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Key to the British Marine Gastropoda

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CONTENTS

I. INTRODUCTION

This key is entirely artificial and is intended solely as an aid to the identification of the British Marine Gastropoda. Nomenclature follows that on the British marine mollusc Census field cards issued by the Conchological Society of Great Britain and Ireland, and some rare species not on the cards are included. Users of this key are referred to descriptions in Alder & Hancock (1845-55) prefix AH and listed according to family and plate numbers or appendix numbers, Eliot (1910) prefix E, Forbes & Hanley (1849-53) prefix FH, Jeffreys (1862-69) prefix J, McMillan (1968) prefix M, Nordsieck (1968 & 1972) prefix N, and van der Spoel (1967a) prefix vS. Volume, page or number references are given after each name. Any differences in specific name from those given in the key are shown in brackets, but differences in generic name are not shown. Additional references are given for species not widely described in the above works. British Prosobranchs (Graham, 1971) carries its own detailed key and for this reason is not included, but it is suggested as additional reference material.

The mechanism of the key is roughly based on dichotomous principles and does not follow the order of classification. Some families are keyed out in separate sections at the end, individual members also appearing in the main part of the key. Some common juvenile forms which differ from the adult are included, as are commoner aberrant forms. One may not wish to destroy a specimen in order to identify it, hence the key can in most cases be used by reference to the shell alone or in shell-less species and those with an internal shell to external characteristics. Figures illustrating actual species are indicated by "*Fig.*" Features common to more than one species are indicated by "Fig." although the whole shell may look different from the illustration.

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II. BIBLIOGRAPHY

ALDER, J. & HANCOCK, A., 1845-55. *Monograph of the British Nudibranchiate Mollusca*, parts 1-7. London: Ray Society.

BOADEN, P.J.S., 1961. Littoral Interstitial species from Anglesey representing three families new to Britain. *Nature* **191**: 512.

CHASTER, G.W., 1892. On the occurrence of *Cyclostrema millepunctatum*, Friele, off the Isle of Man. *Conchologist* **2**: 147-148.

EDMUNDS, M., 1961. *Polycera elegans* Bergh: a new species to Britain and discussion of its taxonomy. *Proc. malac. Soc. Lond.* **34**: 316-321.

ELIOT, C., 1910. *Monograph of the British Nudibranchiate Mollusca*, part 8. London: Ray Society.

FORBES, E. & HANLEY, S., 1849-53. *A History of British Mollusca and their shells.* London.

GRAHAM, A., 1971. British Prosobranch and other operculate Gastropod Molluscs. *Synopses Br. Fauna* (N.S.) **2**.

JANUS, H., 1965. *Molluscs.* London. *Young Specialist Series.*

JEFFREYS, J.G., 1862-69. *British Conchology.* London.

KRESS, A., 1968. *Trapania pallida* sp. nov. (Opisthobranchia, Gastropoda), a genus new to Britain. *Proc. malac. Soc. Lond.* **38**: 161-165.

LEMCHE, H., 1929. Gastropoda opistobranchiata. *Zool. Faroes.* **53**: 1-35.

McMILLAN, N.F., 1968. *British Shells.* London. *Wayside and Woodland Series.*

MASSY, A.L., 1917. Gymnosomatous Pteropoda of the coasts of Ireland. *Scient. Proc. R. Dubl. Soc.* **15**: 223-244.

MORTON, J.E., 1957a. Opistobranchia. Order: Gymnosomata, families: Pneumodermatidae, Cliopsidae. *Fich. Ident. Zooplancton* **79**.

---- 1957b. Opisthobranchia. Order: Gymnosomata, family: Clionidae. *Fich. Ident. Zooplancton* **80**.

---- 1967. *Molluscs. 4th Edition.* London.

MUUS, B.J., 1963. Some Danish Hydrobiidae with the description of a new species, *Hydrobia neglecta. Proc. malac. Soc. Lond.* **35**: 131-138.

NORDSIECK, F., 1968. *Die europäischen Meeres-Gehäuseschnecken (Prosobranchia) vom Eismeer bis Kapverden und Mittelmeer.* Stuttgart.

---- 1972. *Die europäischen Meeresschnecken (Opisthobranchia mit Pyramidellidae; Rissoacea).* Stuttgart.

SMITH, E.H., 1967. Two new species of British Turrids. *Veliger* **10**: 1-4.

SMITH, S.M., 1971. *Rissoa violacea* Desmarest, *Rissoa lilacina* Récluz, *Rissoa rufilabrum* Alder and *Rissoa porifera* Lovén and their distribution in British and Irish waters. *J. Conch.; Lond.* **27**: 235-248.

SPOEL, S. van der, 1967a. *Euthecosomata. A group with remarkable developmental stages (Gastropoda, Pteropoda)*. Gorinchem.

---- 1967b. Pteropoda Thecosomata. *Fich. Ident. Zooplancton* **140-142.**

SWEDMARK, B., 1968. Deux espèces nouvelles d'Acochlidiacées (Mollusques, opisthobranches) de la faune interstitielle marine. *Cah. Biol. mar.* **9**: **175-186.**

TESCH, J.J., 1949. Pteropoda Thecosomata. *Fich. Ident. Zooplancton* **8.**

III. MAIN KEY

1.	Shell only, or shell wholly external	*2*
-	**Shell internal or largely covered by the mantle or foot**	**132** (p. *21*)
-	**Shell absent**	**143** (p. *22*)
2.	**Shell not coiled** (Fig. 2d), **although the apex may be produced and curved over**	**10** (p. *2*)
-	**Shell coiled sinistrally** (Fig. 2b)	**26** (p. *4*)
-	Shell coiled dextrally (Fig. 1)	*3*
3.	Shell with the aperture entire (Fig. 1a)	*4*
-	Shell with the aperture not entire, having an anterior canal or slit (Figs. 1b, 1c)	*6*
4.	**Shell aperture with a tooth or teeth, perhaps reduced to a fold or folds on the columella**	**30** (p. *5*)
-	Shell without teeth	*5*
5.	Shell conical, keeled (Fig. 1d): TROCHIDAE (part only, see section IV, p. *31*)	
-	**Shell tall-spired, aperture much less than ¼ the total height of the shell**	**32** (p. *5*)
-	**Shell globular or helicoid** (Fig. 1a)	**43** (p. *7*)
-	**Shell depressed or flat-coiled** (Fig. 1i, 1j)	**49** (p. *8*)
-	**Shell with the body-whorl forming nearly all the shell and the spire flattened, but not involute. The last whorl is generally at least $^5/_6$ the total height of the shell** (Fig. 1g))	**55** (p. *9*)
-	**Shell involute** (Fig. 1h)	**62** (p. *10*)
-	**Shell with rounded whorls, rather cylindrical, or with a quickly-tapering spire. The last whorl is generally less than ¾ the total height of the shell** (Fig. 1e, 1f)	**70** (p. *12*)
6.	Shell with a slit in the outermost part of the lip, but no anterior canal *(Fig. 1c): Scissurella crispata* Fleming; FH2,544; J3,283; M24; N1,02.10.	
-	Shell with an anterior canal, either open (Fig. 1b), covered over, or even almost closed (Fig. 2c)	*7*
7.	**Shell involute**	**87** (p. *14*)
-	Shell not involute	*8*
8.	**Shell tall-spired, body-whorl including the anterior canal considerably less than ½ the total height of the shell, aperture roundish, anterior canal very short or long and pointed**	**89** (p. *15*)

- **Shell short-spired or dumpy, the body whorl including the anterior canal more than ⅔ the total height of the shell** — **96** (p. *16*)

- Shell medium-spired, the body whorl including the anterior canal ½ to ⅔ the total height of the shell — *9*

9. **Aperture roundish or oval, anterior canal very short, truncated or recurved or pointed** (Fig. 1b, 3b, 3c) — **100** (p. *16*)

- **Anterior canal drawn out into a spout and the aperture round or oval** (Fig. 3g) **or else the aperture elongated and rectangular with the anterior canal not necessarily drawn out into a spout** (Fig. 3h, 3i) — **111** (p. *18*)

Shell not coiled (Fig. 2d), **although the apex may be produced and and curved over**

10. Shell pierced or notched (Fig. 2g, 2h) — *11*

- Shell entire — *14*

11. Shell with a row of holes extending from near the apex to the margin: *Haliotis tuberculata* L.; FH2,485; J3,279; M24; N1,01.00.

