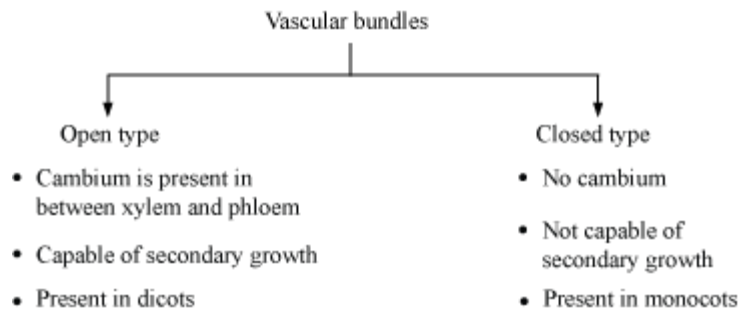




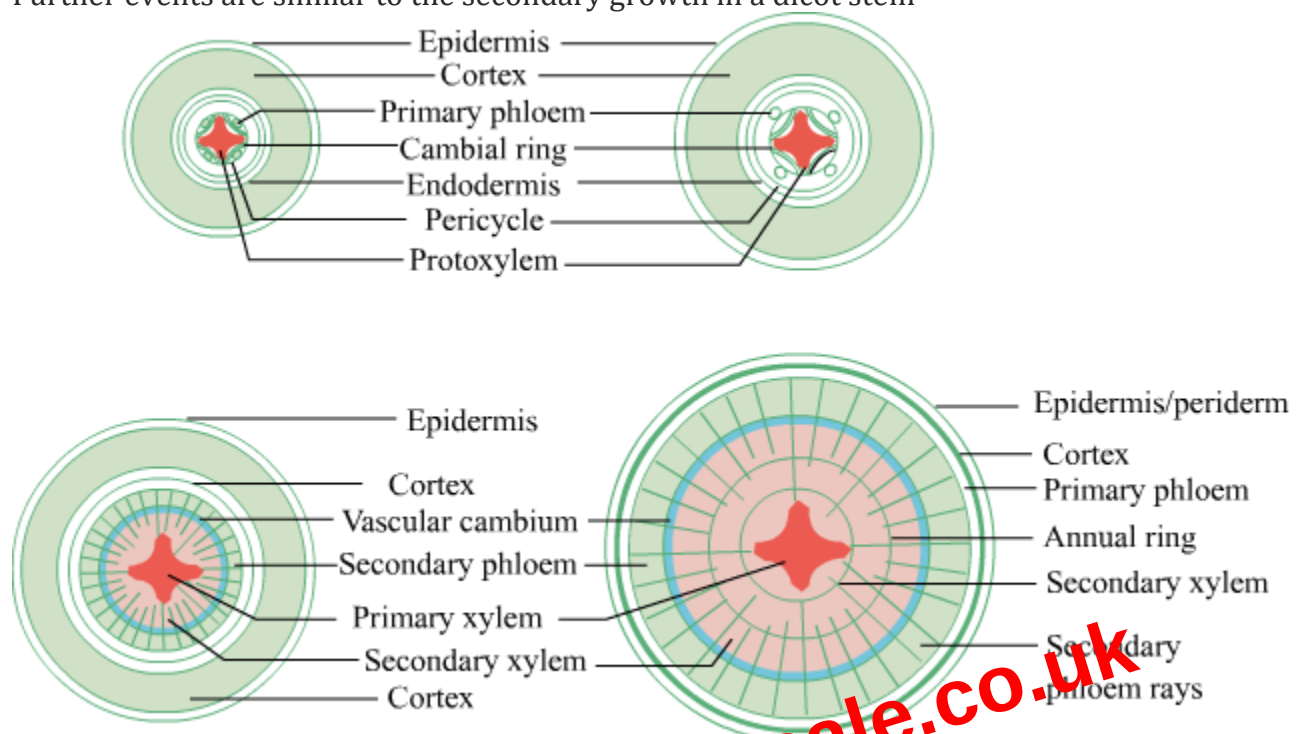
- Xylem and phloem can be arranged in two different kinds of arrangement within a vascular bundle.
- Radial arrangement - when xylem and phloem are present in alternate manner on different radii
- Conjoint arrangement - when xylem and phloem are present at same radius of vascular bundles. Such arrangement usually has phloem located outer to xylem.

Anatomy of Root

Dicot and Monocot Root

Tissue organization	Dicot	Monocot
Figure		
Epidermis	Has a single layer of epidermal cells, some of which protrude to form root hairs	Same as that of dicot root

- Further events are similar to the secondary growth in a dicot stem



Products of Secondary Growth

Spring Wood and Autumn Wood

- The activity of cambium is under the control of many physiological and environmental factors.
- In spring season, cambium is very active and produces a large number of xylary elements with wider vessels. This wood is called spring wood or early wood. It is lighter and has lower density.
- In winters, xylem is less active and forms fewer xylary elements with narrow vessels. This wood is called autumn wood or late wood. It is darker and has higher density.
- Annual ring: When two kinds of wood appear in alternate concentric rings; these help us to estimate the age of a tree

Heart wood and Sap wood

- Heartwood:
- Composed of dead elements, with highly lignified walls