

# **PITS AND PLASMODESMATA**

# PRIMARY PIT FIELD

- ❑ Opening present in primary cell wall called as primary pit field or primordial pits.
- ❑ Characteristic feature of primary pit field is the presence of plasmodesmata.

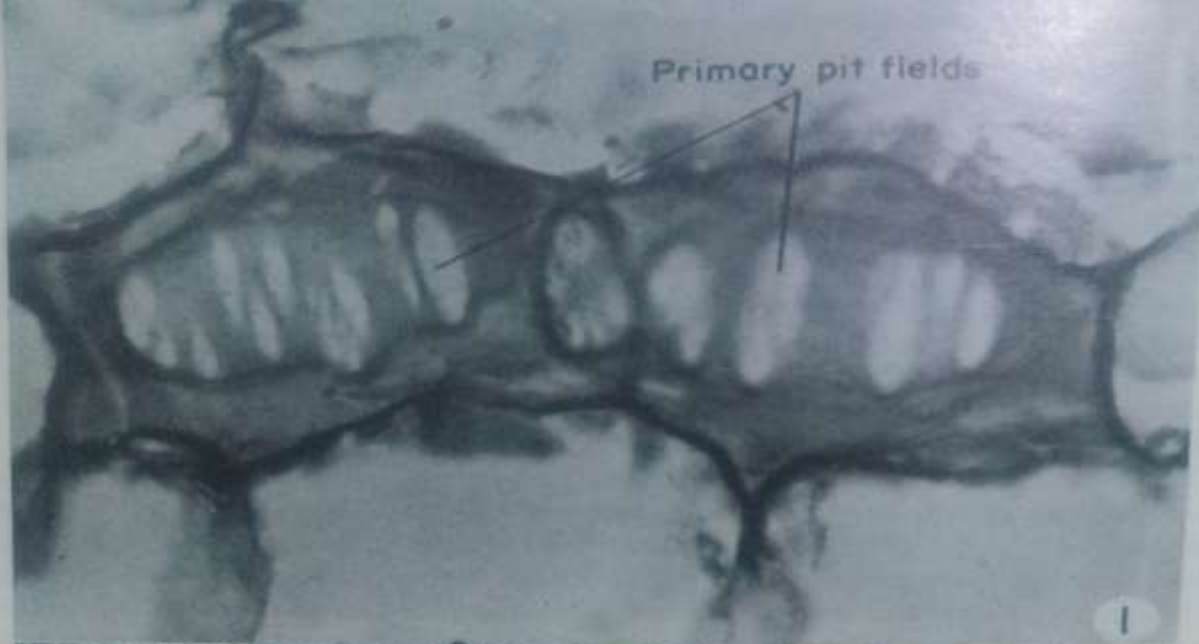


FIG. 21 1, Micrograph of parenchyma cells from the pith of *Nicotiana tabacum* showing primary pit fields.  $\times 950$ . 2, Electron micrograph of a primary pit field of *Zea mays*.  $\times 30,000$ . (No. 2 after Mühlethaler, 1950.)

# PITS

- ❑ Pits are unthickened areas in the secondary walls of plant cells. They , therefore appear as depressions.
- ❑ Each pit has a complementary pit exactly opposite it in the wall of the neighbouring cell. Such pit form a morphological and functional unit called **pit -pair**

# STRUCTURE OF PITS

- **Pit cavity:** the cavity formed by the break in the secondary wall.
- **Pit membrane or closing membrane:** the membrane, built of the primary cell walls and middle lamella, that separates the two pit cavities of the pit-pair.
- **Pit aperture :** the opening of the pit on the inner side of the cell wall.

