

Text figure 1.

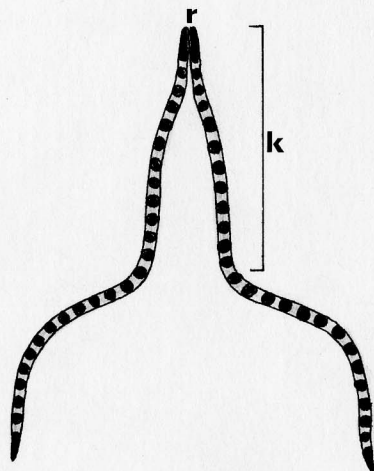
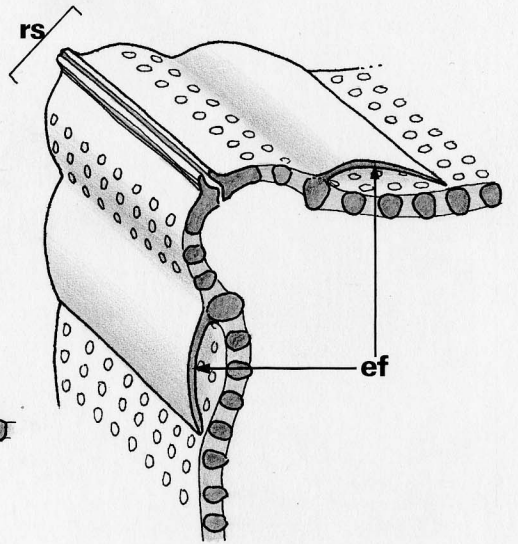
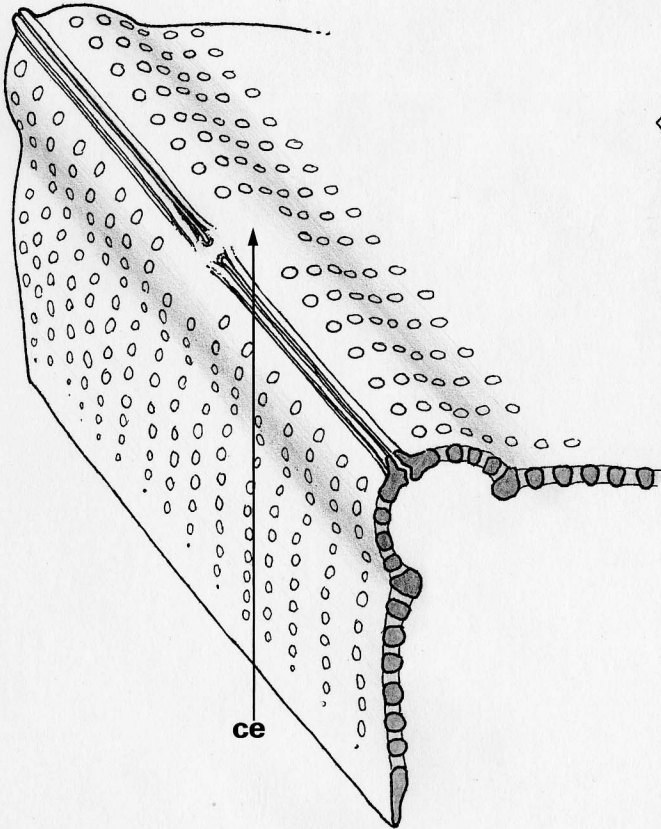
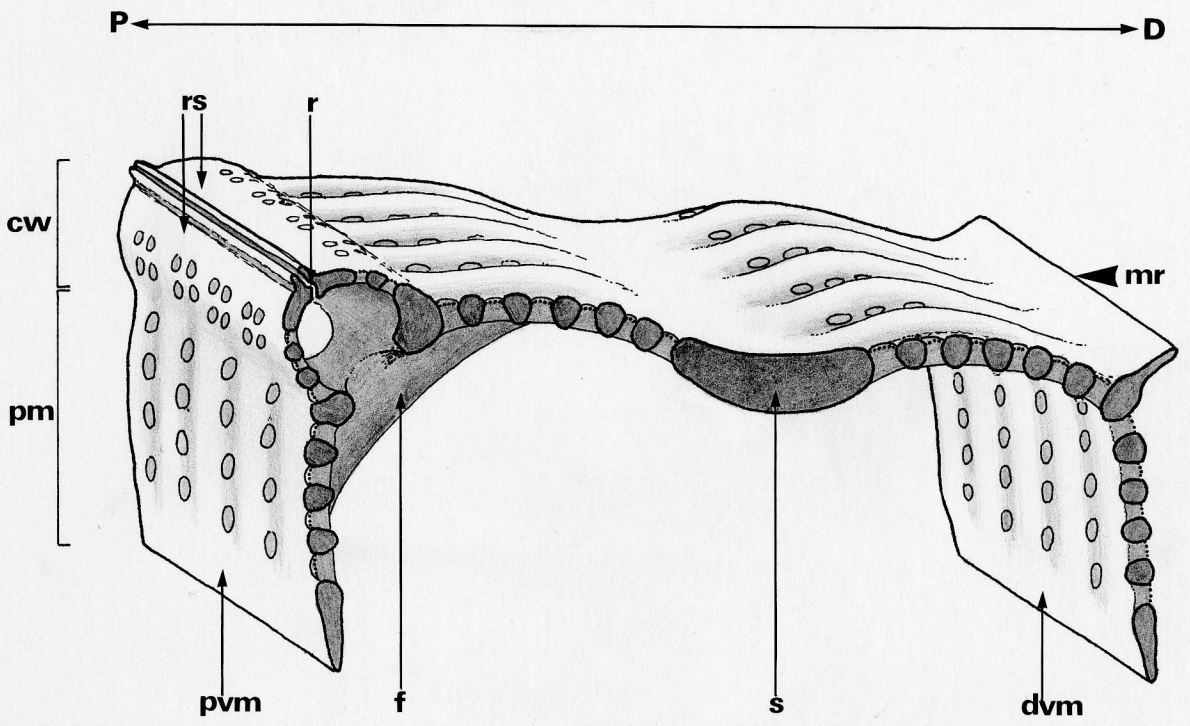
Top: slice of a Nitzschia valve,

