

is protected from desiccation by the soil alone, the surface of the shoot is cuticularized—the pores of interchange (the stomata) being under control. If plants are to be used for coastal or other requirements these fundamental limitations in their mechanism must be respected.

**Plants with Permanent Systems.**—As these are the most important for coastal work it is convenient to explain the different ways in which plants establish a permanent footing in the ground.

In respect of permanence plants are, roughly speaking, either *annual* or *perennial*. The former, as the name implies, establishes each year from seed and endure only for a single season. With the ripening of seed the body dies. Annuals include many “ephemeral” plants on sand dunes and certain pioneer colonizers on muddy foreshores. As will appear in the sequel, they are not without significance to the subject of this book.

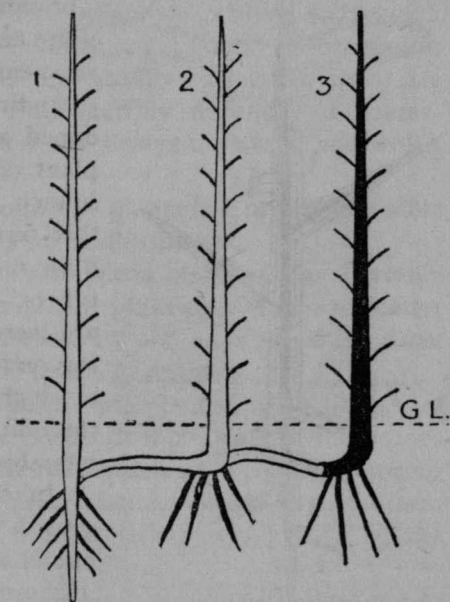


Fig. 9.—Diagram of a Perennial Herb, to show relation of the shoots of successive years to one another. The plant of the third year is drawn solid black. G.L., Ground level.

In some cases vegetative establishment alone is accomplished the first year, flowering and fruiting being postponed to the second season, on which the plant dies. Such plants are termed biennials. On the shore biennials are rare, reputed biennials behaving as perennials.

**Perennial Plants.**—There are two distinct ways in which land plants perennate:—

- (1) That of the perennial herb, the permanent system of which is subterranean;
- (2) That of the ligneous plant, which grows into a shrub or tree.