Explanation of the plates

Objekttyp: **Chapter**

Zeitschrift: **Mitteilungen der Naturforschenden Gesellschaft in Bern**

Band (Jahr): **25 (1968)**

PDF erstellt am: **15.09.2024**

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Explanation of the plates

(All figures diagrammatic, variously magnified; view of shell surface, with aperture to the left unless otherwise indicated; arrows, when present indicate distal direction. Asterisks stand for patterns not seen on actual specimens. Alt. c. bands = alternating colour bands.)

Plate I

Fig. 1	End whorls of gasteropod, showing pattern elements resulting from various types of activities of secretion sources.
Fig. 2 b	Oblique band: secretion continuous. When secretion of same is intermittent it appears as in fig. 2 a, not fig. 3.
Fig. 4	Cross section through superficial portion of shell, showing the in-depth secretion of spots; in such species as *Natica millepunctata* Lam.
Fig. 5	Various types of junctions of lines. Vertical parallel lines = growth lines
Figs. 6, 9	Valves of two varieties of a *Lioconcha,* prob. *L. castrensis* Lam., showing diverging patterns.
Fig. 7	Zigzags, which include both diverging and converging portions.
Fig. 8	*Marginella lineata* Mühl., showing «inflowing» pattern.
Fig. 10	Irregular zigzags in *Strombus vittatus* L. Zigzags are AB, CD, EF. Dashed lines = connecting lines.
Fig. 11	Rhombic network produced by two sets of lines of opposite obliquity.
Fig. 12	Zigzags of *Strombus vittatus* L., showing directional instability.
Fig. 13	Two connected zigzags of *Strombus vittatus*. Dashed lines = connecting lines.

Plate II

Fig. 1 *Polymita picta* Born, showing crossing of white radial band and dark concentric line.

Fig. 2 Discontinuous near-radial lines in *Littorina zebra* Don.

Fig. 3 Interrupted transverse bands in *Imbricaria conica* Desh.

Fig. 4 Interrupted lobes in *Conus lucidus* Wood.

Fig. 5 Interrupted lines and bands (thick, black) in the reticulated pattern of *Tricolia tessellata* Phil. Figure should be shifted clockwise ab. 45 °.

Fig. 6 «Influence» of a dark transverse band on an alt. c. band, such as in *Gibbula ardens* v. Salis.

Fig. 7 Interruption and dislocation of transverse lines by radial band in *Conus generalis* L.

Fig. 8 Sinuous lines in *Voluta undulata* Lam., showing bends to be closer on their flanks and, presumably in «compensation», more numerous on their proximal extremities and thicker on their distal extremities.

Fig. 9 Crossings of transverse sinuous lines and radial alt. c. bands in *Monodonta articulata* Lam.

Fig. 10 «Influence» of «latent» radial bands on dotted pattern of *Conus arenatus* Brug.

Fig. 11 Closely set transverse lines, showing «nearness» effect.

Figs. 12, 13 Influence of growth breaks on pattern elements: 12 a: interruption of radial bands. 12 b: pause in secretion of radial band. 13: Sinuous transverse lines becoming concentric and straight on the other side of growth break, then becoming again sinuous. G. B. = growth break.

Plate III

Figs. 1–6 c Simple pattern elements of the linear type (except 2 a and 1 a, b).

Figs. 6 d–8 Common pattern types in Gasteropods.

Plate IV

Fig. 1 Various theoretically possible simple spot shapes.

Figs. 2–10 Theoretically possible arrangements of «small» elements. 2. Homogeneously irregular. 3. Clustered irregular. 4. Regular perpendicular. 5. Regular oblique. 6. Unidirectional (radial). 7. Two-directional (radial and transverse). 8. Elements arranged in rows. 9. Elements arranged in bands. 10.Elements arranged in crossing pattern.

Figs. 11–13 Some theoretically possible arrangements of «big elements». 11. Elements parallel to each other. 12. Elements touching each other. 13. Elements crossing each other.

Fig. 14 Some theoretically possible arrangements of small and big elements. a) Elements not touching each other. b) Elements touching each other. c) Elements crossing each other. d) Elements within one another.

Fig. 15 Possible relationships of «big» elements with parallel axes (not mentioned in text except for normal parallel and alternate parallel zigzags).

Fig. 16 Rows of spots in a *Mitra* (here *Mitra papalis* Lam.).

Fig. 17 Production of «blurring» in spot margins through different processes. a—d: cross sections through shell, s = shell surface; figures very schematic. a) Spot thinner at margin. b) Spot lighter at margin. c) Spot secreted at deeper levels at the margin. d) Shell substance more opaque over spot margins.

Fig. 18 *Conus striatus* L., showing junction figures of transverse lines and portions of radial bands.