- Shell markedly tubular with apertures at both ends: incomplete or juvenile *Caecum* (see 25, p. *4*)

- Shell with a slit in the basal margin (Fig. 2h) — *12*

- Shell pierced at the apex (Fig. 2g) — *13*

12. Shell very small with a distinctly spiral beak, ornament largely composed of radial ribs: juvenile *Diodora apertura* (Montagu) (see 13)

- Shell not necessarily very small, with a hooked beak, ornament reticulate (Fig. 2e): *Emarginula* (3 species)
  E. conica Lamarck; FH2,479 *(rosea);* J3,261 *(rosea);* M25; N1,03.08 *(rosea).*
  E.crassa Sowerby; FH2,481; J3,263: M25; N1,03.10.
  E. reticulata Sowerby; FH2,477; J3,259 *(fissura);* M24; N1,03.00 *(fissura)* (Fig. 2h, ornament omitted).

13. Slit at the apex, ornament predominantly reticulate: *Diodora apertura* (Montagu); FH2,469 *(reticulata);* J3,266 *(graeca);* M25; N1,04.00 *(graeca)(Fig. 2g).*

- Slit in front of the apex, spiral ribs dominant, apex covered inside by a vaulted sheath: *Puncturella noachina* (L.); FH2,474; J3,257; M25; N1,03.30.

14. Shell conical or cap-shaped — *15*

- Shell otherwise — *25*

15. Shell simple — *16*

- Shell with a spiral twist to the apex — *20*

16. Shell strongly radially ribbed (Fig. 2d): *Patella* (3 species)
P. aspera Röding; FH2,425 *(athletica);* J3,237 *(depressa);* M25; N1,06.11.
P. depressa Pennant; J2,237 *(intermedia);* M25; N1,06.13.
P. vulgata L. FH2,421; J3,236; M25; N1,06.12 *(Fig. 2d, 2e).*

- Shell with radial striae or a granular appearance *17*

- Shell with a septum inside the apex *20*

17. Ornament marked: *Lepeta* (2 species)
L. caeca (Müller); J3,252; M26; N1,08.00.
L. fulva (Müller); FH2,441; *(fulvus);* J3,250; M26; N,108.10 *(fulvum).*

- Shell nearly smooth *18*

18. Shell thin or fairly thin, with numerous fine rays or rows of linear spots coloured blue or grey: *Patina pellucida* (L.); FH2,429; J3,242 *(pellucidum)*: M26; N1,06.00 *(pellucidus) (Fig. 2f).*

- Shell fairly thin, with tortoiseshell or broad-rayed markings: *Acmaea* (2 species)
A. testudinalis (Müller); FH2,434; J3,246; M26 *(tessulata);* N1,07.11.
A. virginea (Müller); FH2,437: J3,248; M26; N1,07.10.

- Shell solid *19*

19. Internal muscle scar (empty shell) markedly waisted, animal has a ring of gills round both the head and foot (Fig. 2e): *Patella* (see 16, p. *3)*

- Internal muscle scar hardly waisted, animal has a ring of gills round the foot only (Fig. 2f): *Patina* (see 18, p. *3)*

20. Animals live in chains of up to 12 individuals, one upon the other: *Crepidula fornicata* (L.); M45; N1,56.10 (*Fig. 2i).*

- Animals live as single individuals, or a single shell found *21*

21. Animal white, sluglike, shell white, very fragile and papery, keeled: *Carinaria lamarckii* Blainville; M46.

- Shell solid or fairly solid, not keeled *22*

22. Shell under 3mm., oval, fairly low, triangular septum present inside the apex, animal has no eyes: *Propilidium exiguum* (Thompson); FH2,443 (*ancyloide);* J3,254 (*ancyloide);* M26; N1,08.20 (*ancyloide).*

- Shell (of adult) much larger *23*

23. Shell flattish, round, ornament slight, white tinged with green or violet: *Calyptraea chinensis* (L.); FH2,463 *(sinensis);* J3,273; M45; N1,56.00. *24*

- Shell high or oval *25*

24. Dominant ornament of radial ribs, no septum inside the apex, shell whitish: *Capulus ungaricus* (L.); FH2,459 *(hungaricus)*; J3,269 *(hungaricus)*; M44; N1,55.10 *(hungaricus)*.

- Dominant ornament of growth lines, large shelf-like septum inside apex (Fig. 2i), shell dirty fawn in colour: *Crepidula fornicata* (L.) (see 20, p. *3*).

25. Shell thin, planar, horny: *Aplysia* (3 species)
A. depilans Gmelin; M67; N3,21.00.
A. fasciata Poiret; M67 *(limacina)*; N3,21.02.
A. punctata Cuvier; FH3,554 *(hybrida)*; J5,5; M66; N3,21.01 *(rosea)*.

- Shell thin, rather pen-shaped, with or without spiky projections or wings: PTEROPODA (part only, see section VII, p. *41*)

- Shell small, tubular, curved, complete adults are closed at the hind end: *Caecum* (2 species) (*Fig. 2f*).
C. *glabrum* (Montagu); FH3,181; J4,77; M39; N1,39.50
C. *imperforatum* (Kanmacher); FH3,178 *(trachea)*; J4,75 *(trachea)*; M39; N1,39.20 *(trachea)*.

(Do not confuse with the Scaphopod *Dentalium* which is larger and always open at both ends).

- Shell solid, ear-shaped, apex quite flat, but with a trace of a coil, nacreous lustre inside: juvenile *Haliotis tuberculata* L. (see 11, p. *2*)

- Shell otherwise: *Philine* (see 63, p. *10*)

Shell coiled sinistrally

26. Shell tall-spired, with reticulate and tuberculate ornament (Fig. 2b): *Triphora perversa* (L.); FH3,195 *(adversum)*; J4,261 *(perversum)*; M41; N1,44.00 (*Fig. 2b*).

- Shell not tall-spired *27*

27. Shell thin: PTEROPODA (part only, see section VII, p. *41*)

- Shell solid *28*

28. Aperture entire, shell minute, taller than broad: juvenile PYRAMIDELLIDAE (see section VI, p. *37*)

- Anterior canal present *29*

29. Ornament of thick low longitudinal ribs and fine spiral lines: rare form of the usually dextral *Buccinum undatum* L. (see 96, p. *16*)

- Shell with fine spiral striae: rare form of the usually dextral *Neptunea antiqua* (L.) (see 109, p. *18*)

(Other usually dextral species are very occasionally found in the sinistral form).

Shell coiled dextrally, aperture entire, with a tooth or teeth, perhaps reduced to a fold or folds on the columella

30. Shell with more than two teeth: *Phytia myosotis* (Draparnaud); FH4,194 *(denticulatus);* J5,106; M72.

- Shell with two teeth: *Leucophytia bidentata* (Montagu); FH4,191 *(bidentatus);* J5,104 *(bidentatus);* M72.

- Shell with one tooth (Fig. 2i) *31*

31. Shell barrel-shaped: *Acteon tornatilis* (L.); FH3,523 *(fasciata):* J4,433; M58; N3,0.00.

- Shell conical: *Monodonta lineata* (da Costa) (see section IV, p. *31)*

- Shell medium-spired, with longitudinal ribs or smooth, very large mouth and a thickened outer lip: *Rissoa membranacea* (J. Adams) (see section V, p. *33)*

  (Do not confuse with the usually medium to tall-spired PYRAMIDELLIDAE, which are smaller and have proportionally smaller apertures).

- Shell cylindrical: *Cima minima* (Jeffreys); J4,115; M43; N1,49.30 N3P,1.670.

- Shell otherwise: PYRAMIDELLIDAE (see section VI, p. *37)*

Shell coiled dextrally, aperture entire, without teeth, tall-spired

32. Shell with strong ornament *33*

- Ornament fine or absent *35*

33. Reticulate ornament (Fig. 3c): *Bittium* (2 species)
  B. reticulatum (da Costa); FH3,192; J4,258; M39: N1,42,00.
  B. simplex (Jeffreys); J4,259; M39.

