

[Figures]

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Figure 1

In this figure and the following, AdMy = Adductor myostracum; Ec = Ectostracum; En = Endostracum; Me = Mesostracum; MeEc = Mesectostracum; MeEn = Mesendostracum; PaMy = Pallial Myostracum; Pe = Periostracum. Whenever necessary the marginal direction is indicated by an arrow. All drawings diagrammatic unless otherwise indicated.

- A. *Chione succincta* (Valenciennes). Longitudinal section near margin (x4) showing distribution of crossed-lamellae (figured as reclined lines). The outermost zone of the ectostracum just beneath the surface is fibrillar; the fibers are not figured here.
- B. *Ostrea* sp. Longitudinal section of shell (x1). Braided black lines = sublayers with «normal type» folia; white areas = sublayers with «chalky» substance.
- C. Longitudinal section and inner surface of a pelecypod valve showing positional relationship of three major palliostracal layers to each other, as well as to the pallial line and adductor scar.
- D. Longitudinal and oblique sections and inner surface of a pelecypod shell showing pallial and adductor myostraca.
- E. *Pitar lupanaria* (Lesson). Outside view and longitudinal section of shell showing the reflected marginal region and an apically-opened spine (x1). Section of spine shown at upper right of figure.
- F. Longitudinal section of a pelecypod near margin showing growth sublayers in the mesostracum. Fast-growth sublayers dashed.
- G. Longitudinal section of a pelecypod near margin showing true sublayers (a and b) in the mesostracum.
- H. Longitudinal section of a pelecypod showing relationship of growth and overlap sublayers. A = slow-growth sublayer; B = fast-growth sublayer; C = overlap sublayer.
- I. Longitudinal section of a pelecypod near marginal region showing imbrications of the ectostracum into the mesostracum.
- J. Longitudinal section of a pelecypod near marginal region showing some growth lines; marginal region steeply inclined.
- K. Same as before, marginal region shelf-like.
- L. Same as before, marginal region reflected.
- M. Same as before, marginal region with subperipheral inflection and steep outer portion.
- N. Longitudinal section of a pelecypod, near pallial line showing homochronous secretion of endostracum and mesostracum (schematic).
- O. Same as before, showing heterochronous secretion of the endostracum and mesostracum.
- P. *Spondylus pictorum* Chemnitz. Hypotype no 36270. Longitudinal section of the marginal region (x2). a = crossed-lamellae; b = inner sublayer of the foliated

layer with steeply inclined folia; c = outer sublayer of the foliated layer with almost horizontal folia.

- Q. Portion of an inner surface of a pelecypod shell showing the pallial line (and hence the pallial myostracum) marginal to the adductor scar (and adductor myostracum).
- R. Same as above, showing pallial line (pallial myostracum) connecting to the marginal region of the adductor scar (adductor myostracum).
- S. Same as above, showing pallial line (pallial myostracum) connecting to the lateral margins of the adductor scar (adductor myostracum).

Figure 2

- A. Longitudinal section of a pelecypod showing endostracal tubules.
- B. Same as above, showing mesendostracal tubules.
- C. Distribution of tubules as in B, showing in detail the tubulation pattern in the apical region.
- D. Longitudinal section of the apical region, tubules occurring in all three layers.
- E. Longitudinal section of a pelecypod showing tubules occurring in all three layers.
- F. Longitudinal section of a pelecypod, tubules in all three layers but appearing only within the pallial line.
- G. Longitudinal section of the marginal region of an arcid, showing distribution of tubules (schematic). Apically from the pallial line the tubules rise gradually in the mesectostracum, the angle between the tips of the rising tubules and the outer surface being in a number of cases about 60° .
- H. *Hinnites giganteus* (Gray). Longitudinal section through part of the endostracum showing arrangement of tubules ($\times 20$). The polygonal areas represent stacks of folia.
- I. *Trachycardium* (*Trachycardium*) *consors* (Sowerby). Transverse section showing types of partitions ($\times 5$). Solid line = primary partition; dashed line = secondary partition; dotted line = lower continuation of primary partition, usually lacking.
- J. *Trachycardium* (*Trachycardium*) *consors* (Sowerby). Transverse section showing ribbing structure ($\times 5$). The dashed areas are the «opaque inverted commas» on the interspace area side of the partitions. The growth line pattern in the rib area tends to be tongue-like. In the interspace area the outermost growth lines show two convexities and three concavities; further in, only one convexity and two concavities. A small furrow on the flange produces the sharp rise just in from the partition at the left of the interspace area.
- K. Transverse section of three composite ribs of a pelecypod showing relationship of rib and interspace areas and partitions.

- L. Transverse section of a pelecypod with contiguous peripheral denticles. The thick black line surrounding each denticle represents the slow-growth deposits that occur there; those of two adjoining denticles appear to coalesce, but in some shells there may be a plane of weakness and perhaps even a narrow fissure between the partitions of two adjoining denticles. The growth lines in each denticle are concentric and the structural elements are perpendicular to the growth lines and hence radially arranged. (See also CHAVAN, 1943.)
- M. Transverse section and inner view of a denticle of a composite ribbing showing position of flanges.
- N. Transverse vertical section across a subperipheral denticle showing pattern of growth laminae; a = slow-growth laminae; b = fast-growth laminae; p = partition.