Fig. 19 a, b: arrangements of «small» elements (lobes and dots), as contrasted to c, arrangement of «big» elements, lobed lines.

Plate V

Fig. 1 Crossed-oblique arrangement of spots, as in *Tricolia pullus,* almost as regular as the «regular oblique» arrangment. Spots are here joined by fine lines forming a regular rhombic network.

Fig. 2 Relatively regular arrangement of spots in radial and transverse directions producing also oblique alignments (along the axes x and x').

Fig. 3 *Conus chaldeus* Röd., showing arrangement of spots.

Fig. 4–7 Showing how alt. c. bands may become differentiated from the rest of the whorl.

Fig. 8 Relationship between light ogives and transverse lobed bands in *Conus textile* L.

Fig. 9 Arborescent «junction figures» of *Neopetraeus arboriferus* Pil., showing overlap of the figures.

Fig. 10 Junction figures of *Bulimulus coturnix* Sowb. DD = transverse element. C = radial elements. A = oblique elements.

Figs. 11–14 Illustrating diverse types of periodicity in secretion of divergent elements. In fig. 14, the elements of fig. 11 continue to be secreted until they meet. – The upper and lower portions of figs. 12 and 13 may be referred to as parts a and b respectively of these figures.

Fig. 15 *Neritina glabrata* Sowb. showing elements with different periodicity in upper and lower portions of the whorl.

Fig. 16 *Neritina oualanensis* Les.: Periodicity of element secretion varies in alternate fashion from upper to lower portion of the whorl.

Plate VI
Linear networks

Fig. 1 Irregular network of the crossed-line type.

Fig. 2 Irregular network of the cellular type.

Fig. 3 Irregularly oriented overlapping rectangular network.

Fig. 4 Rectangular labyrinthic network of the cellular type.

Fig. 5 Rectangular labyrinthic network of the crossed-lines type.

Fig. 6 Overlapping irregular patterns.

Fig. 7 Overlapping irregular rectangular network.

Fig. 8 Rhombic labyrinthic network.

Fig. 9 «Tented» pattern produced from light ogives, as in *Conus aulicus* L.

Fig. 10 «Tented» pattern as in *Oliva porphyria* L. In that species and in most other cases, tents point distally (upper arrow [1]), in rare species proximally (lower arrow [2]). AB and CB will be converging lines in the first case, diverging in the second, etc.

Fig. 11 Association of zigzags and regular rhombic network, as in *Strombus vittatus* L.

Fig. 12 Irregular scaly network.

Fig. 13 Scaly network changing into a rhombic one.

Fig. 14 Theoretical derivation of regular triangular network from rhombic one.

Fig. 15 Derivation of rhombic network from elongate light spots, as in *Theodoxus fluviatilis*. Sketch shows pigment rings around distal end of spots.

Figs. 16–19 Derivation of rhombic and hexagonal networks from expansion of light spots of an ocellated pattern until they adjoin neighbouring spots, variously distributed.

Fig. 20 Hexagonal network in the young *Bulla striata* Brug.

Fig. 22 Hexagonal network derived from the crossing of lines, as in *Littorina meleagris*. AA, BB = set of reclined lines crossing the inclined lines CC and DD.

Fig. 23 Hexagonal network derived from transverse zigzags (AA, BB, etc.) and connecting lines (dotted).

Fig. 21 Theoretical derivation of trapezoidal network from regular hexagonal network.

Plate VII

Figs. 1–6 Theoretically possible but actually unrealized linear networks. Fig. 1 Alternating sinuous curves with connectives; Fig. 4 Parallel sinuous curves with connectives. Figs. 2, 3, 5 Various rectangular patterns. Fig. 6 Overlapping trapezoid network.

Fig. 7 Irregular network of lines and spots.

Fig. 9 Regular network derived from alternately parallel sinuous lines.

Fig. 10 Network derived from sinuous lines at right angle to each other (theoretical).

Figs. 11, 13, 14 Networks derived from lobate lines. Fig. 11: Catenate network, from lobate lines arranged «face to face». Fig. 13 Scaly network, from alternating parallel lobate lines. Fig. 14 From simple parallel lobate lines, with connecting lines.

Figs. 15, 19 «Reverse» networks, with colourless framework. Fig. 15: Rectangular reverse framework. Fig. 19: Hexagonal reverse framework.

Figs. 16–18, 20–22 Checkerboard networks.

Fig. 16 Irregular checkerboard.

Fig. 17 Irregular triangular checkerboard derived from triangles.

Fig. 18 Regular triangular checkerboard and «egg and trapeze» network, both apparently derived from a rhombic network, as in *Littorina meleagris* Pot.

Fig. 20 Rectangular checkerboard formed when grooves traverse an ocellated pattern.

