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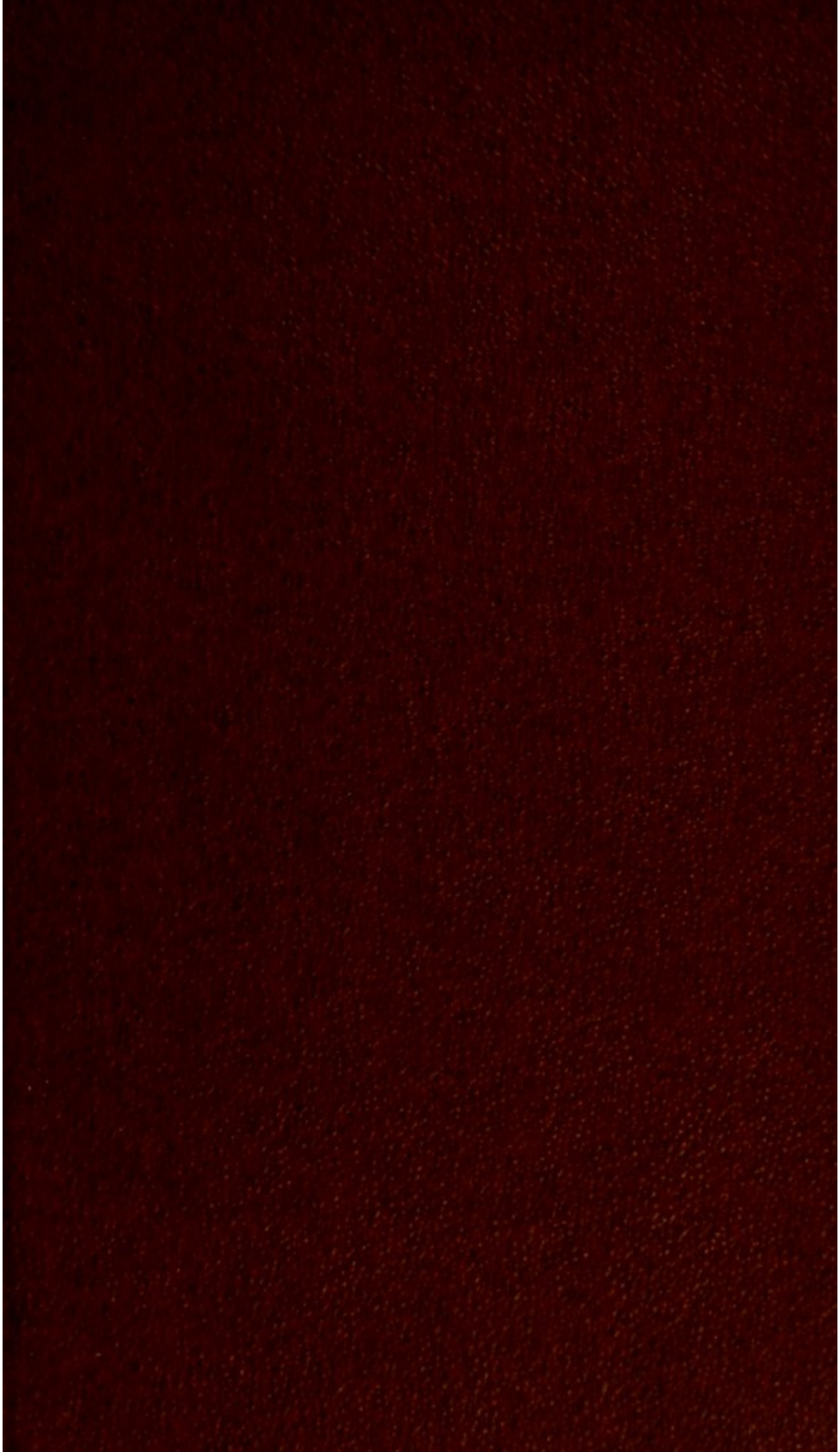

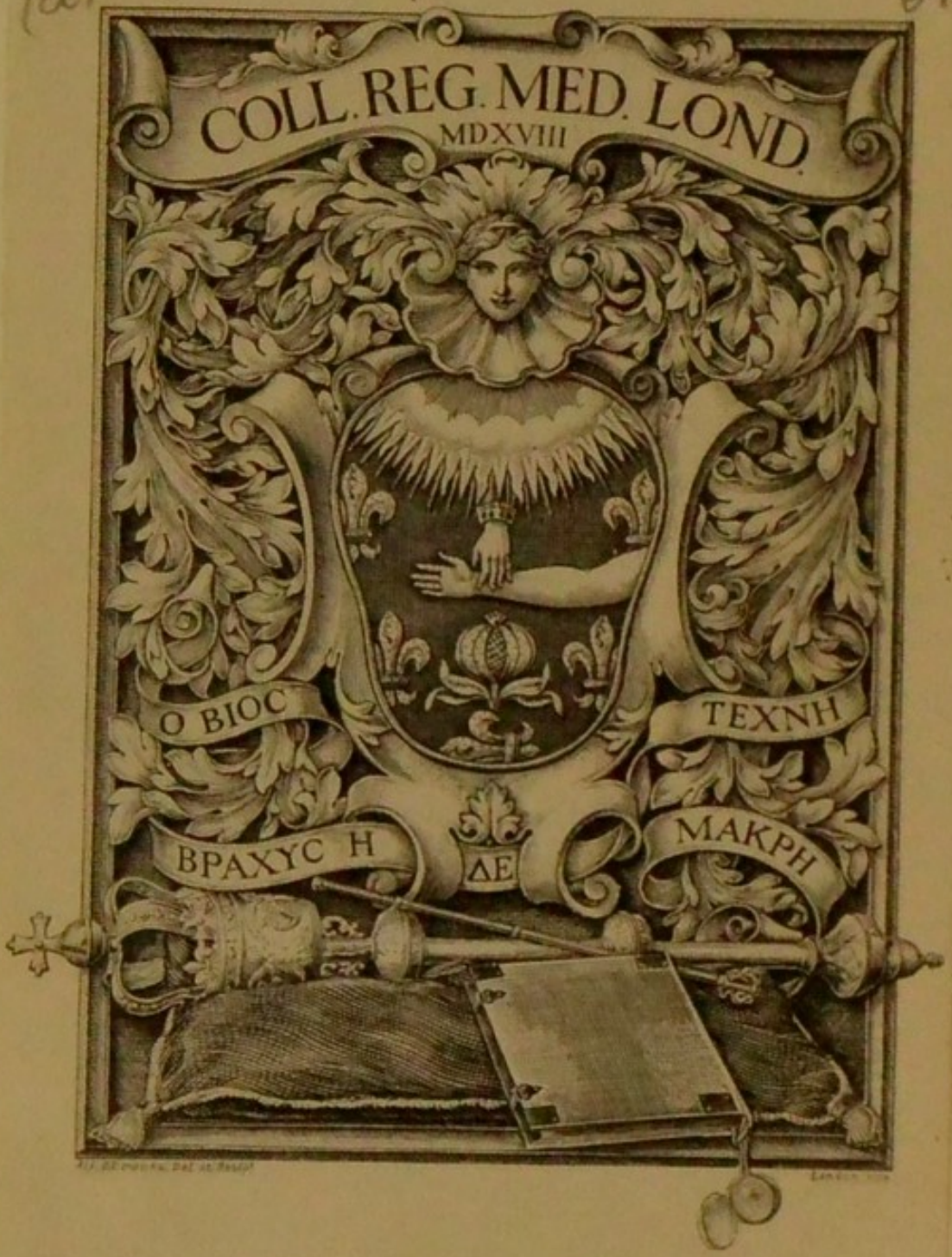

Henry Hartley Hicks

EXAMINATIONS

IN

ANATOMY, PHYSIOLOGY,

Practice of Physic,

SURGERY,

MATERIA MEDICA, CHEMISTRY,

AND

PHARMACY;

FOR THE USE OF STUDENTS.

BY

ROBERT HOOPER, M. D.

THIRD EDITION,

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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. Question. HOW do anatomists divide the skeleton?

Answer. The human skeleton is divided into head, trunk, and extremities. The head is subdivided into cranium, or skull, and face. The upper extremities into brachium, antibrachium, carpus, metacarpus, and phalanges. The lower extremities into femur, crus, tarsus, metatarsus, and phalanges. The trunk is subdivided into spine, thorax, and pelvis.

2. Q. How many bones compose the cranium?

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

3. Q. Describe the parietal bones.

A. The parietal bones are of a quadrangular shape, are externally convex, internally concave, and marked with grooves for the meningeal arteries. They form the lateral and superior part of the cranium.

4. Q. Describe the situation of the sphenoidal bone.

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

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

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

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

A. In the petrous portion of the temporal bone.

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

A. Two: an external and an internal.

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

A. It is called diploë and meditullium.

9. Q. What is attached to the internal angular process of the frontal bone?

A. There are two muscles attached to the internal angular process: viz. the corrugator supercilii and the trochlearis, or obliquus superior.

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

A. Suture.

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

A. The coronal suture.

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

A. By the lambdoidal suture.

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

A. It is called the sagittal suture.

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

A. Two: viz. the true and false.

15. Q. Describe the occipital bone.

A. The occipital bone forms the posterior and inferior part of the skull, is of an irregular figure, externally convex, internally concave. It has many depressions and elevations, and is connected, at its inferior part, by means of a projection, called the basilary process, to the sphenoid bone.

16. Q. Describe the sphenoid bone.

A. The sphenoid bone is divided into a body and wings. It has many processes, depressions, and foramina, and is connected to all the bones of the cranium.

17. Q. What are the processes of the sphenoid bone?

A. The principal processes of this bone are, the two pterygoid processes, the styliform process, the spinous processes, the orbitar processes, the temporal processes, the ethmoidal process, the olivary process, the posterior clinoid processes, and the anterior clinoid processes.

18. 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.

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

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

20. 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.

21. 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.

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

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

23. 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 forehead and upper part of the orbits. It receives the anterior lobus cerebri, forms a notch for the ethmoid bone, is externally convex, internally concave, and has several elevations and depressions.

24. Q. Where is the os ethmoides situated?

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

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

A. The os sphenoideum.

26. Q. At what angle of the parietal bone is the groove for the spinous artery?

A. The spinous artery of the dura mater runs in a groove at the anterior inferior angle of the parietal bone.

27. Q. What rests on the internal surface of the cuneiform process of the occipital bone?

A. The medulla oblongata rests upon the inner surface of the cuneiform or basilary process.

28. Q. What is attached to the lateral parts of the internal crucial spine of the occipital bone?

A. The tentorium, which separates the cerebrum from the cerebellum.

29. Q. In what bone is the foramen opticum?

A. The foramen opticum is in the sphenoid bone.

30. Q. Where is the foramen opticum found in the skull?

A. In the orbit, at the very bottom.

31. Q. What is the use of the foramen opticum?

A. It transmits the optic nerve to the eye.

32. Q. What is the name of the suture that connects the bones of the face to those of the cranium?

A. The bones of the cranium are connected to those of the face by means of the transverse suture.

33. Q. How many bones compose the face?

A. The face is formed by fourteen bones; two superior maxillary, two nasal, two palatine, two jugal, two inferior spongy, two lachrymal, the vomer, and the inferior maxillary bone.

34. Q. What is attached to the styloid process of the sphenoid bone?

A. Three muscles, viz. the stylo-pharyngeus, the stylo-glossus, and the stylo-hyoideus; also the ligament of the os hyoides, and the lateral ligament of the lower jaw.

35. Q. Enumerate the principal elevations of the occipital bone.

A. The principal elevations of the occipital bone are, its condyles, a longitudinal ridge, a superior and an inferior transverse ridge, a tuberosity in the centre of the superior transverse ridge: these are on the external surface. On the internal surface is seen the crucial spine.

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

A. It is a part of the temporal bone.

37. Q. How many bones compose the orbit?

A. Seven: viz. os frontis, os ethmoides, os sphenoides, os lachrymale, os jugale, os palati, and the os maxillare superius.

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

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

39. Q. What bones form the septum narium?

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

40. 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.

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

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

42. Q. Is the body of the sphenoid bone hollow or solid?

A. Hollow: it contains the sphenoidal sinuses, which communicate with the nose.

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

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

44. 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.

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

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

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

A. To the temporal bone.

47. Q. What are the foramina of the superior maxillary bone?

A. The foramina of this bone are, the infra-orbitar foramen, the foramen incisivum, the spheno-maxillary fissure, and the foramen of the antrum maxillare.

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

A. The temporal and occipital bones.

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

A. The pterygoid processes.

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

A. The jugular vein and par vagum.

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

A. Yes: a portion of the palate-bone rises into the inferior part of it.

52. Q. Where is the vomer situated?

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

53. 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 posterior nostril.

54. Q. How many foramina are there in the inferior maxillary bone?

A. There are only two, which belong to the canalis mentalis; one placed externally and anteriorly, the other placed posteriorly and internally.

55. Q. Point out the situation of the zygomatic process on the face.

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

56. 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 eyelashes.

57. Q. What is the name of the portions of the os ethmoides which hang down into the nostrils?

A. The superior turbinated bones and azygos process.

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

A. It is of a quadrangular shape.

59. Q. Enumerate the foramina of the sphenoid bone.

A. The foramina of the sphenoid bone are, the foramina optica, foramina lacera, foramina rotunda, foramina ovalia, foramina spinosa, and the foramina Viduana.

60. Q. What bones of the cranium are called ossa plana?

A. The orbitar plates of the ethmoid bone are so termed.

61. Q. What are the elevations of the superior maxillary bone?

A. The elevations of the superior maxillary bone are, the alveolar process, the spinous process, the palatine process, the nasal process, the orbitar process, the malar process, and the bulbous process.

62. Q. What are the projections of the inferior maxillary bone?

A. The principal projections of the inferior maxillary bone are, the coronoid and condyloid processes; the angles; a ridge passing externally, and another internally, from the base of the coronoid process to the commencement of the chin; a projection on the inner and outer side of each angle; a projection behind the symphysis, and another on each side the base of the chin.

63. Q. What is the division of the internal ear?

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

64. Q. How many teeth are there in the adult, and how are they divided?

A. In the adult there are sixteen teeth in each jaw; and they are divided into three classes on each side of the jaw: two incisores, one cuspidatus, two bicuspides, and three molares.

65. 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.

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

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

67. Q. Describe the spine.

A. The spine is a long, bony, and cartilaginous, hollow column, consisting of twenty-four bones, called vertebræ, which extend from the occipital bone to the os sacrum, and have many processes and foramina.

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

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

69. Q. What is there peculiar to the atlas?

A. The atlas has no body nor spinous process: its transverse processes are longer than those of the rest, and terminate in an obtuse point. The superior articular processes are very large, and are hollowed out for the condyles of the occipital bone. There are two tuberosities within its large arch for the attachment of the transverse ligament; it has a groove behind each superior articular process, and there is a surface for the odontoid process to move on.

70. 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.

71. Q. How are the ribs divided?

A. They are divided into seven true ribs, situated superiorly, and five false, which are placed inferiorly.

72. Q. Where is the os hyoides situated?

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

73. Q. 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.

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

A. The clavicle, or collar-bone.

75. Q. How many bones has the fore-arm?

A. Two; the ulna and radius.

76. 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.

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

A. The intercostal artery, vein, and nerve.

78. Q. How many portions of bone does the sternum consist of?

A. In the adult the sternum consists of three portions: a superior portion, which nearly resembles the ace of hearts; a middle portion, which is flat on each side, and larger below than

above; and an inferior portion, which has attached to it the ensiform cartilage.

