengthened, the toes are turned outwards, and it is almost impossible to turn them inwards, at least without giving the greatest pain; a vacancy is observed at the seat of the acetabulum, and a tumour is felt which is caused by the head of the bone out of the acetabulum.

364. Q. Define a caries.

A. Caries is a mortification of a bone attended with an ichorous fœtid discharge.

365. Q. Why does the toothach produce so considerable a pain?

A. From the inflammation that takes place in the pulp being confined by the fang.

366. Q. What are the causes that give rise to ischuria?

A. Ischuria may arise from inflammation of the bladder produced from various causes; spasms affecting the neck of the bladder; scirrhosities of the prostate gland; caruncles in the urethra; pressure of the uterus in the last months of pregnancy; tumours in the perinæum, and vagina, as prolapsus of the uterus; polypi, or enlargement of the corpus spongiosum; the penis itself pressing the sides of the urethra together; ischuria may also arise from a loss of tone in the bladder itself, and from stones impacted in the urethra.

367. Q. What is meant by hœmatocele scroti?

A. Hœmatocele is a tumour produced by blood being extravasated in the strotum, tunica vaginalis, or in the spermatic chord; it is mostly occasioned by some external violence, as blows inflicted on the scrotum or surrounding parts, producing a rupture of vessels.

368. Q. What are the symptoms of a punctured nerve from bleeding?

A. In a punctured nerve from bleeding the patient feels a more acute pain than usual under the operation, a numbness is communicated to the shoulder, and down to the fingers: these symptoms are often succeeded by spasms

of the neck and jaw, frightful dreams, the patient becomes extremely irritable and delirious.

369. Q. What is a cataract?

A. A cataract is an opacity of the chrystalline lens or its capsule.

370. Q. What is meant by mollities ossium?

A. A state of bones whereby they become soft and preternaturally flexible.

371. If the head of the shoulder bone is luxated upwards, what is the consequence?

A. When the head of the shoulder bone is luxated upwards, a fracture of the acromion process takes place.

372. Q. What is the direction in which luxations of the ulna most commonly happen?

A. Luxations of the ulna most frequently take place upwards and backwards.

373. Q. How is a dislocation of the lower jaw reduced?

A. A dislocation of the lower jaw is reduced by passing both thumbs, previously covered with a linen cloth, into the mouth; the jaw is then to be pushed backwards, depressing the angles and raising the symphysis of the jaw at the same time by gentle pressure; the jaw immediately springs back into its natural situation by the action of the muscles.

374. Q. What is a fungus?

A. A fungus is a soft fleshy excrescence rising out of an old wound or ill conditioned ulcer, and preventing its healing.

375. Q. How are dislocations of the os femoris reduced?

A. In dislocations of the thigh bone, when the head is in the foramen ovale, the muscles of the thigh are first to be relaxed as much as possible, the limb is then to be extended to displace the end of the bone from its cavity: when this is effected the bone is to be drawn upwards and inwards into its socket; this generally effects the reduction: but should the bone be above the acetabulum, a slight extension will effect its reduction; it happens occasionally that the head of the bone is not reduced, owing to the projection of the acetabulum preventing the necessary extension; the bone must then be elevated a little over this projection, and the reduction is then effected.

376. Q. In mortification of a limb, what state are the arteries in near the diseased part?

A. When mortification takes place at the lower part of an extremity, the diameter of the arteries is diminished near the diseased part, and they become stopped up with coagulated blood.

377. Q. When an artery is tied by ligature, how is a permanent obliteration of its channel effected?

A. After an artery is secured by ligature, coagulable lymph is separated near the strictured part, this becomes organized, and unites the sides of the arteries together, and thus obliterates the artery.

378. Q. What are the properties of pus?

A. Pus is a fluid of a lightish colour, of the consistence of cream; it has little smell, is void of acrimony, and consists of globules swimming

in a transparent, colourless fluid. Its specific gravity is greater than that of water.

379. Q. What are the differences between pus and mucus?

A. Pus is distinguished from mucus by the following circumstances; pus sinks in water, mucus floats; pus gives to water a uniform white colour; mucus has a ropy appearance in water. If pus and mucus are mixed with sulphuric acid, on the addition of water the pus is precipitated to the bottom, and the mucus forms swimming flakes. A solution of caustic alkali dissolves both pus and mucus; but on the addition of water the pus is separated and not the mucus.

380. Q. What are the symptoms which announce the formation of pus in inflammation of the hip joint?

A. The symptoms which point out the formation of pus in inflammation of the hip joint are various, as the disease may be acute or chronic. When the former takes place, the parts surrounding the joint become tense and painful, the skin becomes red, inflammatory fever takes place, as the pain abates, rigours succeed, and a swelling is observed about the joint. When the abscess is the consequence of chronic inflammation, an increase of pain takes place previous to the occurrence of suppuration, starting and catchings during sleep are noticed; the pus in the chronic species is a long while before it arrives at the surface, at length a fluctuating tumour forms, but it does not immediately point.

381. Q. What is the character of cancerous ulcer?

A. Cancerous ulcer is irregular in its figure, and unequal on its surface, the edges are thick, serrated, and extremely painful, there are large chasms in its substance, produced partly by sloughing, and partly by an ulcerating process. The ulcer affords a very fœtid sanious matter, it spreads with great rapidity, and in its progress produces frequent hæmorrhages.

382. Q. What prognosis is to be given of wounds of the œsophagus?

A. Wounds of the œsophagus generally are mortal.

383. Q. How is the removal of a tumour from the breast performed?

A. In removing a tumour from the breast, the operation is generally performed as the patient is in a sitting position, the pectoral muscle is to be made tense by keeping the arm back, and if none of the integuments are to be removed, a straight incision is to be made through them, the tumour is to be regularly dissected all round from the circumjacent parts, and its base is to be detached from its connexions from above downwards, till the whole is separated. If the tumour is of a malignant nature, and adhering to the skin and pectural muscle beneath, an inch or two of the fat should be removed on every side of the diseased part, and after the removal of the tumour, the surface of the pectoral muscle, wherever it is adhering to the tumour, should be removed.

384. Q. What is a node?

A. A node is a swelling of a bone, the periosteum, or a tendon mostly arising from a venereal cause.

385. Q. What is the character of a venereal ulcer in the throat?

A. A venereal ulcer affecting the throat is very deep, it has a defined or thick edge, and is generally very foul, having a lardaceous slough adhering to it that cannot be detached.

386. Q. How is the vena saphena to be tied when in a varicose state?

A. The vena saphena is to be tied by passing a ligature under the vessel; the integuments are to be pinched up into a transverse fold, and the ligature is to be conveyed under the vessel by means of a blunt silver needle.

387. Q. How is hydrocele distinguished from other tumours?

A. Hydrocele is distinguished from hernia by the tumour in hernia being somewhat elastic, and becoming more distended when the person coughs. The swelling in hernia always begins at top, and extends gradually downwards. Hernia is distinguished from encysted dropsy of the chord by the swelling lying at the superior part of the scrotum, whilst in hydrocele it is at the inferior part. It may be distinguished from scirrhous testicle, being firm, hard, and not yielding upon pressure, and from the great weight in proportion to its bulk. In hydrocele a lighted candle, placed at the opposite side of the tumour, will make the contents of the sac seem transparent.

388. Q. What are the favourable symptoms that point out success from trepanning?

A. The favourable symptoms which point out success from trepanning are, the patient becoming less stupid, his breathing less oppressed, and the pupils contracting upon exposure to strong light.

389. Q. If, after trepanning, a collection of fluid should be found between the dura and pia mater, how is it to be removed?

A. Under such circumstances, a small hole may be cautiously scratched on the dura mater, to evacuate it.

390. Q. When the parotid duct is wounded, what is the consequence?

A. The consequence of wounding the parotid duct is a fistulous opening which discharges saliva, particularly during meals.

391. Q. What is ecchymosis?

A. Ecchymosis is an extravasation of blood in the cellular membrane, occasioned by a rupture of the small vessels of the part.

392. Q. What is meant by exfoliation?

A. Exfoliation is a separation of a dead portion of bone from the living.

393. Q. What method is to be taken to prevent exfoliation that is likely to occur from a wound?

A. In attempting to prevent exfoliation that may take place from a wound, all that is to be done is to cover the exposed bone as soon as possible with the flesh that has been detached.

394. Q. Where is the fluid in hydrocele situated?

A. The fluid in hydrocele is situated between the tunica vaginalis and the tunica albuginea of the testicle.

395. Q. How are fistulæ in perinæo to be dressed after they have been laid open?

A. Fistulæ in perinæo, after being laid open, are to be dressed quite down to the end, to allow of granulations shooting up from the bottom before reunion of the parts takes place.

396. Q. What is meant by simple fracture?

A. By simple fracture is meant a breach of continuity of bone, without an external wound.

397. Q. What regimen do gun-shot wounds require?

A. Gun-shot wounds generally require the antiphlogistic regimen.

398. Q. How is the operation for phymosis performed?

A. This operation is performed by introducing a directory under the prepuce, then passing a curved pointed bistoury, and slitting open the prepuce.

399. Q. Where do strictures most frequently take place in the urethra?

A. Strictures most commonly occur at the membranous part of the urethra; from its being more acted upon by the salts of the urine; the urine, after being expelled from the bladder, remains at this part of the urethra to be thrown out by the accelaratores urinæ.

400. Q. From whence does the discharge of gonorrhæa flow?

A. The discharge of gonorrhæa flows from the mucus lacunæ of the urethra.

401. Q. What muscles are divided in amputation of the thigh?

A. The muscles divided in amputation of the thigh are the biceps flexor cruris, semitendinosus, semimembranosus, gracilis, sartorius, vastus externus, vastus internus, rectus femoris, cruræus, and the long tendon of the adductor magnus.

402. Q. At what part of the os femoris do fractures most frequently take place?

A. Fractures of the os femoris most frequently take place at the middle or third of its extent.

403. Q. What part of the tibia is most liable to be fractured?

A. The part of the tibia most liable to fractures is the part a little above the internal malleolus.

404. Q. What takes place in a luxation of the ankle, the foot being turned upwards and outwards?

A. When the ankle is luxated, the foot being turned upwards and outwards, the fibula is generally fractured.

405. Q. What change do the collateral branches undergo when a large arterial trunk is tied?

A. The collateral arteries, after a large arterial trunk is tied, dilate, their coats become stronger, and acquire an additional strength; they also are found to become tortuous.

406. Q. What is meant by cicatrization?

A. Cicatrization is that process by which wounds and sores heal, or by which the forma-

tion of new skin takes place over a wound or ulcer.