  These species often have a short anterior canal (see 91 and 95, p. *15)*

- Spiral ribs or lines numerous, dominant: *Turritella communis* Risso; FH3,172; J4,80 *(terebra);* M39; N1,35.40 *(Fig. 2a).*

- Ornament comprises longitudinal ribs and spiral striations together with 3 strong spiral ribs: *Turbonilla fenestrata* (Jeffreys) (see section VI, p. *38)*

- Ornament composed of flattened longitudinal ribs (Fig. 3e, 3f) and possibly some fine spiral ribs (hand lens) which do not extend to the base of the shell, aperture rectangular: PYRAMIDELLIDAE (see section VI, p. *37)*

- Ornament composed of sharp longitudinal ribs which extend to the base of the shell aperture round: EPITONIIDAE *34*

34. Keel encircles the basal whorl, ribs sharp: *Cirsotrema commutatum* (Monterosato); J4,98 *(pseudoscalaris);* M41; N1,46.20 *(commutata).*

- No such keel: *Clathrus* (4 species)
  C. clathratulus (Kanmacher); FH3,209 *(clathratula);* J4,96 *(clathratula);* M41; N1,47.40 *(clathratulum).*
  C. clathrus (L.); FH3,206 *(communis);* J4,91 *(communis);* M41; N1,47.20.
  C. trevelyanus (Johnston); FH3,213 *(trevelyana);* J4,93 *(trevelyana);* M41; N1,47.32 *(trevelyanum).*
  C. turtonis (Turton); FH3,204; J4,89 *(turtonae);* M41; N1,47.31 *(turtonae).*

35. Shell over 10mm. high: smooth or worn *Turritella communis* Risso (see 33, p. *5)*

- Shell less than 10mm. high *36*

36. Shell with a deep suture: ACLIDIDAE (part only) *37*

- Shell with a very shallow suture (Fig. 1d, 21) *39*

37. No sculpture at all: *Pherusina gulsonae* (Clark); FH4, 281; J4,106; M42; N1,49.20.

- Fine sculpture present *38*

38. Longitudinal striae dominant, some faint spiral lines: *Graphis albida* (Kanmacher); FH3,222 *(unica);* J4,100 *(unica);* M42; N1,49.50 *(unica).*

- Sculpture consists of spiral lines (Fig. 2a): *Aclis* (3 species)
  A. ascaris (Turton); FH3,219; J4,102; M42; N1,49.41.
  A. minor (Brown); FH3,220 *(supranitida);* J4,103 *(supranitida);* M42; N1,49.40 *(supranitida).*
  A. walleri Jeffreys; J4,105; M42; N1,49.03.

39. Shell generally semitransparent, highly polished: EULIMIDAE *40*

- Shell opaque, generally not highly polished: *Eulimella* (PYRAMIDELLIDAE, see section VI, p. *37)*

(Some of the EULIMIDAE may be confused with *Eulimella,* descriptions of both should be consulted).

40. Spire straight, apex sharp, columella somewhat calloused, white or coloured bands below the suture: *Eulima* (3 species)
  E. glabra (da Costa); FH3,235 *(subulata);* J4,208 *(subulata);* M43; N1,50.00 *(subulata).*
  E. trifasciata (J. Adams); FH3,237 *(bilineata);* J4,210 *(bilineata);* M43; N1,50.01 *(bilineata).*
  E. stenostoma Jeffreys; J4,207; M43; N1,50.10.

- Spire straight or curved, no coloured or white bands *41*

41. Apex blunt: *Balcis anceps* (Marshall); M44; N1,50.30.

- Apex sharp *42*

42. Shell rather solid, spire straight, last whorl bluntly keeled:
Balcis (2 species, part only)
B. alba (da Costa); FH3,229 *(polita);* J4,201 *(polita);* M43; N1,50.50 *(polita). B. petitiana* Brusina; M43; is a variety.
B. frielei (Jordan); M44; N1,50.53.

- Shell very slender with the last whorl rounded: *Balcis* (2 species, part only)
B. lubrica (Monterosato); FH3,231 *(nitida)*; J4,203 *(intermedia);* M43; N1,50.60 *(intermedia).*
B. sinuosa (Scacchi); N1,50.61 *(intermedia pernula).*

- Shell transparent, curved, last whorl long and narrow, apex extremely sharp: *Balcis* (5 species, part only)
B. collinsi (Sykes); M44; N1,50.79.
B. compactilis (Sykes); N1,50.75.
B. curva (Montersato); M44; N1,50.74.
B. devians (Monterosato); FH3,232 *(distorta);* J4,205 *(distorta);* M44; N1,50.72.
B. monterosatoi (Monterosato); FH3,233 *(gracilis);* J4,205 *(gracilis);* M44; N1,50.73.

Shell coiled dextrally, aperture entire, without teeth, globular or helicoid

43. Shell without umbilicus *44*

- Shell with umbilicus (Fig. 1a) *45*

44. Shell whitish in colour, bulbous but with a narrow pointed spire:
Pelseneeria stylifera (Turton); FH3,226 *(turtoni)*; J4,195 *(turtoni);* M44; N1,51.10.

- Shell violet coloured, with a low rounded spire: *Janthina* (4 species)
J. exigua Lamarck; M42; N1,48.50.
J. janthina (L.); FH2,549 *(communis);* J4,186 *(rotundata);* M42; N1,48.00 *(britannica)* and N1,48.40.
J. pallida Thompson; M42; N1,48.20.

- Shell colour varied, brown, green, orange, yellow, may be striped or mottled: *Littorina* (2 species, part only)
L. aestuarii Jeffreys; J5,205; M31.
L. littoralis (L.); FH3,45; J3,356 *(obtusata);* M31; N1,23.00 *(obtusata).*

45. Suture usually channelled or excavated, but not deep, peristome much reflected or calloused, shell solid: *Natica* (5 species)
N. alderi Forbes; FH3,330 *(nitida);* J4,224; M47 *(poliana);* N1,62.21.

N. catena (da Costa); FH3,326 *(monilifera);* J4,220; M47; N1,62.20 *(Fig. 1a).*

N. fusca Blainville; FH3,334 *(sordida);* J4,218 *(sordida);* M46; N1,62.24.

N. montagui Forbes; FH3,336; J4,227 *(montacuti);* M47; N1,62.30.

N. pallida Broderip & Sowerby; FH3,341 *(pusilla);* J4,216 *(groenlandica);* M46; N1,62.28.

- As above, but shell semitransparent and with a short spire, whorls shouldered: *Amauropsis islandica* (Gmelin); FH3,339 *(helicoides);* J4,214; M46; N1,62.40 *(islandicus).*

- Suture deep or fairly deep, shell under 5mm. high *46*

46. Aperture round, umbilicus quite large, shell horn-coloured or whitish, iridescent: *Rissoella globularis* (Jeffreys); FH4,268; J4,62; M38; N1,34.10, N3R,14.010.

Aperture round, umbilicus very small, shell coloured: *Cingulopsis fulgida* (Adams) (see section V, p. *33)*

- Aperture angular above, peristome entire (Fig. 1j), little reflected: *Skenea cutleriana* (Clark); FH3,164; J3,287 *(cutlerianum);* M29; N1,15.03.

- Aperture narrow above, very wide below: *Diaphana minuta* Brown; FH3,521 *(hyalina);* J4,427 *(hyalinus);* M58; N3,6.00.

- Aperture oval, peristome not entire (Fig. 1k), little reflected *47*

47. Inside of aperture not iridescent, suture fairly deep, the previous whorl visible through the next just below the suture: *Paludinella littorina* (Chiaje); FH3,132 *(littorea);* J5,101; M37; N1,29.61 N3R,04.100 *(litorina)* and *04.101* (littorea).

- Inside of aperture iridescent, suture only moderately deep *48*

48. Shell somewhat keeled: TROCHIDAE (some very small juveniles, see section IV, p. *31)*

- Shell not keeled: *Margarites,* see section IV, p. *32)*

Shell coiled dextrally, aperture entire, without teeth, depressed or flat-coiled

49. Shell loosely coiled, whorls not touching: Juvenile *Caecum* (see 25, p. *6).*

- Shell firmly coiled, peristome entire (Fig. 1i), whorls increasing gradually: *Skeneopsis planorbis* (Fabricius); FH3,156 J4,65; M38; N31.00; N3R,12.000 *(Fig. 1i).*

- Shell firmly coiled, peristome entire, whorls increasing extremely rapidly: juvenile *Capulus ungaricus* (L.) (see 24, p. *4)*

- Shell tightly coiled, peristome not entire (Fig. 1j) *50*

50. Aperture oblique (Fig. 2a) *51*

- Aperture not oblique (Fig. 2b) *52*

51. Shell keeled, aperture oval: TROCHIDAE (part only, see section IV, p. *31)*

- Shell not keeled, aperture round: *Circulus striatus* (Philippi); J3,315 *(duminyi);* M29; N1,16.10.

52. Shell with strong ornament *53*

- Shell with little or no ornament *54*

53. Ornament composed of spiral ridges and spiral ribs: *Tornus* (3 species)
T. imperspicuus (Chaster); M37; N1,30.02; N3R,10.003.
T. subcarinatus (Montagu); FH2,541 *(subcarinata);* J4,231; M37; N.1,30.00, N3R,10.000.
T. unisulcatus (Chaster); M38; N1,30.03; N3R,10.004.

- Ornament composed of longitudinal ribs and spiral ridges: *Ammonicera rota* (Forbes & Hanley); FH3,160; J4,71; M38; N1,32.11; N3R13.101.