where P = proximal
D = distal
pvm = proximal valve margin
pm = proximal mantle
cw = subraphe canal wall
rs = raphe-sternum
r = raphe-slit (which is bordered by
ridges)
s = sternum
mr = marginal ridge
dvm = distal valve margin
f = fibula

Centre left: centre of valve, with raphe endings; note the central expansion (ce) of the raphe-sternum.

Centre right: part of a valve with external flaps (ef)

Bottom: cross-section of a diatom, illustrating the meaning of 'keel' (k) accepted in this thesis.

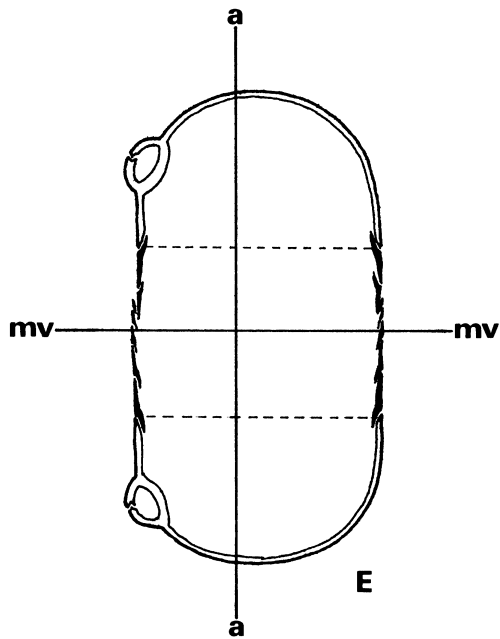
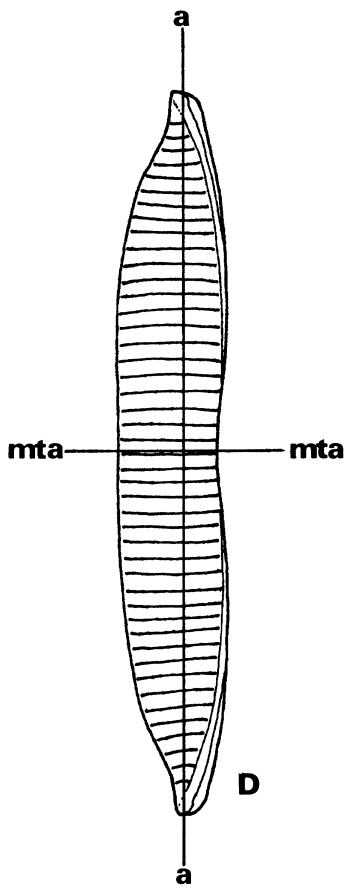
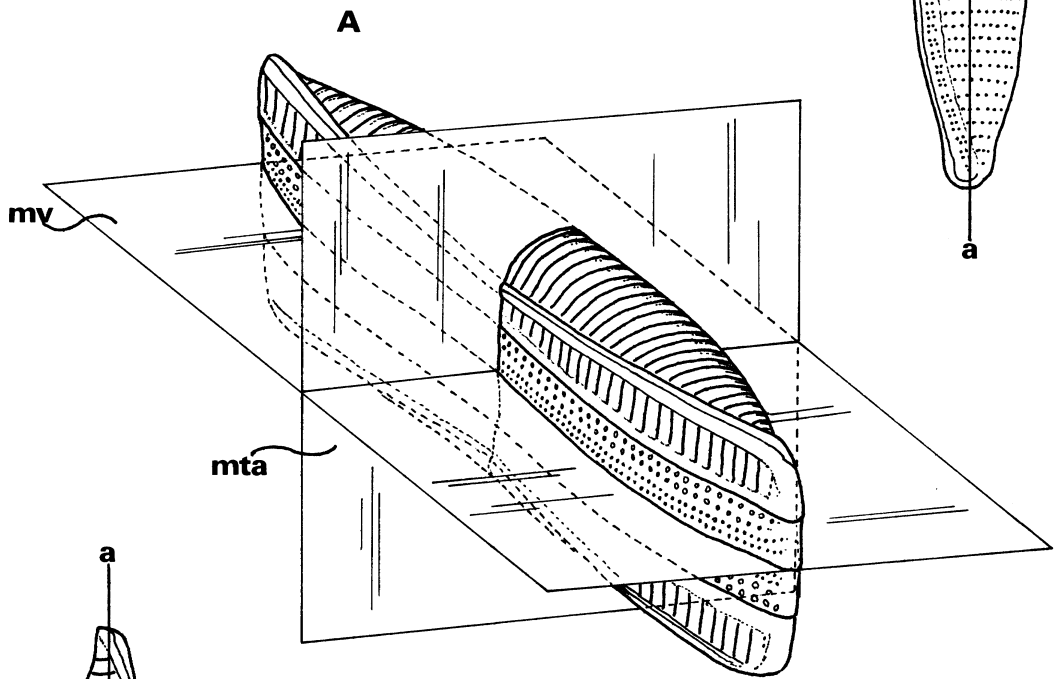
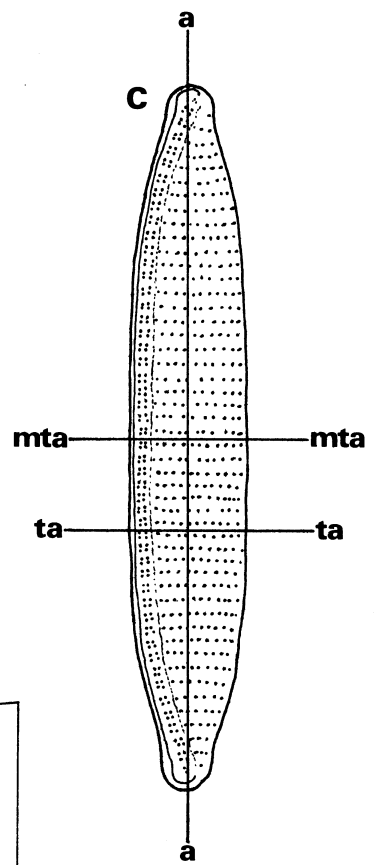
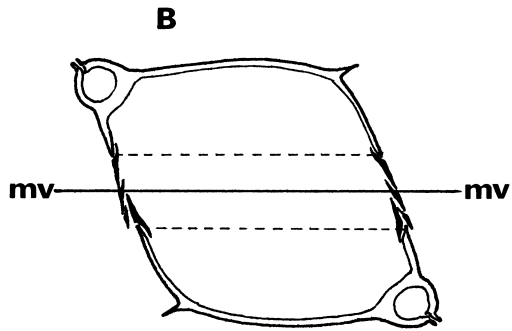


Text 1

Text figure 2.

- A. Hantzschia frustule, with median valvar plane (mv) and median transapical plane (mta)
- B. Nitzschia - cross section of a frustule (along a transapical plane). Epitheca (above) with 3 bands in the epicingulum; hypocingulum containing only one band. Cincture (between dashed lines; N.B. cincture = epicingulum + hypocingulum) narrow in relation to valves. Note that the frustule is 'diagonalsymmetrisch' about the median valvar plane (mv-mv)
- C. Nitzschia - valve, in valve view; note apical plane (a-a), median transapical plane (mta-mta), and a transapical plane (ta-ta). Note symmetry of valve outline about a-a.
- D. Hantzschia - valve, in valve view (labelled as C). Note the asymmetry of the valve outline about a-a.
- E. Hantzschia - transapical section of frustule (near centre). Hypotheca (above) with 2 bands, epitheca with 5. Note off-centre position of apical plane (a-a), and mirror symmetry about median valvar plane (mv-mv). Cincture wide in relation to valves.

Text 2



Text figure 3.

- A. Nitzschia - part of frustule, showing different concepts of 'apical plane'.

a-a is the true apical plane.