407. Q. How is castration performed?

A. Castration is performed in the following manner. The patient is to be laid on a table of convenient height. An incision is then to be made opposite the abdominal ring, and continued a good way down the scrotum, in order to lay bare the spermatic chord and testicle; the spermatic chord thus laid bare is to be detached from the surrounding membranous connexions, and then the surgeon with his finger and thumb separates the blood-vessels from the vas deferens, he must next pass a ligature between them, and having tied the former only, he must cut through the whole chord at a quarter or half an inch from the ligature; the next thing to be done is to dissect the testicle out from the scrotum. Should any vessels bleed, they are to be secured. The wound is next to be brought together to unite by the first intention, and the scrotum is to be supported by the T bandage.

408. Q. What is meant by callus?

A. Callus is the ossific matter that forms the conjunction of a fractured bone.

409. Q. What is the theory of the formation of callus?

A. The theory of the formation of callus is this; from the ends of a broken bone, the arteries secrete a gelatinous matter, this very soon becomes organized by the elongation of the secreting vessel, which at length deposits bone in

this new formed animal substance, so as to produce a junction of the broken bone.

410. Q. What are the consequences that may arise from a fractured sternum?

A. The consequences that may result from a fracture of the sternum are, the fractured portions may be driven inwards, so as to injure the lungs.

411. Q. What are the cases that require the operation for bronchotomy?

A. Bronchotomy has been proposed in the active inflammation of the upper part of the larynx which threatens suffocation. To extract foreign bodies that become impacted in the trachea. In the croup it has been proposed to extract the coagulable lymph that would have caused suffocation. It has also been recommended to be performed on those recently suffocated or drowned, and in glossitis, where the tongue has so enlaged as to shut up the passage through the fauces.

412. Q. What are the symptoms of calculus?

A. The symptoms of calculus are, a dull uneasy sensation about the neck of the bladder, with a similar sensation at the glans penis, this increases, and becomes more frequent. In voiding the urine, the stream is frequently stopped, and great pain is produced at the neck of the bladder; in order to obtain ease, the patient changes his position; sometimes small pieces of stone are voided. The urine is sometimes charged with mucus, at other times lim-

pid; sometimes it is tinged with blood, especially after violent exercise: but the most diagnostic sign is touching the stone with the sound.

413. Q. What sensation is communicated to the operator upon touching a stone in the bladder with the sound?

A. When a stone in the bladder is touched by the sound, a tremulous motion is communicated to the fingers of the operator.

414. Q. Why is the finger introduced into the rectum whilst sounding?

A. The finger is introduced into the rectum whilst sounding in order to raise the undermost part of the bladder, and consequently to bring the calculus in such a situation that the sound may touch it.

415. Q. In trepanning, generally a slight bleeding takes place from the diploë when the saw has arrived at that part; what conclusion is to be formed when it does not take place?

A. When the saw has reached the diploë in trephining, if an oozing of blood does not take place, an inference may be drawn that the dura mater is detached from the cranium at that part.

416. Q. What are the symptoms that sometimes attend luxations, besides an alteration in the shape of the joint?

A. In luxations some degree of inflammation takes place, occasionally there are convulsions and spasmodic affections from compression of the nerves by the displaced bone.

417. Q. How would you endeavour to unite ruptured tendon?

A. A ruptured tendon is to be united, by bringing the ruptured ends of the tendon as nearly in contact as possible, and keeping the muscles of the part relaxed.

418. Q. How is the interrupted suture performed?

A. The interrupted suture is performed by inserting two needles on one ligature, and introducing each of them at the bottom of the wound, they are then to be pushed outwards at a proper distance form the edge of the wound, and the needles are to be taken off the ligature, which is to be pulled to bring the edges of the wound into contact. The number of ligatures is to be according to the extent of the wound.

419. Q. How is the twisted suture performed?

A. The twisted suture is performed by introducing two or more pins, according to the extent of the wound, through both its edges; when the edges of the wound are brought into contact upon the pins, a wax ligature is to be twisted round these so as to form a figure of 8. This kind of suture is generally used in the operation for the hare lip.

420. Q. How is the glovers suture performed?

A. The glovers suture is performed by passing a number of stitches in a spiral direction along the edges of the wound.

421. Q. What is the glovers suture used for?

A. The glovers suture is used for wounds of the abdomen and intestines.

422. Q. What is the interrupted suture used for?

A. The interrupted suture is made use of to bring the edges of large and deep wounds together.

PHYSIOLOGY.

423. Q. WHAT is the course of the circulation?

A. The blood is received from the arteries by the veins, and is returned by the superior and inferior cava to the right auricle of the heart, which, becoming distended, contracts and empties its blood into the right ventricle. The right ventricle then contracts and propels the blood through the pulmonary artery into the lungs, there to undergo a peculiar change, and to be conveyed by the four pulmonary veins into the left auricle. The left auricle being distended evacuates its blood into the left ventricle. The left ventricle propels the blood through the aorta, to be circulated by the arteries, and again to be returned by the veins to the heart.

424. Q. How do you distinguish venal from arterial blood?

A. Venal blood is of a dark colour (excepting that which is in the venal system of the lungs.) Arterial blood is of a florid red vermillion hue (excepting the blood of the pulmonary artery, which is dark.)

425. Q. What is the contraction of the heart called?

A. Systole.

426. Q. In what viscus does the change from arterial to venal blood take place?

A. In the lungs.

427. Q. What is the colour of the blood in the pulmonary artery?

A. Of a dark colour.

328. Q. What is the cause of the bile regurgitating into the gall bladder?

A. Because the opening of the ductus communis choledochus is shut, when digestion is not going on, the bile therefore, not finding an access to the duodenum, regurgitates into the gall bladder.

429. Q. What is the use of the urinary bladder?

A. To receive, to retain for a certain time, and to expel the urine.

430. Q. What is the use of the gastric juice?

A. To digest the food.

431. Q. What is the theory of ossification?

A. First, the formation of a jelly, this becoming cartilage, the absorbents remove a portion of the cartilage, forming a cavity, and the arteries next deposit the osseous matter in the cavity: it is however, not always cartilage that the bony matter is deposited in, for in most of the flat bones the deposition takes place between membranes.

432. Q. How is inspiration performed?

A. The intercostal muscles contract, assisted by other muscles, and increase the transverse

breadth of the cavity of the chest; whilst the diaphragm contracts and increases the length of the cavity of the chest; the air then rushes down the trachea, and inspiration is performed.

433. Q. What is meant by secretion?

A. The formation of a fluid different from the blood, from the minute ends of arteries.

434. Q. What change is produced on the blood in the lungs?

A. The blood is changed from a dark colour to a florid red, it is deprived of hydrogen and carbon, and absorbs oxygen, caloric, and a portion of nitrogen.

435. Q. How is expiration performed?

A. By the relaxation of the intercostal muscles and diaphragm, and the thorax assuming its relaxed state.

436. Q. What is meant by animal heat?

A. The natural heat of an animal, which, in the human being, raises the mercury in Fahrenheit's thermometer to about 98°.

437. Q. Why does not the fluid exhaled to lubricate the different cavities of the body accumulate?

A. Because in a healthy state the inhalents or absorbents counterbalance the exhalents or secreting arteries.

438. Q. How is nutrition effected?

A. By the lacteals, the ostia of which open upon the internal surface of the small intestines, selecting the chyle from the excrementitious part of the food, and conveying it into the thoracic duct which empties itself into the angle of the left jugular and subclavian vein, thereby

repairing the blood of its continual losses in nourishing the body.

439. Q. What membrane moderates the effect of light on the retina ?

A. The iris, which diminishes or enlarges the pupil, according to the intensity of the light.

440. Q. What is the use of the fluid which fills the labyrinth of the ear ?

A. It preserves the nervous fibrils soft, and moderates the tremours of sound.

441. Q. Why does not the fat gravitate to the lower extremities after long standing, like the fluid of an anasarcous person ?

A. Because the fat is contained in vesicles which do not communicate like the cells of the cellular membrane.

442. Q. Why does not the urine excite inflammation of the bladder ?

A. Because the bladder is accustomed to its stimulus, and a great quantity of mucus is secreted by the internal membrane to blunt its acrimony.

443. Q. Why do enlarged mesenteric glands cause an atrophy ?

A. Because they obstruct the passage of the chyle through the lacteals to the thoracic duct.

444. Q. In what ages and sex is the pulse the most frequent ?

A. In children and women the pulse is most frequent.

445. Q. What is the use of the anastomoses of arteries ?

A. The use of arteries anastomosing is to allow of blood being conveyed to parts where its

passage is prevented in the principal branch or branches that supply these parts with blood; another use is that of facilitating the passage of blood from one part to another, and prevent the distention of parts.

446. Q. Is the fat solid or fluid in the living body?

A. The fat in a living body is found in some parts in a state of semifluidity, and in other parts it is found absolutely fluid.

447. Q. What is the cause of fainting that sometimes takes place under the operation of tapping?

A. Fainting takes place in tapping in consequence of the sudden removal of the pressure of fluid from the diaphragm and viscera.

448. Q. How does a compression of the thoracic duct, either by an aneurism of the heart or aorta, occasion so frequently a dropsy?

A. The compression of the thoracic duct prevents the lymph from the absorbent vessels being returned into the blood, the absorbents are therefore prevented performing their office, and an accumulation takes place.

449. Q. Why does a person troubled with calculus find great difficulty in passing the urine when he leans forward?

A. Because the calculus falling against the orifice of the urethra thereby prevents the regular flow of urine.

450. Q. Why does not the urine flow back from the bladder to the kidney?

A. The urine is prevented flowing back to the pelvis of the kidney by the valve formed

by the inner coat of the bladder over the orifice of the ureter, produced by the ureter's piercing the bladder obliquely.

451. Q. Why is the spine composed of so many small bones ?

A. The reason why the spine is composed of so many bones is to allow of great strength with a sufficieut degree of mobility.

452. Q. Is there any alteration in the muscles of a paralytic limb.

A. Yes, the muscles of a paralytic limb are paler and more flaccid.

453. Q. How is the voice performed ?

A. The voice results from the vibration the air suffers during its passage through the glottis, when expelled from the lungs.

454. Q. Which of the two has the greatest power in preventing luxations of the joint, the muscles that surround the joint, or its own ligaments ?

A. The muscles that surround joints give them greater strength than their surrounding ligaments.

455. Q. What is the use the cartilages of the surfaces of joints ?

A. The uses of the articular cartilages are to give the bones a smoothness for easy motion, to assist motion by their elasticity, and to guard against the effects of concussion.