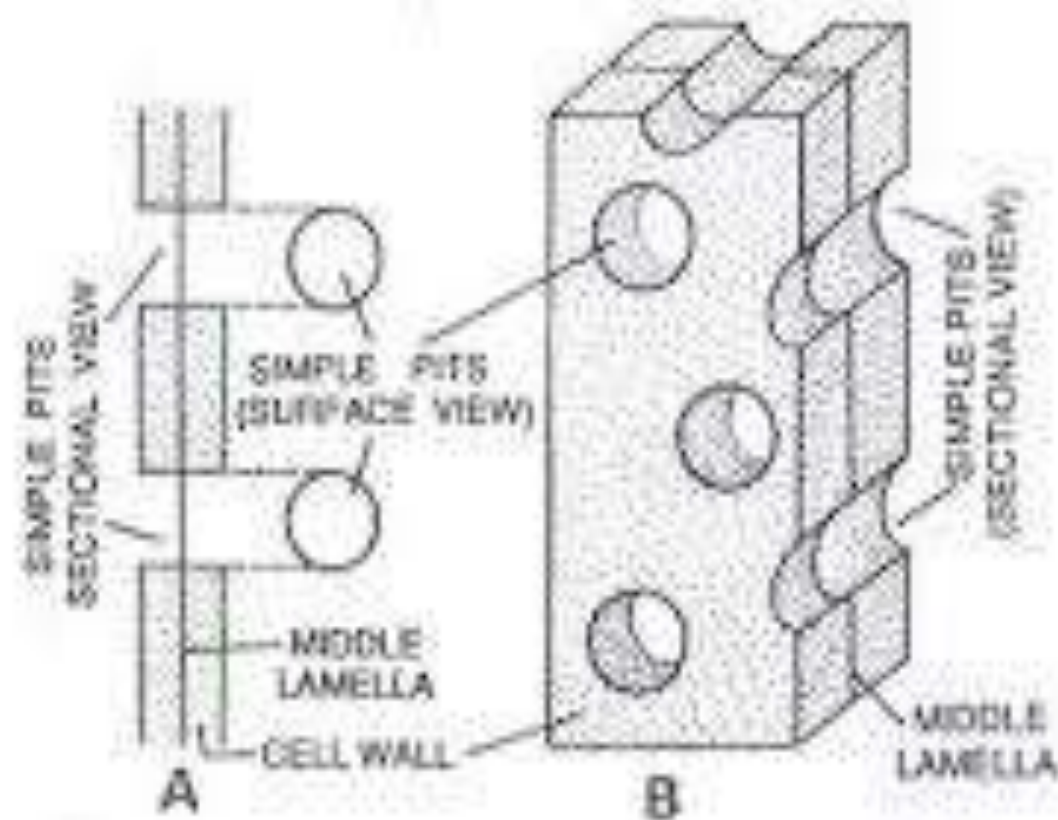


Fig. 34.12. Simple pits. A, cell-wall having two simple pits showing sectional and surface views; B, portion of a cell wall showing some simple pits—sectional view (right-top) surface view (front).