54. Whorls rounded: *Skenea* (3 species, part only)
S. millipunctata (Friele), Chaster (1892) *(millepunctata).*
S. nitens (Philippi); FH2,534 *(pusillus);* J3,289; M29; N1,15.04.
S. serpuloides (Montagu); FH3,161 *(divisa);* J3,290 *(divisa);* M29; N1,15.00 *(divisa).*

- Whorls flattened below, spire sunken: *Omalogyra atomus* (Philippi); FH3,158 *(nitidissima);* J4,69; M38; N1,32.00; N3R,13.000 *(Fig. 1j).*

Shell coiled dextrally, aperture entire, without teeth, the body-whorl occupying at least $^5/_6$ the total height of the shell, but shell not involute

55. Shell thin, transparent, barrel-shaped, very small: *Diaphana minuta* Brown (see 46, p. *8)*

- Shell thin, rather ear-shaped, with flattened spire *56*

- Shell solid *60*

56. Shell with an umbilicus *57*

- Shell without an umbilicus *58*

57. Spire quite flat: *Lacuna pallidula* (da Costa); FH3,56; J3,351; M30; N1,22.40.

- Spire raised: *Lacuna parva* (da Costa); FH3,58 *(puteolus)*; J3,348 *(puteolus)*; M30: N1,22.00 *(puteolus)*.

58. Shell transparent and red-brown or purple, animal white: *Otina ovata* (Brown); FH3,321 *(otis)*; J5,110 *(otis)*; M72.

- Shell colourless, translucent or opaque, pale coloured, pink, greenish or brown, animal yellowish or dirty white. *59*

59. Aperture, oval shell colourless, granular mantle (Fig. 4b) covers the shell in life: *Lamellaria* (2 species)
L. latens (Müller); FH3,358 *(tentaculata)*; J4,236 (*lata* and male of *perspicua*); M48; N1,58.01.
L. perspicua (L.); FH3,355; J4,235; M48; N1.58,00.

- Aperture round or rectangular, shell coloured, mantle does not completely cover the shell in life: *Velutina* (2 species)
V. plicatilis (Müller); FH3,350 *(flexilis)*; J4,239; M48; N1,58.30 *(flexilis)*.
V. velutina (Müller); FH3,347 *(laevigata)*; J4,240 *(laevigata)*; M48; N1,58.20 *(Fig. 1g)*.

60. Shell very low, nacreous lustre inside: juvenile *Haliotis tuberculata* L. (see 11, p. *2)*

- Shell ½ as high as broad, inner lip much reflected over the peristome, brackish to fresh water only: *Theodoxus fluviatilis* (L.); FH3,3; Janua 1; J1,53; M106.

- Shell about as high as broad *61*

61. No spire at all, or a short spire with whorls shouldered: *Littorina* (2 species, part only, see 44, p. *7)*

- Short spire, shell globose *43*

Shell coiled dextrally, aperture entire, without teeth, involute

62. Shell loosely coiled or almost unrolled (Fig. 2k) *63*

- Shell with several tight whorls (Fig. 1h) *65*

63. Shell thin, columella part of a continuous curve from the previous whorl round to the outer lip: *Philine* (7 species)
P. angulata Jeffreys; J4,451; M60; N3,3.70.
P. aperta (L.); FH3,539; J4,457; M60 *(quadripartita)*; N3,3.30 *(quadripartita)*.
P. catena (Montagu); FH3,545; J4,449; M60; N3,3.11 (Fig. 2k, ornament omitted).
P. nitida Jeffreys; J4,456; M60; N3,3.71 *(sinuata)*.

P. punctata (Clark); FH3,547; J4,453; M60 *(alata)*; N3,6.21.
P. quadrata (S. Wood); FH3,541; J4,452; M60; N3,3.51.
P. scabra (Müller); FH3,543; J4,447; M60; N3,3.10.

- Shell thin, columella straight: *Colpodaspis pusilla* M. Sars; N3,6.20.

- Shell rather solid 64

64. Ornament of spiral grooves: *Scaphander lignarius* (L.); FH3,536; J4,443; M59 *(lignaria)*; N3,2.80.

- Reticulate ornament: *Laona pruinosa* (Clark); FH3,549; J4,454; M60; N3,3.40.

65. Shell cylindrical 66

- Shell swollen

66. Outer lip straight: *Cylichna cylindracea* (Pennant); FH3,508; J4,415; M59; N3,2.30 *(Fig. 1h)*.

- Outer lip constricted at the middle or at one end, spire slightly raised or sunken: *Retusa* (5 species)
  R. mammillata (Philippi); FH3,514; J4,420 *(mammillatus)*; M58; N3,9.60 *(mamillata)*.
  R. nitidula (Lovén); FH3,515; J4,412; N3,9.28.
  R. obtusa (Montagu); FH3,512; J4,423 *(obtusus)*; M58 *(alba)*; N3,9.00.
  R. truncatula (Bruguière); FH3,510 *(truncata)*; J4,421 *(truncatulus)*; M58 *(retusa)*, N3,9.10.
  R. umbilicata (Montagu); FH3,519; J4,413; M58 *(subcylindrica)*; N3,9.20 *(subcylindrica)*.

67. Shell not ornamented, but may be coloured 68

- Shell ornamented with punctate striae 69

68. Suture deep: *Akera bullata* Müller; FH3,527; J4,430; M59; N3,20.00.

- Suture shallow; *Haminoea* (2 species)
  H. hydatis (L.); FH3,530; J4,439 *(elegans)*; M59; N3,8.50.
  H. navicula (da Costa); FH3,530 *(hydatis)*; J4,437 *(hydatis)*; M59; N3,8.54.

69. Shell solid: *Roxania utriculus* (Brocchi); FH3,533 *(cranchii)*; J4,440; M59; N3,2.70.

- Shell thin: *Scaphander punctostriatus* (Mighels & Adams); J4,446 *(librarius)*; M59 *(punctostriata)*; N3,2.82.

Shell coiled dextrally, aperture entire, without teeth, with rounded whorls, rather cylindrical, or with a tapering spire, the last whorl generally less than ¾ the total height of the shell

70. Shell white and bulbous with a narrow pointed spire: *Pelseneeria stylifera* (Turton) (see 44, p. *7)*

- Shell with an umbilicus in the form of a long narrow very distinct cleft which ends in a groove: *Lacuna* (3 species, part only)
  L. crassior (Montagu); FH3,67; J3,344; M30; N1,22.20.
  L. parva (da Costa) (see 57, p. *10)*
  L. vincta (Montagu); FH3,62; J3,346 *(divaricata);* M30; N1,22.10.

- Shell otherwise *71*

71. Shell covered with reddish or brown tortoiseshell or zigzag markings: *Tricolia pullus* (L.); FH2,538; J3,338 *(pulla);* M29; N18.00 *(pulla).*

- Not so. Shell over 8mm. high *72*

- Not so. Shell under 8mm. high *73*

72. Shell solid, the body whorl more than ½ the total height of the shell: *Littorina* (4 species, part only)
  L. aestuarii Jeffreys (see 44, p. *7)*
  L. neritoides (L); FH3,26; J3,361; M31; N1,23.30.
  L. littorea (L.); FH3,29; J3,368 *(litorea);* M30; N1,23.10 *(Fig. 1e).*
  L. saxatilis (Olivi); FH3,32 *(rudis);* J3,364 *(rudis);* M30; N1,23.20 *(Fig. 1f).*

- Shell only moderately solid, body whorl ½ the total height of the shell, shell horny, aperture very large: *Rissoa membranacea* (J. Adams) (see Section V, p. *33)*

- Shell only moderately solid, or thin shell, horny, the body whorl less than ½ the total height of the shell: *Hydrobia ulvae* (Pennant); FH3,141; J4,52; M31; N1,24.10; N3R,00.100.

- Shell only moderately solid, shell opaque, pale coloured: *Amauropsis islandica* (Gmelin) (see 45, p. 7 and *8)*

73. Shell with a tonguelike process at the base of the lip (Fig. 1f): juvenile of most species in this group. This obvious character should be disregarded. *74*

- Shell without such a tongue *74*

74. Shell markedly ornamented *75*

- Shell ornament fine, or of growthlines only, or entirely lacking, coloured bands may be present *76*

75. Shell somewhat cylindrical, apex abruptly truncated, with a pronounced suture, whorls rather shouldered, ornament of longitudinal ribs only: *Truncatella subcylindrica* (L.); FH3,317 *(montagui);* J4,85 *(truncatula);* M32; N1,24.50; N3R,03.000.

