

The Skull. It is not till much later than the appearance of the vertebræ that the cranial portion of the vertebral column makes its appearance. The earliest period at which we have noticed it was after it had risen from below, so as to envelope the whole brain in front of the cerebellum, (Pl. 24, fig. 7, *e*²,) and had gained considerable thickness, almost twice as great as the skin just exterior to it. It rises gradually at the posterior part, and grows proportionally thinner, except at its base, (Pl. 23, fig. 3, *l*,) where it becomes very thick. At this point it is merely cartilaginous, and extends in a uniform layer from the nose (fig. 3, *4*) to the posterior opening at its base, (fig. 3, *l*,) including the elements of the vomer, (*5*,) which underlie the Schneiderian membrane (*c*) and the space between the eyes, the ethmoid, (*3*,) the sphenoid, (*6*,) the basal occipital, (*2*,) the occipital crest, (*1*,) and several other bones, not indicated in the figures. The supermaxillary or upper jaw bone (fig. 3, *8*) forms a separate cartilaginous layer. At the time the Turtle is hatched, the different bones of the head are generally marked out, but in very different degrees of ossification. The os incisivum, (Pl. 23, fig. 4, and w-c. 3, *l*,) or intermaxillary bone, although as yet very spongy, is the most ossified, and is probably the one most needed of any for the purposes of feeding. The upper maxillary, (fig. 11, and w-c. 11, *d'*,) the ethmoid, (fig. 4, fig. 11, and w-c. 3, *n''*, w-c. 11, *d*,) and the frontal bones (fig. 4, and w-c. 3, *n*, fig. 10, and w-c. 10, *f*) are hardly less ossified than the mandibles. The parietal (fig. 8, and w-c. 8, *h*) and the sphenoid bones (fig. 8, and w-c. 8, *i*) come next in hardness. The crest of the occiput (fig. 4, fig. 5, and w-c. 3, *n*, *n'*, w-c. 5, *m*, *m'*) has only an external layer (w-c. 3, *n'*, w-c. 5, *m'*) ossified, the rest is cartilaginous; the basilar portion (fig. 4, and w-c. 3, *r*) of this bone begins to be hardened internally. The same may be said of the sphenoid bone (fig. 4, fig. 8, w-c. 3, *r'*, w-c. 8, *i*). The other bones of the head are, as a general thing, merely cartilaginous. The basilar part (fig. 4, and w-c. 3, *r*) of the occipital bone does not trend in the same line with the sphenoid, (*r'*,) but is elevated to an angle of at least thirty degrees above it. In the adult, these two bones trend in the same line.

*The Shield.*¹ Very few investigations have been made respecting the development of the different elements which compose the shield.² The manner in which the roof-like dorsal shield originates has already been described, (p. 562, Pl. 15, fig. 13,) and the changes in form through which it passes have been pointed out. We are not prepared to say any thing more in respect to its internal metamorphoses, until the time when the young Turtle is hatched. At that time the shield

¹ Comp. Part II., Chap. 1, Sect. 4, p. 255, and Sect. 5, p. 263-265.

² For more details, see Rathke, *Entwicklung der Schildkröten*, p. 84, 101, 105, and 177.