In the light microscope, for isolated valves, p^h (or p^e) is usually thought to be, and used as, the apical plane; it is about this plane that the valve's symmetry is usually judged. Where the valve margins can be distinguished, planes p^h or p^e are more appropriate.

In intact frustules plane p^f - p^f is often used. This plane and the true apical plane intersect at the apical axis (ax).

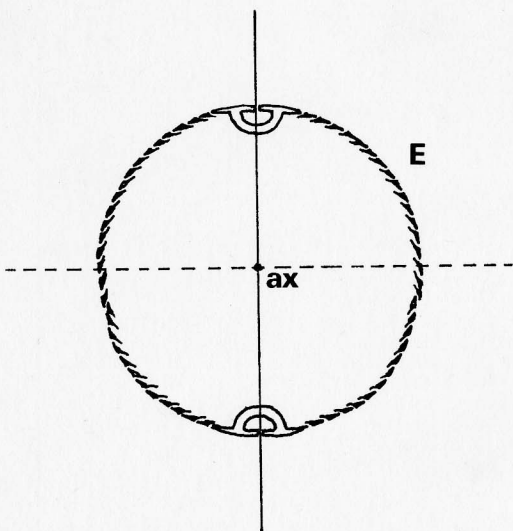
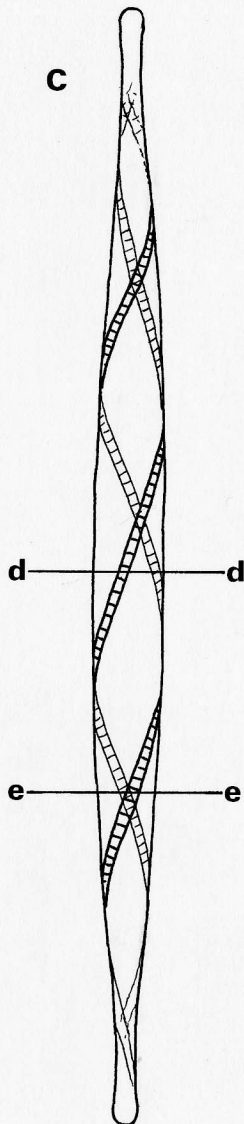
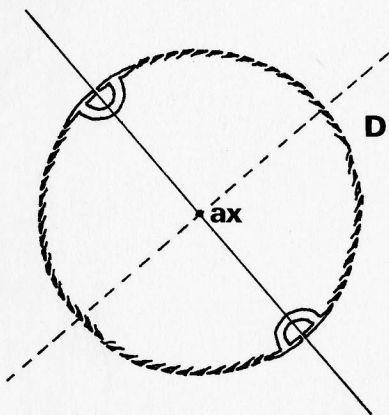
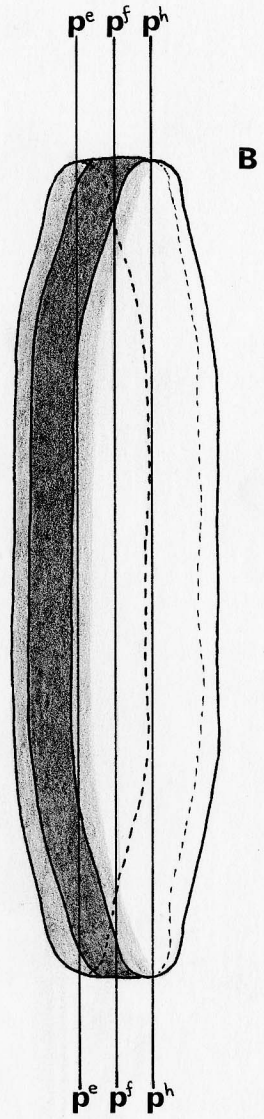
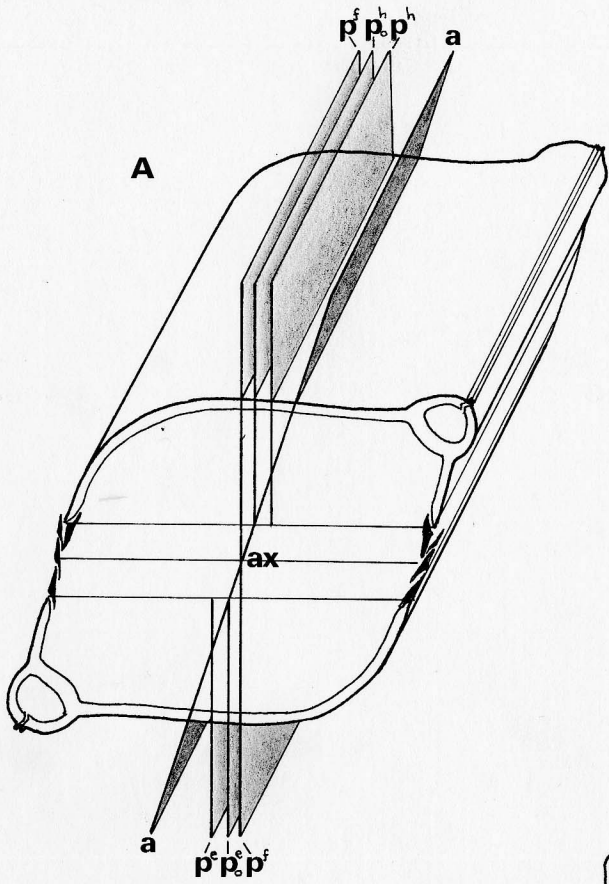
- B. Nitzschia frustule, in valve view - as further explanation of 'A'.