79. Q. How is the clavicle divided?

A. The clavicle is divided into a body; and an internal, or sternal, and an external, or scapular, extremity.

80. Q. On what bone do we lean when on our elbow?

A. The ulna.

81. Q. How many bones compose the shoulder-joint?

A. Two: the scapula and the os brachii.

82. Q. What is the process called on which we lean?

A. The olecranon.

83. Q. What bone unites the arm to the thorax?

A. The clavicle, or collar-bone.

84. 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.

85. Q. What receives the head of the os femoris?

A. The acetabulum, or cup-like cavity of the os innominatum.

86. Q. What ligament is attached to the bottom of the acetabulum?

A. The ligamentum teres of the thigh-bone, which confines the head in its socket.

87. Q. What bone supports the leg?

A. The astragalus, on which the tibia rests.

88. Q. How many bones compose the tarsus?

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

89. Q. Where is the trochanter major situated?

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

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

A. On the back part of the os femoris.

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

A. They are called condyles.

92. Q. What is there particular to be noticed on the os humeri?

A. In noticing the os humeri, we may observe its cylindrical shape, its body and two extremities, the head, neck, great and little tuberosity, the bicipital groove, the two condyles, and trochea.

93. Q. Enumerate the principal parts of the ulna.

A. The principal parts of the ulna are, its body and extremities, the olecranon and coronoid process, the great and little sigmoid cavity, the lesser head, and styloid process.

94. Q. What are the principal parts of the radius?

A. The principal parts of the radius are, its body and two extremities; its round head, which rolls on the ulna; the sigmoid cavity, at its lower extremity; and the styloid process.

95. Q. What are the principal parts of the os femoris?

A. The principal parts of the os femoris are, its body and extremities, the head, neck, the great and little trochanters, the linea aspera, the external and internal condyle, the notch between the condyles, and fossa for the patella.

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

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

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

A. Tibia and fibula.

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

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

99. Q. What bone forms the inner ankle?

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

100. Q. What bone forms the outer ankle?

A. The lower end of the fibula forms it.

101. 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.

102. 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 symphysis pubis to the os sacrum; whereas, in man, it is rounder, and every where of less diameter; the os sacrum is narrower, and the os coccygis more firmly connected.

103. 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.

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

A. The sacrum.

105. Q. What are the terminations of the crista of the ilium called?

A. The terminations of the crista of the ilium are called, the anterior superior, and posterior superior, spinous processes of the ilium.

106. Q. What is attached to the crista of the ilium?

A. The aponeurosis of the fascia lata, the latissimus dorsi, and

obliquus externus abdominis, are attached to its external part, and posteriorly the gluteus maximus.

107. Q. Describe the tibia.

A. The tibia is situated on the inner side of the leg: it is divided into a body and an upper and lower extremity. The upper extremity is called the head, which has two articular surfaces for the condyles of the os femoris. The body has three surfaces and three edges: the lower extremity is smaller than the upper, and forms the malleolus internus.

108. Q. What is affixed to the apex of the patella?

A. A ligament is attached to the apex of the patella, which is also affixed to the tuberosity of the tibia.

109. Q. How would you distinguish the right patella from the left?

A. By attending to these circumstances:—the apex should be placed upwards, the articular surface turned inwards; then, by recollecting the deepest articular concavity is always externally situated, you may easily distinguish the patella of the right side from that of the left.

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

A. No: the pubic portion of each meets to form the pubes.

111. Q. Where is the os coccygis situated?

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

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

A. The glenoid cavity.

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

A. It belongs to the os innominatum.

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

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

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

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

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

A. It is a part of the os innominatum.

117. Q. What bones form the thorax?

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

118. 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.

119. Q. How many kinds of cartilage are there?

A. There are four kinds of cartilages. 1st, Diarthrodial cartilages, which cover the ends of the bones; 2d, Synarthrodial cartilages, which are placed between several bones, as that of the symphisis pubis; 3d, Interarticular cartilages, placed in some of the joints, as those in the knee-joint, &c.; 4th, Those cartilages which supply the place of bone, as the cartilages of the nose, ears, &c.

120. 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 conoid and trapezoid ligaments, that extend from the clavicle to the coracoid process.

121. 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 the os coccygis.

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

A. The ligamentum teres.

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

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

124. Q. Are tendons elastic?

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

125. Q. Where is the ligamentum nuchæ situated?

A. The ligamentum nuchæ arises from the occipital bone, runs down on the back part of the neck, adhering to the spinous processes of the cervical vertebræ, and giving origin to the trapezius and other muscles.

126. Q. Describe the annular ligament of the wrist.

A. The annular ligament of the wrist consists of two parts 1st, The ligamentum carpi transversale externum, which passes from the styloid process of the ulna and os pisiforme, over the back of the wrist, to be affixed to the styloid process of the radius; 2d, The ligamentum carpi transversale internum, which passes across the fore part of the wrist; it arises from the os pisiforme and os unciforme, and is attached to the os scaphoides and os trapezium, on the outer edge.

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

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

128. Q. What are the bones of the tarsus?

A. The bones of the tarsus are seven in number; viz. the astragalus, os calcis, os scaphoides, os cuboides, and the three cuneiform bones.

129. 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.

130. 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.

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

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

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

A. On the right side of the fore part of the loins.

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

A. The long tendon of the biceps flexor cubiti.

134. 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.

135. 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 inserted into 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.

136. 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.

137. Q. What tendon passes over the hamular process of the sphenoid bone?

A. The tendon of the tensor palati passes over the hook-like process, to be inserted into the palatum molle.

138. Q. What forms the sheath of the rectus abdominis?

A. The sheath of the rectus is formed by the tendons of three muscles, viz. the obliquus externus, the obliquus internus, and the transversalis.

139. Q. What are the tendinous partitions called, which are sent betwixt muscles from the fascia covering them?

A. The partitions sent down from the fascia betwixt muscles are called intermuscular ligaments; they connect the muscles, and give origin to many of the fibres.

140. Q. What muscle is inserted into the os pisiforme?

A. The muscle which is inserted into the os pisiforme is called flexor carpi ulnaris.

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

A. They are six in number; viz. trapezius, levator scapulæ, pectoralis minor, rhomboideus, serratus magnus, and subclavius.

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

A. To the extensors.

143. Q. What forms the linea alba?

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

along the centre of the abdomen, forms the ensiform cartilage to the symphysis pubis.

144. 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.

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

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

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

A. Gastrocnemius externus, gastrocnemius internus, and plantaris.

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

A. The tendo Achillis.

148. Q. What muscle crosses the carotid artery and internal jugular vein?

A. These two vessels have the omo-hyoides crossing them, to insert itself into the os hyoides.

149. Q. How many muscles are there on the anterior part of the neck?

A. The muscles on the anterior part of the neck are sixteen in number; viz. platysma myoides, sterno-cleido-mastoideus, omo-hyoideus, sterno-hyoideus, sterno-thyroideus, thyro-hyoideus, crico-thyroideus, digastricus, stylo-hyoideus, stylo-glossus, stylo-pharyngeus, myo-hyoideus, genio-hyoideus, genio-hyo-glossus, myo-glossus, and lingualis.

150. Q. What forms the lineæ transversæ of the abdomen?

A. The lineæ transversæ are formed by the tendinous adhesions

of the recti muscles, which produce three or four white lines that shine through the fascia covering each muscle.

151. Q. What forms the linea semilunaris?

A. The linea semilunaris is a semicircular white line which runs obliquely from the os pubis over the side of the abdomen, at the distance of about four inches from the linea alba; it is formed by the tendons of the two oblique and transverse muscles uniting at the rectum.

152. 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 fore-arm, that covering the abdominal muscles and back, the fascia of the lower extremities, and the plantar and palmar fascia.

153. Q. From whence does the palmar aponeurosis arise?

A. The palmar aponeurosis arises from the tendon of the palmaris, and from the annular ligament of the wrist.

154. 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.

155. Q. From which side of the tendon of the biceps is an aponeurosis sent off?

A. An aponeurosis is sent off from its inside, which assists in forming the fascia of the fore-arm.

156. Q. Describe the fascia covering the fore-arm.

A. The fascia covering the fore-arm is continued from the intermuscular ligaments which pass down to the condyles, covering the os humeri. It is attached to the condyles, and adheres firmly to the olecranon. On the posterior part of the arm it receives a great addition of fibres from the triceps extensor, and on the

fore part of the arm it appears to be a continuation of the aponeurosis of the biceps flexor cubiti.

157. Q. What is the use of aponeuroses?

A. The use of aponeuroses is to brace the muscles, by keeping them in their proper place while in action, and to give origin to many muscular fibres of the muscles which lie immediately under.

158. Q. How many arteries are there?

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

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

A. Coronary arteries.

160. 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.

161. 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.

162. 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.

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

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

164. 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.

165. Q. Through what foramen does the ophthalmic artery enter the orbit?

A. The ophthalmic artery enters the orbit by the foramen opticum; it sends its branches to the forehead, lachrymal gland, fat, muscles, and globe of the eye.

166. Q. What is the course of the arteria transversalis faciei?

A. The transversalis faciei, which is a branch of the temporal, proceeds transversely under the zygoma, over the masseter, and near the parotid duct.

167. Q. Describe the course of the internal carotid as it enters the cranium.

A. The internal carotid, at the base of the cranium, makes a sudden turn forwards, and enters the carotid canal of the temporal bone; it then passes upwards and forwards; after leaving the canal, it again bends upwards and forwards by the side of the sella turcica, and perforates the dura mater at the root of the anterior clinoid process; it is suddenly reflected obliquely backwards and upwards; after which it divides into branches.

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

A. The anterior meningeal artery arises from the carotid.

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

A. The posterior meningeal artery arises from the vertebral.

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

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

171. 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.

172. 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.

173. 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.

174. Q. What are the branches of the internal maxillary artery?

A. The internal maxillary artery gives off the arteria meningea media, which goes to the dura mater through the foramen spinosum; the inferior maxillary, which enters the canal of the lower jaw; the alveolar, to the back teeth of the upper jaw; the infra-orbitar, which gets upon the cheek, through the infra-orbitar canal; the palato-maxillary, which ramifies on the palate; and the spheno-palatine, to the cavity of the nose.

175. Q. At what part is the brachial artery considered to begin?

A. The brachial artery begins immediately below the tendon of the latissimus dorsi.

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

A. The inferior thyroid artery arises from the subclavian.

177. 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.

178. Q. What is the course of the brachial artery?

A. The brachial artery descends behind the inner edge of the biceps, over the coraco-brachialis, covered by the tendinous aponeurosis of the arm, and having the triceps extensor cubiti on the

back part of it; when it gets to the bend of the arm it divides into two principal branches.

180. 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 radii longus.

181. Q. What is the course of the ulnar artery?

A. The ulnar artery, having passed under the flexors of the hand and fingers to the inner part of the fore-arm, along the outer side of the flexor carpi ulnaris, near the wrist, runs between the tendons of the flexor carpi ulnaris and flexor digitorum profundus; it then passes over the annular ligament and under the palmar fascia, to form the superficial palmar arch.

182. Q. What is the course of the radial artery?

A. The radial artery passes over the pronator teres, and takes the direction of the radius; when it gets to the wrist, it gives off several branches, and then forms the arcus profundus.

183. Q. At what distance from the elbow does the brachial artery divide?

A. At about an inch below the elbow the brachial artery generally divides into radial and ulnar.

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

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

185. Q. What forms the profundal palmar arch?

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

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

A. The thoracic aorta gives off the bronchial, the œsophageal, and the inferior intercostal arteries.

187. Q. What vessels does the right pulmonary artery pass before it reaches the lungs?

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

188. Q. What course does the abdominal aorta take?

A. The aorta passes from the thorax into the abdomen between the crura of the diaphragm; as it descends on the fore part of the spine, it inclines a little to the left: it gives off branches in its way downwards, and bifurcates on the fourth lumbar vertebra.

189. Q. What is the course of the coronaria ventriculi?

A. The coronaria ventriculi passes from the cœliac artery towards the left side; it first attaches itself to the stomach near its left extremity, and sends a branch round the cardia, named ramus coronariæ dexter. The trunk is then continued along the lesser curvature, to inosculate with the pylorica or coronaria sinister.

190. Q. What is the course of the arteria splenica?

A. The arteria splenica, after having left the cœliac artery, passes under the stomach and along the upper border of the pancreas, and enters the concave surface of the spleen.

191. Q. What does the cœliac artery supply?

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

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

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

193. Q. Where is the ductus arteriosus situated in the fœtus?

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

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

A. The superior mesenteric artery gives off, on the right side,

three branches: the ilio-colica, the branches of which 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.

195. Q. What is the course of the hepatic artery?

A. It runs from the cœliac artery in a direction opposite to the splenic, towards the right side: after giving off several branches, it divides into the right and left hepatic. The right is distributed to the right lobe of the liver, and to the gall-bladder. The left supplies the whole of the left lobe, the lobulus Spigelii, and part of the right lobe.

196. Q. What are the branches of the pancreatic artery?

A. The pancreaticæ parvæ, which go to the pancreas; the vasa brevia, which go to the great curvature of the stomach; the gastro-epiploica sinistra, which runs along the great curvature of the stomach, inosculating with the gastro-epiploica dextra.

197. Q. What are the branches of the hepatic artery?

A. The hepatic artery gives off the pylorica or coronaria dextra, which ramifies on the pylorus and lesser curvature of the stomach; the gastro-epiploica dextra, which passes under the pylorus to reach the great curvature of the stomach: the pancreatico-duodenalis, which is often a branch of the gastro-epiploica, goes to the pancreas and duodenum.

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

A. The renal or emulgent arteries.

199. 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 un-

der 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 pyramidalis; it then ascends under the middle of the rectus, furnishing branches to the abdominal parietes, and terminates above the umbilicus, anastomosing with the mammary.

200. 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.

201. 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.

202. Q. What are the branches of the inferior mesenteric artery?

A. The inferior mesenteric passes in the mesentery to the left side of the abdomen, and gives off—1. The colica sinistra, which ascends along the left side of the colon, to inosculate with the colica media; 2. Branches which pass to the sigmoid flexure of the colon; 3. The arteria hæmorrhoidalis interna, which runs down behind the rectum, on which it ramifies.

203. Q. How far distant from the aorta and Poupart's ligament does the common iliac divide?

A. The common iliac artery divides at rather more than half way between the aorta and Poupart's ligament.

204. Q. Which is the largest branch of the internal iliac?

A. The arteria glutea, or iliaca posterior, which passes out of the pelvis at the upper part of the sciatic notch.

205. 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.

206. 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.

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

A. They dilate, their coats become stronger, and acquire additional capacity; they are also found to become tortuous.

208. Q. How are arteries distinguished from veins?

A. By their coats being whiter and more dense, and 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.

209. Q. What is the course of the external jugular vein on the neck?

A. The external jugular vein being formed by branches from the temple, side of the face, and throat, crosses obliquely over the sterno-mastoideus muscle, passes behind its outer edge, and goes beneath the clavicle to enter the subclavian vein.

210. Q. On which side of the carotid artery does the internal jugular vein run?

A. The internal jugular vein runs on the outer side of the carotid artery.

211. Q. How is the vena cava abdominalis formed, and what is its course?

A. The vena cava abdominalis is formed by the junction of the two common iliac veins: it passes up through the abdomen on the lumbar vertebræ, and on the right side of the aorta.