- Shell more or less tapered: RISSOIDAE (part only, see section V, p. *33)*

76. Body whorl more than ½ the total height of the shell *77*

- Body whorl ½ the total height of the shell *81*

- Body whorl less than ½ the total height of the shell *85*

77. Shell very solid indeed, dark brown, grey purple or greenish in colour: *Littorina* (part only, see 72, p. *12)*

- Shell solid or transparent, generally whitish, with or without reddish, brownish or purple markings which are not in a tortoiseshell pattern: RISSOIDAE (part only, see section V, p. *33)*

- Shell not solid *78*

78. Suture shallow *79*

- Suture deep *80*

79. Narrow umblicus present, shell opaque, pale coloured: *Amauropsis islandica* (Gmelin) (see 45, p. *7* and *8)*

- No umbilicus, shell horny; dark coloured: *Assiminea grayana* Fleming: FH3,70; J5,99; M37; N1,29.60; N3R,04.000.

80. Whorls shouldered, shell horny; *Pseudamnicola confusa* Frauenfeld; FH3,134 *(anatina);* J1,64 *(similis);* M32.

- Shell helicoid: *Rissoella* (2 species, part only)
  R. globularis (Forbes & Hanley) (see 46, p. *8)*
  R. opalina (Jeffreys); FH3,154; J4,60; M38; N1,34.11; N3R,14.012.

81. Shell solid or rather solid *77*

- Shell not solid, with a deep suture *82*

- Shell not solid, with a shallow suture *83*

82. Apex of the shell pointed, shell brown or greenish: *Hydrobia* (2 species, part only)
  H. neglecta Muus; Muus (1963); M31; N3R00.004 *(minuta).*
  H. ventrosa (Montagu); FH3,138; J1,66; M31; N24.00; N3R,00.002 *(stagnalis).*

- Apex of the shell blunt, shell white: *Cima minima* (Jeffreys) (see 31, p. *5)*

83. Ornament lacking, or composed of fine longitudinal striae, spire pointed, shell brilliant white (or stained): PYRAMIDELLIDAE (part only, see section VI, p. *37)*

- Ornament composed of fine spiral striae, fine punctations, spiral colour bands may be present: RISSOIDAE (part only, see section V, p. *33)*

- Ornament lacking *84*

84. Shell transparent, spire blunt: *Rissoella diaphana* (Alder); FH3,152; J4,59; M38; N1,34.00; N3R,14.00 *(glabra).*

- Shell horny, may have brownish spiral colour bands: *Assiminea grayana* Fleming (see 79, p. *13)*

85. Ornament composed of fine spiral striae (may be microscopic): RISSOIDAE (part only, see section V, p. *33)*

- Ornament of fine longitudinal and spiral striae (may be microscopic: PYRAMIDELLIDAE (part only, see section VI, p. *37)*

- Ornament of growth lines only, shell horny or yellowish-brown in colour *86*

86. Suture fairly deep: *Potamopyrgus jenkinsi* (Smith); M32; N1,24.20; N3R,01.100.

- Suture shallow: *Hydrobia* (3 species)
  H. ulvae (Pennant) (see 72, p. *12)*
  H. neglecta Muus, and *H. ventrosa* (Montagu) (see 82, p. *13)*

Shell coiled dextrally, with an anterior canal, involute

87. Shell strong, squat, with spiral ribs: *Trivia* (2 species)
  T. arctica (Pulteney); FH3,496 *(europaea* var.); M48; N1,59.30 *(europaea).*
  T. monacha (da Costa); FH3,495 *(europaea);* J4,403 *(europaea);* M47; N1,59.32.

- Shell solid, conical, smooth: *Erato voluta* (Montagu); FH3,502 *(loevis);* J4,400 *(laevis);* M47; N1,59.00.

- Shell thin, ovate: juvenile *Trivia* (see above)

- Shell spindle-shaped *88*

88. Shell has a spout-like canal at each end: *Simnia patula* (Pennant); FH3,498; J4,407; M48; N1,61.21.

- Shell has a canal at the bottom only: *Rhizorus acuminatus* (Bruguière); FH3,500 *(acuminata);* J4,411 *(acuminata);* M58; N3,9.70.

Shell coiled dextrally, with an anterior canal, tall-spired, body whorl including the anterior canal considerably less than ½ the total height of the shell

89. Anterior canal fairly long and sharply pointed, ornament of a few coarse tuberculate longitudinal ribs, outer lip sharp: juvenile *Aporrhais* (see 100, p. *16*)

- Anterior canal very short 90

90. Shell thin 91

- Shell solid 93

91. Shell coloured: *Bittium simplex* (Jeffreys) (see 33, p. *5*)

- Shell white 92

92. Ornament entirely lacking, aperture only very slightly notched at the base: *Pherusina gulsonae* (Clark) (see 37, p. *6*)

- Longitudinal ribs present: *Eumetula arctica* (Mörch); J4,272 *(costulata)*; M40; N1,43.80 *(costulata)*.

93. Spiral ribs dominant, especially on the last whorl: *Cerithiella metula* (Lovén), FH 3,198; J4,256; M40; N1,43.60.

- Tuberculate ornament 94

94. Two rows of tubercles present on each whorl: *Cerithiopsis clarkii* Forbes & Hanley; FH3,368; J4,267; M40; N1,43.31 *(clarkii)*.

- Three rows of tubercles present on each whorl: *Cerithiopsis* (3 species, part only)
  C. barleei Jeffreys; J4,268; M40; N1,43.20 *(barlei)*.
  C. jeffreysi Watson; J4,269 *(pulchella)*; M40; N1,43.50 *(pulchella)*.
  C. tubercularis (Montagu); FH3,365 *(tuberculare)*; J4,266; M39; N1,43.00.

- Four rows of tubercles present on each whorl 95

95. Aperture large, anterior canal short and recurved: *Bittium reticulatum* (da Costa) (see 33, p. *5*)

- Aperture small, anterior canal truncated: *Cerithiopsis metaxa* (Chiaje); J4,271; M40 *(metaxae)*; N1,43.40 *(rugulosa)*.

Shell coiled dextrally, with an anterior canal, fairly short-spired or dumpy, the body whorl including the anterior canal more than $^2/_3$ the total height of the shell

96. Shell ornamented with spiral lines and some wide longitudinal ribs: *Buccinum undatum* L.; FH3,401; J4,285; M52; N1,77.70. *(Fig. 3b).*

- Shell smooth or having growth lines only 97

- Shell ornamented with spiral lines or ribs, and growth lines 98

- Ornament reticulate, with pronounced ribs and varices 99

97. Shell thin, aperture very wide: juvenile *Trivia* (see 87, p. *14*)

- Shell solid, aperture elongated, shell conical: *Erato voluta* (Montagu) (see 87, p. *14*)

- Shell solid, aperture wide, shell ovate: *Liomesus ovum* (Turton); FH3,408 *(dalei);* J4,298 *(dalei);* M51; N1,74.00 *(dalei).*

98. Outer lip thickened and ridged on the inside, anterior canal drawn out into a pointed recurved spout: *Galeodea tyrrhena* (Gmelin); M49 *(rugosa);* N1,65.01.

- Outer lip thickened and ridged on the inside, anterior canal short: *Nucella lapillus* (L.); FH3,380; J4,276; M50; N1,70.80.

- Ornament consists of sharp spiral ribs, wide umbilicus present: *Trichotropis borealis* Broderip & Sowerby; FH3,361; J4,245; M44; N1,54.10.

- Ornament very fine, shell thin, wide anterior canal: *Buccinum humphreysianum* Bennet: FH3,410; J4,293; M53; N1,77.90 *(humphfreysianum).*

99. Aperture notched at the top (Fig. 3c), anterior canal open: *Cymatium cutaceum* (L.); J4,303 *(cutaceus);* M49; N1,66.20.

- Aperture not notched at the top (Fig. 3b), anterior canal generally covered: *Ocenebra erinacea* (L.); FH3,370 *(erinaceus);* J4,306 *(erinaceus);* M50; N1,71.30 *(erinaceum). (Fig. 2c).*

Shell coiled dextrally, with an anterior canal, medium-spired body whorl including the anterior canal ½ to ⅔ the total height of the shell, aperture roundish or oval, anterior canal very short, truncated or recurved or pointed

100. Outer lip thickened and drawn out into a wing: *Aporrhais* (2 species)
A. pespelecani (L.); FH3,188; J4,250; M45; N1,57.10.
A. serresianus (Michaud); FH3,186 *(pescarbonis);* J4,253 *(macandreae);* M45; N1,57,15 *(serreseanus).*

- Outer lip corrugated on the inside, not drawn out into a wing 101

- Not so 103

101. Shell spindle-shaped, canal not recurved:
Chauvetia brunnea (Donovan); FH3,377 *(minima);* J4,313 *(minima);* M53; N1,78.10 *(minima).*

- Shell oval-oblong, anterior canal recurved: *Pyrene haliaeeti* (Jeffreys); J4,356; M51; N1,73.40 *(costulata).*

- Shell wide at the base with a short pointed spire, not more than twice as high as wide 102

102. Ornament reticulate, or comprising longitudinal ribs and subordinate spiral ribs: *Nassarius* (3 species)
N. incrassatus (Ström); FH3,391 *(incrassata);* J4,351 *(incrassata);* M53; N1,81.40 *(incrassata).*
N. pygmaeus (Lamarck); FH3,394 *(pygmaea);* J4,354 *(pygmaea);* M54; N1,81.41 *(varicosa).*
N. reticulatus (L.); FH3,388 *(reticulata);* J4,346 *(reticulata);* M53; N1,81.10 *(reticulata).*

- Ornament composed of irregular spiral ribs and some growthlines, the latter may be frilled: *Nucella lapillus* (L.) (see 98, p. *16*).