- C. Cylindrotheca frustule: note helical twist of raphe system.

- D. Transapical section of 'C' at d-d.

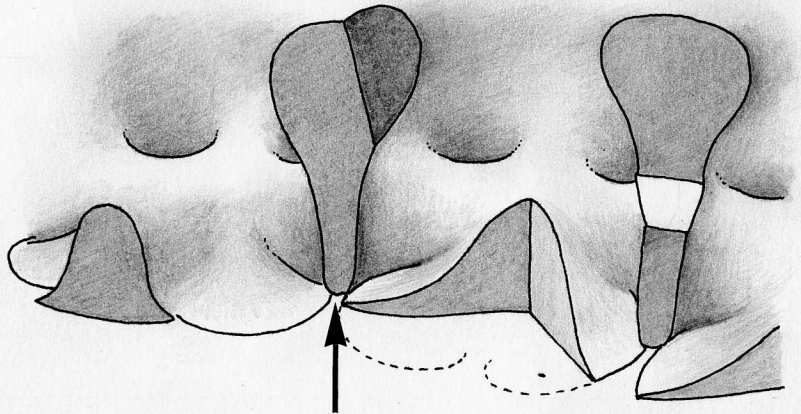
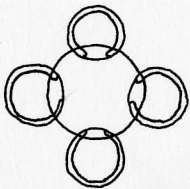
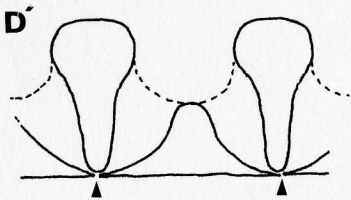
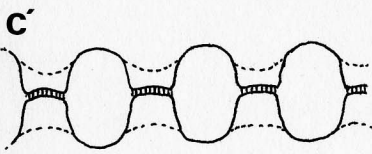
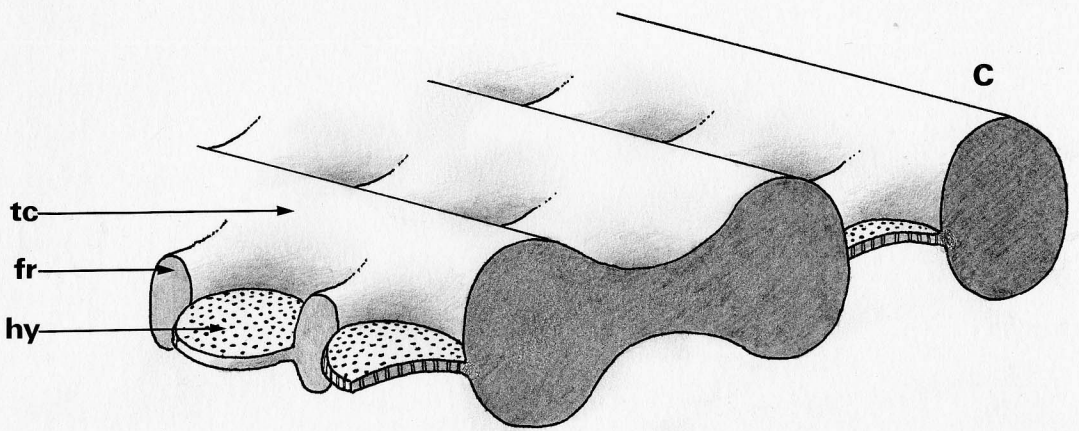
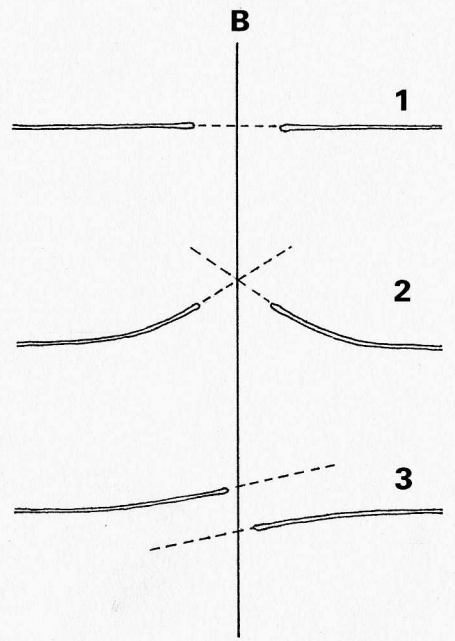
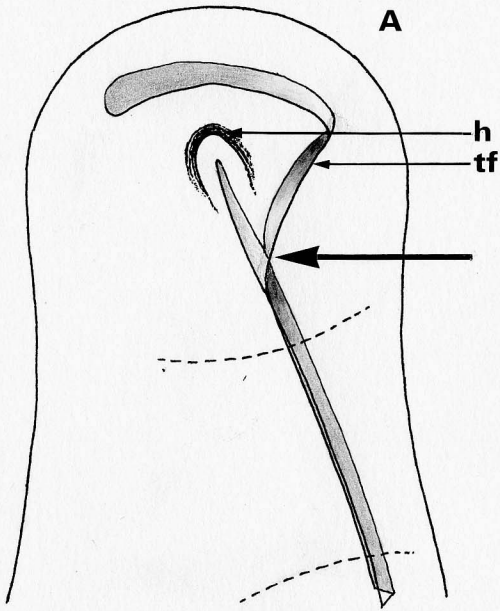
- E. Transapical section of 'C' at e-e. Note that only the apical axis can be distinguished in this diatom.