# TYPES OF PITS

❖ Simple pits

❖ Bordered pits

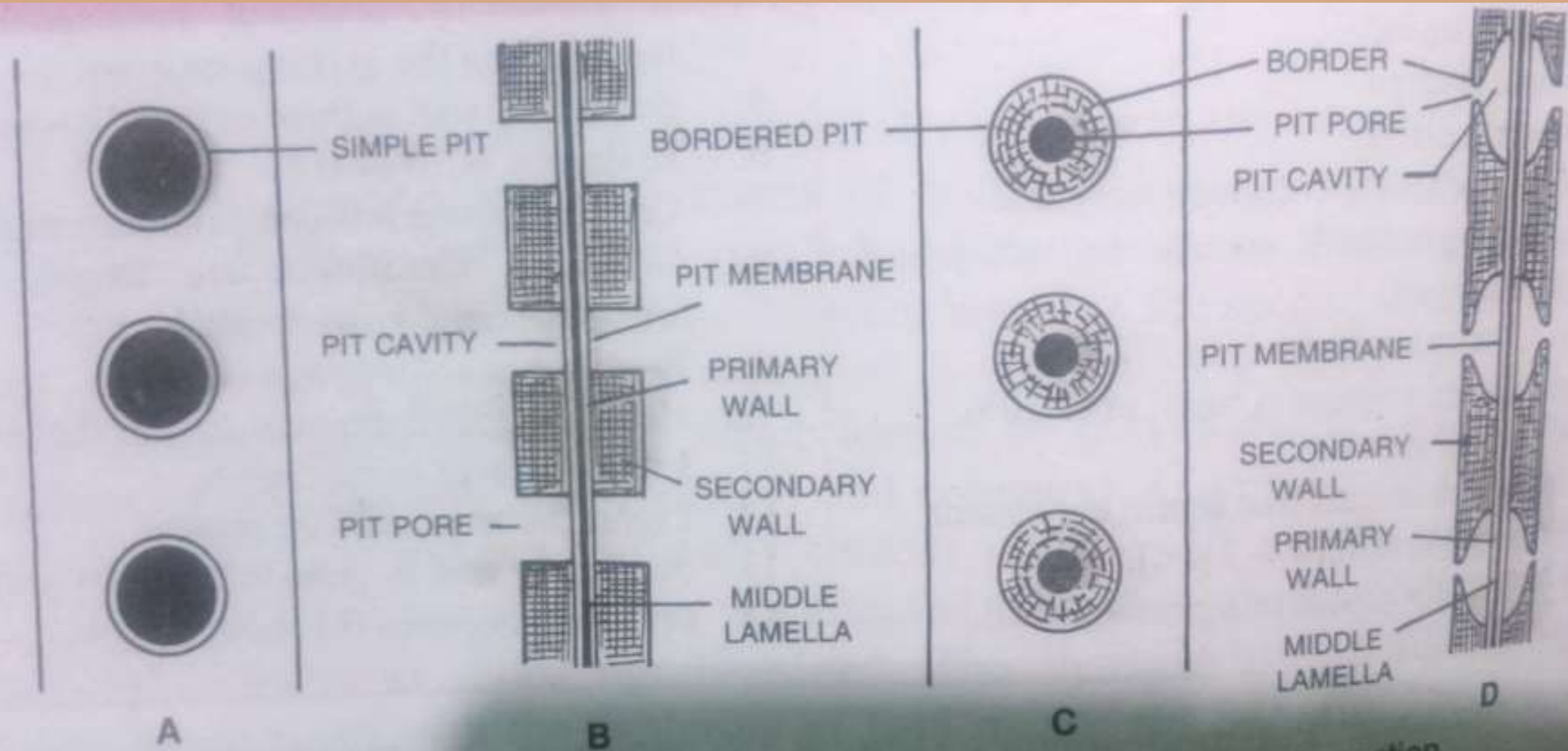
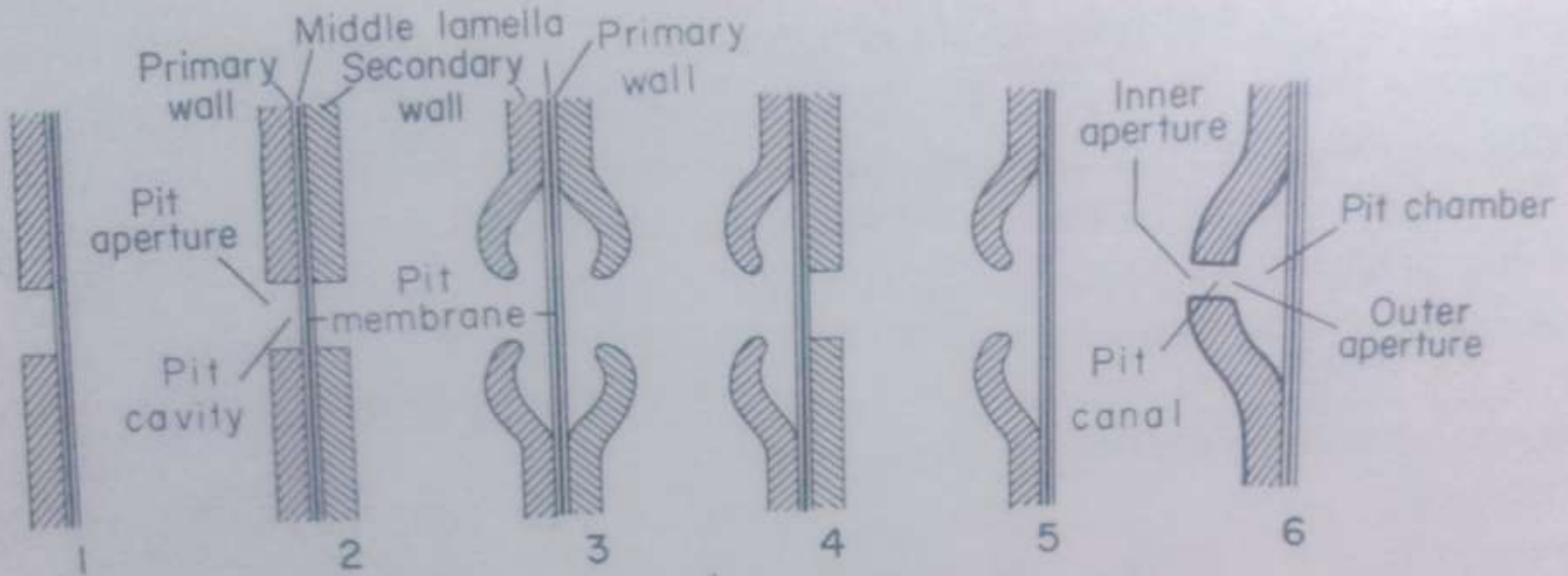


Fig. 8.20. Pits. A, surface view of simple pits. B, simple pit pairs in section. C, surface view of bordered pits. D, bordered pit pairs in section.



