

consists of the vertebral column already described, the fibrous corium, (Pl. 9e, fig. 12, c,) and the ribs (a, b) imbedded in the latter. The ribs do not touch each other laterally, as in the adults of many genera, but their margins (Pl. 9e, fig. 12, b) are flattened, and run out into a thin edge. At the surface of the ribs, the passage is so gradual from the fibrous bony layer (Pl. 22, fig. 1, b, c, d, e, f, fig. 2, b, c, d, e, f) into the fibrous corium, (fig. 1, g, g', h, h', fig. 2, h,) that it is impossible to distinguish the one from the other. In fact, since the ribs are developed from what was once a uniform layer of corium throughout the whole extent of the shield, it is not at all to be expected that the line of demarcation should be very definite at this age. The true cartilagino-osseous matrix of the ribs is in the interior of each rib (Pl. 9e, fig. 12, a, a'; Pl. 22, fig. 1, a, a', a², a³, fig. 2, a, a', a², a³).

The Limbs. The changes through which the limbs pass, as far as their external configuration is concerned, have been sufficiently described in the last section. At first they are lateral protrusions (Pl. 24, fig. 14, w', p. 555) of the musculo-cutaneous layer from the sides of the body, and are composed of a solid mass of cells, identical with each other throughout the whole limb. The bone, or rather the matrix of the bone, is formed by a certain portion of the cells in the axis of the limbs becoming differentiated from the others, by increasing in size and assuming a less elongated shape, (Pl. 21, fig. 22, 22a, 24,) and at the same time separating from each other. This arrangement produces a different effect upon the light from that of the cells in the surrounding parts, so that the position of each bone-matrix may be recognized without much trouble (Pl. 25, fig. 11). The matrices are not sharply defined, because the passage from the elongated cells of the unossifying portion to the broad cartilage cells of the matrix is not sudden, but gradual. Later, however, the bone matrix becomes more definite in outline, (Pl. 21, fig. 21; Pl. 25, fig. 12, b, c, d,) and differs very much in appearance from the surrounding portion of the limb (Pl. 21, fig. 20, b, b'; Pl. 25, fig. 12, a). About the time of hatching, the bones are all well developed, and have in a great measure the characteristic shape of those of the adult, but the ossification is only external, the central part of the bones being occupied by almost pure cartilage (Pl. 22, fig. 5, 6, 6a, 6b). The bones of the feet are the most ossified, especially the terminal ones; and not only is the fibrous layer hardened, but also a considerable thickness of the cartilaginous basis contains lime. The femur comes next in amount of ossification, but this occurs only along the cylinder, and not at all on the ends. The scapula, and its process, the acromion, are but a little less ossified than the last. The other bones have a very thin external fibrous ossified layer, the rest of each bone being highly cartilaginous.

The Muscles. During our investigation of the development of the Turtles, our