which it articulates with the occipital bone above and the second vertebra below. The second vertebra, *axis,* or *Vertebra dentata,* has its body surmounted by a thick, tooth-like *odontoid* process, which is regarded as the body of the atlas displaced from its proper vertebra and fused with the axis. This process forms a pivot round which the atlas and head move in turning the head from one side to the other; the spine is large, thick and deeply bihd. The seventh, called *Vertebra prominens,* is distinguished by its long prominent spine, which is not bifid, and by the small size of the foramen at the root of the transverse process. In the human spine the distinguishing char­acter of all the cervical vertebrae is the foramen at the root of the trans­verse process.

The thoracic vertebrae, formerly called dorsal, are twelve i.ι number in the human spine. They are intermediate in size and position to the cervical and lumbar vertebrae, and are all distinguished by having one or two smooth surfaces on each side of the body for articulation with the head of one or two ribs. The arch is short and with imbricated laminae; the ring is nearly circular; the spine is oblique, elongated and bayonet­shaped; the transverse processes are directed back and out, not bifid, and with an articular surface in front for the tubercle of a rib ; and the articular processes are flat and nearly vertical. The first, twelfth, eleventh, tenth and sometimes the ninth, thoracic verte­brae are distinguished from the rest. The first is in shape like the seventh cervical, but has no foramen at the root of the transverse process, and has two articular facets on each side of the body; the ninth has sometimes only one facet at the side of the body; the tenth, eleventh, and twelfth have invariably only a single facet on the side of the body, but the eleventh and twelfth have stunted transverse processes, and the twelfth has its lower articular processes shaped like those of a lumbar vertebra.

The lumbar vertebrae in man are five in number. They are the lowest of the true vertebrae, and also the largest, especially in the centrum. The arch has short and deep laminae; the ring is triangular; the spine is mas­sive and hatchet-shaped; the trans­verse processes are long and pointed ; the articular are thick and strong, the superior pair concave, the inferior convex, and the inferior notches, as in the thoracic vertebrae, are deeper than the superior. In the lumbar vertebrae and in the lower thoracic an accessory process projects from the base of each transverse process, and a mammillary tubercle from each superior articular process. The fifth lumbar vertebra has its body much deeper in front than behind and its spine is less massive.

The sacrum is composed of five originally separate vertebrae fused into a single bone. It forms the upper and back wall of the pelvis, is triangular in form, and possesses two surfaces, two borders, a base, and an apex. The anterior or pelvic surface is concave, and is marked by four transverse lines, which indicate its original subdivision into five bones, and by four pairs of foramina, through which are transmitted the anterior sacral nerves. Its posterior surface is convex; in the middle line are four spines, because in the last sacral vertebra the spinal canal is not closed behind. On each side of these are two rows of tubercles, the inner of which are the conjoined articular and mammillary processes, the outer the transverse processes of the originally distinct vertebrae. Between these rows four pairs of foramina are found transmitting the posterior sacral nerves from the sacral canal, which extends through the bone from base to near the apex, and forms the lower end of the spinal canal. By its borders the sacrum is articulated with the haunch-bones—by its base with the last lumbar vertebra, by its apex with the coccyx. The human sacrum is broader in proportion to its length than in other mammals; this great breadth gives solidity to the lower part of the spine, and, conjoined with the size of the lateral articular surfaces, it permits a more perfect junction with the haunch-bones, and is correlated with the erect position. Owing to the need in woman for a wide pelvis, the sacrum is broader than in man. (For details see A. Μ. Paterson, “ The Human Sac­rum,” *Sci. Trans. R. Dublin Soc.* vol. v. ser. 2.)