# COMBINATION IN PITS

- Simple pit-pair
- Bordered pit-pair
- Half bordered pit pair
- Blint pit
- Unilateral compound pitting
- Branched simple pit



STRUTCTURE OF PITS: 1, simple pits. 2, simple pit pair. 3, bordered pit pair. 4, half-bordered pit pair. 5 & 6, bordered pits

# STRUCTURE OF BORDERED PITS

- **Pit chamber:** part of pit cavity that is formed by overarching of the secondary wall.
- **Pit aperture:** the opening in the secondary wall that faces the cell lumen.
- **Pit canal:** it is formed between cell lumen and the pit chamber, if the secondary wall is very thick. Pit canal has two opening that are inner aperture and outer aperture.

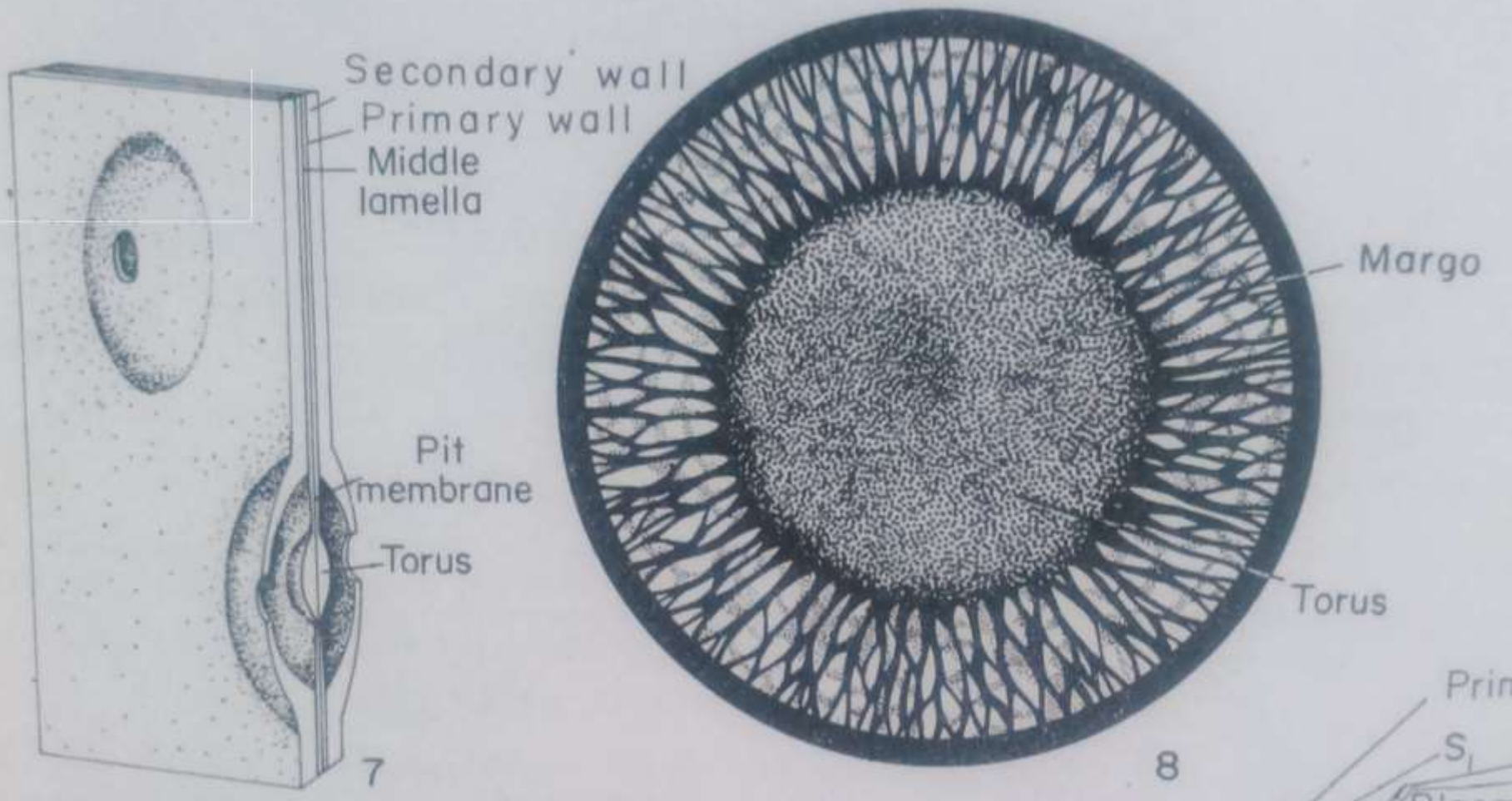
# COMBINATION IN BORDERED PITS

## ❖ Torus and margo

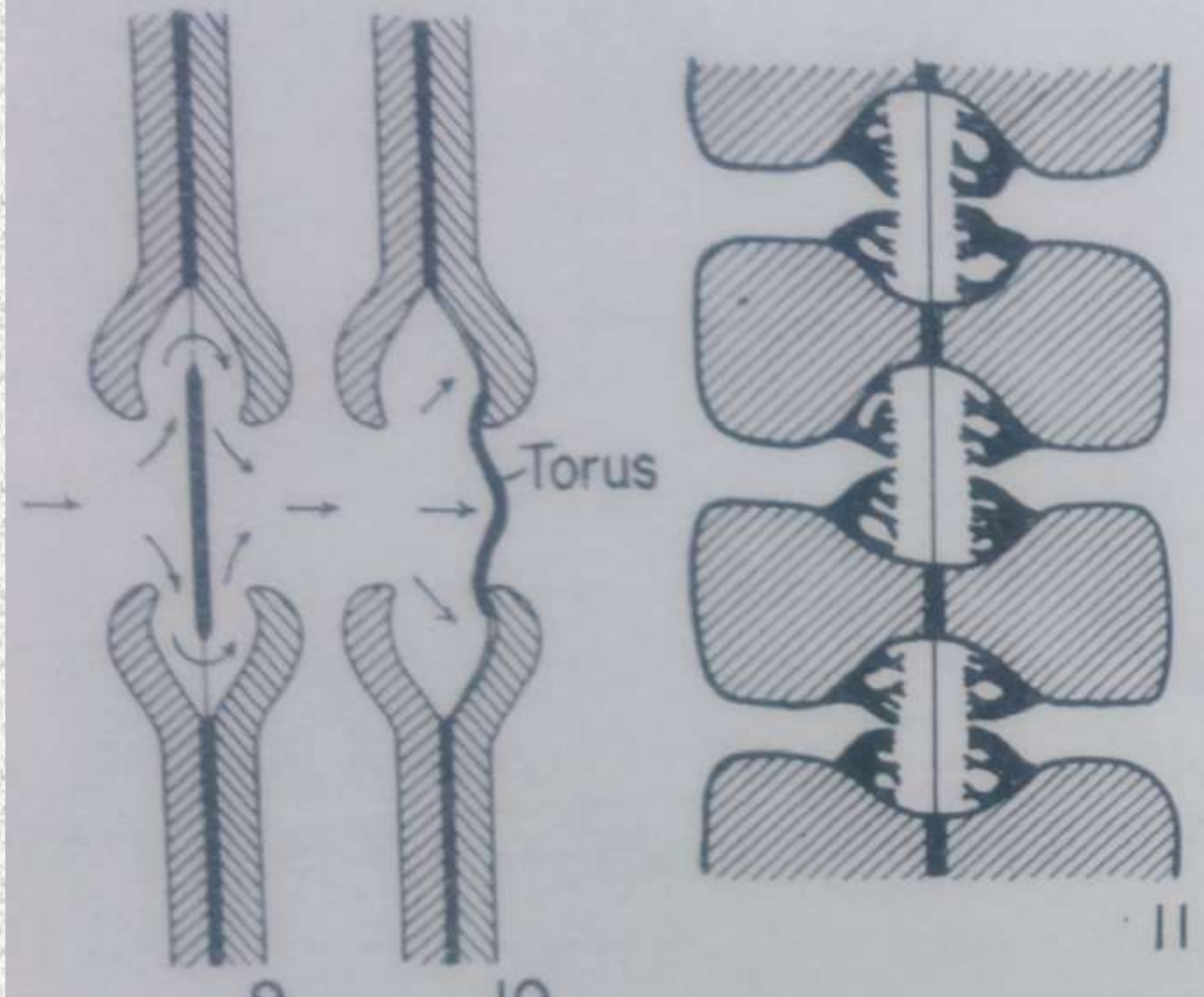
Each bordered pit pair encloses a web-like microfibril structure called margo that supports a central and much less permeable torus, the assembly acting as a valve to open or close the opening between tracheids.