212. Q. Do the superficial veins of the fore-arm lie above the fascia or below it?

A. The principal veins of the fore-arm lie above the fascia.

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

A. No, they have none.

214. 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.

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

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

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

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

217. 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.

218. Q. What is the situation of the intercostal or great sympathetic nerve in the neck?

A. The intercostal nerve lies behind the carotid artery in the cellular membrane, betwixt that vessel and the muscles covering the vertebræ of the neck.

219. Q. What is the situation of the par vagum in the neck?

A. On separating the internal jugular vein, and trunk of the

carotid artery, the par vagum is seen lying in the same sheath of cellular substance with those vessels.

220. Q. What nerve lies upon the belly of the anterior scalenus muscle?

A. The phrenic nerve lies upon the anterior scalenus muscle, and gets into the thorax betwixt the subclavian artery and vein.

221. Q. What nerve is that which is seen ascending between the under surface of the trachea and œsophagus at the lower part of the neck?

A. The recurrent of the par vagum.

222. Q. What nerves supply the diaphragm?

A. The phrenic or diaphragmatic nerves.

223. Q. Where does the great sciatic nerve arise?

A. From a plexus of nerves formed by the fourth and fifth lumbar nerves, joined by the first, second, and third sacrals.

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

A. The semilunar ganglion.

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

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

226. 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.

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

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

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

A. They arise from the thalami nervorum opticorum.

229. 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.

230. 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.

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

A. From the spinal marrow.

232. 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.

233. Q. What nerve supplies the nose with the sense of smelling?

A. The olfactory, or first pair.

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

A. The cervical ganglion.

235. 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.

236. 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.

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

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

238. Q. What nerve perforates the sterno-cleido-mastoideus muscle?

A. The sterno-cleido-mastoideus is pierced about its middle, by the nervus accessorius.

239. Q. What plexus of nerves surrounds the axillary artery?

A. The brachial plexus.

240. Q. Describe the course of the great sciatic nerve out of the pelvis.

A. This nerve is formed from the fourth and fifth lumbar, and three first sacral nerves; it passes betwixt the pyriformis and gemini muscles, and escapes from the back part of the pelvis by the sciatic notch.

241. Q. Describe the course of the anterior crural nerve while in the pelvis.

A. The anterior crural nerve at its origin lies under the psoas magnus muscle, &c. and, as it descends, passes betwixt the psoas magnus and iliacus internus, till, having passed under Poupart's ligament, it emerges from betwixt those muscles, and appears on the outside of the inguinal artery.

242. Q. What forms the anterior crural nerve?

A. The three or four superior lumbar nerves.

243. Q. Describe the course of the obturator nerve and its origin.

A. The obturator nerve is formed by branches of the second, third, and fourth lumbar nerves; it lies under the inner border of the psoas magnus, descends into the pelvis, and goes obliquely downwards, accompanying the obturator artery through the thyroid hole.

244. 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.

245. 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.

246. 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.

247. Q. What is a gland?

A. A gland is an organic body composed of blood-vessels, nerves, and absorbents, and destined for the secretion of some peculiar fluid.

248. Q. How are glands distinguished?

A. They are distinguished into four classes:—Simple glands—Compounds of simple glands—Conglobate glands—Conglomerate glands.

249. Q. Where are the mesenteric glands situated?

A. In the fat between the layers of the mesentery, near the branches of the blood-vessels.

250. Q. What is the name given to the absorbents entering a gland?

A. They are called vasa inferentia.

251. Q. Absorbent vessels go out from the opposite side of the glands, in the manner they entered them: what name is given to those vessels?

A. They are called vasa efferentia.

252. Q. Where is the pituitary gland situated?

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

253. Q. Where is the lachrymal gland situated?

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

254. 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.

255. 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.

256. Q. What is the name of the excretory duct of the submaxillary gland, and where does it open?

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

257. Q. Where is the thyroid gland situated?

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

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

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

259. Q. How are the absorbents divided?

A. The absorbents are divided into lymphatic and lacteal vessels.

260. Q. Do absorbents exist in every part of the body?

A. Yes: it is supposed that absorbents exist in every part of the body; but they have not yet been observed in the cavity of the cranium, nor in the placenta.

261. 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.

262. 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.

263. Q. What is the line called that runs along the centre of the corpus callosum?

A. The line in the centre of the corpus callosum is called raphe.

264. Q. Where is the formix situated?

A. The formix is situated immediately under the septum lucidum.

265. Q. How do the posterior crura of the formix terminate?

A. The posterior crura of the formix terminate by forming the corpora fimbriata.

266. Q. What forms the lyra?

A. The lyra is formed by the medullary lines of the inferior surface of the formix.

267. Q. Where is the hippocampus minor situated?

A. The hippocampus minor is situated in the posterior horn of the lateral ventricle.

268. Q. Where is the hippocampus major situated?

A. The hippocampus major is situated in the posterior horn of the lateral ventricle.

269. Q. Where is the third ventricle situated?

A. The third ventricle is a space between the two thalami nervorum opticorum.

270. Q. How many membranes has the brain?

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

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

A. The superior longitudinal sinus is the principal vessel.

272. Q. Where is the tentorium situated?

A. Between the cerebrum and cerebellum.

273. Q. How many lobes has the brain?

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

274. Q. How many hemispheres has the cerebrum?

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

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

A. They are called ventricles.

276. Q. What separates the lateral ventricles from each other?

A. The septum lucidum.

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

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

278. Q. What separates the thalamus nervi optici from the corpus striatum?

A. A white prominent line, called tænia semicircularis.

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

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

280. Q. How many laminæ has the dura mater?

A. The dura mater has two laminæ.

281. Q. What parts of the brain does the falx separate?

A. The falx separates the two hemispheres.

282. Q. What does the tentorium separate?

A. The tentorium separates the cerebrum from the cerebellum.

283. Q. How are the sinuses of the dura mater formed?

A. The sinuses of the dura mater are formed by the separation of the two layers of that membrane.

284. Q. Does the pia mater dip between the convolutions of the brain, or pass over them?

A. The pia mater dips between the convolutions; but the tunica arachnoidea passes over them.

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

A. The external lamina of the dura mater nourishes the internal table of the skull.

286. Q. What are 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, and the accessory nerves of Willis;—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.

287. Q. How is the pia mater nourished?

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

288. Q. Where are the tubercula quadrigemina situated?

A. The tubercula quadrigemina are situated behind the thalami nervorum opticorum, and under the pineal gland.

289. Q. What canal passes under the tubercula quadrigemina?

A. The canal is called iter à tertio ad quartum ventriculum; it forms the communication between the third and fourth ventricle.

290. Q. What is situated at the anterior part of the third ventricle?

A. At the anterior part of the third ventricle are situated the anterior crura of the fornix, the commissura anterior cerebri, and infundibulum.

291. Q. What forms the floor of the third ventricle?

A. The commissura inferior.

292. Q. Where is the valvula magna cerebri situated?

A. The valvula magna cerebri is situated over the iter à tertio ad quartum ventriculum, and the upper part of the fourth ventricle.

293. Q. What forms the arbor vitæ?

A. It is formed by the medullary and cineritious substance of the brain, which are distributed in such a manner as to give the appearance of the branches of a shrub.

294. Q. What are the medullary tracts at the sides of the valvula magna cerebri called?

A. These lines are called processus ad testes, or columnæ valvulæ Vieussenii.

295. Q. Where is the calamus scriptorius situated?

A. The calamus scriptorius is situated in the fourth ventricle.

296. Q. What is to be observed on the medulla oblongata?

A. On the medulla oblongata are seen the pons Varolii, the corpora olivaria, and corpora pyramidalia.

297. 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.

298. Q. How many coats has the eye?

A. Three; viz. the tunica sclerotica, the tunica choroides, and the retina:—the anterior portion of the sclerotica is transparent, and called the cornea transparens: the anterior part of the choroid membrane forms the iris and the uvea; and there is, also, the membrane of the lens and of the vitreous humour: so that many anatomists make eight coats.

299. Q. What is the tunica conjunctiva?

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

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

A. The curtain formed by the iris and uvea.

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

A. The crystalline lens and a little water.

302. Q. What artery nourishes the crystalline lens?

A. The arteria centralis retinæ.

303. 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.

304. 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.

305. Q. What part of the eye is the true organ of vision?

A. The retina.

306. 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.

307. Q. How many chambers has the eye?

A. Two: an anterior and a posterior chamber.

308. 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.

309. 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.

310. 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.

311. 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.

312. Q. Where does the Eustachian tube begin?

A. The Eustachian tube begins at the upper and fore part of the tympanum.

313. Q. What membrane lines the meatus auditorius externus?

A. The meatus is lined by a continuation of the skin.

314. Q. If a probe were passed to the bottom of the meatus auditorius, what would it rest on?

A. The membrana tympani.

315. Q. Where is the fenestra ovalis situated?

A. The fenestra ovalis is situated in the tympanum, above the promontory.

316. Q. Where do the cells of the mastoid process open?

A. They open at the upper and back part of the tympanum.

317. Q. Where does the fenestra rotunda lead to?

A. The fenestra rotunda leads to the cochlea.

318. Q. How many openings are there in the vestibulum?

A. Five foramina, which communicate with the semicircular canals;—the fenestra ovalis, and a round hole which communicates with one of the canals of the cochlea.

319. Q. What are the principal parts of the cochlea?

A. The principal parts of the cochlea are, the gyri, the modiolus, the infundibulum, the scala vestibuli, and the scala tympani.

320. Q. How are the semicircular canals distinguished?

A. The semicircular canals are three in number: they are distinguished into the superior or vertical, the posterior or oblique, and the exterior or horizontal.

321. Q. How is the palate divided?

A. It is divided into palatum durum and palatum molle.

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

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

323. 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.

324. Q. What forms the second arch of the palate?

A. The levator palati, covered by the skin of the mouth.

325. Q. What lies between the two arches of the palate?

A. The tonsil gland.

326. Q. What does the uvula consist of?

A. The uvula consists of the azygos uvulæ, enveloped in the membrane of the palate.

327. Q. Where is the pharynx, and what is it?

A. The pharynx is a large muscular bag in form of an irregular funnel, at the back of the mouth, which terminates in the œsophagus.

328. Q. What forms the inner membrane of the pharynx?

A. The inner membrane of the pharynx is formed by the continuation of the membrane of the mouth.

329. Q. How many cartilages has the larynx?

A. The larynx has five cartilages; viz. the thyroid, the cricoid, the two arytenoid, and the cartilage of the epiglottis.

330. 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 phrenic nerve, the par vagum, and the great intercostal nerves.

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

A. It has two lobes.

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

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

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

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

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

A. The thymus gland.

335. Q. How many membranes has the pericardium?

A. The pericardium has two membranes; an external and an internal.

336. Q. What part of the thorax does the pericardium adhere most to?

A. The pericardium adheres most firmly to the tendinous part of the diaphragm.

337. Q. What arteries nourish the pleura?

A. The arteries that nourish the pleura are branches from the intercostal, mammary, diaphragmatic, bronchial, and œsophageal arteries.

338. Q. What is the heart?

A. The heart is a hollow muscular viscus, situated in the

pericardium, in the cavity of the thorax, resting upon the diaphragm.

339. Q. Has the external surface of the heart any membranous covering?

A. Yes: it has a membranous coat, which is a reflexion of the inner layer of the pericardium.

340. Q. Where are the musculi pectinati situated?

A. In the right auricle of the heart.

341. Q. Where is the tricuspid valve situated?

A. The tricuspid valve is situated between the right auricle and right ventricle, hanging from the opening between them.

342. Q. Where does the pulmonary artery originate?

A. The pulmonary artery arises from the right ventricle.

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

A. Yes, by the foramen ovale.

344. Q. Where is the Eustachian valve situated?

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

345. 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.

346. 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.

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

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

348. 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.

349. Q. What are the regions of the abdomen?

A. The abdomen is divided into three regions, each of which is subdivided:—1. The epigastric region, which is the superior: its sides are termed hypochondriac regions.—2. The umbilical region, situated in the centre of the abdomen, the sides of which are termed iliac or epicolic regions.—3. The hypogastric region, which is subdivided into three regions, one middle, termed regio pubis, and two lateral, named inguinal regions.

350. 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 suprarenal capsules, part of the aorta descendens, and vena cava ascendens.

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

A. The peritonæum.

352. Q. What forms the mesentery?

A. The mesentery is formed by a doubling of the peritonæum.

353. Q. Where does the mesentery begin?

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

354. Q. How is the colon fixed to the spine?

A. The colon is fixed to the spine by a continuation of the mesentery, which is called mesocolon.

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

A. The liver.

356. Q. Where is the gall-bladder situated?

A. The gall-bladder is situated in the right hypochondrium, attached to a depression in the right lobe of the liver.

357. Q. How many coats has the gall-bladder?

A. The gall-bladder has three coats; viz. an external or peritonæal, a middle or muscular coat, and an internal or villous coat.

358. Q. What is the appearance of the internal surface of the gall-bladder?

A. The internal surface of the gall-bladder is smooth and of a green colour, and appears every where perforated by the ducts of small follicles, which afford a mucus to defend the inner coat.

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

A. The outer surface of the peritonæum is cellular.

360. 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.

361. 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.

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

A. No: only their anterior surfaces.

363. Q. Where is the great lobe of the liver situated?

A. The great lobe of the liver is situated in the right hypochondriac region, and rests upon the pylorus, colon, and top of the right kidney.

364. Q. Where is the small lobe of the liver situated?

A. The small lobe of the liver is situated in the epigastric region, only a small portion of it lying in the left hypochondriac region.

365. 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.

366. Q. What forms the capsule of Glysson?

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

367. Q. What is the use of the liver?

A. To secrete bile.

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

A. Pori biliarii.

369. Q. Where is the spleen situated?

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

370. Q. What nerves supply the spleen?

A. The nerves of the spleen are branches of the great sympathetic and eighth pair.

371. Q. Where is the pancreas situated?

A. The pancreas extends from the fissure of the spleen across the spine, under the posterior surface of the stomach, and terminates at the duodenum.

372. Q. What arteries nourish the pancreas?

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

373. Q. What is the elongation or process sent down from the right extremity of the pancreas called?

A. This process was called by Winslow, pancreas minus; it is also called head of the pancreas.

374. Q. Where is the pancreatic duct situated?

A. The pancreatic duct is situated at the left extremity of the pancreas; it runs in the substance of the gland, and terminates obliquely in the duodenum, along with the ductus communis choledochus.

375. 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.

376. 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.

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

A. The ureter.

378. Q. What does the substance of the kidney consist of?

A. The substance of the kidney consists of an outer part called cortical, and an inner, termed medullary.

379. Q. What viscera are in contact with the right kidney?

A. The right kidney is connected to the liver and duodenum.

380. Q. Is the cortical substance endowed with any peculiar function?

A. Yes: that of secreting the urine.

381. Q. What forms the papillæ of the kidney?

A. The terminations of the medullary substance with the uriniferous tubes.

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

A. The ureter.

383. 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.

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

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

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

A. The gastric juice.

386. Q. What is the beginning of the colon called?

A. The commencement of the colon is called caput coli.

387. 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.

388. Q. Which is the broadest of the small intestines?

A. The duodenum is the broadest of the small intestines.

389. Q. How are the mucous glands of the intestines distinguished?

A. The mucous glands of the intestines are distinguished into

solitary and congregate, and from their describers glandulæ Peyeri and glandulæ Brunneri.

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

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

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

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

392. 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, into the pelvis, and ends in the rectum.

