

beneath it. Some of the cartilage cells do not fill the cavity in the matrix; and in such cases (fig. 1a, fig. 1b) the thick cell wall (*b*) may be seen passing across the cavity, sometimes at one end and sometimes at both. Close upon this, there rests a dense, fibrous layer, (fig. 1, *b, c, d, e, f*, fig. 2, *b, c, d, e, f*), containing cells in various stages of development. The innermost of these cells (fig. 1, *c*) are irregularly round and very flat, (fig. 2, *c*), so as to appear almost like dark lines in a transverse section, and each contains a rather faint, granular mesoblast; otherwise the contents are homogeneous. The irregular, wavy processes from these cells connect here and there with those of neighboring cells, and appear to be spaces in the fibrous substance; but whether they are direct prolongations from the cell could not be made out with certainty, although it appeared very probable that such is the case. A little further toward the surface of the bone, these cells are found to be elongate-oval (*d*) or oval, and not quite so flat (fig. 2, *d*) as those last mentioned, and the wavy processes are shorter, but the mesoblast is the same. Still further outward, the cells (fig. 1, *e*) are very much elongated, irregular in outline, and are as thick (fig. 2, *e*) as they are broad. Their mesoblasts have altogether disappeared, and the wavy prolongations are very faint. At the surface of the middle line of the rib, the cells (fig. 1, *f*) are very long and slender. At the edge of the rib (fig. 1, *g*) the surface cells are like those at the middle line, but they are much more slender. They cannot be distinguished very readily from those in the soft, fibrous corium, except that the latter are in a yielding matrix, whilst the former are surrounded by a hardened substance. The fibres (*g*¹) of this outermost layer, as well as those (*h*¹) of the corium, are composed of rows of minute granules. The fibres of the more interior layers are very faint. As these investigations were made upon perfectly fresh bones, and no reagents were used, it is clear that the mesoblasts of the cells in the fibrous layers are perfectly normal, and fully show that bone lacunæ, with their characteristic canaliculi, are nothing less than these mesoblasted cells, with their wavy processes anastomosing with each other.

The Limbs. Soon after the shield begins to form, and the feet begin to show external signs of the toes, (Pl. 25, fig. 11, and p. 565,) the bones of the feet, or rather their cartilaginous matrices, are quite conspicuous. The terminal or claw bones have not yet appeared. The matrix of each bone is composed of very irregular cartilage cells (Pl. 21, fig. 22, 24). Those in the centre are set at a considerable distance from each other, but as they approach the surface of the matrix they approximate, and at the same time gradually assume the smaller size and form of those in the surrounding tissue (fig. 25). Each cell contains fine granular contents and a large, round, clear mesoblast, which contains one or two entoblasts (fig. 22a). A short time before the Turtle is hatched, the