456. Q. What is the most elastic substance in the body ?

A. The most elastic substance in the body is cartilage.

457. Q. Are tendons elastic ?

A. Tendons are not elastic, for if they were, the power of muscles would be greatly diminished.

458. Q. What is the use of the adeps?

A. The adeps guards against the effects of pressure, it lessens the specific gravity of the body, fills up the interstices of muscles, and is a reservoir for nourishment to the body.

PRACTICE OF PHYSIC.

459. Q. WHAT do you mean by a tetanus?

A. It is a tonic spasm of the extensor or flexor muscles of the body.

460. Q. How would you treat inflammation of the bowels?

A. By general and topical blood-letting, by the warm bath and fomentations, by the frequent exhibition of purges, and by giving saline diaphoretics with mucilaginous drinks.

461. Q. What is a dysentery?

A. It is a spasmodic constriction of the colon, with a retention of the natural fæces, and the frequent expulsion of mucus or sanguineous motions.

462. Q. What are the symptoms of enteritis?

A. Fever, costiveness, a twisting around the umbilicus, tension and acute pain of the abdomen, increased pain upon pressure, tenesmus or vomiting, according to the seat of the inflammation; quick, or slow, and hard, contracted pulse;

great prostration of strength, and high coloured urine.

463. Q. What are the symptoms of volvulus?

A. Violent pain and distention of the abdomen, attended with a peculiar twisting around the navel, obstinate costiveness, slight febrile symptoms, and a frequent vomiting of a stercoraceous matter.

464. Q. What are the symptoms of nephritis?

A. Pyrexia, pain in the region of the kidney, extending along the course of the ureter, accompanied with numbness of the leg and thigh of the affected side, nausea, and vomiting, retraction of the testicle, high-coloured urine, sometimes mucous or bloody, frequent micturation, dysuria.

465. Q. How would you distinguish hepatitis from gastritis?

A. From gastritis by the seat of the pain, by the sympathetic pains of the clavicle and shoulder, by the less prostration of strength and greater fulness of the pulse, by the colour of the stools and urine.

466 Q. What purges would you give in nephritis?

A. Oleaginous purges and frequent emollient clysters.

467. Q. What are the symptoms of pneumonia?

A. Obtuse pain and sense of weight and oppression in the chest: anxious breathing, and the pain is increased during inspiration; hard,

contracted, and frequent pulse; the face is usually flushed, and of a purple hue; the tongue is white, the urine is high-coloured, and there are other symptoms of synocha.

468. Q. How would you distinguish cystitis from enteritis?

A. From enteritis by the seat of the pain: the tension and tumour which is above the pubes in cystitis, by the micturation, and by the painful discharge of urine in small quantities or the complete obstruction to its passage.

469. Q. When gangrene takes place in internal parts, what are the symptoms?

A. A peculiar appearance of the countenance; cold perspirations; coldness of the extremities; sudden cessation of pain; hiccup; subsultus tendinum; suppression of urine; convulsions, and the pulse scarcely perceptible.

470. Q. What are the symptoms of hydrocephalus?

A. Languor, inactivity, loss of appetite, nausea, vomiting, parched tongue, dry skin, flushing of the face, and other symptoms of pyrexia; pain over the eyes, the pain in the headach becomes extremely acute, and intermits, occasioning the patient to scream violently, disturbed sleep, extreme restlessness, flushed countenance, costiveness, vomiting, stupor, convulsions, dilated pupils.

471. Q. What is a typhus fever?

A. A very infectious fever, characterized by great debility, disturbed animal functions, languid circulation, furred tongue, aching pains in different parts of the body, particularly the head

and small of the back, and the evacuated fluids of the body undergoing speedy putrefaction.

472. Q. What are the indications of cure in a typhus fever?

A. To excite a new action in the system, by rousing the actions of the brain and arteries. To support the strength of the patient, and to obviate the putrid tendency in the fluids.

473. Q. What is the best way of destroying the fœtid smell of sick wards?

A. By extricating nitrous fumes from a mixture of nitre and sulphuric acid placed in hot sand.

474. Q. What is meant by scrofula?

A. A peculiar disease affecting people of a particular habit of body, and usually the glandular parts.

475. Q. What is the best way of relieving inflammatory affections?

A. By bleeding either locally or generally, by blisters, exhibiting cathartics, diaphoretics, and a low diet.

476. Q. How is the colic distinguished from enteritis.

A. The colic is distinguished from enteritis by the peculiar twisting and occasional pain, by the absence of fever in the early part of the disease, by the pain in enteritis being increased, in colic alleviated by pressure; by the irregular contraction of the abdominal muscles.

477. Q. How is a diarrhæa distinguished from dysentery?

A. Diarrhæa is distinguished from dysentery by being unattended either with fever, inflam-

mation, contagion, or tenesmus, by the appearance of the matter evacuated, which in one disease is feculent or mixed with alimentary matter, in the other mucal, sanguinous, or putrid.

478. Q. How many species of diabetes are there?

A. There are two species of diabetes, viz. diabetes mellitus, and the diabetes insipidus.

479. Q. How is mania distinguished from phrenitis?

A. Mania is distinguished from phrenitis by the former not being accompanied by fever, which the latter always is.

480. Q. What is meant by anasarca?

A. Anasarca is a preternatural collection of serum or watery fluid in the cellular membrane of the whole or part of the body.

481. Q. What are the indications in the cure of scurvy?

A. The indications in the cure of scurvy are; 1st. to correct the septic tendency of the fluids; 2d. to palliate urgent symptoms; 3d. to restore the tone of the solids.

482. Q. What are the species of tympanites?

A. There are two species of tympanites, viz. tympanites abdominalis, or collection of air in the cavity of the peritonæum; and tympanites intestinalis, or collection of air in the cavity of the intestines.

483. Q. What sex is most subject to tetanus?

A. The male sex is most subject to tetanus, and those of a robust or vigorous constitution.

484. Q. What is the general division of tetanus?

A. The general division of tetanus is into trismus, or locked jaw; opisthotonos, when the spasmodic affection of the muscles causes the body to be bent backwards; and emprosthotonos, when the body is bent forwards.

485. Q. What are Dr. Cullen's species of paralysis?

A. His species of paralysis are, 1st. Paralysis Partialis, or palsy of a certain muscle or set of muscles; 2nd. Paralysis hemiplegica, or a total palsy of one side of the body; 3d. Paralysis paraplegica, or a palsy of one half the body taken transversely; 4th. Paralysis venenata, or palsy from poisons.

486. Q. How many species of catarrh are there?

A. Two, viz. catarrhus a frigore, or common cold, and catarrhus contagiosus, or the influenza.

487. Q. What are the species of apoplexy?

A. There are several: but the most useful distinction is into the sanguineous and the serous.

488. Q. What are the indications of cure in dropsy?

A. To evacuate the fluid, and to prevent a second accumulation.

489. Q. How many species of cholera morbus are there?

A. Two, viz. cholera spontanea and cholera accidentalis.

490. Q. What are the species of syncope?

A. Three, viz. syncope accidentalis, syncope cardiaca, and syncope anginosa.

491. Q. What are the indications of cure in catarrh?

A. To reduce the febrile action of the system, and to allay the irritation of the affected parts.

492. Q. How is synocha distinguished from typhus?

A. From typhus by the more sudden accession of the disease: by its arising from common causes, as sudden alterations of temperature; the application of cold to a heated body; violent exercise, intemperance, &c. and not from contagion; by the strength of the body not being diminished; the hardness of the pulse; the whiteness of the tongue; and by the high colour of the urine.

493. Q. How is cynanche tonsillaris distinguished from cynanche maligna?

A. By the fever, which, in the former, is inflammatory, in the latter typhoid, and by the absence of ulceration in cynanche tonsillaris.

494. Q. How is rheumatism distinguished from podagra?

A. By its generally attacking the larger joints; by the pain shifting its seat, and following the course of the muscles in its translation to other parts; by the disease not having been preceded by symptoms of the dyspepsia; by its occurring at any period of life, whereas gout is usually confined to the adult age.

495. Q. How is tympanites distinguished from ascites?

A. By the absence of fluctuation and of those symptoms which characterise the hydropic diathesis.

MATERIA MEDICA.

496. Q. HOW many species of cinchona or Peruvian barks are there?

A. There are several species, but only three in general use, viz. cortex cinhonæ cordifoliæ, or yellow bark;—cortex cinchonæ lancifoliæ, or common quilled bark;—cortex cinchonæ oblongifoliæ, or red bark.

497. Q. What are the virtues of cinchona barks?

A. Tonic, antiseptic, and stomachic.

498. Q. What are the virtues of opium?

A. Narcotic, antispasmodic and stimulant, or sedative, according to the dose which is administered.

499. Q. What is the dose of digitalis?

A. From one to three grains in the form of powder.

500. Q. What cathartic exerts its influence on the rectum?

A. Aloes.

501. Q. What are the virtues of aloes?

A. Cathartic, emmenagogue and anthelmintic.

502. Q. What do you mean by cathartics?

A. Those medicines, which, when taken internally, increase the alvine evacuations.

503. Q. What do you mean by emmenagogues?

A. Medicines which have the power of determining blood to the uterus, either by their local irritation, or by their exciting the action of the system generally.

504. Q. What are diaphoretics?

A. They are medicines which augment the insensible perspiration.

505. Q. What are diuretics?

A. Those medicines which increase the secretion of urine.

506. Q. What quantity of confectio opii of the London pharmacopœia contains one grain of opium?

A. About six and thirty grains.

507. Q. What is meant by antispasmodics?

A. Medicines which have the power of allaying or removing inordinate motion in the muscular system.

508. Q. What medicines come under the class of antispasmodics?

A. Moschus, castoreum, oleum animale, petroleum, ammonia, assafœtida, sagapenum, galbanum, valeriana, oleum cajeputa, opium, camphor, æther.

509. Q. What is meant by sialogogues?

A. Those medicines which promote a discharge of saliva from the salivary glands.

510. Q. What are tonics?

A. Medicines which give tone to the system or muscular fibre.

511. Q. What is the dose of confectio opii?

A. From five grains to half a drachm.

512. Q. In a fluid ounce of the liquor antimonii tartarizati how much antimonium tartarizatum is contained?

A. Two grains.

513. Q. What quantity of mercury is contained in three grains of the pilula hydrargyri?

A. One grain.

514. Q. How many kinds of aloes are now used in medicine?

A. Two, viz. the extract of the aloes spicata, called socotrine aloes, and the extract of the aloes vulgaris, called Barbadoes aloes.