393. Q. Where do the mouths of the lacteals open?

A. Upon the internal surface of the small intestines.

394. Q. Where does the mesentery begin?

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

395. Q. How does the rectum differ from the colon?

A. The rectum differs from the colon in being covered only anteriorly and laterally by the peritonæum; its muscular fibres are stronger and thicker, and spread uniformly over the intestine.

396. 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.

397. Q. Of what do the ligamenta lata uteri consist?

A. The ligamenta lata consist of two membranous productions or doublings of the peritonæum, which go from the sides of the uterus and vagina, to be affixed to the sides of the pelvis.

398. Q. What are the ligamenta rotunda uteri?

A. They are cords composed of vessels and ligamentous fibres, arising from the corners of the uterus.

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

A. Through the Fallopian tube.

400. 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.

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

A. The upper and posterior part.

402. Q. What is the length of the urethra in females?

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

403. Q. Where is the female urethra situated?

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

404. Q. Where is the bladder situated?

A. The bladder is situated within the pelvis, immediately behind the ossa pubis; in males before the rectum, and in females between the uterus and pubes.

405. Q. On which side of the vesiculæ seminales do the ureters enter into the bladder?

A. The ureters perforate the bladder on the outside of the vesiculæ seminales.

406. Q. What muscle does the ureter pass in going to the bladder?

A. The ureter descends from the kidney over the psoas muscle.

407. Q. Where is the epididymis situated?

A. The epididymis is situated at the outer and back part of the testicle.

408. 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 glans penis, another at the bulb of the urethra, and a third in the prostate gland.

409. Q. To what do the openings of the verumontanum belong?

A. The orifices found on the verumontanum belong to the vesiculæ seminales.

410. Q. Where is the urethra most dilated?

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

411. Q. What forms the corpus pampyniforme?

A. The corpus pampyniforme is formed by a plexus of veins that have a distant resemblance to the shoots of the vine.

412. Q. What form the coni vasculosi?

A. The coni vasculosi are formed by the vasa efferentia becoming convoluted into conical bundles.

413. Q. What does the corpus spongiosum urethræ consist of?

A. The corpus spongiosum urethræ consists of a plexus of veins; it is expanded at its anterior part to form the glans penis.

414. Q. Describe the situation and course of the corpora cavernosa penis.

A. The corpora cavernosa arise by what are called the crura from the tubera ischii; they ascend along the ischium and pubes, and are united immediately before the cartilaginous arch of the pubes: they are covered by a ligamento-tendinous substance, which is very elastic: internally they are cavernous, and are separated from each other by the septum pectiniforme, so called from its numerous perforations.

415. 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.

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

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

417. 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.

418. Q. What forms the scrotum?

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

419. Q. What forms the common integuments?

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

420. Q. What is the use of 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.

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

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

422. Q. Are tendons elastic?

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

423. 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.

PHYSIOLOGY.

1. 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.

2. Q. What is the use of the tuberculum Loweri?

A. The use of the tuberculum Loweri is supposed to be that of preventing the blood of the one cava from rushing upon that of the other, and to direct it into the auricle.

3. Q. How is the blood prevented from returning back into the right auricle after it has got into the right ventricle?

A. It is prevented from returning by a valve called tricuspid, which is placed within the ventricle.

4. Q. What prevents the reflux of blood into the left auricle of the heart?

A. The blood is prevented from going back into the auricle from the left ventricle, by the valvula mitralis.

5. 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

vermilion hue (excepting the blood of the pulmonary artery, which is dark).

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

A. Systole.

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

A. In the lungs.

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

A. It is of a dark colour, like venous blood.

9. Q. What is the chief agent in digestion?

A. The gastric juice.

10. Q. What is the use of the sphincter pylori?

A. The sphincter pylori, by contracting, prevents the grosser indigested parts of the aliment from escaping, and, by dilating, allows the digested pulp to pass into the duodenum.

11. Q. What is the use of the mesentery?

A. The use of the mesentery is to suspend and retain the intestines in their places, to furnish them with an external coat, and to form a bed for their glands, vessels, and nerves.

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

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

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

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

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

A. To digest the food.

15. 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.

16. 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.

17. Q. What is meant by secretion?

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

18. 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.

19. Q. What is the use of the palatum molle?

A. The palatum molle acts like a valve, in preventing what we swallow from passing into the nose, and conducts the fluids of the nose into the mouth.

20. Q. What prevents the faeces from returning from the large intestines into the small?

A. The valvula coli, placed at the beginning of the colon, allows the contents of the ileum to pass into the large intestines, but completely prevents their return.

21. Q. What causes the bile to pass from the gall-bladder into the duodenum?

A. The bile is discharged from the gall-bladder, when the stomach is full, chiefly by the pressure of the surrounding viscera, and by the contractile power of the gall-bladder.

22. Q. What is the use of the bile?

A. The use of the bile is to excite the peristaltic motion of the intestines, to correct too great a disposition to acidity, and to assist in chylification.

23. Q. What is the use of the pancreatic juice?

A. The pancreatic juice is said to incorporate the bile with the alimentary mass, and to answer the same purposes.

24. Q. How is the urine expelled?

A. The urine is expelled partly by the contraction of the bladder itself, and partly by the action of the abdominal muscles and diaphragm, which press the intestines against the bladder.

25. Q. What is the use of the tunica vaginalis testis?

A. The use of the tunica vaginalis is to enclose the testicle, and to assist the cremaster in supporting the testicle: it also exhales a fluid, which lubricates the surface of the testicle.

26. Q. What are the powers engaged in expelling the fæces?

A. The powers engaged in expelling the fæces are, the muscular coat of the rectum, the levator ani, assisted by the action of the diaphragmatic and abdominal muscles.

27. Q. How is expiration performed?

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

28. 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 95°.

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

A. Because in a healthy state the inhalants or absorbents counterbalance the exhalants or secreting arteries.

30. Q. How is nutrition effected?

A. By the lacteals, the mouths 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 jugular and subclavian vein, thereby repairing the losses the blood continually sustains in nourishing the body.

31. 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.

32. 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 tremors of sound.

33. 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.

34. Q. What is the use of the omentum?

A. The use of the omentum is supposed to be that of lubricating the viscera, and to prevent them from being injured by friction.

35. Q. How does the ovum get from the ovarium into the uterus?

A. The ovum, when impregnated, escapes from the ovarium through the Fallopian tube, which is grasping the ovarium at the time.

36. Q. What is the use of the prostate gland?

A. The use of the prostate gland is not well known; it affords a fluid, which is supposed to be of use in generation.

37. 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 defend it from the acrimony of the urine.

38. 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.

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

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

40. 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 those parts with blood: another use is that of facilitating the passage of blood from one part to another, and prevent the distention of parts.

41. 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.

42. Q. What is the cause of the 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.

43. 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.

44. 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.

45. 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.

46. 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 sufficient degree of mobility.

47. 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.

48. 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.

49. 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.

SURGERY.

1. 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 of sight. Often there is hæmorrhage from the nose, eyes, and ears; and the fæces and urine are discharged 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.

2. 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 compression 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.

3. 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.

4. 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.

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

A. Apply the trephine.

6. 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.

7. Q. In wounds of the scalp are sutures to be used?

A. The use of sutures is always to be avoided as much as possible. Most surgeons prefer sticking-plaster.

8. Q. When the scalp is much contused or torn, is it advisable to cut off the injured portion?

A. No: it is better to attempt to preserve the torn portion.

9. Q. What is the general treatment of a contused and lacerated scalp?

A. The treatment is to clean the injured portion of the scalp, as much as possible, from extraneous bodies; to retain it in its natural position, and to keep down inflammation.

10. Q. What are the consequences that sometimes take place from punctured wounds of the scalp?

A. In punctured wounds of the scalp an erysipelas frequently takes place; the inflammation and tumour often affect the whole head and face, the skin of which wears a yellowish cast, receives the impression of the finger; and a symptomatic fever is produced.

If the wound be small, and have passed beneath the aponeurosis, worse symptoms than these even accrue.

11. Q. What is to be done when the scalp (after being injured) becomes tense, the pain great, and the symptomatic fever very high?

A. It is recommended to make an incision over the wounded part down to the bone, which in general removes all the bad symptoms.

12. Q. If there be doubt as to a fracture of the cranium, and it is thought not necessary to trepan, what plan of treatment should the patient be put on?

A. The antiphlogistic plan is the best, under such circumstances.

13. Q. What are the symptoms that attend an inflamed state of the membranes brought on by injury?

A. The symptoms are pain in the head, restlessness, want of sleep, frequent and hard pulse, hot and dry skin, flushed countenance, inflamed eyes, nausea, vomiting, rigor, and towards the end convulsion and delirium.

14. Q. In what parts of the body do herniæ most frequently appear?

A. Herniæ most commonly make their appearance at the groin, the navel, the labia pudendi, and the upper and fore part of the thigh.

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

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

16. Q. What is a bubonocele?

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

17. Q. What do you mean by hydrocele?

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

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

A. The patient is seized with sickness; obstinate costiveness comes on; synochal fever takes place, and a vomiting of fæcal matter. 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.

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

A. Having shaved off the hair from the tumour, 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.

20. 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 tincture of opium, dropping in two or three drops twice or thrice a-day, between the eyelid and ball.

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

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

22. 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.

23. 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.

24. 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.

25. Q. What is meant by a reducible hernia?

A. A reducible hernia is one that has its contents lying quietly in the sac, and admits of being readily put back into the abdomen.

26. Q. What is meant by an irreducible hernia?

A. An irreducible hernia is one which, from adhesions of the intestine to the sac, or thickened omentum, cannot be returned into the abdomen.

27. Q. How does incarcerated hernia differ from irreducible hernia?

A. An incarcerated or strangulated hernia not only cannot be reduced, but circulation is stopped, and the contents of the bowel are prevented passing onwards to the anus.

28. Q. In incarcerated herniæ, whether are those most easily reduced that contain small or large intestine?

A. An incarcerated small intestine is more easily reduced than an incarcerated large intestine.

29. Q. Which is the most dangerous, an intestinal or an omental hernia?

A. An intestinal hernia is the most dangerous, and especially if it is small and recent.

30. Q. How is a femoral hernia distinguished from an enlarged lymphatic gland?

A. The swelling of a femoral hernia comes on in a sudden

manner; it is elastic, and may be reduced in size by pressure; whilst a gland, when inflamed, is inelastic, it cannot be reduced in size by pressure, and the swelling comes on gradually.

31. Q. What forms the sac in hernia congenita?

A. The sac in hernia congenita is formed by the tunica vaginalis.

32. 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.

33. 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.

34. 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 axillary 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.

35. Q. How many methods are there employed for the radical cure of hydrocele?

A. There are six different methods employed in the radical cure of hydrocele; viz. the incision, the excision, the application of caustic, the introduction of a tent, the employment of a seton, and injecting some stimulating fluid into the cavity of the tunica vaginalis.

36. Q. How many ways can the lower jaw be dislocated?

A. The lower jaw can only be luxated forwards on the zygomatic arches.

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

A. Two: the scrofulous and the rheumatic species.

38. 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.

39. 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 slough, before the wound can heal; they also frequently contain pieces of cloth or bullets.

40. 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.

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

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

42. 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 bone. The interosseous ligament is then to be thoroughly divided by the scalpel, or the catalene; the soft parts 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.

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

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

44. Q. What joint of the body is most subject to dislocation?

A. The shoulder-joint is most subject to dislocation.

45. Q. How many ways may the head of the thigh-bone be dislocated?

A. The head of the thigh-bone may be dislocated upwards and outwards on the dorsum of the ileum; upwards and forwards on the body of the os pubis; downwards and inwards on the foramen ovale; and downwards and outwards on the os ischium.

46. Q. What are the symptoms of lumbar abscess?

A. This kind of abscess generally forms in a very insidious manner: patients in the incipient stage of the disease cannot walk so well as usual; they feel a degree of uneasiness about the lumbar region; but in general there is no acute pain, even when the abscess has acquired such a size as to form a large tumour protruding externally.

47. 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.

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

A. Generally exfoliation, to a certain degree.

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

A. The os unguis.

50. 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. The hip-joint, on the contrary, is confined as to motion; the acetabulum is also very deep in the fresh subject, so as almost to cover the head of the os femoris; and thus this joint is rendered very strong.

51. Q. What are the general causes of mortification?

A. The general causes of mortification are—an impeded flow

of blood from a part; the stoppage of the flow of blood into the same; and a disturbed state of this fluid, and of the nerves.

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

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

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

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

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

A. That recommended by Mr. Hay, 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.

55. Q. How many ways are there of puncturing 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.

56. 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.

57. 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.

58. 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.

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

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

A. Pressure upon the brain.

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

A. To 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.

62. Q. How are fistulæ in perinæo produced?

A. Fistulæ in perinæo are generally produced by strictures in the urethra. The urine being impeded in its passage along the urethra, an ulceration takes place on the inside of that part of the urethra which is enlarged and within the stricture; the internal membrane having ulcerated, the urine readily gets into the loose cellular membrane and substance of the urethra; an abscess is the consequence, which bursts externally, and forms a fistulous opening.

63. Q. Why are fistulæ generally dilated?

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

64. 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.

65. Q. What is meant by epiphora?

A. By an epiphora is meant an accumulation of tears on the anterior part of the eye.

66. Q. What are the causes of epiphora?

A. An epiphora may be caused by a more copious secretion of tears than the puncta lachrymalia can absorb; and by an obstruction in the lachrymal canal.

67. Q. What are the symptoms of empyema?

A. The most pathognomonic symptom is hearing the fluid rattle upon shaking the person's chest; there is also a difficulty of lying on the opposite side, difficulty of breathing, and sometimes an enlargement of the side of the chest which contains the fluid.

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

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

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

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

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

A. Resolution, suppuration, and mortification.

71. 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.

72. 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.

73. 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 requires 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 be highly inflamed, it 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 in some instances 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 that for contused wounds.

74. Q. How is chordee accounted for?

A. In chordee, the inflammation having affected the corpus spongiosum as well as the urethra, it produces in it an extravasation of coagulable lymph, as in the adhesive inflammation, which, uniting the cells together, destroys the power of distention of the corpus spongiosum, and makes it unequal, in this respect, to the corpora cavernosa penis, and therefore a curvature takes place.

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

A. To prevent a high degree of inflammation, which often terminates in gangrene; 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 used, and the patient is to take bark, wine, and a nourishing diet.

76. Q. What are the terminations of erysipelas?

A. Resolution, gangrene, and suppuration.

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

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

78. 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.

79. Q. What is the general treatment of the hip-joint disease?

A. In the early part of the disease of the hip-joint, entire rest, the application of fomentations, and the employment of topical

bleeding, particularly cupping, are highly proper: this plan of treatment is to be adopted to reduce inflammation; when no inflammation is present, recourse should be had to blisters, or caustic issues.

80. Q. Where do surgeons generally recommend the application of a caustic issue to relieve an affection of the hip?

A. In the depression just behind and below the trochanter major.

81. 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.

82. 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.

83. 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.

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

A. Generally bad.

85. 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 be-

tween the liver, diaphragm, and lungs, and the abscess evacuating itself into the lungs. Thirdly, by adhesion taking place between the liver and alimentary canal, and the abscess making its way into the stomach or intestine. Fourthly, into the cavity of the abdomen.

86. 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.

87. Q. What symptoms will enable you to distinguish an enlarged prostate gland from stone in the bladder?

A. The symptoms attending a diseased prostate gland resemble those of stone in the bladder; but with this difference, that the motion of a coach or a horse does not increase the grievance when the prostate is affected, while it does so in an intolerable degree in cases of stone.