## ❖ Vestured pits

In some dicotyledons, thin, simple or branched sculpturings are present on the secondary wall that forms the pit chamber or around the pit aperture. Such pits are called vestured pits.



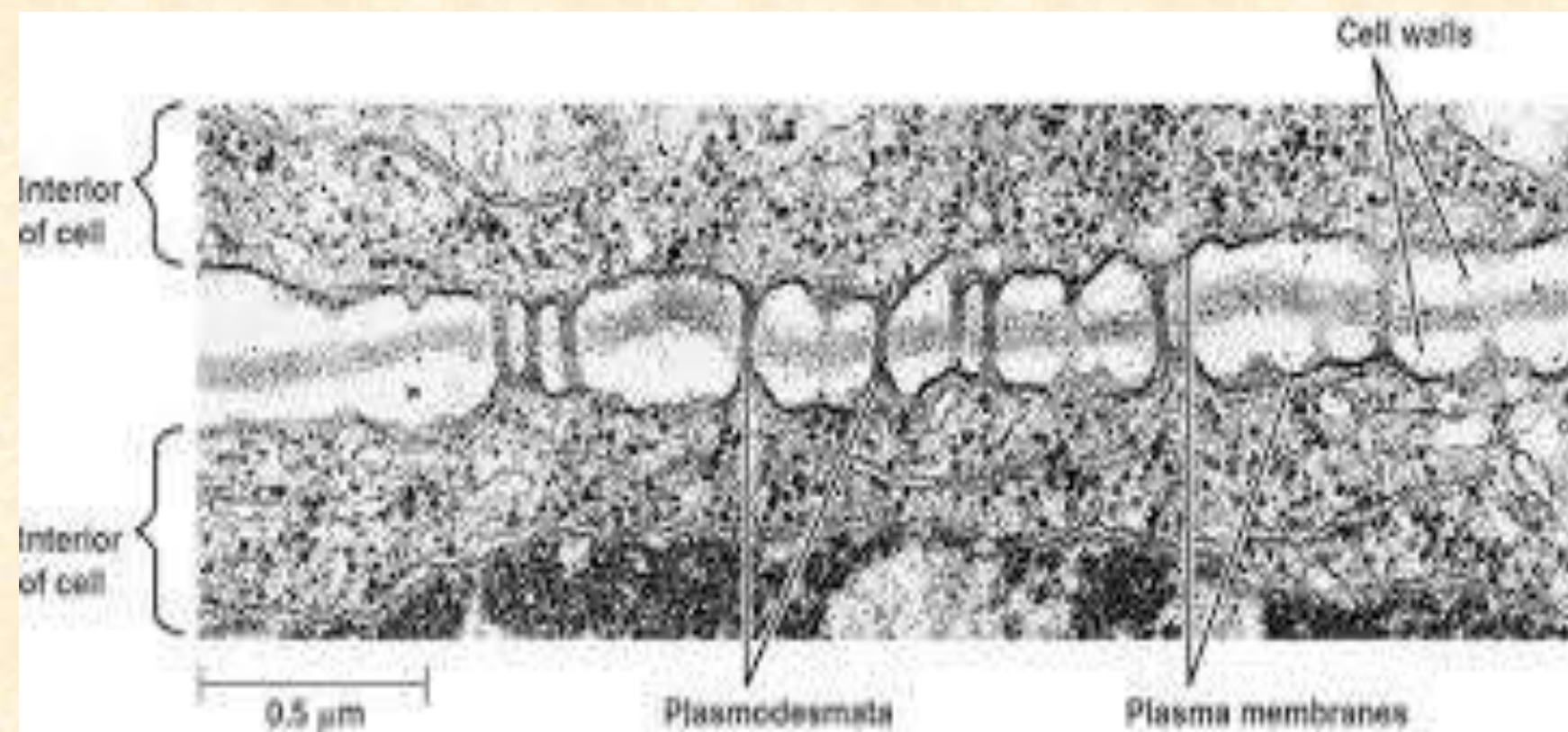
7, three-D diagram of a portion of the adjacent walls of two tracheids showing the structure of bordered pit-pairs. 8, diagram of pit membrane and torus of *Pinus* showing the perforations in the membrane



9 & 10 Longitudinal sections of bordered pit-pairs of a tracheid. Arrow indicate direction of water flow . 9 , torus and membrane in median position. 10 , torus closing one of the pit apertures

# PLASMODESMATA

- ❑ Plasmodesmata are protoplasmic strands that connect the protoplasts of neighbouring cells.
- ❑ Diameter is 40-50nm.
- ❑ Easily seen in endosperm of seeds such as *Phoenix* , *Aesculus* , *Diospyros* and in cotyledons of some plants.