The coccyx consists of four or five vertebrae in the human spine though the last one is sometimes suppressed. It is the rudimentary tail, but instead of projecting back, as in mammals generally, is curved forward, and is not visible externally, an arrangement which is also found in the anthropoid apes and in Hoffmann’s sloth. Not only is the tail itself rudimentary in man, but the vertebrae of which it is composed are small, and represent merely the bodies and transverse processes of the true vertebrae. As there are no arches, the ring is not formed, and the spinal canal does not extend, therefore, beyond the fourth piece of the sacrum. The first coccygeal vertebra, in addition to a body, possesses two processes or horns, which are the superior articular processes.

The human spine is more uniform in length in persons of the same race than might be supposed from the individual differences in stature, the variation in the height of the body in adults being due chiefly to differences, in the length of the lower limbs. The average length of the spine is 28 in.; its widest part is at the base of the sacrum, from which it tapers down to the tip of the coccyx. It diminishes also in breadth from the base of the sacrum upwards to the region of the neck. Owing to the projection of the spines behind and the transverse processes on each side, it presents an irregular outline on those aspects; but in front it is more uniformly rounded, owing to the convex form of the antero-lateral surfaces of the bodies of its respective vertebrae. In its general contour two series of curves may be seen, an antero-posterior and a lateral. The antero-posterior is the more important. In the infant at the time of birth the sacro­coccygeal part of the spine is concave forward, but the rest of the spine, except a slight forward concavity in the series of thoracic vertebrae, is almost straight. When the infant begins to sit up in the arms of its nurse, a convexity forward in the region of the neck appears, and subsequently, as the child learns to walk, a convexity forward in the region of the loins. Hence in the adult spine a scries of convexo-concave curves are found, which are alternate and mutually dependent, and are associated with the erect attitude of man. A lateral curve, convex to the right, opposite the third, fourth, and fifth thoracic vertebrae, with compensatory curve convex to the left immediately above and below, is due apparently to the much greater use of the muscles of the right arm over those of the left, drawing the spine in that region somewhat to the right. In disease of the spine its natural curvatures are much increased, and the deformity known as humpback is produced. As the spine forms the central part of the axial skeleton, it acts as a column to support not only the weight of the body, but of all that can be carried on the head, back and in the upper limbs: by its transverse and spinous processes it serves also to give attachment to numerous muscles, and the transverse processes of its thoracic vertebrae are also for articulation with the ribs.

The Thorax, Pectus, or Chest is a cavity or enclosure the walls of which are in part formed of bone and cartilage. Its skeleton consists of the sternum in front, the twelve thoracic vertebrae behind, and the twelve ribs, with their corre­sponding cartilages, on each side.

The sternum or breast bone is an elongated bone which inclines downward and forward in the front wall of the chest. It consists of three parts—an upper, called manubrium or presternum; a middle, the gladiolus or mesosternum ; and a lower, the ensiform process or xiphisternum. Its anterior and posterior surfaces are marked by transverse lines, which indicate not only the subdivision of the entire bone into three parts, but that of the meso­sternum into four originally distinct segments. Each lateral border of the bone is marked by seven depressed surfaces for articulation with the seven upper ribs: at each side of the upper border of the presternum is a sinuous depression, where the clavicle, a bone of the upper limb, articulates with this bone of the axial skeleton. The xiphisternum remains cartilaginous up to a late period of life, and from its pointed form has been named the ensiform cartilage.

The ribs or costae, twenty-four in number, twelve on each side of the thorax, consist not only of the bony ribs, but of a bar of cartilage continuous with the anterior end of each bone, called a *costal cartilage,* so that they furnish examples of a cartilaginous skeleton in the adult human body; in aged persons these cartilages usually become converted into bone. The upper seven ribs are connected by their costal cartilages to the side of the sternum, and are called *sternal* or *true* ribs; the lower five do not reach the sternum, and are named *a-sternal* or *false,* and of these the two lowest, from being comparatively unattached in front, are called *free* or *floating.* Another and perhaps more useful classification is to speak of the first seven ribs as vertebro-sternal, the next three as vertebro-costal, and the last two as vertebral. All the ribs arc