88. Q. Are the symptoms of calculus sufficient to convince a surgeon that there is a stone in the bladder?

A. No: the operation of sounding must be had recourse to, before a calculus can be ascertained to exist.

89. 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.

90. 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.

91. Q. What are granulations?

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

92. 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.

93. 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.

94. 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.

95. Q. What is meant by meliceris?

A. Meliceris is a tumour of the encysted kind; the contents of which resemble wax or honey.

96. Q. What is meant by condyloma?

A. Condylomata are tumours or excrescences about the anus.

97. Q. What is meant by couching?

A. Couching consists in removing the opaque lens out of the axis of vision by means of a peculiar-formed needle.

98. 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 imprac-

ticable, an artificial opening 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.

99. Q. What are exostoses?

A. They are tumours of bone formed upon bone.

100. 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.

101. Q. What is meant by sarcocele?

A. A scirrhous enlargement of the testicle.

102. 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 interstices of the muscles, and between the integuments: these abscesses are produced originally by inflammation. There are also other causes giving rise to fistulæ, as condylomatous tumours, &c.

103. 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.

104. Q. What are the symptoms of a cataract?

A. A cataract commences by a spot or speck in the pupil of the eye: it is most commonly of a gray or whitish colour. In

the commencement of the disease it occasions a weakness or imperfection of the sight, and it terminates sooner or later in the almost total extinction of vision.

105. Q. What is the treatment of a cataract?

A. The treatment of a cataract consists in bleeding, cupping, scarifications, setons, issues, blisters and fumigations; and the principal internal remedies are aperients, emetics, cathartics, sudorifics, cephalics, and sternutatories.

106. Q. In a transverse wound of the trachea how is re-union 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.

107. 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 thyroideal artery: the trunk of the carotid artery is seldom cut.

108. 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.

109. 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.

110. Q. What is the treatment of a carbuncle?

A. The treatment of a carbuncle is as follows. In the local treatment the grand thing is to make an early and free incision into the tumour, so as to allow the sloughs and matter to escape readily. As much of the matter as possible is to be at once pressed out, and then the part is to be covered with an emollient poultice. With respect to the constitutional treatment, bark and camphire are the internal medicines most commonly needed. Sulphuric acid may also be given, as well as wine and aromatics, and opium when the pain is very severe.

111. 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.

112. 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 canal;—and permanent stricture, which is caused by a partial narrowness, forming a ridge. There is also another kind of stricture, which depends upon a permanent contraction and an occasional spasmodic affection.

113. 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 downwards until it reaches the bulb of the urethra; when this has happened, the beak of the instrument has passed under the arch of the pubes; the handle of the instrument is then to be gradually brought forward 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.

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

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

115. Q. What kind of treatment do gun-shot wounds require?

A. In general, gun-shot wounds require the antiphlogistic plan of treatment.

116. Q. What is meant by a polypus?

A. A polypus is a kind of tumour, which is generally narrow where it originates, and then becomes wider, somewhat like a pear. Polypi are most commonly met with in the nose, uterus, vagina, and antrum of Highmore.

117. Q. In the cure of polypus, which is to be preferred, extirpation or ligature?

A. As the extraction of polypus is invariably attended with hæmorrhage, ligature is generally preferred.

118. 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.

119. Q. What is a bronchocele?

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

120. 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.

121. 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.

122. 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.

123. 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.

124. Q. What is meant by scrofula?

A. Scrofula is a disease of the glands, with a peculiar constitution of body.

125. Q. What is meant by sphacelus?

A. Sphacelus is a complete state of mortification.

126. Q. What is meant by a sinus?

A. A sinus is a long hollow track, leading from some abscess or diseased bone.

127. Q. What is rickets owing to?

A. Rickets seems to consist in a want of due firmness in the bones, in consequence of a deficiency of phosphate of lime in their structure.

128. 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.

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

A. I would 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.

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

A. To the catheter.

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

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

132. Q. What is meant by suppuration?

A. Suppuration signifies a process by which a peculiar fluid, termed pus, is formed in the substance, or from the surface, of parts of the body, when such parts are particularly circumstanced.

133. Q. What is meant by ranula?

A. By ranula is meant a tumour under the tongue, arising from an obstruction of the saliva in the ducts of the sublingual glands.

134. 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 ante-

rior 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.

135. 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.

136. 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 the use of cold, astringent, sedative applications, warm emollient poultices, and fomentation, according to its nature. If suppuration should commence, by giving tonics and cordials, a generous diet, and forwarding the process by poultices. If mortification should appear likely to ensue, bark, acids, and wine, will be proper, also stimulating poultices of beer-grounds, and fomentations with bitter decoctions and camphorated spirit.

137. 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.

138. Q. How many ways may the foot be dislocated?

A. The foot may be dislocated inwards or outwards, forwards or backwards.

139. Q. Why do dislocations of the foot inwards occur more frequently than dislocations outwards?

A. Dislocations of the foot inwards occur more frequently than outwards, from the malleolus internus not being so low as the malleolus externus.

140. Q. How are dislocations of the foot inwards or outwards to be reduced?

A. In accomplishing these luxations, it is best to relax the strong muscles of the calf by bending the leg on the thigh. The case is afterwards to be treated as a fracture of the leg.

141. 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 after the first week, until they come easily off.

142. Q. What is the treatment of a 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.

143. 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.

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

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

145. 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 are 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 inflammation 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.

146. Q. What is the situation of the protruded viscera in congenital hernia?

A. In congenital hernia the protruded viscera are situated in the tunica vaginalis in contact with the testicle; having descended into this position before the closure of the communication with the abdomen.

147. Q. In umbilical hernia, by what is the stricture formed when strangulation takes place?

A. In strangulated umbilical hernia the stricture is made by the tendinous opening in the linea alba.

148. 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.

149. 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.

150. Q. What is a steatoma?

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

151. Q. What is meant by atheroma?

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

152. Q. What is meant by tic douloureux?

A. Tic douloureux is a painful affection of the nerves, and mostly those of the face, particularly of the filaments of that branch of the fifth pair of nerves which comes out through the infra-orbitar foramen.

153. Q. What is the most efficacious plan to be adopted for the relief of the tic douloureux?

A. The most effectual plan is to cut down and divide the nerve above where the pain is seated.

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

A. If the operation to liberate strangulated hernia be 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.

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

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

156. 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.

157. 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.

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

A. In the treatment of venereal ophthalmy mercurial frictions are to be made use of, and 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 nitrico-oxydum.

159. Q. What is a thrombus?

A. A thrombus is a tumour formed by a collection of extravasated coagulated blood under the integuments after bleeding.

160. Q. What are the causes of a thrombus?

A. A thrombus sometimes depends on the vein being com-

pletely divided; but it more frequently depends on the opening of the vein not corresponding to that of the skin.

161. Q. Where is the blood effused in thrombus?

A. Thrombus is caused by the blood being effused into the cellular membrane, by the side of the vein.

162. 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.

163. 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 outwards; 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.

164. Q. Define a caries.

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

165. Q. Why does the tooth-ache produce so considerable a pain?

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

166. 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.

167. Q. How is cystocele distinguished from bubonocele?

A. Cystocele is always easily distinguishable by the regular diminution of the swelling whenever the patient makes water.

168. Q. What constitutes a phrenic hernia?

A. A phrenic hernia is constituted by the abdominal viscera occasionally protruding through the diaphragm, either through some of the natural apertures of this muscle, or deficiencies or lacerations in it.

169. Q. What is meant by hæmatocele scroti?

A. Hæmatocele is a tumour produced by blood being extravasated in the scrotum, 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.

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

A. In 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; and the patient becomes extremely irritable and delirious.

171. Q. What is a cataract?

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

172. Q. What is meant by mollities ossium?

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

173. Q. 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.

174. 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.

175. Q. What causes may give rise to abscesses of the psoas muscle?

A. The causes which give rise to abscesses of the psoas muscle are, excessive fatigue from walking, and then exposing the back to cold while the body is still warm with exercise. They may also be brought on by strains, attempting to raise great weights, or by twists when carrying a heavy load on the back.

176. Q. On the first attack of inflammation of the psoas muscle, what is to be done?

A. When inflammation has attacked the psoas muscle, the antiphlogistic plan is to be adopted; and bleeding, the warm bath, purgatives, &c. must be had recourse to.

177. 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.

178. 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.

179. 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 will be effected.

180. 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.

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

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

182. Q. In injuries of the gall-bladder or liver, what prognosis is to be given?

A. In wounds of the liver the prognosis is bad, by reason of

the great quantity of blood flowing through that viscus and the soft texture of the liver itself, which renders it very apt to pour out a great quantity of blood from a small wound. Injuries of the gall-bladder are still worse; as, in such cases, the bile is evacuated into the cavity of the abdomen, where its tendency to putrefaction soon produces the most fatal effects.

183. 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.

184. 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 an 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.

185. 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 red, and inflammatory fever takes place; as the pain abates, rigors 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.

186. Q. What is meant by hydrops articuli?

A. By hydrops articuli is meant a collection of serous fluid in the capsular ligament of a joint.

187. Q. How is a fracture of the neck of the humerus distinguished from a luxation?

A. When the neck of the humerus is fractured, a depression is observed at the superior extremity and external side of the arm: in luxation, downwards and inwards, of the head of the bone under the projection of the acromion, a deep depression is found in the part which the head of the humerus before occupied; whereas, in fracture of the neck of that bone, the shoulder retains its original form; the acromion does not project, and the depression is found below the point of the shoulder: besides, the unequal and fractured extremity of the bone will be easily felt; a crepitus may also be heard, by moving the arm in different directions.

188. 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 fetid sanious matter, it spreads with great rapidity, and in its progress produces frequent hæmorrhages.

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

A. Wounds of the œsophagus generally are mortal.

190. 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 adherin; to the skin and pectoral 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.

191. 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.

192. Q. What parts of the scapula are most commonly fractured?

A. The parts of the scapula most liable to fracture are, the acromion, inferior angle, neck, and coracoid process.

193. Q. What bad consequences may be apprehended from a fractured rib?

A. The bad consequences of a fractured rib may be, that a spicula may be driven inwards, it may lacerate the pleura, wound the lungs, and cause the dangerous train of symptoms attendant on emphysema.

194. 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.

195. 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.

196. 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. Hydrocele 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.

197. 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.

198. 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 incision may be cautiously made through the dura mater, to evacuate it.

199. Q. What is meant by a fissure of the cranium?

A. It is a partial fracture, in which the bone is, as it were, cracked only.

200. Q. How many kinds of dislocations of the patella are there?

A. The patella may be luxated outwards or inwards. The luxation outwards is most common, because the bone more easily slips in this direction off the outer condyle of the femur than inwardly.

201. Q. How may the tibia be luxated?

A. The tibia may be luxated forward, backward, or to either side.

202. 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.

203. 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.

204. Q. What is meant by exfoliation?

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

205. 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.

206. 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.

207. 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 re-union of the parts takes place.

208. Q. What is meant by simple fracture?

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

209. Q. How is a luxation of the tibia reduced?

A. A luxation of the tibia is most easily reduced by making gentle extension, and pushing the head in its proper place.

210. Q. What is meant by extravasation?

A. Extravasation is a term applied by surgeons to fluids which are out of their proper vessels or receptacles.

211. Q. What is meant by fistula lachrymalis?

A. Fistula lachrymalis is a disease arising from an obstruction in the ductus nasalis, and preventing the tears and mucus of the lachrymal parts of the eye from descending into the nose.

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

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

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

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

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

A. Strictures most commonly occur in 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 acceleratores urinæ.

215. Q. From whence does the discharge of gonorrhœa flow?

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

216. 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.

217. 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.

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

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

219. Q. What is meant by spina bifida?

A. Spina bifida is a disease attended with an incomplete state of some of the vertebræ, and a fluid swelling, which is most commonly situated over the lower lumbar vertebræ, sometimes over the dorsal and cervical ones, and in some instances over the os sacrum.

220. Q. What prognosis is to be given in spina bifida?

A. The prognosis in spina bifida is bad; whether the tumour is opened or not, death always follows.

221. Q. After the operation for lithotomy, what disease is sometimes brought on?

A. Peritonitis is the disease which is mostly brought on from the operation of lithotomy; and the majority of patients who die after lithotomy perish from peritoneal inflammation.

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

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

223. 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.

224. Q. What is meant by cicatrization?

A. Cicatrization is that process by which wounds and sores heal, or by which the formation of new skin takes place over a wound or ulcer.

225. 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 then to be brought together to unite by the first intention, and the scrotum is to be supported by the T bandage.

226. Q. What is meant by callus?

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

227. Q. What treatment should be adopted if inflammation of the peritonæum succeed the operation for lithotomy?

A. Copious venesection should be put in practice. At the same time eight or ten leeches should be applied to the hypogastric region. The belly should be fomented, and the bowels kept open with the oleum ricini. Together with the use of the warm bath, a blister on the lower part of the abdomen, and emollient glysters, are highly proper.

228. 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.

229. 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 portion may be driven inwards, so as to produce a solid junction of the broken bone.

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

A. Bronchotomy has been proposed in the croup, to extract the coagulable lymph that would have caused suffocation. To remove foreign bodies that become impacted in the trachea. It has also been recommended to be performed on those recently suffocated or drowned, and in glossitis, where the tongue has so enlarged as to shut up the passage through the fauces.

231. Q. What are the symptoms of stone in the urinary bladder?

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 occasionally charged with mucus, at other times limpid; sometimes it is tinged with blood, especially after violent exercise; but the most diagnostic sign is touching the stone with the sound.

232. Q. To what is prolapsus ani generally owing?

A. Prolapsus ani is mostly owing to a debility of the sphincter ani, and parts in its neighbourhood, which serve to support that intestine, and keep it in its proper place.

233. Q. What causes the water to stop suddenly, which occasionally happens in drawing off the fluid in ascites?

A. This occurrence generally takes place from a piece of omentum or intestine obstructing the canula, which may be removed by introducing a probe, or any other blunt instrument, into the canula.

234. 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 with the sound, a tremulous motion is communicated to the fingers of the operator.

235. Q. Why is the finger introduced into the rectum while sounding?

A. The finger is introduced into the rectum while 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.

236. Q. In trepanning, a slight bleeding generally 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.

237. 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 convulsed motions and spasmodic affections of the muscles, from compression of the nerves by the displaced bone.

238. Q. How would you endeavour to unite a 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.

239. Q. What is the most common cause of a suppression of urine?

A. The most common cause of a suppression of urine, when a primary disease, is a paralytic affection of the coats of the bladder.

240. Q. What are the causes of incontinence of urine?

A. Incontinence of urine may be induced, from irritation on the neck of the bladder by stones, from a paralysis of the sphincter of the bladder, and from laceration of the parts in the extraction of large stones.

241. 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 from 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.

242. 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.

243. Q. How is the glover's suture performed?

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

244. Q. For what is the glover's suture used?

A. The glover's suture is used for wounds of the abdomen and intestines.

245. Q. For what is the interrupted suture used?

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

PRACTICE OF PHYSIC.

1. Q. How many classes are there in the Cullenian arrangement of diseases?

A. There are four classes, viz. pyrexiæ—neuroses—cachexiæ—locales.

2. Q. How many orders are there in the class pyrexiæ?

A. There are five, viz. febres—phlegmasiæ—exanthemata—hæmorrhagiæ—profluvia.

3. Q. What are the divisions and genera in the order febres?

A. There are two divisions in the order febres, viz. intermittents and continued fevers. The genera of the intermittents are, quotidiana—tertiana—quartana. Those of the other division are, synocha—typhus—synochus.