Text 3



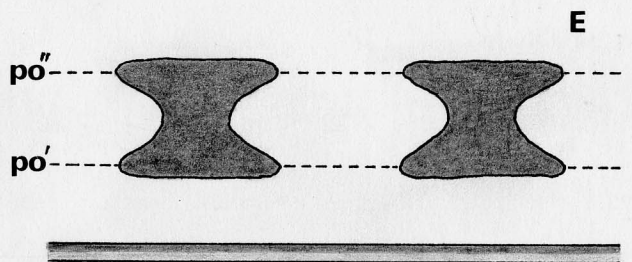
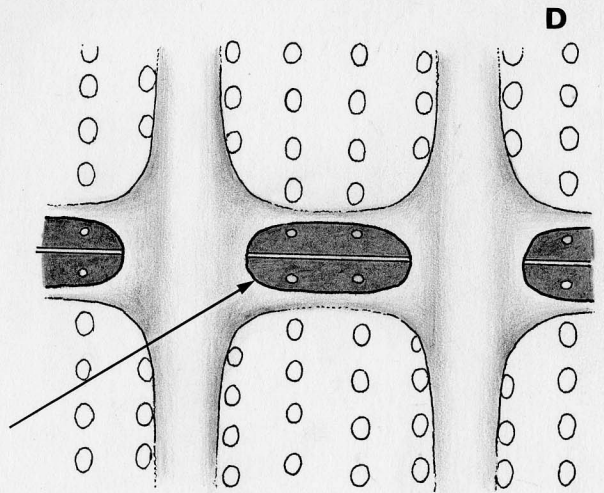
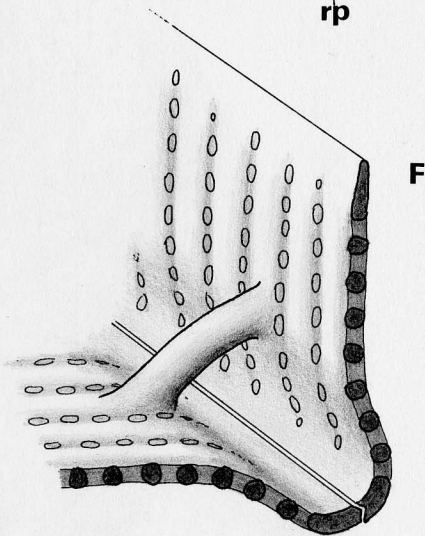
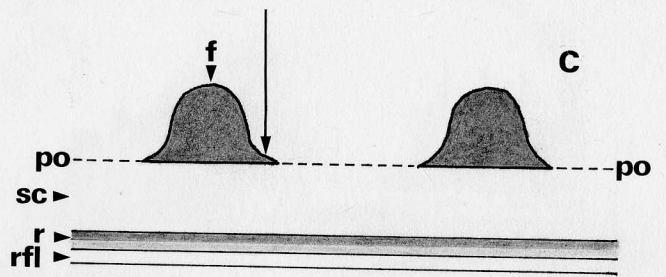
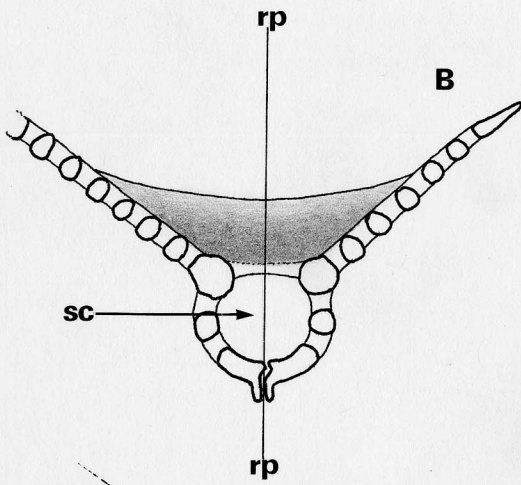
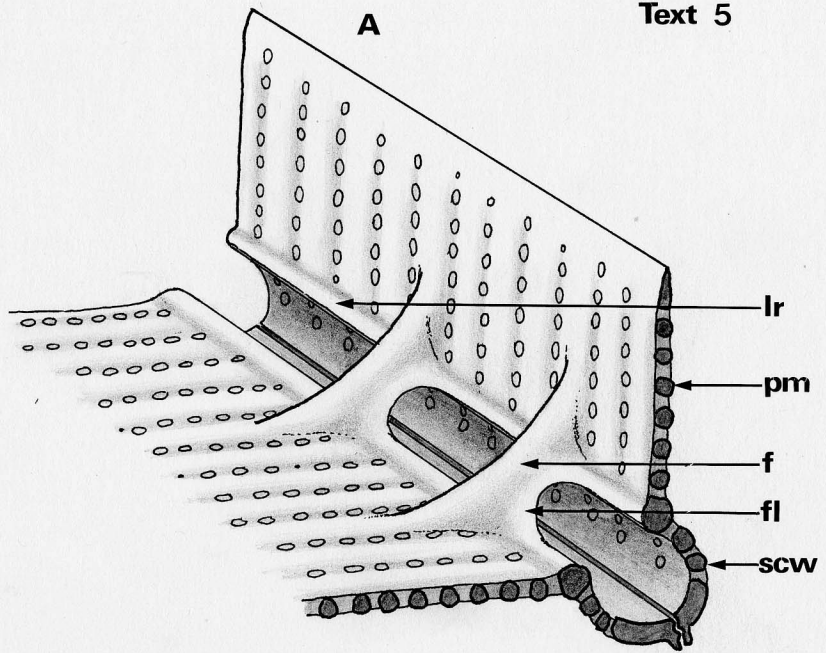
Text figure 4.