103. Shell fairly thin, 104

- Shell solid 106

104. Spire blunt, anterior canal recurved: juvenile *Nassarius* (see 102, p. *17*)

- Spire pointed, anterior canal not recurved 105

105. Ornament composed of spiral lines or fine reticulations: juvenile *Nucella lapillus* (L.) (see 98, p. *16*)

- Ornament composed of spiral lines and tuberculate longitudinal ribs: juvenile *Aporrhais* (see 100, p. *16*)

106. Anterior canal a little recurved 107

- Anterior canal not recurved 108

107. Ornament composed of spiral lines and close-set longitudinal ribs: *Colus fenestratus* (Turton); FH3,412 *(fusiforme);* J4,343, M52; N1,75.20 *(fusiformis).*

- Ornament composed of fine spiral lines and thick wide apart longitudinal ribs: *Buccinum undatum* L. (see 96, p. *16*)

108. Ornament composed of fine spiral ribs and growth lines (Fig. 1b) 109

- Ornament consists of growth lines and very fine spiral lines 110

109. Shell more than ½ as wide as high, last whorl rotund: *Neptunea antiqua* (L.); FH3,423 *(antiquus);* J4,323 *(antiquus);* M52; N1,76.00 *(Fig. 1b).*

- Shell less than ½ as wide as high, last whorl slim: *Beringius turtoni* (Bean); FH3,431; J4,331; M51; N1,74.10.

110. Spire pointed: *Volutopsius norwegicus* (Gmelin); FH3,428 *(norvegicus);* J4,329 *(norvegicus);* M51; N1,74.10 *(norvegicus).*

- Spire very blunt: *Liomesus ovum* (Turton) (see 97, p. *16*)

Shell coiled dextrally, with an anterior canal, medium-spired, the body whorl including the anterior canal ½ to ⅔ the total height of the shell. The anterior canal may be drawn out into a spout with the aperture round or oval (Fig. 3g) **or else the aperture is elongated and rectangular and the anterior canal not necessarily drawn out into a spout** (Fig. 3h, 3i).

111. Ornament composed of spiral lines or ribs only 112

- Ornament composed of longitudinal ribs only 114

- Ornament composed of longitudinal ribs and subordinate spiral lines or ribs [1] 119

- Reticulate ornament[1] 128

Ornament composed of dominant spiral lines or close-set ribs, a few longitudinal ribs or varices are present[1] 131

[1]Shell form in these groups is somewhat variable. If in doubt consult the allied groups.

112. Shell thin: *Thesbia nana* (Lovén); FH3,461; J4,359; M55; N1,92.00.

- Shell solid 113

113. Shell distinctly rough with irregular spiral ribs: *Troschelia berniciensis* (King), FH3,421; J4,341; M54; N1,83.40.

- Many sharp spiral ribs present: *Philbertia teres* (Reeve); FH3,462; J4,362; M57; N1,94.80 *(anceps).*

- Shell almost smooth with spiral lines or very low spiral ribs:
  Colus (4 species, part only)
  C. gracilis (da Costa); FH3,416 *(islandicus);* J4,335; M51; N1,74.50.
  C. howsei (Marshall); FH3,419 *(propinquus);* J4,338 *(propinquus);* M51; N1,74.54 *(propinquus).*
  C. islandicus (Gmelin); J4,333; M51; N1,74.51;
  C. jeffreysianus (Fischer); J4,340 *(buccinatus);* M52; N1,74.55.

114. Aperture elongate 115

- Aperture round or oval 118

115. Shell very thin: *Typhlomangelia nivalis* (Lovén); J4,388; M55; N1,91.80.

- Shell thick 116

116. Longitudinal ribs low, more than 10 per whorl: *Mangelia powisiana* (Dautzenberg); FH3,478 *(laevigata)*; J4,386 *(laevigata)*; M56; N1,93.21.

- Longitudinal ribs pronounced 117

117. Aperture small, about ⅓ the total height of the shell: *Haedropleura septangularis* (Montagu); FH3,458; J4,390; M54; N1,90.60.

- Aperture about ½ the total height of the shell: *Mangelia coarctata* (Forbes); FH3,485 *(costata)*; J4,379 *(costata)*; M55; N1,92.40 *(costata)* and N1,92.41.

118. Anterior canal drawn out into a straight spout, longitudinal ribs well incised and straight: *Trophon truncatus* (Ström); FH3,436 *(clathratus)*; J4,319; M49; N1,70.33 *(Fig. 3g)*.

- Anterior canal short and pointed, longitudinal ribs flattish: juvenile *Aporrhais* (see 100, p. *16*)

119. Aperture roundish or oval, anterior canal may be drawn out into a spout 120

- Aperture elongate 125

120. Umbilicus present 121

- No umbulicus 123

121. Aperture notched at the top (Fig. 3c): *Cymatium cutaceum* (L.) (see 99, p. *16*)

- Aperture not notched at the top (Fig. 3b) 122

122. Whorls turretted (Fig. 3c, 3h): *Ocenebra erinacea* (L.) (see 99, p. *16*)

- Whorls rounded (Fig. 3g): *Ocinebrina aciculata* (Lamarck); FH3,374 *(corallinus)*; J4,310 *(aciculatus)*; M50; N1,71.10.

123. Whorls turretted, anterior canal drawn out into a long spout: *Trophon* (2 species, part only)
T. barvicensis (Johnston), FH3,442; J4,318; M49; N1,70.22.
T. muricatus (Montagu); FH3,439; J4,316; M50; N1,70.20.

- Whorls rounded 124

124. Shell more than twice as high as wide: *Philbertia purpurea* (Montagu); FH3,465; J4,373; M57; N1,94.30.

- Shell less than twice as high as wide: *Urosalpinx cinerea* (Say); M50; N1,70.90.

125. Aperture not notched at the top 126

- Aperture notched or receding at the top. This highly diagnostic character may be difficult to see, especially if the outer lip is broken 127

126. Whorls turretted, spiral lines very prominent, ornament almost reticulate: *Lora* (2 species)
L. trevelliana (Turton); FH3,452; J4,398 *(trevelyana);* M54; N1,91.38 *(trevelyana).*
L. turricula (Montagu); FH3,450; J4,395; M54; N1,91.20 *(Fig. 3h).*

- Whorls oval, spiral lines not prominent: *Lora rufa* (Montagu); FH3,454; J4,392; M54; N90.61.

127. Aperture very long and narrow, body whorl including the anterior canal more than ½ the total height of the shell (Fig. 3i): *Mangelia* (3 species, part only)
M. attenuata (Montagu); FH3,488; J4,377; M55; N1,92.90 *(Fig. 3i).*
M. coarctata (Forbes) (see 117, p. *19*).
M. rugulosa (Philippi); J4,381; M55; N1,92.42.

- Aperture moderately long, slightly swollen, body whorl including the anterior canal less than ½ the total height of the shell: *Mangelia* (4 species, part only)
M. brachystoma (Philippi); FH3,480; J4,382; M56; N1,93.24.
M. costulata (Blainville); FH3,483 *(striolata);* J4,376 *(striolata);* M55; N1,93.40.
M. nebula (Montagu); FH3,476; J4,384; M56; N1,93.20.
M. powisiana (Dautzenberg) (see 116, p. *19*).

- Aperture moderately long, not swollen, body whorl including the anterior canal ½ the total height of the shell: *Philbertia gracilis* (Montagu); FH3,473; J4,363; M56; N1,94.00.