4. Q. What are the genera of the order phlegmasiæ?

A. There are eighteen genera in this order, viz. phlogosis—ophthalmia—phrenitis—cynanche—pneumonia—carditis—peritonitis—gastritis—enteritis—hepatitis—splenitis—nephritis—cystitis—hysteritis—rheumatismus—odontalgia—podagra—arthropuosis.

5. Q. What are the eruptive fevers in the order exanthemata?

A. There are ten genera of eruptive diseases in the order exanthemata, viz. variola—varicella—rubeola—scarlatina—pestis—erysipelas—miliaria—urticaria—pemphigus—aphtha.

6. Q. How many genera has the order hæmorrhagiæ?

A. There are five genera in this order, viz. epistaxis—hæmoptysis—hæmatemesis—hæmorrhois—menorrhagia.

7. Q. What diseases belong to the order profluvia?

A. Catarrhus and dysenteria.

8. Q. How many orders are there in the class neuroses?

A. Four: comata—adynamiæ—spasmi—vesaniæ.

9. Q. What genera belong to the order comata?

A. There are only two in this order, viz. apoplexia and paralysis.

10. Q. What are the diseases belonging to the order adynamiæ?

A. Syncope—dyspepsia—hypochondriasis—chlorosis.

11. Q. What diseases belong to the order spasmi?

A. Tetanus—trismus—convulsio—chorea—raphania—epilepsia—palpitatio—asthma—dyspnœa—pertussis—pyrosis—colica—cholera—diarrhœa—diabetes—hysteria—hydrophobia; making seventeen in all.

12. Q. How many genera are there in the order vesaniæ?

A. There are four genera in this order, viz. amentia—melancholia—mania—oneirodynia.

13. Q. How many orders has the class cachexiæ?

A. Three; viz. marcores—intumescentiæ—impetigines.

14. Q. What genera belong to marcores?

A. The genera of marcores are tabes and atrophia.

15. Q. What diseases belong to the order intumescentiæ?

A. There are thirteen diseases that belong to this order, viz. polysarcia—pneumatosis—tympanites—physometra—anasarca—hydrocephalus—hydrorachitis—hydrothorax—ascites—hydrometra—hydrocele—physconia—rachitis.

16. Q. What are the genera in the order impetigines?

A. They are: scrofula—syphilis—scorbutus—elephantiasis—lepra—frambesia—trichoma—icterus.

17. Q. What are the orders of the class locales?

A. Locales comprehends eight orders: dysæsthesia—dys-

orexiæ — dyscinesiæ — apocenoses — epischeses — tumores — ectopiæ — dialysis.

18. Q. What do you understand by inflammation?

A. By inflammation is understood that state of a part in which it is painful, hotter, redder, and more turgid than it naturally is. These local symptoms, when present in any great degree, or when they affect very sensible parts, are attended with fever.

19. Q. How many kinds of inflammation are there?

A. There are two kinds of inflammations; viz. the phlegmonoid and the erysipelatous; each of which is divided into the acute or active, and the chronic or passive.

20. Q. How do you distinguish phlegmonoid from erysipelatous inflammation?

A. Phlegmonoid inflammation may be distinguished by the tumefaction being circumscribed, and not diffused, as in erysipelatous inflammation. The redness of phlegmon does not disappear on pressure, as in erysipelas; nor is the sense of throbbing and darting pain so observable in erysipelas as in phlegmon.

21. Q. How would you distinguish chronic from acute inflammation?

A. Chronic inflammation may be distinguished from acute by its long continuance, the want of activity in the symptoms, and by the fever having abated, or assumed a new type.

22. Q. What treatment does active inflammation require?

A. Active inflammation requires powerful antiphlogistic measures; as blood-letting, purging, diaphoretics, and a low diet.

23. Q. Does active erysipelas give way to the same plan?

A. Active erysipelas in the country generally gives way to the same kind of treatment; but the erysipelas of large towns,

being accompanied by typhus fever, soon requires bark, acids, wine, &c.

24. Q. What is the proper regimen and diet of inflammatory diseases called?

A. The proper regimen and diet of inflammatory diseases is called antiphlogistic.

25. Q. What foods and drink do you consider antiphlogistic?

A. The foods and drink which may be considered as antiphlogistic are, all kinds of vegetables, especially the farinaceous, light puddings, barley-water, toast and water, &c.

26. Q. Which are the best antiphlogistic purgatives?

A. The best are those which are refrigeratory, such as the sulphate of soda, the sulphate of magnesia, the sulphate of potass, and the supertartrate of potass.

27. Q. What is meant by inflammatory diathesis?

A. By inflammatory diathesis is meant a state of body that favours and attends inflammatory diseases, such as a redundancy of blood, an increased action of the heart and arteries, a fulness of habit, &c.

28. Q. What kind of urine is made when active inflammation exists?

A. When active inflammation exists, the urine voided is of a high colour; and, when allowed to stand, deposits the lateritious or brickdust-like sediment.

29. Q. What is the composition of the lateritious sediment?

A. The lateritious sediment is found to consist of uric acid, with phosphate of lime.

30. Q. What character has the pulse when inflammation is going on?

A. The pulse, when inflammation is going on, is frequent, strong, and hard.

31. Q. What kind of delirium is most frequent in typhus fevers?

A. The delirium most frequent in typhus is not of the violent kind, and is marked by low muttering, accompanied with stupidity.

32. Q. Is bleeding recommended in the cure of typhoid fevers?

A. Bleeding is not recommended in typhus fevers, because it would weaken the energy of the powers necessary to life, the actions of which are already weaker than they ought to be.

33. Q. How many species of typhus fevers are there?

A. There are four species of typhus fevers; 1st, typhus nervosus, or nervous fever; 2d, typhus mitior, the low fever, or mild form of typhus; 3d, the typhus gravior, the severe species of typhus fever, or putrid fever; 4th, the typhus icterodes, or typhus with symptoms of jaundice.

34. Q. What is the most common cause of typhus fevers?

A. Contagion, a poison generated from putrid animal and vegetable substances; by the human body under the disease; by confined animal secretions, and other sources.

35. Q. What are the symptoms of trismus?

A. When trismus comes on gradually, the symptoms are —a slight stiffness is at first perceived at the back part of the neck, which, after a short time, becomes considerably increased, and at length renders the motion of the head both difficult and painful. With the rigidity of the head, there is likewise an uneasy sensation at the root of the tongue, together with some difficulty in swallowing; and a great tightness is perceived about the chest, with a pain at the sternum, shooting into the back; a stiffness next takes place about the jaws, which increases

to such a height, that the teeth become closed together, and the disease trismus or locked-jaw is formed.

36. Q. To what diseases are muscles subject?

A. Muscles are subject to morbid contraction, which may be either spasmodic, or permanent; they are liable to inflammation, to have abscesses form in them, to become gangrenous, to become flaccid, to be diminished in bulk, to have bony matter deposited in their substance, and to rheumatism.

37. Q. What is a cramp or spasm?

A. A spasm or cramp is an involuntary contraction of the muscular fibres, or that state of the contraction of muscles which is not spontaneously disposed to alternate with relaxation.

38. Q. What is the office of the liver?

A. The office of the liver is to supply a fluid called bile to the intestines, which is of the utmost importance in chylification.

39. Q. What are the characters of healthy bile?

A. Healthy bile is of a yellow-green colour, of a plastic consistence, like thin oil, and when very much agitated it froths like soap and water; its smell is somewhat like musk, and its taste is bitter.

40. Q. What are its uses?

A. The uses of bile are, 1st, to extricate the chyle from the chyme; 2d, by its acridity it excites the action of the intestines; 3d, it imparts a yellow colour to the fæces; 4th, it prevents the abundance of mucus, and acidity in the primæ viæ.

41. Q. Does bile ever get into the blood?

A. Yes: bile gets into the blood when its regular course is interrupted, as in jaundice, diseased liver, &c.

42. Q. How does it get into it?

A. Bile gets into the blood through the medium of the absorbents, which remove it from the bile-ducts that are preter-

naturally distended, and convey it into the blood by means of the thoracic duct.

43. Q. What is the most common way in which the bile is prevented passing, as it ought to do, out of the ducts into the duodenum?

A. The most common way in which bile is prevented passing through its ducts into the duodenum, is from an obstruction in the ductus communis choledochus.

44. Q. In what way may the ductus communis choledochus be obstructed?

A. The ductus communis may be obstructed by spasm, by a calculus, by mucus from the duodenum, and by the pressure of adjacent tumours.

45. Q. How do you know when the bile is vitiated or unhealthy?

A. The stomach does not perform its function properly, the intestines are irritated, and the fæces are not of their healthy colour.

46. Q. Does a vitiated bile influence the formation of the blood?

A. Yes:—vitiated bile impairs digestion; the chyle is not properly separated from the chyme, or that which is separated is of a diseased quality; and when formed into blood, the blood is of an unhealthy nature, and improper for nutrition.

47. Q. What are the unhealthy appearances of the blood that you are acquainted with?

A. The unhealthy appearances of the blood that are usually met with are, an excess of crassamentum, an excess of coagulable lymph in the crassamentum, which shows itself by the white coriaceous crust on the surface; a loose flabby cruor; an excess of serum; a yellow serum.

48. Q. When too much coagulable lymph exists in the cruor, how does it affect the solids?

A. When there is too much coagulable lymph in the cruor, the solids are firmer than they should be, and there is a predisposition in the system to inflammatory diseases.

49. Q. When the crassamentum is loose, and the serum in excess, how are the solids influenced?

A. The solids are loose and flabby, and there is a tendency to dropsy.

50. Q. What do you understand by excitement?

A. Excitement is the property by which animals may be affected by external agents, as well as by certain powers peculiar to themselves, in such a manner, that the phenomena peculiar to the living state can be produced.

51. Q. In the commencement of fevers, when there is no diminution of vital energy, what means are the most likely to stop their progress?

A. The means most likely to stop their progress, under such circumstances, are, an emetic, combined with a cathartic and blood-letting.

52. Q. What are the most proper remedies to check febrile action at the very commencement, when there is an evident diminution of vital power?

A. When there is an evident diminution of vital powers at the commencement of febrile action, a cordial diaphoretic, as the compound powder of ipecacuanha, spirit of sulphuric and nitric ether, are found the most successful.

53. Q. What do you mean by a tetanus?

A. It is a tonic spasm of several muscles of the body.

54. 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 exhibitions of purges, and by giving saline diaphoretics with mucilaginous drinks.

55. 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 mucous or sanguineous motions.

56. 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.

57. 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.

58. 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 micturition, dysuria.

59. 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.

60. Q. What purges would you give in nephritis?

A. Oleaginous purges and frequent emollient clysters.

61. 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.

62. 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 micturition, and by the painful discharge of urine in small quantities, or the complete obstruction to its passage.

63. 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 susceptible.

64. 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 head becomes extremely acute, and intermits, occasioning the patient to scream violently; disturbed sleep, extreme restlessness, flushed countenance, costiveness, vomiting, stupor, convulsions, dilated pupils.

65. 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.

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

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

67. Q. What is the best way of destroying the fetid smell of sick wards?

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

68. Q. What is meant by scrofula?

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

69. 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.

70. 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.

71. Q. How is a diarrhœa distinguished from dysentery?

A. Diarrhœa is distinguished from dysentery by being unattended either with fever, inflammation, 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, sanguineous, or putrid.

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

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

73. Q. How is mania distinguished from phrenitis?

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

74. 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.

75. 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.

76. 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.

77. 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; 2d, 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.

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

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

79. Q. What are the species of apoplexy?

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

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

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

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

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

82. Q. What are the species of syncope?

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

83. 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.

84. 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.

85. 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.

86. 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 dyspepsia; by its occurring at any period of life, whereas gout is usually confined to the adult age.

87. Q. How is tympanites distinguished from ascites?

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

MATERIA MEDICA.

1. Q. WHERE does ammoniacum come from?

A. Ammoniacum comes from the East Indies; the plant which affords this substance is also said to grow in Nubia, Abyssinia, and the interior of Egypt.

2. Q. What are the virtues of ammoniacum?

A. The virtues of ammoniacum are stimulant, antispasmodic, and expectorant; its dose is from ten to thirty grains. Externally applied, it is supposed to soften and ripen hard tumours.

3. Q. How many species of cinchona or Peruvian barks are there?

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

4. Q. What are the virtues of cinchona bark?

A. Tonic, antiseptic, and stomachic.

5. Q. What are the virtues of opium?

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

6. Q. What is the dose of digitalis?

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

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

A. Aloes.

8. Q. What are the virtues of aloes?

A. Cathartic, emmenagogue, and anthelmintic.

9. Q. What do you mean by cathartics?

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

10. Q. What do you mean by emmanagogues?

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.

11. Q. What are diaphoretics?

A. They are medicines which augment the insensible perspiration.

12. Q. What are diuretics?

A. Those medicines which increase the secretion of urine.

13. Q. What quantity of confectio opii of the London Pharmacopœia contains one grain of opium?

A. About six-and-thirty grains.

14. Q. What is meant by antispasmodics?

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

15. 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.

16. Q. What are the diseases in which arnica flowers have been exhibited?

A. Arnica flowers are given on the Continent, but seldom in this country, in paralytic diseases, retention of the urine, amaurosis; in putrid diseases, in typhoid inflammations; in dysentery and diarrhœa, and to promote the uterine discharge.

17. Q. What are the virtues of arum?

A. Arum is given as a stimulant, in cachectic cases supposed to arise from an accumulation of phlegm, and in some rheumatic

affections, in the dose of ten or fifteen grains three times a day, in the form of bolus.

18. Q. What is meant by sialogogues?

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

19. Q. What are tonics?

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

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

A. From five grains to half a drachm.

21. Q. In a fluid ounce of the liquor antimonii tartarisati how much antimonium tartarisatum is contained?

A. Two grains.

22. Q. What quantity of mercury is contained in three grains of the pilula hydrargyri?

A. One grain.

23. 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.

24. 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.

25. Q. What are expectorants?

A. Such medicines as promote the secretion from the lungs.

26. Q. What are stimulants?

A. Those medicines which increase the action of the nervous and vascular system.

27. Q. What medicines come under the class of tonics?

A. Peruvian bark; quassia; camomile; gentian; oak bark; calumba; 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.

28. Q. How much mercury is contained in two drachms of the unguentum hydrargyri fortius?

A. One drachm.

29. Q. In ten grains of the pulvis ipecacuanhæ compositus how much opium is contained?

A. One grain.

30. Q. What is the dose of the oxidum hydrargyri rubrum?

A. From half a grain to two grains.

31. 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.

32. Q. What is meant by antiseptics?

A. Those medicines which are capable of resisting a tendency to putrefaction.

33. Q. What are the substances that come under the class of antiseptics?

A. All the acids; Peruvian bark; quassia; calumba; wormwood; southernwood; alkohol; æther; wine; seneka root; opium; camphor.

34. Q. What is meant by anthelmintics?

A. Such substances as have the power of destroying worms.

35. Q. Enumerate the principal anthelmintics.

A. Worm-seed; tin-filings; assafœtida; tansy; Indian pink; male fern; tobacco; cowitch; cabbage-tree bark; savine; aloes; camboge; hedge-hyssop; jalap; castor oil; almond oil; and most of the cathartics.

36. Q. In what part of the root of the polygala senega does the active part reside?

A. The active part of the root of the polygala senega resides in the bark.

37. Q. From what part of the world do we obtain the polygala senega?

A. The polygala senega grows wild in North America.

38. Q. What is the name of the plant that affords the radix bistorta?

A. Polygonum bistorta.

39. 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.

