

may frequently observe quite broad intercellular spaces, often to such an extent as deserving the term "lacunes," which are very common to roots of plants that grow in moist situations.

The innermost layer of the cortex is differentiated into an endodermis (*End*), the structure and function of which suggests that of the exodermis, and forms a closed sheath around the central cylinder of the root.

Bordering directly on the endodermis, thus representing the outermost tissue of the cylinder, is a layer, and mostly a single one, of thin-walled cells, which is called the pericycle or pericambium (*P.*). The cell walls are never suberized nor do they show any foldings. It is a tissue of great importance, since the lateral roots become developed from this, and usually also the root-shoots.

Inside the pericycle we find the leptome (*L.*) with sieve-tubes and companion-cells, and the hadrome (*H.*) with the vessels. These two elements, the leptome and hadrome, are in the root arranged in separate groups, side by side, alternating with each other in contrast to the stem, where they are located in the same radius, the leptome outside, the hadrome inside. The vessels are of different width in proportion to their age, the narrowest being the earliest developed. The sieve-tubes and their companion-cells are, as already stated, located between the rays of the hadrome, and their delicate structure makes them readily distinguished from the thick-walled vessels and conjunctive tissue, the last of which occupies the centre of the root; it is parenchymatic and corresponds well with the pith of the stems.

This root represents the annual type, and no increase in thickness takes place, thus the root remains unchanged until it dies at the end of the season. But if we now examine perennial roots, we notice that an increase in thickness generally takes place which results in greatly modified structures of which the following is the most frequent and may be considered the normal.

The first sign of change in structure is to be observed in the central cylinder where a cambial tissue becomes formed in the shape of arches and on the inside of the leptome; this cambial tissue thus originates in the conjunctive tissue bordering on the