Fig. 21 Rectangular checkerboard formed by closely spaced dislocated oblique bands.

Fig. 22 Rectangular checkerboard formed by big «junction spots» of rhombic pattern.

Plate VIII

Diagrams showing unrolled Molluscan shell, with much proximal-distal shortening, to illustrate variety of pattern ontogeny in various genera.

Plate IX

Figs. 1, 2 Same as in preceding plate. Diagrams of *Neritina communis* Quoy and *Meretrix petechialis* Lam.

Fig. 3 Basal whorls of *Pyramidella maculosa* Lam., showing colour pattern on whorl surface.

Fig. 4 Portion of colourless zigzag of *Columbella fulgurans* Lam. crossing three ribs and showing effect of ribs on zigzag.

Fig. 5 Lobe or ogive with «eye-lash» pattern in *Neritina pulchella* Recl.

Fig. 6 Same pattern as in preceding figure, but associated with warts, as in *Neritina squamosa* Swob. (viewed almost tangentially to surface).

Fig. 7 3 whorls of *Pusia tricolor* Gm. Transverse bands regular when associated with ribs in upper two whorls, irregular where the ribs are absent (last whorl).

Fig. 8 *Rissoa grossa* Mich., showing lineoles regular when between the ribs, irregular further down.

Fig. 9 *Smaragdia viridis* L., showing relation of lines to blotches.

Fig. 10 *Busycon contrarium* Conr., showing relation of shoulder nodes to growth breaks (vertical lines) and concentric bands (dark bands to left of lines).

In the printing, the magnifications of the figures for the next two plates have been increased by $^1/_3$ from those indicated.

Plate X

Fig. 1 *Imbricaria conica* Desh. (X 2), showing dark radial lines curving around extremities of light transverse segments.

Fig. 2 *Conus lucidus* Wood (X 1. 2), showing relationship of radial lines and transverse segments.

Fig. 3 *Charonia tritonis* L. (X 2/3), showing relationship of rather vaguely developed dark transverse bands and lobed radial alternating-colour bands.

Fig. 4 *Monodonta articulata* Lam. (X 2. 5), showing relationship of sinuous transverse lines and radial alternating colour bands.

Fig. 5 *Conus striatus* L. (X 1), showing relationship of transverse irregular lines to the radial rows of spots.

Fig. 6 *Conus imperialis* L. (X 1), showing on the lip the relationship of the inner dark areas to the superficial dark lines.

Fig. 7 *Littorina zigzag* Gm. (X 2), showing crossing of lines of opposite obliquity forming network with parallelogram-shaped cells.

Fig. 8 *Helix aspersa* Müll. (X 1. 5), with irregular network.

Fig. 9 *Strombus vittatus* L. (X 4), showing regular rhombic network.

Fig. 10 *Sunetta meroe* L. (X 2), showing rhombic labyrinthic network (near shell margin).

Fig. 11 *Nitidella ocellata* Gm. (X 5. 5), showing (rather indistinctly!) hexagonal network (at base of whorl) derived from oblique rows of isolated ocelli (on other portions of the whorls).

Plate XI

Fig. 1 *Littorina meleagris* Pot. (X 5), showing hexagonal network (right of specimen) derived from the crossing of lines of opposite obliquity, and (upper left) the lines of one set which are straight where they are not «influenced» by those of the other set.

Fig. 2 *Conus abbas* Hwass (X 3), showing lobate pattern that grades into hexagonal and rhombic networks.

Fig. 3 *Terebra dimidiata* L. (X 2), with «reverse» rectangular network.

Fig. 4 *Neritina piratica* Rus. (X 2. 5), with lobate network derived from adjoining transverse sinuous lines.

Fig. 5 *Conus* cf. *pyramidalis* Maur. (X 2), showing hexagonal network derived from transverse zigzags and connecting lines.

Fig. 6 *Babylonia ambulacra* Sowb. (X 1. 5), with reverse hexagonal network.

Fig. 7 *Neritina glabrata* Sowb. (X 5), showing two sets of lines with widely different periodicity.

Fig. 8 *Littorina meleagris* Pot. (X 6), showing triangular checkerboard (center of specimen).

Fig. 9 *Oliva porphyria* L. (X 1. 5), showing «tent pattern», and numerous sinuous lines near whorl summit.

Fig. 10 *Planaxis lineatus* Costa (X 5), showing abrupt change (in middle of penultimate whorl) from a regular «associated» type of pattern to an irregular «correlated» pattern.

Fig. 11 *Pusia tricolor* Gm. (X 9), showing correlated pattern regular when associated to ribs (upper whorl, white transverse bands), becoming completely irregular where ribs are lacking (3 lower whorls).