515. Q. What is the dose of the nitras argenti?

A. From gr. fs. to gr. iij.; it has been given in a much larger dose.

516. Q. What are expectorants?

A. Such medicines as promote the secretion from the lungs.

517. Q. What are stimulants?

A. Those medicines which increase the action of the nervous and vascular system.

518. Q. What medicines come under the class of tonics?

A. Peruvian bark; quassia; camomile; gentian; oak bark; columba; lesser centaury; pomegranate; cascarilla; wormwood; southernwood; tansy; buck bean; elm bark; agrimony; ferrugineous preparations; sulphat of copper; oxide of zinc; sulphat of zinc; alum; and most of the mineral acids.

519. Q. How much mercury is contained in two drachms of the unguentum hydrargyri fortius?

A. One drachm.

520. Q. In ten grains of the pulvis ipecacuanhæ compositus how much opium is contained?

A. One grain.

521. Q. What is the dose of the oxidum hydrargyri rubrum?

A. From half a grain to two grains.

522. Q. What is the dose of the submurias hydrargyri?

A. From one to twelve grains, to act as a purgative, and from one eighth of a grain to one grain, to act as an alterative.

523. Q. What is meant by antiseptics?

A. Those medicines which are capable of resisting a tendency to putrefaction.

524. Q. What are the substances that come under the class of antiseptics?

A. Acids; Peruvian bark; quassia; columba; wormwood; southernwood; alkohol; æther; wine; seneka root; madder; opium; camphor; carbonic acid.

525. Q. What is meant by anthelmintics?

A. Such substances as have the power of destroying worms.

526. Q. Enumerate the principal anthelmintics?

A. Worm-seed; tin-filings; assafœtida; tansy; Indian pink; male fern; tobacco; cowitch; cabbage tree bark; savine; aloes; gamboge; hedge-hyssop; jalap; castor-oil; almond oil; and most of the cathartics.

527. Q. What do you mean by alteratives?

A. Alteratives are those medicines which so change the state of the solids and fluids as to

effect the cure of a disease without producing any evacuation, or suddenly increasing the animal functions.

528. Q. What are astringents?

A. They are medicines which have the power of constringing the animal fibre.

529. Q. What are the substances that come under this class.

A. Alum; superacetate of lead; preparations of iron; opium; logwood; oak-bark; pomegranate; galls; tormentil; simarouba; red roses; balaustine flowers; rhubarb in small doses; catechu; oxide of zinc; acetate of zinc; sulphat of copper; sulphuric acid; the calcareous earths; and bistort.

530. Q. What are the virtues of the nitras argenti?

A. It is used externally as an escharotic; internally it is given as an antispasmodic in epilepsy and chorea St. Viti.

531. Q. What are the virtues of the antimonium tartarisatum?

A. It acts as a diaphoretic in the dose of one eighth of a grain to one grain, and as an emetic from one grain to six.

532. Q. In cases where poison has been taken, what emetic would you select?

A. The sulphat of zinc, as it is more speedy in its operation than most of the other emetics.

533. Q. What are the virtues and dose of the pulvis ipecacuanhæ compositus?

A. It is given as a diaphoretic from four grains to a scruple.

534. Q. What are the virtues of the sulphuretum hydrargyri rubrum ?

A. It is given as an alterative from two grains to a scruple, and it is also used to fumigate venereal ulcers of the throat and other parts.

535. Q. What are the virtues of the acetas potassæ ?

A. It is given as a diuretic and purgative from ten grains to three drachms.

536. Q. What are the virtues of the tartras potassæ ?

A. It is given as a purgative from a scruple to three drachms.

537. Q. What are the virtues of the pulvis antimonialis ?

A. It is given as an alterative and diaphoretic from three grains to fifteen.

538. Q. What is the dose of the oxy-murias hydrargyri ?

A. From the sixteenth part of a grain to half a grain.

539. Q. What are styptics ?

A. They are substances which possess a power of stopping hæmorrhages.

540. Q. What is meant by errhines ?

A. Those medicines which, when applied to the membrane of the nose, excite sneezing, and increase the secretion therefrom.

541. Q. What do you mean by epispastics ?

A. Substances which blister the skin, that is, which increase the action of the vessels of those parts of the body to which they are applied, producing an efflux of fluid there and a

lection of serum between the cuticle and cutis.

542. A. What is catechu ?

A. A reddish brown substance of an astringent taste, prepared in India by boiling the wood of the acacia catechu, and evaporating the decoction by the heat of the sun.

543. Q. What is scammony ?

A. A concrete gummy resinous juice, of a light grey colour, and rather an unpleasant smell and bitterish sub-acrid taste, brought from Aleppo and Smyrna, and which exudes from the cut root of the convolvulus scammonia.

544. Q. What is myrrh ?

A. A substance of a black red colour, solid and heavy, of a peculiar smell and bitter taste, brought from Arabia.

545. Q. What is ipecacuanha ?

A. A small root wrinkled and contorted, of a greyish or ash colour, of a bitter sub-acrid taste and very little smell, the produce of the callicocca ipecacuanha, growing in south America.

546. Q. What is camphor ?

A. A substance which is white and pelucid, somewhat unctuous to the touch, of a bitterish, aromatic, acrid taste ; of a fragrant smell, resembling that of rosemary; it is found in concrete lumps between the bark in the interstices of the wood and pith of the laurus camphora, which grows in Japan; it undergoes two sublimations before we receive it in England.

547. Q. From whence do we obtain opium, and what is the name of the plant that affords it ?

A. It is obtained from Persia, Arabia, and Turkey, where incisions are made into the capsule or head of the papaver somniferum; the juice flows and becomes concrete by the heat of the sun.

548. Q. What animal affords castor, and what part of the animal does it form?

A. The animal that affords this substance is the castor fibre, which inhabits the northern countries of Europe and America; the substance so called is found in two bags situated in the inguinal regions of the male beaver, distinct from the testes.

549. Q. What is quassia?

A. A wood afforded by the quassia excelsa, which grows abundantly at Surinam.

550. Q. What plant affords the jalap root?

A. The convolvulus jalapa, which grows in South America.

551. Q. From whence do we obtain spermaceti?

A. From the head of the physeter macrocephalus, a species of whale that inhabits the northern seas.

CHEMISTRY AND PHARMACY.

552. Q. HOW is distillation performed?

A. Distillation is performed in three ways; 1st. Per ascensum; 2nd. Per descensum; 3rd. Per latus.

553. Q. Explain the three methods and the apparatus made use of.

A. The distillation per ascensum is performed generally with the common still, which has affixed to it a head and refrigeratory. The still is for the purpose of containing the materials to be distilled, the head for the vapour to ascend. From the head a tube is continued in a circular manner through a tub of cold water: this last constitutes the refrigeratory; the use of which is to condense the vapour into a fluid by abstracting heat. Distillation per descensum is performed in the following way;—a perforated tinned iron plate is fixed within any convenient vessel so as to leave a space beneath it; on this the substance to be distilled is laid, and over it is placed another plate accurately closing the mouth of the vessel, and strong enough to bear the fuel. The heat is thus applied at top, and the vapour is forced to descend into the inferior cavity, where it is condensed. Distillation per latus is performed in a retort with a receiver; the fluid to be distilled is introduced into the body of the retort, the receiver is then adjusted, and heat is applied to the retort, the fluid is thus raised to a state of vapour that becomes condensed into a fluid, which runs down the side of the neck into the receiver.

554. Q. What is meant by the solution?

A. Solution is the diminution of the aggregation of a solid, so as to cause it to loose the solid form, and to enter into chemical combination with a fluid.

555. Q. What is the difference between infusion and decoction?

A. Infusion consists in pouring upon any substance a cold or hot menstruum, and suffering it to stand a certain time, and then straining it off. Decoction consists in boiling the substance with the menstruum a certain time, and then straining off.

556. Q. What is meant by precipitation?

A. It is that process by which a solid is obtained from a solution.

557. Q. In what respects does crystallization differ from precipitation?

A. Only that the particles of the solvend on separating from the solution assume certain determinate arrangements.

558. Q. What is the transparency of crystals owing to?

A. To a quantity of water that they hold, which is called water of crystallization.

559. Q. When crystals part with their water of crystallization, what are they said to do?

A. To effloresce.

560. Q. What is meant by deliquescence?

A. It is a term given to express a property in some salts by which they absorb the moisture of the atmosphere, and become fluid.

561. Q. What is meant by attraction?

A. A term given to denote the power by which bodies unite with each other, or remain in contact with each other until a superior force is exerted to separate them.

562. Q. What is the difference between at-

traction of aggregation or cohesion, and chemical attraction or affinity?

A. Attraction of aggregation denotes that power which is exerted between particles of a similar nature, as those of mercury, glass, wood, &c. On the contrary, chemical attraction denotes the power exerted between particles of a dissimilar nature, as, salt and water, muriatic acid and soda, nitric acid and potash, &c.

563. Q. What is the result of a chemical combination?

A. A new substance is formed in which the particles combined have assumed new properties.

564. Q. When a compound is resolved into its constituent parts, what process is it said to have undergone?

A. The process of analysis.

565. Q. How is the analysis of compounds effected?

A. Either by the power of heat, or by the power of a superior affinity.

566. Q. What is meant by synthesis?

A. The formation of a compound (possessing new properties) by the combination of two or more simple substances.

567. Q. What is caloric?

A. A substance, the evolution of which produces the sensation of heat.

568. Q. What are the general effects of caloric upon substances?

A. 1st. Substances are expanded, and thus increase in bulk by their combination with ca-

loric (excepting alumina, which is contracted.) 2nd. It is the cause of fluidity. 3rd. It produces vaporization. 4th. It effects ignition; and its combination with some substances is said to be the cause of their elasticity.

569. Q. What is oxygen?

A. The acidifying principle; a peculiar gas, colourless, invisible and elastic; it supports life and flame.

570. Q. When oxygen enters into combination, what are the classes of compounds that it forms?

A. Two classes, viz. oxydes and acids.

571. Q. What is an oxyde?

A. A metal, or a combustible combined with oxygen, that does not possess acid properties.

572. Q. What are the properties of hydrogen?

A. It is an invisible elastic gas, which has a peculiar smell, extinguishes flame, burns in contact with oxygen, explodes when mixed with oxygen, and is about 12 times lighter than common air.