- A. Valve pole, showing the raphe structure (based on observations of Hantzschia amphioxys); note the separation of the inner and outer raphe fissures (arrow), the helictoglossa (h), which is internal, and the terminal fissure (tf), which is external.
- B. Central raphe endings: coaxial-symmetrical (1)
noncoaxial-symmetrical (2)
noncoaxial-asymmetrical (3).
- C. Hymenate valve construction - transapical costae (tc) and frets (f) delimiting \pm circular poroids, in which there are hymena (hy).
- C'. Section along an apical plane.
- D.D'. Volate valve construction (based on observations of Epi-
themia zebra); pores almost closed by flaps extending out
from the pore walls, leaving narrow, arcuate slits (arrows).



Text figure 5.

- A. Valve interior - part. Note the longitudinal ridge (lr) joining the proximal fibula (f) bases at the junction of the subraphe canal wall (scw) and the proximal mantle (pm), and the flanges (fl) extending out from the fibulae towards the longitudinal ridges. Another longitudinal ridge joins the distal bases.
- B. 'A' in transapical section; note the subraphe canal (sc).
- C. 'A' in section along rp-rp in 'B'. Portulae formed along dashed line (po-po). Note flanges (arrow) extending out from fibula (f).
sc = subraphe canal
r = raphe-slit
rfl = flanges bordering raphe-slit (see also Text F.1, top.
- D. 'A' seen along rp-rp in 'B'. Note oval-subrectangular portulae (arrow).
- E. A valve (sectioned along the same plane as 'C') in which portulae are formed at two levels.
po'' = inner portula level
po' = outer portula level
- F. A valve in which no subraphe canal is distinguishable; fibulae bar-like.



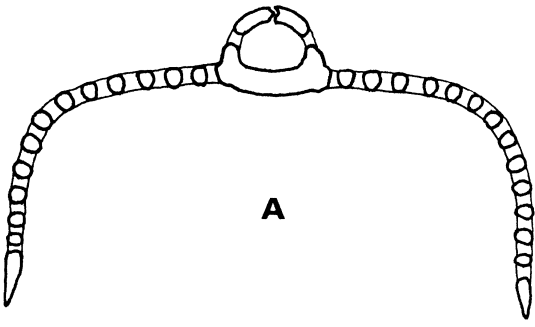
Text figure 6.