Figure 3

- A. Longitudinal section showing the main shell layers in a primitive gastropod (schematic).
- B. Longitudinal section showing the main shell layers in a primitive cephalopod (schematic, based on an uncoiled *Nautilus*).
- C. Longitudinal section showing the main shell layers in a scaphopod (schematic).
- D. Longitudinal section showing the main shell layers in a chiton (schematic).
- E. Longitudinal section showing the main shell layers in a pelecypod (schematic).
- F. Longitudinal section of the marginal region of a pelecypod shell showing the orientation of the «perpendicular» micro-structural elements as they appear in many genera. A—B—C = structural element which originates at the outer shell surface, and reaches all the way to the mesendostracal boundary.
- G. Longitudinal section of the marginal region of a pelecypod with a reflected margin, showing the radiating pattern of the structural elements in the ectostracum. The structural elements such as A—A' originate at the periphery near the middle of the ectostracum and with further growth of the shell migrate upwards and downwards (as indicated by arrows), while new elements continually appear in the middle of the ectostracum.
- H.—K. Transverse section of a rib of the *Lyropecten* group showing formation of interlocking structure of the rib area by growth of the folia towards the axis of the area, the folia on the two sides of the rib area alternating and each in turn spreading somewhat beyond the axis of the rib area (as deduced from observations of many consecutive sections). The arrows indicate the direction of migration of the individual folia.
- L. *Spondylus pictorum* Chemnitz. Transverse section showing ribbing structures, especially the characteristic loop-shaped arrangement of the folia in the rib areas, and the more or less circular sections of stacks of rod-like folia in the interspace areas (x2).

- M. *Lithophaga plumula* Hanley. Longitudinal section showing layers and sublayers in the shell (much magnified, thickness much exaggerated). Black = conchiolin sheets or sublayers in endostracum; white = nacreous sublayers in endostracum; striped = prismatic sublayers in endostracum.
- N. *Lithophaga plumula* Hanley. Longitudinal section showing erosion of shell from outside (indicated by broken arrows) and secretion of endostracal conchiolin sheets on the inside (full arrows). Schematic. The individual endostracal conchiolin sheets are indicated by black bands in the endostracum. Much magnified. Thickness of shell much exaggerated.