128. Shell heavy, umbilicus present 121 (p. *19*)

- Shell not heavy, no umbilicus 129

129. Whorls turretted, anterior canal drawn out into a spout: *Trophon* (part only, see 123, p. *19*)

- Whorls turretted, aperture somewhat elongate: *Lora* (see 126, p. *20*)

- Whorls rounded 130

130. Aperture not notched at the top: *Nucella lapillus* (see 98, p. *16*)

- Aperture notched at the top: *Philbertia* (4 species, part only) and *Cenodagreutes* (2 species). These genera are not clearly distinguishable except by internal characteristics.
P. asperrima (Brown); FH3,467 *(asperrimus);* J4,370 *(reticulata);* N57; N1,94.13 *(reticulata asperrima).*
P. leufroyi (Michaud); FH3,468; J4,336; M56; N1,94.70.
P. linearis (Montagu); FH3,470; J4,368; M57; N1,94.60 *(Fig. 3c).*
P. purpurea (Montagu); (see 127, p. *20*)

C. aethus Smith; Smith (1967).
C. coccyginus Smith; Smith (1967).

131. Aperture notched at the top: *Ranella olearium* (L.); M49; N1,66.00 *(gigantea)*.

- Aperture not notched at the top: *Charonia lampas* (L.); M49; N1,66.61.

Shell internal, or largely covered by the mantle or foot

132. Animal can withdraw into its shell: return to **2** (p. *1*) and key out using shell characteristics

- Animal cannot withdraw into its shell 133

133. Animal pelagic, fragile foot produced into two lobes, narrow at the base, used for swimming (Fig. 4a): PTEROPODA (part only, see section VII, p. *41*)

- Not so 134

134. Shell internal 135

- Shell at least partly external, generally covered by the mantle (Fig. 4b) or foot (Fig. 4c). 138

135. Margins of the foot very wide, used as swimming lobes (Fig. 4c) animal not fragile, may emit purple liquid when disturbed: *Aplysia* (see 25, p. *4*)

- Foot has no permanent swimming lobes, animal does not emit purple liquid 136

136. Mantle more or less smooth: *Berthella plumula* (Montagu); FH3,559; J5,11; M68; N3,26.10, also *Berthellina engeli* Gardiner; M68; N3,26.00, from which it cannot easily be distinguished on the basis of external characteristics.

- Mantle granular or tuberculate 137

137. Feathery gill plume clearly visible on the right side: *Pleurobranchus membranaceus* (Montagu); FH3,558; J5,10; M68; N3,26.30.

- Gill plume not visible: *Lamellaria* (see 59, p. *10*)

138. Eyes clearly visible 139

- Eyes not clearly visible 140

139. Foot large, with lateral swimming lobes, tentacles flattened: *Haminoea* (see 68, p. *11*) *(Fig. 4c)*

- Foot not large, tentacles long and thin: *Velutina* (see 59, p. *10*)

140. No tentacles: *Akera bullata* Müller (see 68, p. *11*)

- Tentacles free (Fig. 3b), triangular in shape: *Roxania utriculus* (Brocchi) (see 69, p. *11*)

- Tentacle-like processes rounded and grooved: *Colpodaspis pusilla* M. Sars (see 63, p. *11*)

- Tentacles united to form a head shield (Fig. 4c) 141

141. Foot has narrow lobes, shell external: *Scaphander* (see 64, and 69, p. *11*)

- Foot has wide lobes, shell covered by the mantle: PHILINIDAE 142

142. Mouth has horny jaws, head shield notched in front: *Laona pruinosa* (Clark) (see 64, p. *11*)

- Cephalic shield not notched in front: *Philine* (see 63, p. *10*)

Shell absent

143. Animal pelagic, fragile, transparent, foot produced into two lobes, narrow at the base, used for swimming (Fig. 4a): PTEROPODA (part only, see section VII, p. *41*)

- **Animal intestitial or parasitic in habit** **192** (p. *29*)

- Not so 144

144. Animal smooth 145

- Animal tuberculate or with exposed gills or other processes on the back (Fig. 4d, 3e) 147

145. Tentacles united into a head shield (Fig. 4c), animal black: *Runcina coronata* (Quatrefages); FH3,612 *(hancocki);* J5,15 *(hancocki);* M61; N3,10.00.

- Tentacles reduced to lateral crests: *Limapontia* (2 species)
  L. capitata (Müller); E141; FH3,614 *(nigra);* J5,28 *(nigra);* M67; N3,19.10 *(nigra).*
  L. depressa Alder & Hancock; E142; J5,29; M68.

- Tentacles free (Fig. 3b) 146

146. Lateral swimming lobes present: *Elysia viridis* (Montagu); E140; FH3,614; J5,31; M67; N3,18.00.

- No swimming lobes: *Acetonia senestra* Quatrefages; E140; FH3,616 *(cocksii);* J5,30 *(cocksii);* M67.

147. Anus median, at the extreme hind end of the body between the mantle and the foot: *Onchidella celtica* (Forbes & Hanley); FH4,3 *(celticum);* J5,95 *(celticum);* M72.

- Anus median, dorsal (Fig. 4a) 148

- **Anus lateral** **169** (p. *26*)

148. **Gills surround the anus. No cerata** (Fig. 4d) **149** (p. *23*)

- **Back covered with fleshy processes (cerata)** (Fig. 4e) **166** (p. *25*)

Shell absent, animal tuberculate or with exposed gills or other processes on the back, anus median, dorsal, gills surround the anus. No cerata

149. Gills retractile, can be withdrawn into the body or into sheaths 150

- Gills not retractile, permanently displayed: POLYCERIDAE 156

150. More than 20 gills: *Onchidoris fusca* (Müller); AH1,11 *(bilamellata);* FH3,567 *(bilamellata);* J5,90 *(bilamellata);* M69; N3,39.30. *(bilamellata).*

- Fewer than 20 gills: GLOSSODORIDIDAE 151

151. Oral tentacles (Fig. 4d) flattened, 5 tripinnate gills (Fig. 4h): *Cadlina laevis* (L.); AH1,6 *(repanda);* FH3,566 *(repanda);* J5,86 *(repanda);* N3,42.00.

- Oral tentacles linear 152

- Oral tentacles tubercular 155

152. Gills bipinnate (Fig. 4g), 6 in number, mantle covered with minute granular tubercles: *Aporodoris millegrana* (Alder & Hancock); AH *App.*(2); E106; J5,84; N3,51.10.

- Gills simply pinnate (Fig. 4f) 153

- Gills tripinnate (Fig. 4h) 154

153. Gills 10 in number, set in a circle, mantle covered with pilose tubercles: *Rostanga rufescens* Iredale & O'Donoghue; AH1,7 *(coccinea);* FH3,565 *(coccinea);* J5,86 *(coccinea);* N3,45.00 *(rubre).*

- Gills numerous, set in a horseshoe: *Doris verrucosa* L.; E157 *(derelicta);* N3,46.00.

154. Eight tripinnate gills, mantle covered with large and small warty tubercles, animal plump: *Archidoris stellifera* Vayssière; J5,85 *(testudinaria);* M69; N3,51.30.

- Seven tripinnate gills, mantle covered in mostly small warty tubercles, animal flat: *Geitodoris planata* (Alder & Hancock); AH1,8; N3,48.00.

- Five tripinnate gills, mantle covered with pilose tubercles: *Jorunna tomentosa* (Cuvier); AH1,5 *(johnstoni);* FH3,564 *(johnstoni);* J5,85 *(johnstoni);* N3,52.00.

155. Dorsal tentacles (rhinophores) linear, 6 bipinnate gills, mantle covered with conical pointed tubercles: *Aldisa zetlandica* Alder & Hancock); J5,84; AH42; E105; N3,44.00.

- Dorsal tentacles conical, 9 tripinnate gills, mantle has flattish tubercles: *Archidoris* (2 species, part only)
  A. pseudoargus (Rapp); AH1,3 *(tuberculata);* FH3,563 *(tuberculata);* J5,83 *(tuberculata);* M69; N3,47.00 *(tuberculata).*
  A. flammea (Alder & Hancock); AH1,4; FH3,564; J5,83; M69; N3,47.01.

156. Dorsal tentacles retractile, with distinct sheaths, 3 tripinnate gills 157

- Dorsal tentacles not retractile, sheaths absent or indistinct, gills various 160

157. Oral tentacles distinct, body elongate 158

- Oral tentacles none or indistinct, body humped 159

158. Mantle tuberculate: *Limacia clavigera* (Müller); AH1,20 *(claviger);* FH3,573 *(claviger);* J5,71 *(claviger);* N3,41.00 *(claviger).*

- Body covered with yellow papillae: *Crimora papillata* (Alder & Hancock); E110; J5,74; N3,39.20.

159. Mantle tuberculate and with brilliant spots of blue-green with brown borders: *Aegires punctilucens* (Orbigny); AH1,21; FH3,574; J5,70; N3,40.00.

