the terminations of the projection, commissural, or association fibers, ascend to end in the cortex. The axons of the cells of Martinotti are also ascending fibers.

Special Types of Cerebral Cortex.—It has been already pointed out that the minute structure of the cortex differs in different regions of the hemisphere; and A. W. Campbell[1] has endeavored to prove, as the result of an exhaustive examination of a series of human and anthropoid brains, "that there exists a direct correlation between physiological function and histological structure." The principal regions where the "typical" structure is departed from will now be referred to.

1. In the calcarine fissure and the gyri bounding it, the internal band of Baillarger is absent, while the band of Gennari is of considerable thickness, and forms a characteristic feature of this region of the cortex. If a section be examined microscopically, an additional layer of cells is seen to be interpolated between the molecular layer and the layer of small pyramidal cells. This extra layer consists of two or three strata of fusiform cells, the long axes of which are at right angles to the surface; each cell gives off two dendrites, external and internal, from the latter of which the axon arises and passes into the white central substance. In the layer of small pyramidal cells, fusiform cells, identical with the above, are seen, as well as ovoid or star-like cells with ascending axons (*cells of Martinotti*). This is the *visual area* of the cortex, and it has been shown by J. S. Bolton[2] that in old-standing cases of optic atrophy the thickness of Gennari's band is reduced by nearly 50 per cent.

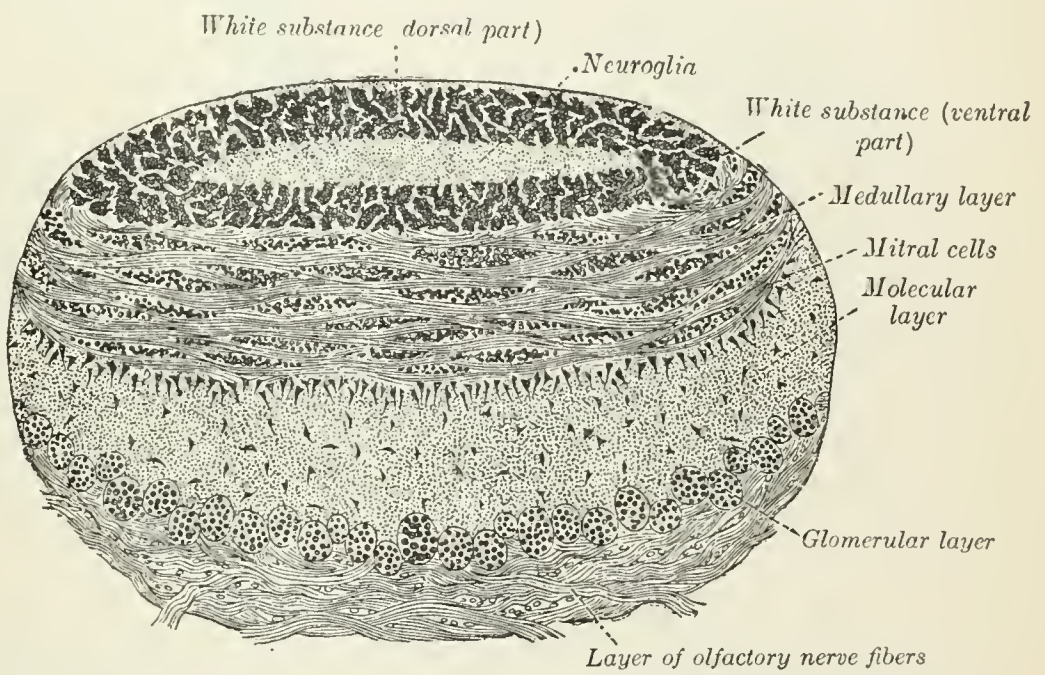

FIG. 755.—Coronal section of olfactory bulb. (Schwalbe.)

A. W. Campbell says: "Histologically, two distinct types of cortex can be made out in the occipital lobe. The first of these coats the walls and bounding convolutions of the calcarine fissure, and is distinguished by the well-known line of Gennari or Vicq d'Azyr; the second area forms an investing zone a centimetre or more broad around the first, and is characterized by a remarkable wealth of fibers, as well as by curious pyriform cells of large size richly stocked with chromophilic elements—cells which seem to have escaped the observation of Ramón y Cajal, Bolton, and others who have worked at this region. As to the functions of these two regions there is abundant evidence, anatomical, embryological, and pathological, to show that the first or calcarine area is that to which visual sensations primarily pass, and we are gradually obtaining proof to the effect that the second investing area is constituted for the interpretation and further elaboration of these sensations. These areas therefore deserve the names *visuo-sensory* and *visuo-psychic*."

2. The anterior central gyrus is characterized by the presence of the giant cells of Betz and by "a wealth of nerve fibers immeasurably superior to that of any other part" (Campbell), and in these respects differs from the posterior central gyrus. These two gyri, together with the paracentral lobule, were long regarded as constituting the "motor areas" of the hemisphere; but Sherrington and Grunbaum have shown[3] that in the chimpanzee the motor area never extends on to the free face of the posterior central gyrus, but occupies the entire length of the anterior central gyrus, and in most cases the greater part or the whole of its width. It extends into the depth of the central sulcus, occupying the anterior wall, and in some places the floor, and in some extending even into the deeper part of the posterior wall of the sulcus.

[1] Histological Studies on the Localization of Cerebral Function, Cambridge University Press
[2] Philosophical Transactions of Royal Society, Series B, cxciii, 165.
[3] Transactions of the Pathological Society of London, vol. liii.