Fig. 1

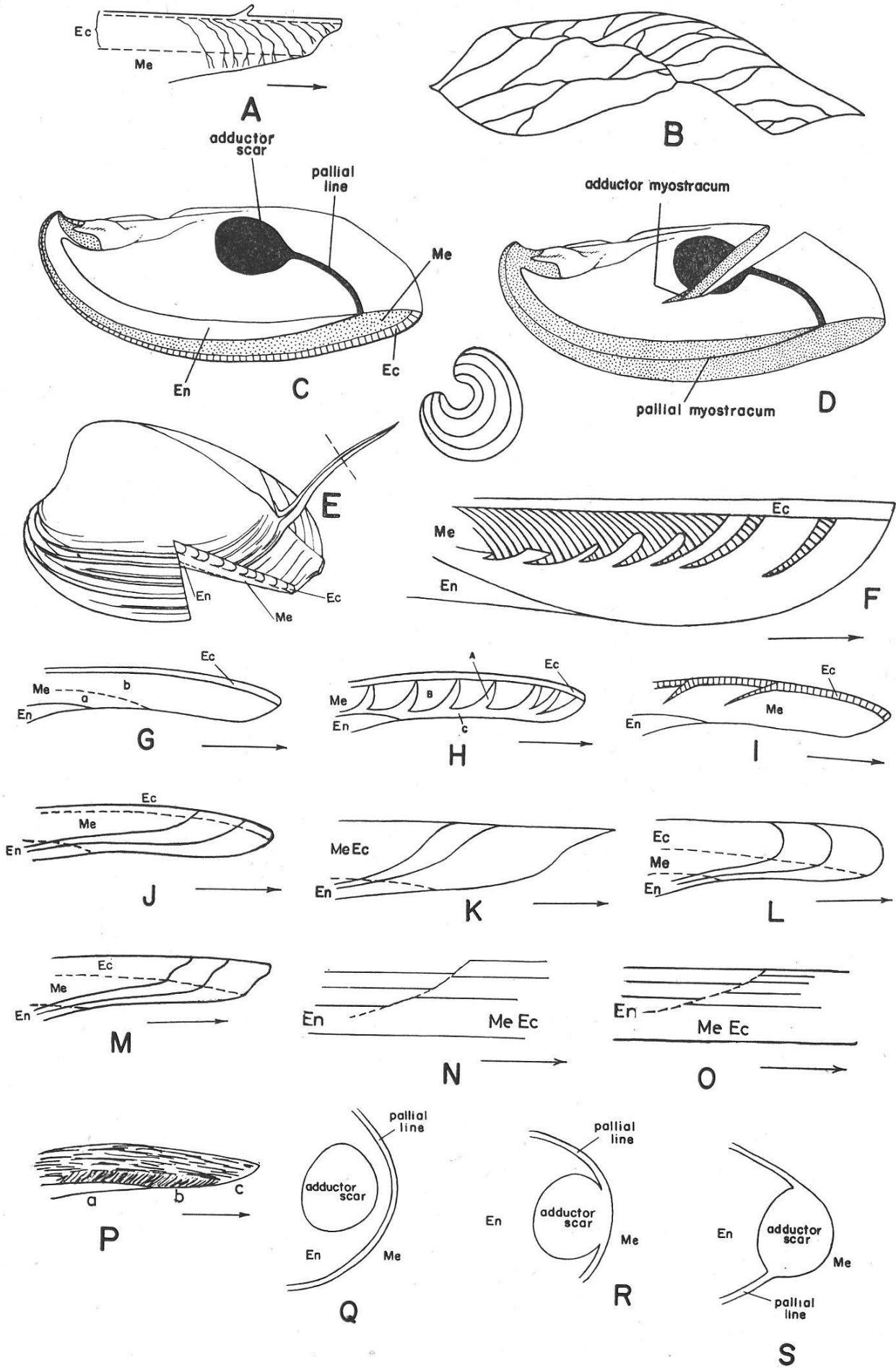


Fig. 2

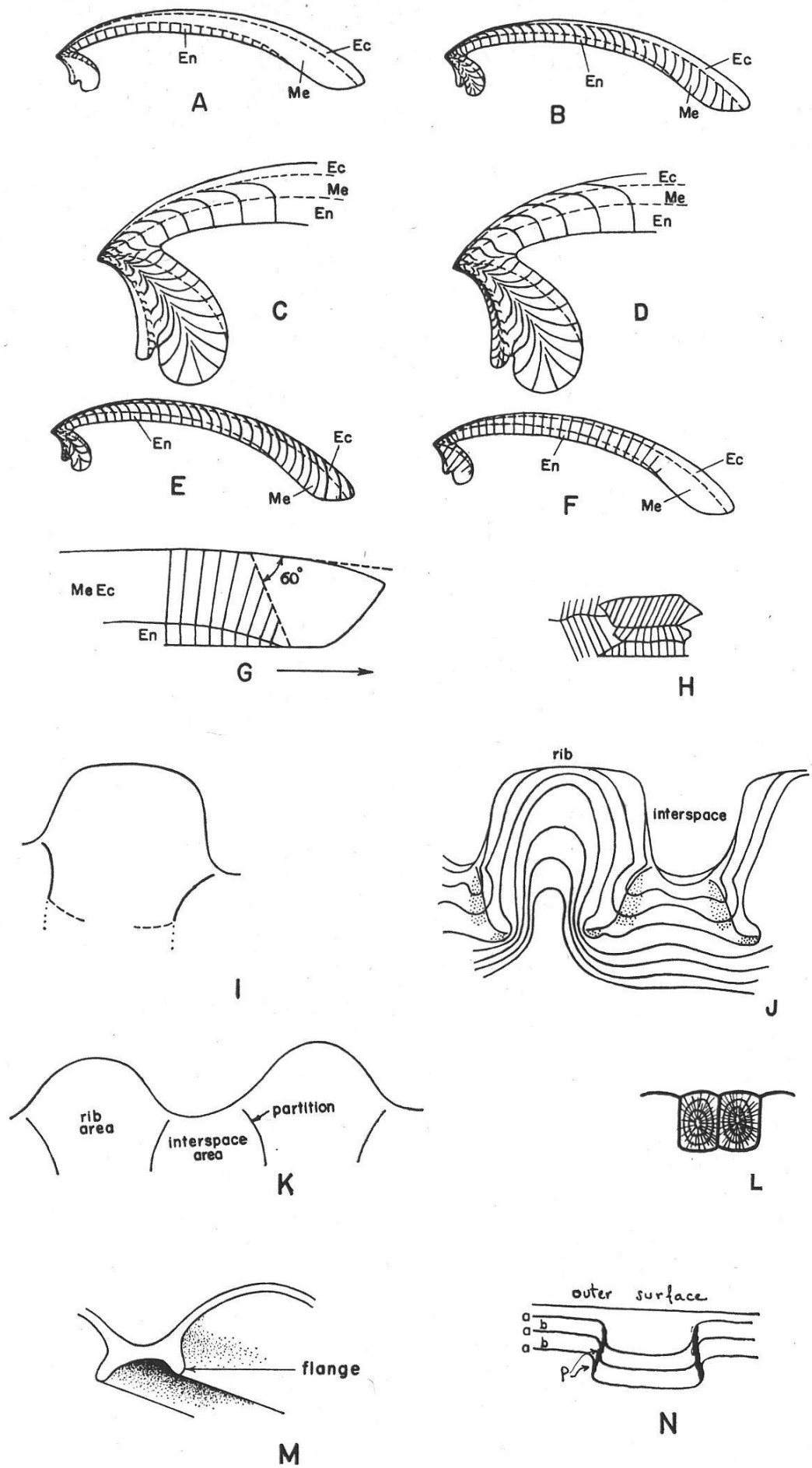


Fig. 3