573. Q. What are the compounds of hydrogen?

A. Sulphurated, phosphorated, and carbonated hydrogen gas.

574. Q. What is the composition of water?

A. Oxygen and hydrogen in chemical combination.

575. Q. What is meant by a hydrate?

A. A combination of water with a salt or other substances; the crystals are hydrates, and the sulphur præcipitatum is an hydrate of sulphur.

576. Q. What is nitrogen?

A. An elastic, invisible gas, exceedingly irrespirable, and which extinguishes flame.

577. Q. What are the compounds of nitrogen?

A. In a state of mechanical combination with oxygen, it forms atmospheric air, and when chemically combined with different proportions of oxygen, it forms two oxydes and one acid, viz. nitrous oxyde, or gaseous oxyde of azot; nitric oxyde, which possesses a greater proportion of oxygen than the preceding, and nitric acid, which is fully saturated with oxygen.

578. Q. What are the component parts of atmospheric air?

A. Atmospheric air is chiefly composed of oxygen, nitrogen, and carbonic acid.

579. Q. How is a combination of a combustible with a metal or on earth designated?

A. The combustible is terminated by the word uret, but the metal or earth retains its original name; for example, if sulphur and lime were combined, it would be called sulphuret of lime; phosphorus and iron, phosphuret of iron; and so forth.

580. Q. What is phosphorus?

A. A very inflammable substance, of a white semitransparent colour, and of the consistency of wax.

581. Q. What are the compounds of phosphorus?

A. It combines with certain combustibles, earths, and metals, forming phosphurets; it forms an oxyde, and two acids, viz. the phosphorus acid and the phosphoric acid.

582. Q. In what does pure carbone exist?

A. The diamond is pure carbon.

583. Q. What is charcoal?

A. An oxyde of carbon.

584. Q. What are the other compounds of carbon?

A. Gaseous carbonic oxyde, carbonic gas, and the carburetted hydrogen gas.

585. Q. How would you exhibit carbonic acid gas internally?

A. Either by exhibiting the saline draught in the state of effervescence, or by giving yeast mixed up in a convenient vehicle, or by giving the double soda water.

586. Q. What is sulphur?

A. A simple inflammable substance.

587. Q. From what kingdom of nature do we obtain sulphur?

A. From the mineral kingdom; it is found in various forms: in a native state, forming strata with gypsum and limestone; it is also thrown out from volcanos, and it is also found combined with several metals; sulphur also exists both in the vegetable and animal kidgdom.

588. Q. What are the preparations of sulphur directed to be made use of by the London pharmacopæia

A. Sulphur lotum, sulphur præcipitatum, oleum sulphuratum, and sulphuretum potassæ.

589. Q. How is the sulphur præcipitatum made?

A. By boiling quick lime, sulphur and water together for a certain time; filtering the solu-

tion, and adding muriatic acid in order to throw down the sulphur, which is to be separated and washed.

590. Q. What takes place during this operation?

A. During the boiling the sulphur combines with a portion of hydrogen from the water, it afterwards unites itself to the lime, forming an hydroguretted sulphuret of lime; this is held in solution by the water, and passes through the filter; upon the addition of muriatic acid, the muriatic acid combines with the lime, the hydrogen is evolved from the sulphur, and the suphur is precipitated.

591. Q. In what respects do the sulphur lotum and the sulphur præcipitatum differ from the sulphur sublimatum?

A. The sulphur sublimatum contains a small portion of sulphuric acid; the other preparations are free from this acid, and are considered to hold a portion of water in a state of chemical combination; they are therefore hydrates of sulphur.

592. Q. What combinations does sulphur form with oxygen?

A. It forms an oxyde, the sulphureous acid and the sulphuric acid.

593. Q. Are there any other compounds of sulphur?

A. Yes, it combines with hydrogen, phosphorus, the metals, the earths, and alkalis.

594. Q. What are acids?

A. They are substances of a sour taste, pos-

sessing a power of changing vegetable blues to a red, and of combining with earths, metals, and alkalis.

595. Q. What does an acid consist of?

A. An acid consists of a base or bases combined with oxygen; the base is called the acidifiable principle, and the oxygen is called the acidifying principle.

596. Q. How do chemists distinguish the acids according to the proportion of oxygen with which they are combined?

A. If an acid basis is perfectly saturated with oxygen, the acid produced is said to be perfect, and is distinguished in English by the syllable IC, as sulphur*ic* acid; but if the base predominates, the acid is considered as imperfect, and is distinguished by the English OUS, as sulphure*ous* acid. When an acid has an excess of oxygen, it is called oxygenated and hyper-oxygenated.

597. Q. What are the acids employed medicinally?

A. The acetic, tartaric, citric, benzoic, carbonic, boracic, muriatic, nitric, sulphuric, phosphoric, succinic.

598. Q. How is benzoic acid made?

A. A quantity of gum benzoin and lime are rubbed together, and boiled with a quantity of water for half an hour, it is then filtered, and to the solution muriatic acid is added as long as any precipitate is formed; the precipitate is then collected and dried to undergo the process of sublimation.

599. Q. What is the theory of the formation of benzoic acid in this way?

A. The lime during the boiling takes the benzoic acid from the gum benzoin, the benzoate of lime thus formed is held in solution by the water: upon the addition of muriatic acid, the lime abandons the benzoic acid to combine with the muriatic acid; the benzoic acid from its insolubility is precipitated, and the muriat of lime remains in the solution.

600. Q. How is citric acid made?

A. A quantity of lemon juice is made boiling hot, and a sufficient quantity of prepared chalk is added until it is saturated: the powder that forms is then washed and dried: dilute sulphuric acid is then to be boiled upon the powder; the fluid is next filtered off and evaporated with a gentle heat, so that crystals may form as it cools. The crystals are further purified by repeated crystallization.

601. Q. How is the formation of citric acid effected as thus directed by the London College?

A. When the lemon juice and prepared chalk are mixed together, the citric acid and lime combine, while the carbonic acid escapes in effervescence; the citrate of lime is decomposed by the sulphuric acid which is added, for it takes to the lime, and sets the citric acid at liberty.

602. Q. What salt is taken into the stomach when the saline draught is given?

A. The citrate of potash.

603. Q. In what respects do the nitric and nitrous acids differ?

A. The nitrous acid holds in solution a quantity of nitric oxyde, which is continually escaping. this gas gives the acid an orange colour, and is the cause of its fuming: the nitric acid is colourless, and does not evolve nitric oxyde.

604. Q. How is muriatic acid made?

A. A quantity of sulphuric acid diluted with water is put into a glass retort; to this is added a quantity of muriat of soda; one third of the water directed to be used is put into the receiver to absorb a quantity of gas that may be suddenly evolved; the receiver is then luted to the retort, and the muriatic acid is distilled over by the heat of a sand bath.

605. Q. In the formation of muriatic acid what are the decompositions and combinations?

A. The murias sodæ is decomposed by the sulphuric acid which combines with the soda: the muriatic acid, thus let loose in the state of gas, is absorbed by the water.

606. Q. How is nitric acid made?

A. Equal parts of dried nitrate of potash and sulphuric acid are put into a glass retort; distillation is then to be carried on in a sand bath until a red vapour arises; the nitric acid that is distilled over is to be re-distilled from a fresh portion of dried nitrate of potash.

607. Q. In making nitric acid, what takes place?

A. The sulphuric acid combines with the potash of the nitras potassæ, forming sulphat of potash, and the nitric acid is distilled over.

608. Q. How is boracic acid obtained?

A. By adding sulphuric acid to a hot solu-

tion of borax; this combines with the soda of the borax, forming sulphat of soda, and the boracic acid is crystallized upon the solution cooling.

609. Q. How is the oxy-muriatic acid obtained?

A. It is obtained from a mixture of muriat of soda, black oxyde of manganese, and sulphuric acid; during the process the sulphuric acid combines with the soda, forming sulphat of soda, the muriatic acid consequently being set at liberty combines with a portion of oxygen from the black oxyde of manganese, and is converted into oxy-muriatic acid.

610. Q. Why is the oxy-muriatic acid required to be kept in the dark?

A. Because it is decomposed by the agency of light: that is, it is resolved into muriatic acid from the loss of the oxygen with which it was combined.

611. Q. Has this acid the property of changing vegetable blues to a red?

A. No: it deprives vegetable substances of colour: hence its utility in bleaching.

612. Q. What is the composition of nitric acid?

A. Oxygen and nitrogen.

613. Q. What is the composition of phosphoric acid?

A. Phosphorus and oxygen.

614. Q. In what state do we obtain hyper-oxy-muriatic acid?

A. Combined with an alkaline base; as forming the hyper-oxy-muriat of potash. This is the only state in which it exists.

615. Q. What is the composition of carbonic acid?

A. Carbon and oxygen; by heating potassium or the metal of potash in carbonic acid, the potassium combines with the oxygen of the carbonic acid, and charcoal or oxyde of carbon is deposited.

616. Q. What are the acids that have not hitherto been decomposed?

A. The muriatic acid, the fluoric acid, and the boracic acid.

617. Q. What is the composition of the vegetable acids?

A. Varied proportions of carbon and hydrogen acidified by oxygen.

618. Q. What are alkalis?

A. They are substances that possess an acrid taste, a urinous smell; they convert most vegetable blues to a green, and they render oils miscible with water.

619. Q. What is the composition of the alkalis?

A. A metal and oxygen.

620. Q. What is the general distinction of alkalis?

A. Into fixed and volatile. they are also distinguished into vegetable alkali or potash, mineral alkali or soda, and volatile alkali or ammonia. Potash and soda are considered as fixed alkalis, because they are not volatilized but by a very intense heat, whereas ammonia, which is the volatile alkali. requires only the temperature of atmosphere to change its state of aggregation.

621. Q. How is the potash of commerce obtained?

A. From the lixivium of wood ashes:—the ashes of all wood afford this alkali, but the harder woods most abundantly. Another method of obtaining potash is by burning the impure tartar of commerce and lixiviating it.

622. Q. How is the sub-carbonas potassæ obtained?

A. By mixing a quantity of impure potash of commerce with a stated quantity of water: by boiling these for a certain time, filtering the solution, and finally evaporating the water from the salt, while stirring it.

623. Q. How are the extraneous or more crystallizable salts of the impure potash got rid of?

A. Sub-carbonate of potash being very soluble in water in comparison to the extraneous salts contained in impure potash, an advantage is taken of this, for only a sufficient quantity of water is added to dissolve the sub-carbonates; the extraneous salts therefore not being dissolved remain upon the filter. They consist chiefly of sulphate of potash, muriat of potash, with a quantity of earthy impurities.

