ferential, or by some authors **primary** or **fundamental lamellæ**, to distinguish them from those laid down around the axes of the Haversian canals, which are then termed **secondary** or **special lamellæ.**

The **Haversian canals**, seen in a transverse section of bone as round holes at or about the center of each Haversian system, may be demonstrated to be true canals if a longitudinal section be made (Fig. 74). It will then be seen that the canals run parallel with the longitudinal axis of the bone for a short distance and then branch and communicate. They vary considerably in size, some being as much as 0.12 mm. in diameter; the average size is, however, about 0.05 mm. Near the medullary cavity the canals are larger than those near the surface of the bone. Each canal contains one or two bloodvessels, with a small quantity of delicate connective tissue and some nerve filaments. In the larger ones there are also lymphatic vessels, and cells with branching processes which communicate, through the canaliculi, with the branched processes of certain bone cells in the substance of the bone. Those canals near the surface of the bone open upon it by minute orifices, and those near the medullary cavity open in the same way into this space, so that the whole of the bone is permeated by a system of bloodvessels running through the bony canals in the centers of the Haversian systems.

The **lamellæ** are thin plates of bony tissue encircling the central canal, and may be compared, for the sake of illustration, to a number of sheets of paper pasted one over another around a central hollow cylinder. After macerating a piece of bone in dilute mineral acid, these lamellæ may be stripped off in a longitudinal direction as thin films. If one of these be examined with a high power of the microscope, it will be found to be composed of a finely reticular structure, made up of very slender transparent fibers, decussating obliquely; and coalescing at the points of intersection; these fibers are composed of fine fibrils identical with those of white connective tissue. The intercellular matrix between the fibers is impregnated by calcareous deposit which the acid dissolves. In many places the various lamellæ may be seen to be held together by tapering fibers, which run obliquely through them, pinning or bolting them together; they were first described by Sharpey, and were named by him **perforating fibers** (Fig. 75).

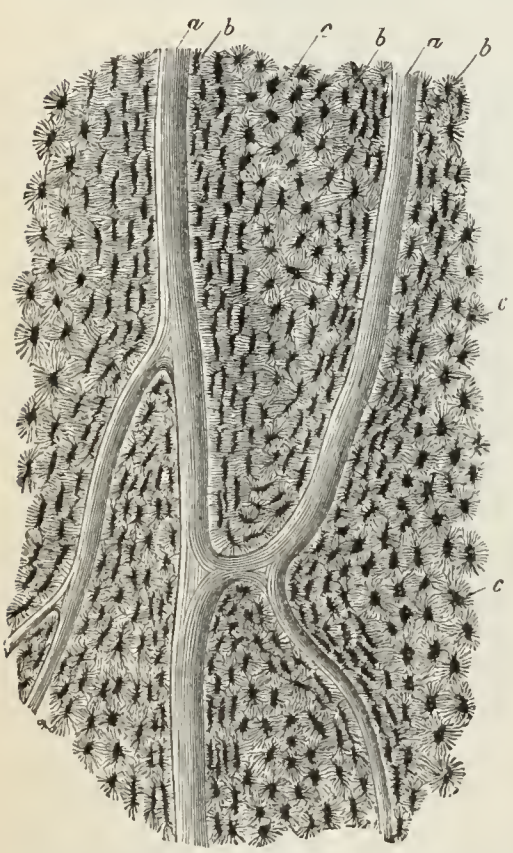

FIG. 74.—Section parallel to the surface from the body of the femur. × 100. *a*, Haversian canals; *b*, lacunæ seen from the side; *c*, others seen from the surface in lamellæ, which are cut horizontally.

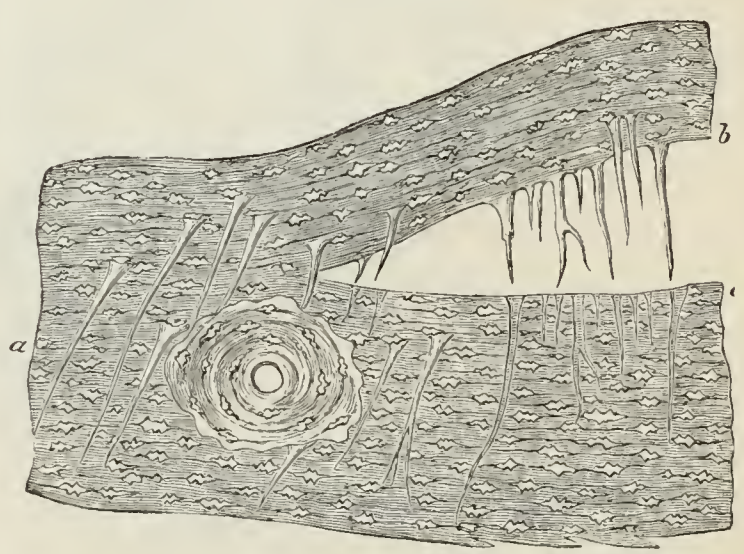

FIG. 75.—Perforating fibers, human parietal bone, decalcified. (H. Müller.) *a*, perforating fibers *in situ*; *b*, fibres drawn out of their sockets; *c*, sockets.

The **Lacunæ** are situated between the lamellæ, and consist of a number of oblong