# STRUCTURE OF PLASMODESMATA

- Plasmodesmata is lined by plasma membrane.
- It encloses tubular extensions of endoplasmic reticulum called **desmotubule**.
- The space between desmotubule and plasma membrane contain 8 – 10 microchannels.

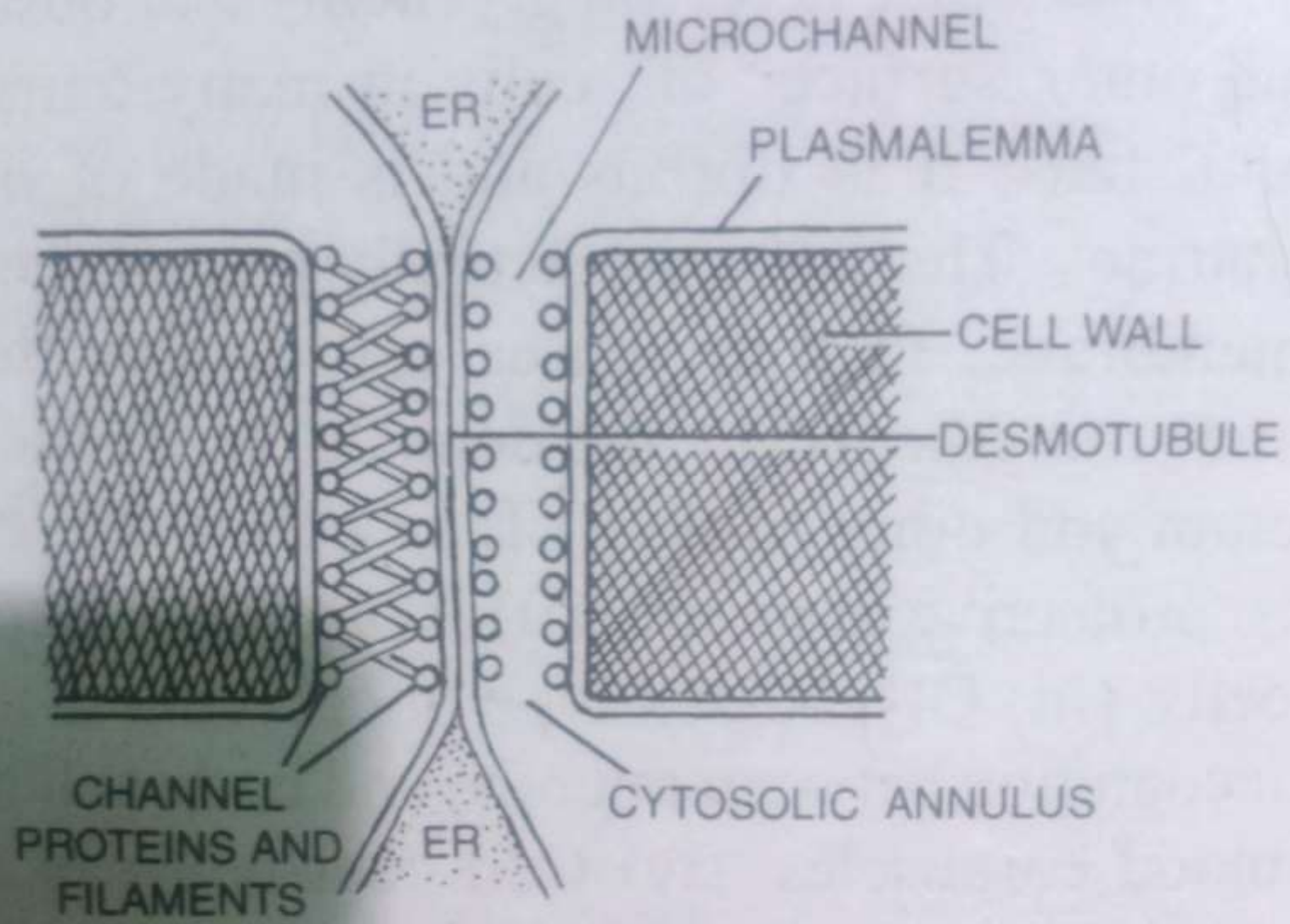


Fig. 8.19. Components of plasmodesmata.