624. Q. What is the difference between sal tartari, sal absinthii and sub-carbonas potassæ?

A. Very little difference, excepting in the proportion of carbonic acid with which they are combined; they are all sub-carbonates of potash, but are differently obtained.

625. Q. What are the preparations of potash directed to be used by the London College?

A. Acetas potassæ, sulphas potassæ, super-sulphas potassæ, tartras potassæ, sub-corbonas potassæ, carbonas potassæ, liquor sub-carbonatis potassæ, liquor potassæ, potassa fusa, potassa cum calce.

626. Q. How is the potassa fusa obtained?

A. By evaporating the water from the liquor potassæ, melting the salt, and casting it into proper moulds.

627. Q. How is the liquor potassæ made?

A. By putting together sub-carbonate of potash, quicklime and hot water, suffering them to remain a length of time, then filtering.

628. Q. Why is the lime added?

A. To abstract the carbonic acid from the sub-carbonate of potash.

629. Q. What is the composition of cremor tartari?

A. It is a super-tartrate of potash; that is, combined with an excess of tartaric acid.

630. Q. How is the tartras potassæ made?

A. It is made by adding a quantity of sub-carbonate of potash to a quantity of super-tartrate of potash dissolved in water, evaporating to a certain extent, and crystallizing the salt.

631. Q. What effect has the sub-carbonate of potash in this preparation?

A. It parts with its carbonic acid to combine with the excess of tartaric acid in the super-tartras potassæ to form a neutral salt.

632. Q. How is the perfect carbonate of potash formed?

A. By adding carbonate of ammonia to sub-carbonate of potash dissolved in water. This splution is exposed to a certain degree of heat,

until all the ammonia is expelled, and the sub-carbonate of potash becomes a perfect carbonate by taking carbonic acid from the carbonate of ammonia.

633. Q. Why is the carbonate of potash preferred to the sub-carbonate for a saline draught to be taken in the state of effervescence?

A. Because it affords most carbonic acid.

634. Q What remains in the retort after the distillation of nitric acid?

A. A super-sulphat of potash.

635. Q. What is the composition of nitre crystals?

A. Nitric acid, potash, and water.

636. Q. Why is the nitras potassæ made use of in forming sulphuric acid?

A. To supply the sulphur, when burning, with a greater quantity of oxygen.

637. Q. What are the states of combination that potash enters into with tartaric acid?

A Two states, so as to form an acidulous salt and a neutral salt.

638. Q. How is the tartras potassæ made?

A. By adding a sufficient quantity of sub-carbonate of potash to neutralize the super-tartrate of potash, which is previously to be dissolved in hot water: it is afterwards to be evaporated, filtered, and then put by in order to crystallize.

639. Q. How is impure soda obtained?

A. It is generally obtained by lixiviating the ashes of burnt plants, that have grown on the sea-shore, particularly the herb called by Linnæus Salsola kali.

640. Q. How is the sub-carbonas sodæ obtained?

A. By boiling a stated quantity of impure soda of commerce in a quantity of distilled water, filtering the solution, evaporating it, and crystallizing the salt.

641. Q. How is the carbonas sodæ obtained?

A. By adding sub-carbonate of ammonia to sub-carbonate of soda, dissolved in a quantity of distilled water; exposing this solution to heat for a certain time, in order to expel the ammonia; then crystallizing the carbonate of soda.

642. Q. What salt remains after the distillation of muriatic acid?

A. Sulphat of soda, which is directed to be reserved and prepared for use.

643. Q. What is the composition of common table salt?

A. It consists principally of muriatic acid and soda.

644. Q. Why does it diliquese?

A. Because it contains a little muriat of magnesia.

645. Q. How is ammonia obtained?

A. In a variety of ways; it is abundantly formed by animal decomposition; it exists in combination with an acid in soot; it is obtained by distilling hartshorn, or bones; but it is generally obtained from the sal ammoniac of commerce.

646. Q. What is the composition of ammonia?

A. Hydrogen and nitrogen: but Mr. Davy

has made it appear to be a compound of a metal which he has named ammonium.

647. Q. What compounds of ammonia are directed to be kept by the London College?

A. Carbonas ammoniæ, liquor acetatis ammoniæ, liquor carbonatis ammoniæ, and the liquor ammoniæ.

648. Q. How is the formation of carbonate of ammonia effected?

A. By sublimation from a mixture of dried prepared chalk and muriat of ammonia; a double decomposition takes place; the lime of the prepared chalk combines with the muriatic acid, forming muriat of lime, while the carbonic acid, the other constituent of the chalk, combines with the ammonia, and forms carbonate of ammonia, which is sublimed.

649. Q. Is this a perfect carbonate?

A. No: it is a sub-carbonate; the carbonate of ammonia is void of smell.

650. Q. How is the liquor ammoniæ made?

A. By abstracting the muriatic acid of muriat of ammonia by means of lime, and causing the ammoniacal gas to be absorbed by water.

651. Q. How is the liquor ammoniæ acetatis made?

A. By saturating acetic acid with carbonate of ammonia.

652. Q. What is an earth?

A. A substance that is nearly insoluble in water; that has little or no smell; that is incombustible; and, when pure, assumes the form of a white powder. The specific gravity of an earth should not exceed 4.9. All the earths

are supposed to have metallic bases, but are at present considered as simple substances.

653. Q. How many earths are at present known to chemists?

A. Nine; viz. silex, argil, magnesia, lime, barytes, strontian, zircon, glucine, and yttria.

654. Q. What are the earths that are used in medicine?

A. They are four in number; viz. magnesia, lime, argil, or alumina, and barytes; which last is not admitted into the London Pharmacopœia.

655. Q. What substances afford argil?

A It exists in many fossils, and forms the basis of common clay.

656. Q. What is there peculiar to this earth?

A. It contracts when exposed to heat, and becomes so hard as to be capable of striking fire with steel.

657. Q. Is argil ever found pure in nature, or used in medicine in its pure state?

A. No.

658. Q. What compounds of argil are directed to be kept in the shops, by the London College?

A. The alumen exsiccatum, and the liquor aluminis compositus.

659. Q. What is the composition of alumen?

A. Sulphuric acid in excess, argil, or alumina, and a small portion of potash, and often ammonia.

660. Q. Why is potash always put in to form alum?

A. To facilitate crystallization, the sulphat, or super-sulphat of argil alone, crystallizes in very small quantities, and that with great difficulty.

661. Q. Is alum ever found in nature?

A. Yes, it is often found in a species of slate, denominated alum slate, which is mixed with the layers of coal.

662. Q. From whence do we obtain magnesia?

A. It is never found in the pure state; but in combination in many fossils; it is also found combined with acids in many springs, and in sea-water; from these several sources the earth is obtained.

663. Q. What preparations of magnesia does the college direct to be used?

A. The carbonas magnesiæ and the sulphas magnesiæ, and magnesia.

664. Q. How is the carbonas magnesiæ made?

A. By mixing together a solution of sub-carbonate of potash and of sulphat of magnesia, boiling for a certain time, and filtering. The carbonate of magnesia remains upon the filter, and is to be well washed with hot water, to entirely deprive it of the sulphat of potash; it is afterwards dried.

665. Q. What takes in this process?

A. A double decomposition takes place; the potash loses its carbonic acid to combine with the sulphuric acid, while the magnesia loses its sulphuric acid to combine with the carbonic

acid; and thus a carbonate of magnesia is obtained, and a sulphat of potash remains in solution.

666. Q. When the carbonate of magnesia is exposed to an intense heat for some time, what takes place?

A. It loses its carbonic acid, and pure magnesia is obtained.

667. Q. Which is lightest, the carbonas magnesiæ, or magnesia?

A. Magnesia.

668. Q. How is sulphat of magnesia obtained?

A. It used to be obtained by evaporating the water of the mineral springs at Epsom, but it is now generally obtained by evaporating the bittern, or the fluid that remains after the crystallization of salt from sea-water.

669. Q. What are the sources of lime?

A. It is a constituent of chalk-stone, limestone, marl, shells, bones; it is found combined with many acids, as carbonic, fluoric, boracic, and sulphuric acid; it exists in small portions in sea water, in spring and river water, and it is found in vegetables.

670. Q. What preparations of lime do the London College direct to be kept?

A. Calx, liquor calcis, creta preparata.

671. Q. How is calx, or lime, to be obtained?

A. By burning chalk-stone with a white heat, until it ceases to effervesce, or give off carbonic acid when thrown into acetic acid.

672. Q. Is this pure lime which remains?

A. Sufficiently pure for medical purposes, but not for chemical.

673. Q. What takes place in the slacking of lime?

A. The water is absorbed with a hissing noise, the lime cracks and falls into powder, a great quantity of caloric is evolved so as to convert one portion of water into a vapour, while the other portion of the water enters into combination with the lime, and becomes solidified.

674. Q. What is a metal?

A. It is a simple substance, possessed of great tenacity and hardness, opacity, the property of reflecting light, a certain specific gravity and of combustibility, when raised to a certain temperature, in contact with oxygen.

675. Q. Are all the metals opaque?

A. Yes, all except gold-leaf, which, when beat extremely thin, transmits green light.

676. Q. What is the difference between ductility, malleability, and tenacity?

A. Malleability is that property by which a metal may be pressed or beat into thin leaves, or plates. Ductility, the property by which a metal may be drawn into wires of certain diameters; and tenacity, the power of cohesion of the particles of metals by which they allow of ductility and malleability.

677. Q. What is the cause of expansion in metals?

A. Caloric, which is supposed to cause the metallic particles to assume greater distance.

678. Q. Do metals conduct caloric?

A. Yes: they are the best conductors of th. principle.

679. Q. Do metals differ much in fusibility

A. Yes. Mercury melts at a very low tem. perature, even in the coldest atmosphere; o. the contrary, platinum requires the most intens. heat for its fusion.

680. Q. Are these the chief properties o. metals?

A. Yes, excepting that they are the best electrical conductors, and generate Galvanism by contact.

681. Q. When a metal combines with oxygen, what change has it undergone?

A. It has become oxydized, and the compound formed is called an oxyde.

682. Q. When a metal combines with an acid so as to form a salt, what change does the metal first undergo?

A. It becomes oxydized either by decomposing the water, or part of the acid, and is then dissolved by the remaining acid.

683. Q. When two metals are combined, what is the compound called?

A. An alloy; excepting the combination of a metal with mercury, which is termed an amalgam.

684. Q. What is the number of metals at present known?

A. They amount to twenty-one, if the new metals of alkalis, &c. are excluded.

685. Q. Enumerate the matals?

A. Gold, platinum, silver, mercury, copper, iron, tin, lead, nickel, zinc, bismuth, antimony,

tellurium, arsenic, cobalt, manganese, tungsten, molybdenum, uranium, titanium, chromium.