Transapical sections of valves:

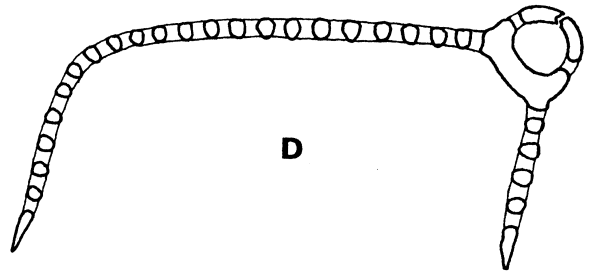
- A. Raphe system central, subraphe canal raised above the general level of the valve.
- B. Raphe system central, subraphe canal slightly raised.
- C. Raphe system central, subraphe canal not raised.
- D. Raphe system eccentric, subraphe canal raised.
- E. Raphe system eccentric, subraphe canal only very slightly raised.

All the above have equally developed proximal and distal mantles.

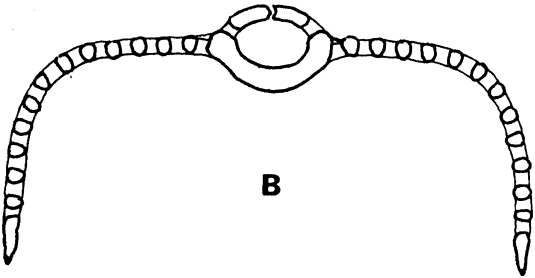
- F. Raphe system eccentric, subraphe canal raised, proximal mantle higher than distal; valve acutely angled at raphe.
- G. Raphe system central, keeled.
- H. Raphe system eccentric, valve very acutely angled at raphe.



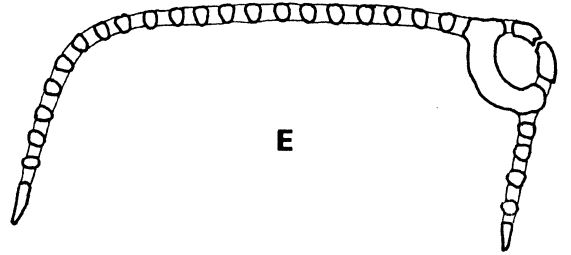
A



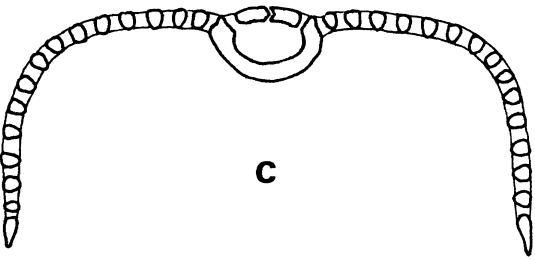
D



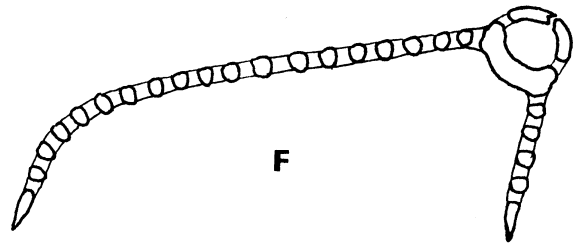
B



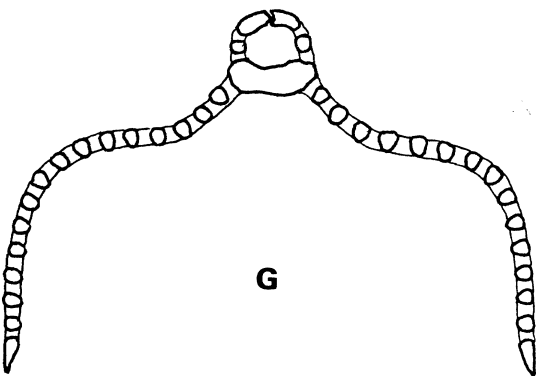
E



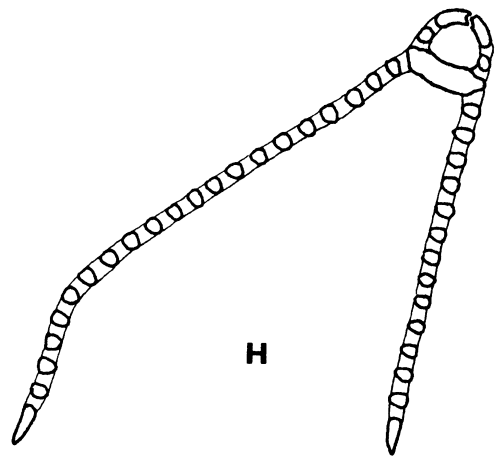
C



F



G



H