# CLASSIFICATION OF PLASMODESMATA

- On the basis of origin:
  - primary plasmodesmata
  - secondary plasmodesmata
  
- On the basis of branching:
  - branched plasmodesmata
  - Unbranched plasmodesmata

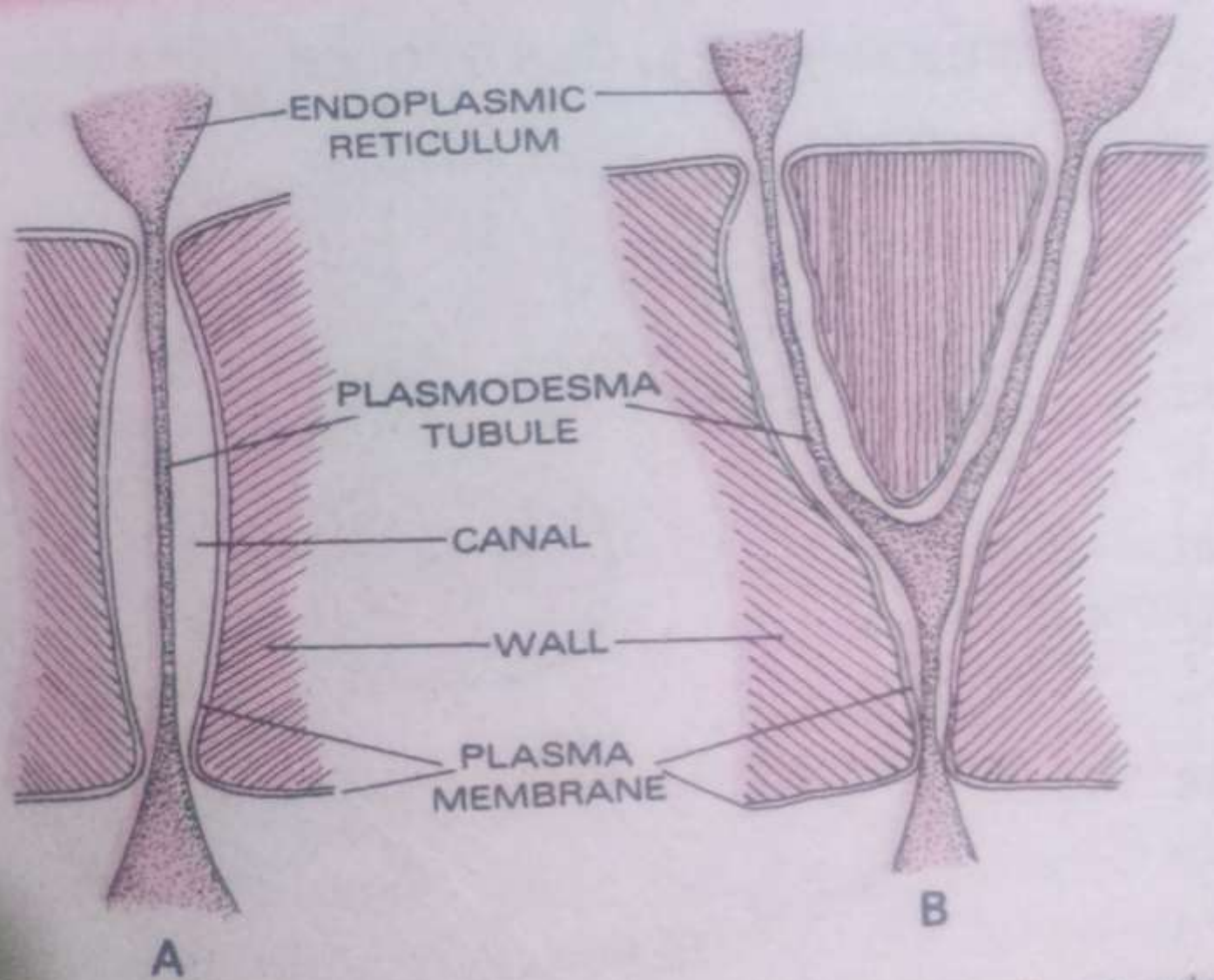


Fig. 8.18. Structure of plasmodesmata. A, simple. B, branched (as between sieve tube cells and companion cells).

# FUNCTION OF PLASMODESMATA

- Transport of materials and relay of stimuli.
- Regulate traffic of molecules between cells.
- Important role during development of organelle.
- Involved in short distance movement of viruses.

# BIBIOGRAPHY

- Plant anatomy by A. Fahn
- True man's elementary biology by Bhatia & Tyagi.
- internet

***THANK YOU***