The notochord extends as far forward as the anterior end of the mid-brain, and becomes partly surrounded by mesoderm (Fig. 68). The posterior part of this mesodermal investment corresponds with the basilar part of the occipital bone, and shows a subdivision into four segments, which are separated by the roots of the hypoglossal nerve. The mesoderm then extends over the brain-vesicles, and thus the entire brain is enclosed by a mesodermal investment, which is termed the **membranous cranium**. From the inner layer of this the bones of the skull and the membranes of the brain are developed; from the outer layer the muscles, bloodvessels, true skin, and subcutaneous tissues of the scalp. In the shark and dog-fish this membranous cranium undergoes complete chondrification, and forms the cartilaginous skull or **chondrocranium** of these animals. In mammals, on the other hand, the process of chondrification is limited to the base of the skull—the roof and sides being covered in by membrane. Thus the bones of the base of the skull are preceded by cartilage, those of the roof and sides by membrane. The posterior part of the base of the skull is developed around the notochord, and exhibits a segmented condition analogous to that of the vertebral column, while the anterior part arises in front of the notochord and shows no regular segmentation. The base of the skull may therefore be divided into (*a*) a **chordal** or **vertebral**, and (*b*) a **prechordal** or **prevertebral portion.**

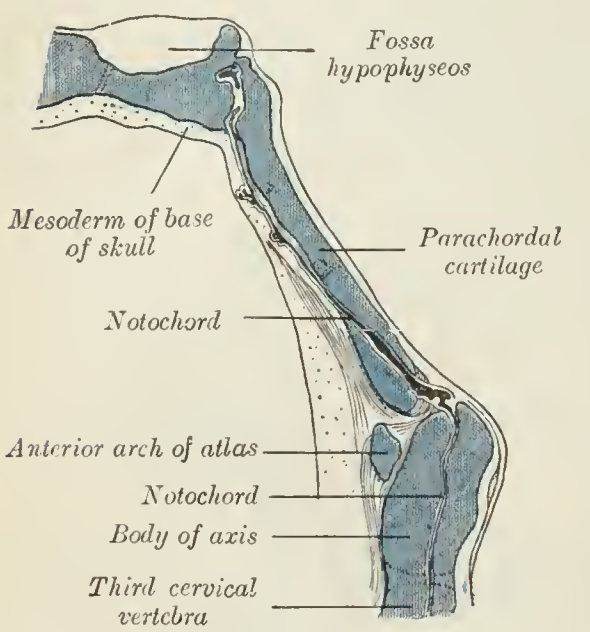

Fig. 68.—Sagittal section of cephalic end of notochord. (Keibel.)

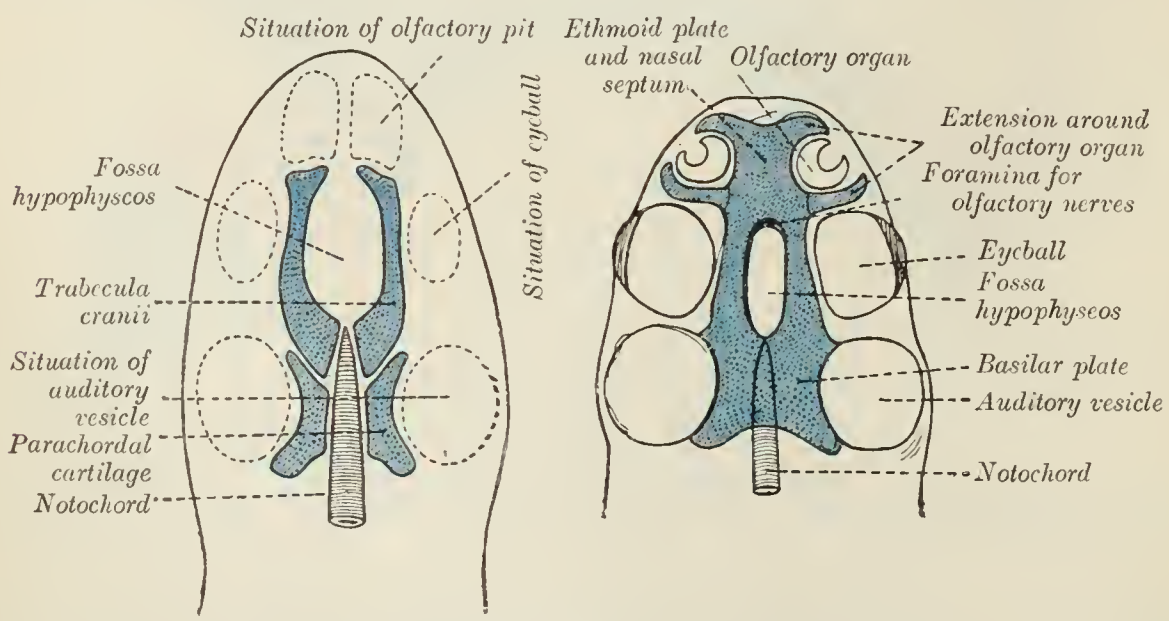

Fig. 69.—Diagrams of the cartilaginous cranium. (Wiedersheim.

In the lower vertebrates two pairs of cartilages are developed, viz., a pair of parachordal cartilages, one on either side of the notochord; and a pair of prechordal cartilages, the **trabeculæ cranii**, in front of the notochord (Fig. 66). The **parachordal cartilages** (Fig. 69) unite to form a basilar plate, from which the cartilaginous part of the occipital bone and the basi-sphenoid are developed. On the lateral aspects of the parachordal cartilages the auditory vesicles are situated,