686. Q. What are the metals that are used in medicine?

A. Silver, mercury, copper, iron, tin, lead, zinc, bismuth, arsenic, antimony.

687. Q. In what state is silver found in nature?

A. Native and mineralized.

688. Q. What are the preparations of silver used in medicine?

A. Only the nitras argenti, which is made with silver, nitric acid, and distilled water. The nitric acid and water are mixed; the silver is then added, which speedily becomes dissolved by the application of a gradual heat; when this is effected, the solution is evaporated, in order to obtain a dry nitrate of silver. The nitrate of silver is then melted in a crucible, with a gentle heat, and is cast into proper moulds.

689. Q. What takes place during the melting of the nitrate of silver?

A. It loses part of its nitric acid, and becomes reduced to a sub-nitrate.

690. Q. What are the sources of mercury?

A. It is found native; it is found in combination with muriatic acid, and it is found in combination with sulphur, constituting an ore called native cinnabar; from this ore the quicksilver of commerce is generally obtained.

691. Q. What preparations of mercury are directed to be used by the London Pharmacopœia.

A. Oxymurias hydrargyri, liquor oxymuriatis

hydrargyri, hydrargyrus cum creta, submurias hydrargyri, nitrico oxydum, hydrargyri oxydum, hydrargyri cinereum, oxydum hydrargyri rubrum, hydrargyrus præcipitatus albus, hydrargyrus purificatus, and hydrargyri sulphuretum rubrum.

692. Q. How is the oxymurias hydrargyri formed?

A. Mercury and sulphuric acid are first boiled together, in a glass vessel, until a dry salt is obtained; by this process the mercury first becomes oxydized, and then dissolves in the remaining acid; this is evaporated, until a dry salt is procured, which is an oxy-sulphat of mercury; this is to be mixed with a quantity of dried muriat of soda, and sublimed; the order of affinities is now changed; the muriatic acid combines with the oxyde of mercury, forming an oxy-muriat of mercury, which is sublimed, and the sulphuric acid combines with the soda, forming sulphat of soda, which is not sublimed.

693. Q. In what state of oxydizement does the mercury exist in this preparation?

A. In the state of red oxyde.

694. Q. How is the hydrargyrus cum creta made?

A. By rubbing creta and mercury together, until the globules of the murcury disappear.

695. Q. What is the composition of this preparation?

A. It is composed of an oxyde of mercury combined with carbonate of lime.

696. Q. How is the submurias hydrargyri made?

A. A quantity of oxy-muriat of mercury is rubbed with a quantity of purified mercury, until the globules of the mercury are extinguished; it is then to be sublimed, and the sublimation and rubbing are to be repeated three times; after which it is to be reduced to a very subtile powder.

697. Q. What is the use of the purified mercury in this preparation?

A. It abstracts from the oxy-muriat of mercury a portion of its oxygen; by which the oxyde of mercury that existed in the oxy-muriat is converted into an imperfect black oxyde; this imperfect oxyde requires less muriatic acid to saturate it than the perfect oxyde does; the compound formed is therefore a muriat, but the London College have thought proper to call it a submuriat, to prevent mistakes.

698. Q. How is the nitrico-oxydum hydrargyri made?

A. A quantity of mercury, nitric acid, and distilled water, are boiled together, until the mercury is dissolved; the solution is then evaporated, until a dry white mass appears; this white salt is to be rubbed into powder, and exposed to heat gradually raised, until it no longer gives off red fumes.

699. Q. What takes place during the formation of nitric oxyde of mercury?

A. The mercury decomposes a portion of the nitric acid by attracting oxygen; it becomes converted into an oxyde, and nitric oxyde gas is evolved; the oxyde of mercury thus formed, is then dissolved by the undecomposed nitric acid,

and a nitrate of mercury is formed. When the dried nitrate of mercury is exposed to heat, the greatest part of the nitric acid is driven off, and a perfect oxyde of mercury remains, holding a very small portion of nitric acid.

700. Q. How is the red oxyde of mercury made?

A. By exposing mercury in a glass vessel, with a broad bottom, a long neck and a narrow mouth, to a heat of 600°, until the mercury is converted into red scales, which are to be reduced to a very fine powder.

701. Q. What is the theory of this process?

A. The mercury, when exposed to 600°, rises in vapour up the neck of the vessel; the vapour of the mercury combines with a maximum of oxygen, by decomposing atmospheric air, and falls back into the vessel in the state of dark red scales which become of a deeper red as the process goes on.

702. Q. Why does not the mercury escape when exposed to this temperature?

A. Because the vessel is provided with a long narrow neck, that is drawn out into a capillary opening, which prevents the escape of the mercury, but allows a free admission of air.

703. Q. How is the gray oxyde of mercury prepared?

A. It is prepared by boiling sub-muriat of mercury with lime water, constantly stirring, until a gray oxyde of mercury is separated; it is then to be washed with distilled water, and dried. During this preparation, the lime combines with the muriatic acid of the muriat of mercury, and its oxyde is separated.

704. Q. Why are iron filings directed to be used in purifying mercury?

A. Because the iron has a greater attraction for the metals which mercury is often amalgamated with, than for the mercury.

705. Q. How is the sulphuretum hydrargyri made?

A. It is made by mixing mercury with melted sulphur over the fire; when this is effected, the mass is cooled, reduced to powder, and sublimed.

706. Q. How is the hydrargyrus præcipitatus albus made?

A. By dissolving muriat of ammonia and oxy-muriat of mercury in water, and pouring into this solution a quantity of liquid sub-carbonate of potash. The powder that is thrown down is washed until it becomes insipid and dried.

707. Q. Where is iron found?

A. It is found abundantly in the earth, under a variety of forms, mineralized by sulphur, combined with earths, alloyed with metals; it exists, in the waters of many springs; it is contained in vegetables; it gives colour to the blood, and to many fossil substances.

708. Q. What preparations of iron are directed to be kept by the London College?

A. Ferrum ammoniatum; carbonas ferri; sulphas ferri; ferrum tartarasatum; liquor ferri alkalini; tinctura ferri muriatis; tinctura ferri ammoniati; vinum ferri.

709. Q. What is the composition of ferrum ammoniatum?

A. It is composed of muriat of iron and muriat of ammonia.

710. Q. How is it made?

A. By subliming equal parts of carbonate of iron and muriat of ammonia.

711. Q. How is the carbonate of iron made?

A. By dissolving sub-carbonate of soda and sulphat of iron in two separate portions of water, mixing the solutions, suffering the green powder to subside, then washing and drying it.

712. Q. What change of affinities is produced by mixing these solutions?

A. The carbonic acid combines with the iron, leaving the soda to combine with the sulphuric acid; a sulphat of soda therefore remains in solution, and a carbonate of iron is precipitated. This new compound consists of the black oxyde of iron, combined with carbonic acid, but upon exposure to the air, passes very soon to the state of red oxyde.

713. Q. How is the ferrum tartarizatum made?

A. It is made by mixing iron filings, supertartrate of potash, and water together; they are exposed to the air in a broad glass vessel, for eight days: the compound is then dried in a sand bath, and reduced to powder; after this is done, it is to be mixed with another portion of water, and exposed for eight days longer.

714. Q. What is the theory of the formation of this compound?

A. During the exposure to the air, the iron becomes oxydized by abstracting oxygen both from the air and the water with which it is mixed; and the oxyde of iron combines with the superabundant tartaric acid of the super-

tartrate of potash; the compound formed is therefore a tartrate of potash and iron.

715. Q. What is the composition of the liquor ferri alkalini?

A. It is considered as composed of nitric acid, red oxyde of iron, with potash, forming a triple compound.

716. Q. How is it made?

A. It is made with iron, nitric acid, distilled water, and solution of sub-carbonate of potash. The acid and water are first to be mixed, and poured on the iron; when the effervescence has ceased, the acid solution is to be poured off, and added gradually to the solution of sub-carbonate of potash, occasionally shaking, it has assumed a deep brown red colour, and no further effervescence takes place; it is then to be set by for six hours, and its clear solution poured off.

717. Q. How is the tinctura ferri muriatis made?

A. Carbonate of iron is put with muriatic acid for three days; during which time the carbonic acid is displaced from the red oxyde of iron and the red oxyde combines with the muriatic acid, and forms an oxy-muriat of iron, which is afterwards combined with a quantity of rectified spirit.

718. Q. What compound of iron exists in the vinum ferri?

A. A tartrate of iron and potash.

719. Q. In what state in nature is lead found?

A. It is found oxydized, forming a variety of ores; combined with sulphur, forming an ore called galena; combined with muriatic and

cabonic acids. It is found in a state of carbonate, phosphate, arseniate, arsenic, phosphate, molybdate, and sulphat.

720. Q. What are the compounds of lead admitted into the new London Pharmacopœia?

A. Liquor acetatis plumbi; super-acetas plumbi, liquor acetatis plumbi.

721. Q. How is the super-acetate of lead made?

A. It is made by boiling the carbonated oxyde of lead in acetic acid, which displaces the carbonic acid and combines with the oxyde of lead; the solution is to be filtered, evaporated to a certain extent, and set aside to crystallize.

722. Q. How is the liquor acetatis plumbi made?

A. By boiling acetic acid and vitrified oxyde of lead together, to a certain extent; then setting the solution by, that the feculencies may subside.

723. Q. What is the theory of this process?

A. The oxyde of lead combines with the acetic acid, and a sub-acetate of lead is formed.

724. Q. How is the cerusse of commerce prepared?

A. A quantity of sheets of lead are rolled up in a spiral form; these are placed perpendicularly on a support, over a vessel containing vinegar; several of these vessels covered are placed together, and surrounded with dung, the heat of which raises the vinegar in vapour, which converts the surface of the lead into a

white oxyde, or rather a carbonate; at length the whole of the lead is thus converted; it is then taken out, and ground to powder.

725. Q. In what state is copper found in nature?

A. It is found mineralized by oxygen; combined with carbonic acid, forming malachite and mountain blue; in combination with phosphoric acid, with muriatic acid, with sulphuric acid, with arsenic acid; and it is abundantly found mineralized with sulphur, forming all the varieties of copper pyrites.

726. Q. What are the compounds of copper directed to be used by the London Pharmacopœia?

A. They are the cuprum ammoniatum, and the liquor cupri ammoniati.

727. Q. How is the ammoniated copper made?

A. It is made by rubbing sulphat of copper and sub-carbonate of ammonia together in a glass mortar, until the mixture ceases to effervesce; it is then to be wrapped in bibulous paper, and dried by a moderate heat.