40. Q. What are astringents?

A. They are medicines which have the power of constringing the animal fibre.

41. 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.

42. 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 Sancti Viti.

43. 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.

44. 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.

45. 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.

46. Q. What are the virtues of myrrh?

A. Myrrh is given internally as a stimulant; it occasions a mild diaphoresis, and promotes the fluid secretions in general: it proves serviceable in cachectic diseases, arising from inactivity of the system; it acts also on the uterine system, and resists putrefaction.

47. Q. What is the systematic name of the tree that affords the chian turpentine?

A. It is called pistachia terebinthus, and it grows abundantly in the islands of Chios and Cyprus.

48. 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.

49. Q. What are the virtues of the acetas potassæ?

A. It is given as a diuretic and purgative from ten grains to three drachms.

50. Q. What are the virtues of the tartras potassæ?

A. It is given as a purgative from a scruple to three drachms.

51. Q. What are the virtues of the pulvis antimonialis?

A. It is given as an alterative and diaphoretic from three grains to fifteen.

52. Q. What is the dose of the oxy-murias hydrargyri?

A. From the sixteenth part of a grain to half a grain.

53. Q. What are styptics?

A. They are medicines which possess a power of stopping hæmorrhages.

54. 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.

55. 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 collection of serum between the cuticle and cutis.

56. Q. 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.

57. Q. What are the virtues of juniper oil?

A. Juniper oil is given internally as a stimulant, carminative, diaphoretic, and diuretic.

58. Q. What are the virtues of gum acacia?

A. Gum acacia is exhibited internally as a mucilaginous demulcent. It is very nutritious, and is employed in diarrhœa, dysentery, chincough, hoarseness, strangury, &c. It is also used to give form to some remedies, and correct the acrimony of others.

59. Q. What is the medical use of elaterium?

A. Elaterium, in a few grains, operates as a drastic cathartic, and emetic, and is extremely useful in dropsy of the chest and belly.

60. Q. What is scammony?

A. A concrete gummi-resinous juice, of a light gray colour, and rather an unpleasant smell and bitterish sub-acid taste, brought from Aleppo and Smyrna. It exudes from the cut root of the convolvulus scammonia.

61. 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.

62. Q. What is ipecacuanha?

A. A small root wrinkled and contorted, of a grayish or ash colour, of a bitter sub-acid taste, and very little smell, the produce of the Callicocca ipecacuanha, growing in South America.

63. Q. What is camphor?

A. A substance which is white and pellucid, 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.

64. 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.

65. Q. Does the papaver somniferum afford any other officinal preparations besides opium?

A. There are two preparations made from the capsules of the white poppy, besides opium, viz. the syrupus papaveris, and the extractum papaveris.

66. Q. What are the officinal preparations of opium?

A. The preparations of opium are, the pilula saponis cum opio, pulvis opiatus, tinctura opii, tinctura camphoræ composita, pulvis ipecacuanhæ compositus, confectio opii, and the pulvis cretæ compositus.

67. Q. What animal affords castor, and what part of the animal does it form?

A. The animal that affords this substance is the castor fiber, 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.

68. Q. What is quassia?

A. A wood afforded by the Quassia excelsa, which grows abundantly at Surinam.

69. Q. What plant affords the jalap root?

A. The Convolvulus jalapa, which grows in South America.

70. Q. From whence do we obtain cetaceum?

A. From the head of the Physeter macrocephalus, a species of whale that inhabits the northern seas.

71. Q. What are the virtues of linseed, and what plant affords them?

A. The virtues of linseed are emollient and demulcent; they are used in cataplasms. The infusion is much given as a pectoral drink, in ardor urinæ and nephritic pains. The plant that affords these seeds is called Linum usitatissimum.

CHEMISTRY AND PHARMACY.

1. Q. WHAT is meant by effervescence?

A. Effervescence is the escape of a gas which is separated during the action of bodies on each other.

2. Q. How is distillation performed?

A. Distillation is performed in three ways:—1st, per ascensum; 2d, per descensum; 3d, per latus.

3. 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.

4. Q. What is the composition of the vinegar of commerce?

A. The vinegar of commerce contains, besides the pure acetic acid, a quantity of water, tartaric acid, tartrate of potass, mucilaginous matters, and sometimes phosphoric acid.

5. Q. How do we get alkohol?

A. Alkohol is produced from wine and vegetable infusions that have undergone the spirituous fermentation, by distillation.

6. Q. What is meant by solution?

A. Solution is the diminution of the aggregation of a solid, so as to cause it to lose the solid form, and to enter into chemical combination with a fluid.

7. 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, and then straining off.

8. Q. What is meant by precipitation?

A. That process by which a solid is obtained from a solution.

9. Q. What substances are generally used to deprive rectified spirit of its water?

A. The sub-carbonate of potash has been used; but muriate of lime is thought preferable, because its affinity for water is not only very great, but, by being soluble in alkohol, it comes in contact with every particle of the fluid.

10. Q. In what respects does crystallization differ from precipitation?

A. Only that the particles in the solvend, on separating from the solution, assume certain determinate arrangements.

11. Q. To what is the transparency of crystals owing?

A. To a quantity of water that they hold, which is called water of crystallization.

12. Q. When crystals part with their water of crystallization, what are they said to do?

A. To effloresce.

13. 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.

14. 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.

15. Q. What is the difference between attraction 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.

16. Q. What is the result of a chemical combination?

A. A new substance is formed, in which the particles combined have assumed new properties.

17. Q. When a compound is resolved into its constituent parts, what process is it said to have undergone?

A. The process of analysis.

18. Q. How is the analysis of compounds effected?

A. Either by the power of heat, or by the power of a superior affinity.

19. Q. Which is heaviest, platinum or gold?

A. Platinum is the heaviest.

20. Q. What gives the peculiar character to mineral waters?

A. Mineral waters derive their peculiarity of character in general, either from containing carbonic acid or soda not neutralized, sulphuretted hydrogen, purging salts, earthy salts, or iron, or from the temperature exceeding in a greater or less degree that of the atmosphere.

21. Q. What is meant by synthesis?

A. The formation of a compound (possessing new properties) by the combination of two or more simple substances.

22. Q. What is caloric?

A. A substance, the evolution of which produces the sensation of heat.

23. Q. What are the general effects of caloric upon substances?

A. 1st, Substances are expanded, and thus increase in bulk by their combination with caloric (excepting alumina, which is contracted). 2d, It is the cause of fluidity. 3d, It produces vaporization. 4th, It effects ignition; and its combination with some substances is said to be the cause of their elasticity.

24. Q. What is oxygen?

A. The acidifying principle; a peculiar gas, colourless, invisible, and elastic: it supports life and flame.

25. Q. When oxygen enters into combination, what are the classes of compounds that it forms?

A. Two classes; viz. oxides and acids.

26. Q. What is an oxide?

A. A metal, or a combustible, combined with oxygen, that does not possess acid properties.

27. 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 twelve times lighter than common air.

28. Q. What are the compounds of hydrogen?

A. Sulphurated, phosphorated, and carbonated hydrogen gas.

29. Q. What are the purging salts usually contained in mineral waters?

A. The purging salts usually found in mineral waters are, muriate of magnesia, of soda, of lime, and the sulphats of soda and magnesia.

30. Q. To what is the sparkling of mineral waters owing?

A. It is owing to the carbonic acid which they contain.

31. Q. What is the composition of water?

A. Oxygen and hydrogen in chemical combination.

32. 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.

33. Q. What is nitrogen?

A. An elastic, invisible gas, exceedingly irrespirable, and which extinguishes flame.

34. 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 oxides and one acid, viz. nitrous oxide, or gaseous oxide of azot; nitric oxide, which possesses a greater proportion of oxygen than the preceding; and nitric acid, which is fully saturated with oxygen.

35. Q. What are the component parts of atmospheric air?

A. Atmospheric air is chiefly composed of oxygen, nitrogen, and carbonic acid.

36. Q. How is a combination of a combustible with a metal or an earth designated?

A. The combustible is terminated by the syllable *uret*, but the metal or earth retains its original name: for example, if sulphur and lime were combined, it would be called sulph*uret* of lime; phosphorus and iron, phosph*uret* of iron; and so forth.

37. Q. What is phosphorus?

A. A very inflammable substance, of a white semi-transparent colour, and of the consistency of wax.

38. Q. What are the compounds of phosphorus?

A. It combines with certain combustibles, earths, and metals, forming phosphurets; it forms an oxide, and two acids, viz. the phosphorous acid and the phosphoric acid.

39. Q. In what does pure carbon exist?

A. The diamond is pure carbon.

40. Q. What is charcoal?

A. An oxide of carbon.

41. Q. What are the other compounds of carbon?

A. Gaseous carbonic oxide, carbonic gas, and the carburetted hydrogen gas.

42. 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 the double soda water.

43. Q. What is sulphur?

A. A simple inflammable substance.

44. 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, mixed with gypsum and limestone: it is also thrown out from volcanoes, and it is found combined

with several metals: sulphur likewise exists both in the vegetable and animal kingdoms.

45. Q. What are the preparations of sulphur directed to be made use of by the London Pharmacopœia?

A. Sulphur lotum, sulphur præcipitatum, oleum sulphuratum, and sulphuretum potassæ.

46. Q. How is the sulphur præcipitatum made?

A. By boiling quick lime, sulphur, and water, together for a certain time; filtering the solution, and adding muriatic acid in order to throw down the sulphur, which is separated and washed.

47. Q. To what is the pale colour of sulphur præcipitatum owing?

A. The pale colour of the sulphur præcipitatum is said by some to be owing to its more minute division; but by Dr. Thomson it is supposed to be caused by its containing a little water.

48. Q. When subcarbonate of potash is made to unite with sulphur by means of fusion, what takes place?

A. When this combination takes place, the carbonic acid is expelled.

49. 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 sulphur is precipitated.

50. 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.

51. Q. What combinations does sulphur form with oxygen?

A. It forms an oxide, the sulphureous acid, and the sulphuric acid.

52. Q. Are there any other compounds of sulphur?

A. Yes; it combines with hydrogen, phosphorus, the metals, the earths, and alkalis.

53. Q. What are acids?

A. They are substances of a sour taste, possessing a power of changing vegetable blues to red, and of combining with earths, metals, and alkalis.

54. 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 the acidifying principle.

55. 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, sulphur*eous* acid. When an acid has an excess of oxygen, it is called oxygenated, and hyper-oxygenated.

56. Q. What are the acids employed medicinally?

A. The acetic, tartaric, citric, benzoic, carbonic, boracic, muriatic, nitric, sulphuric, phosphoric, succinic.

57. Q. How is benzoic acid made?

A. A quantity of gum benzoin and lime is 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.

58. 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 muriate of lime remains in the solution.

59. 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 to be 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.

60. 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.

61. Q. How is the strength of muriatic acid ascertained?

A. Half an ounce of limestone should be dissolved in a fluid-ounce of muriatic acid.

62. Q. What salt is taken into the stomach when the common saline draught is given?

A. The citrate of potash.

63. Q. In what respects do the nitric and nitrous acids differ?

A. The nitrous acid holds in solution a quantity of nitric oxide, 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 oxide.

64. 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 muriate 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.

65. Q. In the formation of muriatic acid, what are the decompositions and combinations?

A. The muriate of soda is decomposed by the sulphuric acid, which combines with the soda: the muriatic acid, thus let loose in the state of gas, is dissolved by the water.

66. Q. What salt remains after the distillation of muriatic acid?

A. The residuum in the retort consists principally of sulphate of soda.

67. Q. In what state does muriatic acid deprived of water exist?

A. When muriatic acid is deprived of water, it exists in the state of gas.

68. Q. Does nitric acid absorb humidity, or not?

A. Nitric acid has a great affinity for humidity, for it attracts the water from the atmosphere.

69. Q. What vapour is used by the French chemists to destroy contagion?

A. The vapour of the oxymuriatic acid.

70. 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.

71. Q. In making nitric acid, what takes place?

A. The sulphuric acid combines with the potash of the nitrate of potass, forming sulphat of potash, and the nitric acid is distilled over.

72. Q. How is boracic acid obtained?

A. By adding sulphuric acid to a hot solution of borax; this combines with the soda of the borax, forming sulphat of soda, and the boracic acid is crystallized upon the solution cooling.

73. Q. How is the oxymuriatic acid obtained?

A. It is obtained from a mixture of muriate of soda, black oxide 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 oxide of manganese, and is converted into oxymuriatic acid.

74. Q. Why is the oxymuriatic 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.

75. 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.

76. Q. What is the composition of nitric acid?

A. Oxygen and nitrogen.

77. Q. What are the properties of phosphorous acid?

A. Phosphorous acid is a white fluid of an oily appearance; it has a fetid odour and disagreeable taste; it gives out a thick white smoke and vivid flame, when strongly heated; and it is decomposed by ignited charcoal.

78. Q. What compound of phosphoric acid is used in medicine?

A. The officinal preparation of phosphoric acid is phosphate of soda, or the combination of phosphoric acid and soda.

79. Q. What is the composition of phosphoric acid?

A. Phosphorus and oxygen.

80. Q. In what state do we obtain hyper-oxymuriatic acid?

A. Combined with an alkaline base; as forming the hyper-oxymuriate of potash. This is the only state in which it exists.

81. 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 oxide of carbon, is deposited.

82. Q. What are the acids that have not hitherto been decomposed?

A. The muriatic acid, the fluoric acid, and the boracic acid.

83. Q. What is the composition of the vegetable acids?

A. Varied proportions of carbon and hydrogen acidified by oxygen.

84. Q. What are alkalis?

A. They are substances that possess an acrid taste, and a urinous

smell; they convert most vegetable blues to a green, and they render oils miscible with water.

85. Q. What is the composition of the alkalis?

A. A metal and oxygen.

86. 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 the atmosphere to change its state of aggregation.

87. 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.

88. 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.

89. 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 sulphat of potash, muriate of potash, with a quantity of earthy impurities.

90. 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.

91. 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-carbonas potassæ, carbonas potassæ, liquor sub-carbonatis potassæ, liquor potassæ, potassa fusa, potassa cum calce.

92. Q. What are the nitrates used in medicine?

A. The nitrates used in medicine are the nitrate of potash and the nitrate of silver.

93. Q. How are the carbonates known?

A. They are decomposed by all the acids, producing an effervescence, and they preserve their alkaline properties in some degree.

94. Q. What carbonates are used in medicine?

A. The carbonates used in medicine are, carbonate of barytes, carbonate of lime, of magnesia, of potash, of soda, of ammonia, of zinc, and of iron.

95. 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.

96. Q. How is the liquor potassæ made?

A. By putting together sub-carbonate of potash, quick lime, and hot water, suffering them to remain a length of time, then filtering.

97. Q. Why is the lime added?

A. To abstract the carbonic acid from the sub-carbonate of potash.

98. Q. What is the composition of cremor tartari?

A. It is a super-tartrate of potash; that is, potass combined with an excess of tartaric acid.

99. 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.

100. 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.

101. Q. How is the perfect carbonate of potash formed?

A. By adding carbonate of ammonia to sub-carbonate of potash dissolved in water. This solution 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.

102. 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.

103. Q. What remains in the retort after the distillation of nitric acid?

A. A super-sulphat of potash.

104. Q. What is the character of the acetates?

A. Acetates are very soluble in water, are decomposed by heat, by exposure to air, and by the stronger acids.

105. Q. What acetates are used in medicine?

A. There are four acetates used in medicine; viz. acetate of potass, of lead, of zinc, and of mercury.

106. Q. What is the composition of nitre crystals?

A. Nitric acid, potash, and water.

107. 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.

