

## CEREBRAL DEVELOPMENT OF THE EARLIER VERTEBRATA.

### ITS APPARENT PRINCIPLE.

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It is held by a class of naturalists, some of them of the highest standing, that the skulls of the vertebrata consist, like the columns to which they are attached, of vertebral joints, composed each, in the more typical forms of head, as they are in the trunk, of five parts or elements,—the centrum or body, the two spinous processes which enclose the spinal cord, and the two ribs. These cranial vertebræ, four in number, correspond, it is said, to the four senses that have their seat in the head: there is the nasal vertebra, the centrum of which is the vomer, its spinal processes the nasal and ethmoid bones, and its ribs the *upper* jaws; there is the ocular vertebra, the centrum of which is the anterior portion of the sphenoid bone, its spinal processes the frontals, and its ribs the *under* jaws; there is the lingual vertebra, the centrum of which is the posterior sphenoid bone, its spinal processes the parietals, and its ribs the hyoid and branchial bones,—portions of the skeleton largely developed in fishes; and, lastly, there is the auditory vertebra, the centrum of which is the base of the occipital bone, and its spinal processes the occipital crest, and which in the osseous fishes bears attached to it, as its ribs, the bones of the scapular