728. Q. From whence do we obtain arsenic?

A. It is found in nature amongst the ores of cobalt, antimony, tin, iron, copper, and silver; it is found in combination with sulphur, forming an ore called orpiment, and it is found combined with oxygen, forming an ore called the white oxyde of arsenic?

729. Q. What preparations of arsenic are used in medicine?

A. The oxydum arsenici præparatum, and the liquor arsenicalis.

730. Q. How is the prepared oxyde of arsenic made?

A. By reducing common oxyde of arsenic to powder, and placing it in a crucible, covered by an inverted crucible; into which the oxyde of arsenic is sublimed.

731. Q. How is the liquor arsenicalis made?

A. By taking sixty-four grains of prepared oxyde of arsenic, and sixty-four grains of the sub-carbonate of potash from tartar; these are to be boiled in a glass vessel, with a pint of water, until they are entirely dissolved, to which is to be added four fluid drachms, with as much water as will make the whole to fill a pint measure exactly.

732. Q. What is the compound formed in this preparation?

A. An arseniate of potash.

733. Q. Has the oxyde of arsenic any peculiar properties?

A. Yes; instead of being insipid, as most other oxydes are, it is acrid and corrosive to the taste, it is soluble in water, and can be crystallized in octaedrons; it reddens the infusion of litmus, and combines with alkalis; it has therefore been considered, by some chemists, rather as an acid than an oxyde, and has been called arsenious acid.

734. Q. What are the sources of antimony?

A. Antimony is found native in combination with oxygen, with sulphur, and with muriatic acid.

735. Q. What preparations of antimony does the London College direct to be kept?

A. The oxydum antimonii, sulphuretum antimonii præcipitatum, antimonium tartarizatum, pulvis antimonialis, and the liquor antimonii tartarizati.

736. Q. How is the oxyde of antimony made?

A. A quantity of sulphuret of antimony is to be added to a mixture of muriatic acid and nitric acid; it is then to be digested for an hour, in a boiling heat; the solution is then to be strained, and poured into a quantity of water, in which is dissolved a portion of sub-carbonate of potash; a precipitate is then formed, which is to be well washed and dried on bibulous paper.

737. Q. What is the theory of the formation of this oxyde?

A. The antimony of sulphuret first becomes oxydized by the nitric acid, which is decomposed; the oxyde of antimony is then dissolved by the muriatic acid, and a muriat of antimony is obtained, when this is added to the sub-carbonate of potash; the sub-carbonate of potash is first decomposed, the carbonic acid escapes, and the potash unites itself to the muriatic acid and forms muriat of potash; the muriatic acid having thus combined with the potash, the oxyde of antimony is precipitated.

738. Q. What becomes of the sulphur that formed the sulphuret of antimony?

A. It remains upon the filter, when the solution of muriated antimony is filtered.

739. Q. How is the sulphuretum antimonii præcipitatum made ?

A. Sulphuret of antimony, solution of potash, and distilled water, are mixed and boiled over a slow fire; the mixture is kept stirred, and as much distilled water is added as evaporates; when this part of the process is finished, the solution is to be strained through a double linen cloth, and while it is yet hot, sulphuric acid is to be dropped in, as may be required, to precipitate the powder, which is afterwards to be well washed, to free it of the sulphat of potash, then dried.

740. Q. Explain what takes place in this process.

A. Potash, sulphur, antimony, and water, are boiled together; the water becomes decomposed into its constituents, oxygen and hydrogen, the potash unites to the greater part of the sulphur, and attracts hydrogen from the water, so that a hydro-sulphuret of potash is formed; the antimony combines with the oxygen of the water, and the sulphur which it retains attracts the other portion of hydrogen, which the sulphuret of potash has not combined with; an hydro-sulphuretted oxyde of antimony is thus formed, which is held in solution; when the sulphuric acid is added, the hydro-sulphuret of potash is decomposed, the sulphuric acid and potash combine, and form sulphate of potash, the hydrogen escapes, and the sulphur intimately mixed with the hydro-sulphuretted oxyde of antimony is precipitated.

741. Q. How is the antimonium tartarizatum made?

A. It is made with oxyde of antimony, supertartrate of potash, and distilled water. The water is boiled in a glass vessel, and the antimony and super-tartrate of potash previously mixed together are added; it is then boiled for half an hour, filtered through paper, and evaporated to a certain extent; after which it is set by to crystallize slowly.

742. Q. What takes place in the formation of this compound?

A. The excess of tartaric acid, that exists in the super-tartrate of potash, combines with the oxyde of antimony, and forms a tartrate of antimony; this combines with the tartrate of potash, and forms a triple salt, consisting of tartaric acid, antimony, and potash.

743. Q. How is antimonial powder made?

A. By mixing one part of sulphuret of antimony and two parts of hartshorn shavings, throwing them into a broad iron pot, heated to a white heat, and stirring the mixture constantly until it acquires an ash colour; having taken it out, it is to be reduced to powder, and put into a coated crucible, upon which another inverted crucible, having a small hole in its bottom, is to be luted; the fire is then to be raised to whiteness, and kept so for two hours. The mass is then to be reduced to a very fine powder.

744. Q. What does this compound consist of?

A. It consists of oxyde of antimony and phosphate of lime.

745. Q. Describe the phœnomena that take place during its preparation.

A. When the sulphuret of antimony and hartshorn shavings are exposed to a white heat the sulphuret of antimony is decomposed, its sulphur is driven off, and the antimony remains oxydized, while the gelatine of the hartshorn shavings is destroyed, and nothing is left but phosphate of lime, which becomes mixed with the oxyde of antimony.

746. Q What is the active ingredient of the yest cataplasm?

A. The carbonic acid gas evolved, which is the product of fermentation.

747. Q. What are the chemical compounds that exist in the mistura ferri composita?

A. Carbonate of iron and sulphate of potash.

748. Q. What is meant by fermentation?

A. The spontaneous change of vegetable substances, by which their properties become altered.

749. Q. What circumstances are required for fermentation to go on?

A. A certain degree of fluidity; a degree of heat between 55° and 65° Fahrenheit and the contact of air.

750. Q. What are the general species of fermentations?

A. Fermentation is divided into the spirituous, the acetous, and the putrefactive; besides which Dr. Thompson has added two others, viz. the panary and the saccharine fermentation.

751. Q. What ingredients are necessary for fermentation ?

A. Water, sugar, and mucilage.

752. Q. Can a fluid, after it has undergone the acetous fermentation, be made to undergo the vinous ?

A. No: fermentation will only take place in the regular succession; from the acetous to the vinous, from the vinous to the putrefactive.

753. Q. What are the products of the spirituous fermentation ?

A. Ardent spirits, wines, beers, &c.

754. Q. What do the acetous and putrefactive fermentations produce ?

A. The acetous fermentation produces vinegar, and the putrefactive fermentation produces ammonia.

755. Q. How is alkohol obtained ?

A. Alkohol may be obtained by distilling any spirituous liquor. Brandy affords the greatest quantity, but in this country it is usually obtained from malt spirit, when it is termed rectified spirit.

756. Q. How does the London College direct alkohol to be made from rectified spirit ?

A. A quantity of heated sub-carbonate of potash is added to a quantity of rectified spirit; these are macerated together for twenty-four hours; the alkohol is then distilled off by means of a water bath.

757. Q. What is the use of the sub-carbonate of potash ?

A. It abstracts the greatest part of the water from the rectified spirit. Alkohol appears always to contain a portion of water.

758. Q. What is the solvent of a resin?

A. Alkohol; but rectified spirit is generally used.

759. Q. In what menstruum is gum soluble?

A. Water, and not in alkohol.

760. Q. What menstruum should be used to dissolve a gum resin?

A. A mixture of spirit and water.

761. Q. What use is made of rectified spirit in medicine?

A. To make ethers, different spirits, and tinctures.

762. Q. What are the different medicinal spirits composed of?

A. A particular volatile oil, a quantity of alkohol, and water.

763. Q. What are the elements of alkohol?

A. Oxygen, hydrogen, and carbon.

764 Q. What is an ether?

A. A compound formed by the action of an acid upon alkohol; it is the lightest fluid known; it is highly volatile, pungent, odorous, and inflammable.

765. How are ethers designated?

A. They are named from the acid by which they are obtained; that obtained by sulphuric acid and alkohol, is called sulphuric ether; by acetic acid, acetic ether; by nitric acid, nitric ether, and so forth.

766. Q. What is the composition of ether?

A. Oxygen, hydrogen, and carbon.

767. Q. How does ether differ from alkohol, as its constituents are the same?

A. The proportions of its constituents are dif-

ferent, it is supposed to contain more hydrogen and less carbon than alkohol.

768. Q. Is the acid decomposed in the formation of ether?

A. In some degree; but its presence seems chiefly to predispose to an alteration of the affinities of the elements of the alkohol.

769. Q. What ethereal compounds are directed to be kept in the shops by the London College?

A. The sulphuric ether, the rectified ether, ethereal oil, aromatic spirits of ether, compound spirits of ether, spirit of nitric ether.

770. Q. How is the æther sulphuricus made?

A. By distillation from equal quantities of rectified spirit and sulphuric acid. There are several precautions necessary in the making of ether; it is to be distilled from a glass retort into a double receiver, or two receivers luted together; they are to be kept cold by ice, or cold water; the distillation is to be carried on until a heavier fluid passes over that sinks to the bottom of the ether.

771. Q. How is æther rectificatus made?

A. Sulphuric ether is distilled from a certain quantity of fused potash and water; if fourteen fluid ounces are used, twelve ounces are to be distilled over.

772. Q. Of what use is the potash in this preparation?

A. It combines with the sulphurous acid and ethereal oil, which the sulphuric acid contained; these remain behind in the retort.

773. Q. How is the oleum æthæreum made?

A. After the distillation of sulphuric ether, the distillation is to be carried on until a black froth begins to rise, when the retort is to be immediately removed. The oil is then to be separated from the fluid in the receiver, and washed with lime-water, to free it of the adherent acid.

774. Q. What is the spiritus ætheris aromaticus made with?

A. It is made with cinnamon bark, cardamom-seed, long pepper, ginger root, and spirits of sulphuric ether.

775. Q. What is the spiritus ætheris compositus formed of?

A. It is formed of spirits of sulphuric ether and ethereal oil.

776. Q. How is the spiritus ætheris nitrici made?

A. By distillation from a mixture of nitric acid and rectified spirit.

THE END.