108. 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.

109. 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.

110. 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 Salsola kali.

111. 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.

112. 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.

113. Q. What salt remains after the distillation of muriatic acid?

A. Sulphat of soda, which is directed to be reserved and prepared for use.

114. Q. What is the composition of common table salt?

A. It consists principally of muriatic acid and soda.

115. Q. Why does it deliquesce?

A. Because it contains a little muriate of magnesia.

116. 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.

117. Q. What is the composition of ammonia?

A. Hydrogen and nitrogen: but Sir Humphry Davy has made it appear to be a compound of a metal, which he has named ammonium.

118. 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.

119. Q. How is the formation of carbonate of ammonia effected?

A. By sublimation, from a mixture of dried prepared chalk and muriate of ammonia; a double decomposition takes place; the lime of the prepared chalk combines with the muriatic acid, forming muriate of lime, while the carbonic acid, the other constituent of the chalk, combines with the ammonia, and forms carbonate of ammonia, which is sublimed.

120. Q. Is this a perfect carbonate?

A. No; it is a sub-carbonate: the carbonate of ammonia is void of smell.

121. Q. How is the liquor ammoniæ made?

A. By abstracting the muriatic acid of muriate of ammonia by means of lime, and causing the ammoniacal gas to be absorbed by water.

122. Q. How is the liquor ammoniæ acetatis made?

A. By saturating acetic acid with sub-carbonate of ammonia.

123. 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.

124. Q. How many earths are at present known to chemists?

A. Nine; viz. silex, argil, magnesia, lime, barytes, strontian, zircon, glucine, and yttria.

125. 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.

126. Q. What substances afford argil?

A. It exists in many fossils, and forms the basis of common clay.

127. 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.

128. Q. Is argil ever found pure in nature, or used in medicine in its pure state?

A. No.

129. Q. What substances afford gallic acid?

A. Gallic acid is afforded by nut-galls and most astringent substances.

130. 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.

131. Q. What is the composition of alumen?

A. Sulphuric acid in excess, alumina, a small portion of potash, and often ammonia.

132. 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.

133. 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.

134. 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.

135. Q. What preparations of magnesia does the College direct to be used?

A. The carbonas magnesiæ and the sulphas magnesiæ, and magnesia.

136. 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 deprive it entirely of the sulphat of potash; it is afterwards dried.

137. Q. What takes place 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.

138. 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.

139. Q. Which is lightest, the carbonas magnesiæ, or magnesia?

A. Magnesia.

140. Q. How is sulphat of magnesia obtained?

A. It used to be made 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.

141. Q. What are the sources of lime?

A. It is a constituent of chalk-stone, lime-stone, 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.

142. Q. What preparations of lime do the London College direct to be kept?

A. Calx, liquor calcis, creta præparata.

143. 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.

144. Q. Is this pure lime which remains?

A. Sufficiently pure for medical purposes, but not for chemical.

145. 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.

146. 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.

147. Q. Are all the metals opaque?

A. Yes, all except gold-leaf, which, when beat extremely thin, transmits green light.

148. 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.

149. Q. What is the cause of expansion in metals?

A. Caloric, which is supposed to cause the metallic particles to assume greater distances.

150. Q. Do metals conduct caloric?

A. Yes: they are the best conductors of that principle.

151. Q. Do metals differ much in fusibility?

A. Yes. Mercury melts at a very low temperature, even

the coldest atmosphere; on the contrary, platinum requires the most intense heat for its fusion.

152. Q. Are these the chief properties of metals?

A. Yes, excepting that they are the best electrical conductors, and generate galvanism by contact.

153. Q. When a metal combines with oxygen, what change has it undergone?

A. It has become oxydized, and the compound formed is called an oxide.

154. 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.

155. 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.

156. 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.

157. Q. Enumerate the metals.

A. Gold, platinum, silver, mercury, copper, iron, tin, lead, nickel, zinc, bismuth, antimony, tellurium, arsenic, cobalt, manganese, tungsten, molybdenum, uranium, titanium, chromium.

158. Q. What are the metals that are used in medicine?

A. Silver, mercury, copper, iron, tin, lead, zinc, bismuth, arsenic, antimony.

159. Q. In what state is silver found in nature?

A. Native and mineralized.

160. 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.

161. 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.

162. 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.

163. 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 sulphuretum hydrargyri rubrum.

164. 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 muriate of soda, and sublimed: the order of affinities is now changed; the muriatic acid combines with the

oxide of mercury, forming an oxy-muriate of mercury, which is sublimed, and the sulphuric acid combines with the soda, forming sulphat of soda, which is not sublimed.

165. Q. In what state of oxidizement does the mercury exist in this preparation?

A. In the state of red oxide.

166. Q. How is the hydrargyrus cum creta made?

A. By rubbing creta and mercury together, until the globules of the mercury disappear.

167. Q. What is the composition of this preparation?

A. It is composed of an oxide of mercury combined with carbonate of lime.

168. Q. How is the submurias hydrargyri made?

A. A quantity of oxy-muriate 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.

169. Q. What is the use of the purified mercury in this preparation?

A. It abstracts from the oxy-muriate of mercury a portion of its oxygen; by which the oxide of mercury that existed in the oxy-muriate is converted into an imperfect black oxide: this imperfect oxide requires less muriatic acid to saturate it than the perfect oxide does; the compound formed is therefore a muriate, but the London College have thought proper to call it a sub-muriate, to prevent mistakes.

170. Q. How is the nitrico-oxydum hydrargyri made?

A. By boiling mercury, nitric acid, and water, to dryness, and then raising the heat gradually until the red vapour ceases to arise.

171. Q. What colour does the oxide of gold give to glass?

A. Glass is coloured purple by the oxide of gold.

172. Q. What compound is formed with the oxide of gold and ammonia?

A. This compound is called fulminating gold.

173. Q. What takes place during the formation of nitric oxide of mercury?

A. The mercury decomposes a portion of the nitric acid by attracting oxygen; it becomes converted into an oxide, and nitric oxide gas is evolved; the oxide 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 greater part of the nitric acid is driven off, and a perfect oxide of mercury remains, holding a very small portion of nitric acid.

174. Q. How is the red oxide 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.

175. Q. What is the theory of this process?

A. The mercury, when exposed to a heat of 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.

176. 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.

177. Q. How is the gray oxide of mercury prepared?

A. It is prepared by boiling sub-muriate of mercury with lime-water, constantly stirring, until a gray oxide 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 muriate of mercury, and its oxide is separated.

178. Q. Why are iron filings directed to be used in purifying mercury?

A. Because the iron has a greater attraction for the metals with which mercury is often amalgamated, than for the mercury.

179. 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.

180. Q. How is the hydrargyrus præcipitatus albus made?

A. By dissolving muriate of ammonia and oxy-muriate 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.

181. 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.

182. Q. What preparations of iron are directed to be kept by the London College?

A. Ferrum ammoniatum; carbonas ferri; sulphas ferri; ferrum tartarizatum; liquor ferri alkalini; tinctura ferri muriatis; tinctura ferri ammoniati; vinum ferri.

183. Q. What is the composition of ferrum ammoniatum?

A. It is composed of muriate of iron and muriate of ammonia.

184. Q. How is it made?

A. By subliming equal parts of carbonate of iron and muriate of ammonia.

185. 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.

186. 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 oxide of iron, combined with carbonic acid, but upon exposure to the air, passes very soon to the state of red oxide.

187. 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.

188. 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 oxide of iron combines with the superabundant tartaric acid of the supertartrate of potash; the compound formed is therefore a tartrate of potash and iron.

189. Q. When iron wire is burnt in oxygen gas, what compound is formed?

A. When iron is burnt in oxygen gas, the compound formed is the black oxide of iron.

190. Q. When iron is heated, in contact with air, what is formed?

A. In this process a black oxide of iron is formed.

191. Q. When carbon is united to iron, what is formed?

A. Steel.

192. Q. What is the composition of the liquor ferri alkalini?

A. It is considered as composed of nitric acid, red oxide of iron, with potash, forming a triple compound.

193. 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 until 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.

194. 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 oxide of iron, and the red oxide combines with the muriatic acid, and forms an oxymuriate of iron, which is afterwards combined with a quantity of rectified spirit.

195. Q. What compound of iron exists in the vinum ferri?

A. A tartrate of iron and potash.

196. Q. In what state in nature is lead found?

A. It is found oxydized, forming a variety of ores; com-

bined with sulphur, forming an ore called galena; combined with muriatic and carbonic acids. It is found in the state of carbonate, phosphate, arseniate, arsenic phosphate, molybdate, and sulphat.

197. Q. What is plumbago?

A. Plumbago is a carburet of iron, or iron combined with carbon, in its first degree of oxidisement.

198. Q. What are the compounds of lead admitted into the new London Pharmacopœia?

A. Liquor acetatis plumbi; super-acetas plumbi, and liquor acetatis plumbi dilutus.

199. Q. How is the super-acetate of lead made?

A. It is made by boiling the carbonated oxide of lead in acetic acid, which displaces the carbonic acid and combines with the oxide of lead; the solution is to be filtered, evaporated to a certain extent, and set aside to crystallize.

200. Q. How is the liquor acetatis plumbi made?

A. By boiling acetic acid and vitrified oxide of lead together, to a certain extent; then setting the solution by, that the feculencies may subside.

201. Q. What is the theory of this process?

A. The oxide of lead combines with the acetic acid, and a sub-acetate of lead is formed.

202. Q. How is the cerusse of commerce prepared?

A. Small 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 oxide, or rather a carbonate; at length the whole of the

lead is thus converted; it is then taken out, and ground to powder.

203. 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.

204. Q. What preparation of iron exists in the mistura ferri composita?

A. A carbonate of iron.

205. 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.

206. 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.

207. 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 oxide of arsenic.

208. Q. What preparations of arsenic are used in medicine?

A. The oxydum arsenici præparatum, and the liquor arsenicalis.

209. Q. How is the prepared oxide of arsenic made?

A. By reducing common oxide of arsenic to powder, and

placing it in a crucible, covered by an inverted crucible; into which the oxide of arsenic is sublimed.

210. Q. How is the liquor arsenicalis made?

A. By taking sixty-four grains of prepared oxide 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 exactly fill a pint measure.

211. Q. What is the compound formed in this preparation?

A. An arseniate of potash.

212. Q. Has the oxide of arsenic any peculiar properties?

A. Yes; instead of being insipid, as most other oxides 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 oxide, and has been called arsenious acid.

213. Q. What are the sources of antimony?

A. Antimony is found native in combination with oxygen, with sulphur, and with muriatic acid.

214. 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.

215. Q. How is the oxide of antimony made?

A. A quantity of sulphuret of antimony is to be added to a mixture of muriatic acid and nitric acid; which is 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.

216. Q. What is the theory of the formation of this oxide?

A. The antimony of the sulphuret first becomes oxydised by the nitric acid, which is decomposed; the oxide of antimony is then dissolved by the muriatic acid, and a muriate 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 muriate of potash; the muriatic acid having thus combined with the potash, the oxide of antimony is precipitated.

217. Q. When zinc is exposed in the state of fusion to the action of air, what is formed?

A. Zinc, under these circumstances, catches fire, and forms the white oxide.

218. Q. What metals are generally employed to decompose water?

A. The metals generally made use of to decompose water are iron and zinc.

219. Q. What preparations of zinc are used in medicine?

A. The oxide and sulphat of zinc.

220. 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 preci-

pitate the powder, which is afterwards to be well washed, to free it of the sulphat of potash; then dried.

221. 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, with which the sulphuret of potash has not combined; an hydro-sulphuretted oxide 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 sulphat of potash, the hydrogen escapes, and the sulphur intimately mixed with the hydro-sulphuretted oxide of antimony is precipitated.

222. Q. What acids dissolve the oxides of mercury?

A. The oxides of mercury are dissolved by the sulphuric, nitric, and oxymuriatic acids.

223. Q. How is the antimonium tartarizatum made?

A. It is made with oxide of antimony, supertartrate of potash, and distilled water. The water is boiled in a glass vessel, and the antimony and supertartrate 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.

224. Q. What takes place in the formation of this compound?

A. The excess of tartaric acid, that exists in the supertartrate of potash, combines with the oxide 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.

225. 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 now to be raised to whiteness, and kept so for two hours. The mass is then to be reduced to a very fine powder.

226. Q. What does this compound consist of?

A. It consists of oxide of antimony and phosphate of lime.

227. Q. Describe the phenomena 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 oxide of antimony.

228. Q. What is the active ingredient of the yeast cataplasm?

A. The carbonic acid gas evolved, which is the product of fermentation.

229. Q. What are the chemical compounds that exist in the mistura ferri composita?

A. Carbonate of iron and sulphat of potash.

230. Q. What is meant by fermentation?

A. The spontaneous change of vegetable substances, by which their properties become altered.

231. 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.

232. Q. What are the species of fermentations?

A. Fermentation is divided into the spirituous, the acetous, and the putrefactive; besides which, Dr. Thomson has added two others, viz. the panary and the saccharine fermentation.

233. Q. What ingredients are necessary for fermentation?

A. Water, sugar, and mucilage.

234. 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; first from the acetous to the vinous, and then from the vinous to the putrefactive.

235. Q. What are the products of the spirituous fermentation?

A. Ardent spirits, wines, and beers.

236. Q. What do the acetous and putrefactive fermentations produce?

A. The acetous fermentation produces vinegar, and the putrefactive fermentation produces ammonia.

237. 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.

238. 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.

239. Q. What is the use of the sub-carbonate of potash?

A. It abstracts the greater part of the water from the rectified spirit. Alkohol appears always to contain a portion of water.

240. Q. What is the solvent of a resin?

A. Alkohol; but rectified spirit is generally used.

241. Q. In what menstruum is gum soluble?

A. Water, and not in alkohol.

242. Q. What menstruum should be used to dissolve a gum resin?

A. A mixture of spirit and water.

243. Q. What use is made of rectified spirit in medicine?

A. To make ethers, different spirits, and tinctures.

244. Q. When arsenic is exposed to heat, what smell does it emit?

A. Arsenic, when exposed to heat, emits a smell like garlic.

245. Q. Of what are the different medicinal spirits composed?

A. A particular volatile oil, a quantity of alkohol, and water.

246. Q. What are the elements of alkohol?

A. Oxygen, hydrogen, and carbon.

247. 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.

248. Q. 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.

249. Q. What is the composition of ether?

A. Oxygen, hydrogen, and carbon.

250. Q. How does ether differ from alkohol, as its constituents are the same?

A. The proportions of its constituents are different: it is supposed to contain more hydrogen and less carbon than alkohol.

251. 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.

252. 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.

253. 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.

254. 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.

255. 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.

256. Q. How is the oleum æthereum 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.

257. 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.

258. Q. Of what is the spiritus ætheris compositus formed?

A. It is formed of spirits of sulphuric ether and ethereal oil.

259. Q. How is the spiritus ætheris nitrici made?

A. By distillation from a mixture of nitric acid and rectified spirit.

260. Q. How are essential oils obtained?

A. Essential oils are obtained either by expression or distillation.

261. Q. Why are not essential oils distilled with alkohol instead of water?

A. Because the volatile oils are volatile at the temperature of boiling water: but there are many of them not volatile at the temperature at which alkohol boils, consequently the alkohol would pass over weakly impregnated with their odour and properties.

THE END.

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