- Body smooth: *Thecacera* (3 species)
  T. capitata Alder & Hancock; AH *App.*(11); J5,73; N3,41.51.
  T. pennigera (Montagu); AH1,21a; FH3,575; J5,72; N3,41.50.
  T. virescens Forbes & Hanley; AH *App.*(10); FH3,576; J5,73; N3,41.52.

160. Mantle absent, body smooth but with two rows of 5 linear appendages, 3 tripinnate gills: *Ancula cristata* (Alder); AH1,25; FH3,580; J5,77; N3,37.40 *(gibbosa).*

- Mantle absent, appendages opposite dorsal tentacles and gills only: *Trapania pallida* Kress; Kress (1968).

- Mantle present 161

161. Mantle has lateral and anterior processes 162

- Mantle has no lateral processes 163

162. Body linear, tapering behind, processes at the anterior end only: *Polycera* (2 species, part only)
  P. elegans (Bergh); Edmunds (1961); N3,41.40.
  P. quadrilineata (Müller); AH1,22; FH3,576; J5,75; N3,41.10.

- Body ovate, thick, with lateral processes continued down the sides, *Okenia* (4 species)

O. aspersa (Alder & Hancock); AH1,26; FH3,578; J5,79; M69; N3,37.30 *(quadricornis)*.

O. elegans (Leuckart); AH1,27; J5,78; M69; N3,37.20.

O. leachii (Alder & Hancock); AH1,27; J5,79; M69; N3,37.22 *(leachi)*.

O. pulchella (Alder & Hancock); AH *App.*(14); J5,80; M69; N3,37.24.

163. Mantle has a distinct rim 164

- Mantle has no such rim 165

164. More than 5 gills present: *Goniodoris* (2 species)

G. castanea Alder & Hancock; AH1,19; FH3,572; J5,82; M69; N3,37.01.

G. nodosa (Montagu); AH1,18; FH3,572; J5,81; M69; N3,37.00.

- Fewer than 5 gills present: *Polycera* (3 species, part only)

P. dubia M. Sars; FH3,577 *(lessonii)*; J5,76 *(lessoni)*; AH1,24 *(lessonii)*, N3,41.30.

P. faeroensis Lemche; Lemche (1929).

P. notha (Johnston); FH3,578 *(ocellata)*; J5,76 *(ocellata)*; AH1,23 *(ocellata)*; N3,41.31 *(lesseni)*.

163. Mantle papillose, 7-9 gills present: *Acanthodoris* (2 species)

A. pilosa (Abildgaard); FH3,570; J5,93; AH1,15; N3,38.20.

A. subquadrata (Alder & Hancock); FH3,571; J5,93 *(quadrangulata)*; AH1,16; N3,38.21.

- Mantle tuberculate, generally more than 9 gills:

Adalaria (2 species) and *Onchidoris* (8 species, part only).

These genera differ in their internal characters, specially the radula.

A. loveni (Alder & Hancock); E108; J5,88; N3,38.11.

A. proxima (Alder & Hancock); AH1,9; J5,88; N3,38.10.

O. depressa (Alder & Hancock); AH1,12; FH3,568; J5,91; N3,38.33.

O. diaphana (Alder & Hancock); AH1,10; N3,38.31.

O. inconspicua (Alder & Hancock); AH1,12; FH3,569; J5,91; N3,38.35.

O. luteocincta (Mr Sars); E109; N3,38.40.

O. muricata (Müller); AH1,9 *(aspera)*; FH3,567 *(aspera)*; J5,87 *(aspera)*; M69; N3,38.37 *(ulidiana)*.

O. neapolitana (Chiaje); N3,38.39.

O. oblonga (Alder & Hancock); AH1,16; FH3,568; J5,90; N3,38.32.

O. pusilla (Alder & Hancock); AH1,13; FH3,569; J5,92; N3,38.36.

O. sparsa (Alder & Hancock); AH1,14; FH3,570; J5,92; N3,38.34.

Shell absent, animal tuberculate or with exposed gills or other processes on the back, anus median, dorsal, the back covered with cerata

166. Cerata very numerous, some anterior to the tentacles 167

- Cerata numerous, but none in front of the tentacles 168

167. Dorsal tentacles simple, linear: *Proctonotus mucroniferus* (Alder & Hancock); AH3,42; FH3,608; J5,57; N3,67.00 *(pilosa)*.

- Dorsal tentacles laminated and united by an arched crest: *Janolus* (3 species)
  J. cristatus (Chiaje); AH3,44 *(cristata)*; FH3,609 *(splendida)*; J5,58 *(cristata)*; N3,67.20 *(cristata)*.
  J. flagellatus Eliot; E165.
  J. hyalinus (Alder & Hancock); AH3,44 *(hyalina)*; E122; J5,59 *(hyalina)*; N3,67.10.

168. Anus posterior, tentacles reduced or absent: *Alderia modesta* (Lovén); AH3,41; E137; FH3,611; J5,33; M67; N3,17.60.

- Anus anterior, tentacles well developed: *Stiliger bellulus* (Orbigny); E136. Also *Hermea* (2 species)
  H. bifida (Montagu); AH3,39; FH3,610; J5,33; M67; N3,17.10.
  H. dendritica (Alder & Hancock); AH3,40; FH3,609; J5,34; M67; N3,17.00.

Shell absent, animal tuberculate or with exposed gills or other processes including cerata on the back or sides, anus lateral

169. Cerata absent: *Armina loveni* (Bergh); E111; FH4,290 *(lineata)*; J5,17; N3,65.02.

- Cerata present 170

170. Cerata branched 171

- Cerata not branched 172

171. Dorsal tentacles have arborescent sheaths: *Dendronotus frondosus* (Ascanius); AH3,3 *(arborescens)*; FH3,586 *(arborescens)*; J5,62 *(arborescens)*; N3,60.00.

- Dorsal tentacles have no sheaths: *Hero formosa* (Lovén); E120; J5,63; N3,69.00.

172. More than one pair of oral processes present, cerata arranged in two longitudinal rows or crests 173

- One pair of oral tentacles present 174

173. Two pairs of oral processes present, arrangement of cerata is bilaterally symetrical: *Lomanotus* (3 species)
  L. flavidus (Alder & Hancock); E112; FH3,586; J5,65; N3,57.00.
  L. genei Verany; E115; J5,65 *(portlandicus)*; N3,57.00.
  L. marmoratus (Alder & Hancock); E116; FH3,585; J5,64; M70; N3,57.00.

- Four pairs of oral processes present, 5 groups of cerata on the left side and 4 groups on the right side of the animal: *Hancockia uncinata* (Hesse); E118 *(eudactylota)*; N3,59.00 *(uncinnata)*.

174. Dorsal tentacles retractile, sheathed 175

- Dorsal tentacles not retractile, without sheaths 177

175. Cerata arranged in tufts on the inside of raised lateral humps on the back: *Scyllaea pelagica* (L.); AH *App.*(17); FH3,584; J5,66; N3,58.00.

- Cerata arranged in a single row down each side of the back 176

176. Large jaws present: *Tritonia* (3 species)
T. hombergii Cuvier; AH2,2 and AH *App.*(16) *(alba);* FH3,582 *(hombergi);* J5,67 *(hombergi)* and J5,68 *(alba)*; M69; N3,56.00 *(hombergeri)* and N3,56.10 *(alba).*
T. lineata Alder & Hancock; AH2,4; FH3,583; J5,68; M69; N3,56.22.
T. plebeia Johnston; AH2,3; FH3,583; J5,68; M70; N3,56.01.

- No jaws: *Doto* (5 species)
D. coronata (Gmelin); AH3,6; FH3,587; J5,61; M70; N3,62.17.
D. cinerea Trinchese; E124; N3,62.22 *(rosea).*
D. cuspidata Alder & Hancock; E123; J5,61; M70; N3,62.10.
D. fragilis (Forbes); AH3,5; FH3,588; J5,60; M70; N3,62.12.
D. pinnatifida (Montagu); AH3,45; J5,60; M70; N3,62.15.

177. Cerata arranged in clusters 178

- Cerata arranged in rows or all over the back 183

178. Eleven clusters, each on a common pedicle: *Calma glaucoides* (Alder & Hancock); AH3,22; J5,44; N3,78.00.

- Four to seven clusters on each side 179

179. Dorsal tentacles as long as or longer than the oral tentacles: *Coryphella rufibranchialis* (Johnston); AH3,14; FH3,593; J5,41; M70 *(verrucosa);* N3,70.02 *(verrucosa).*

- Oral tentacles longer than the dorsal tentacles 180

180. Cerata have white tips or a white ring or rings near the tips 181

- Cerata not so 182

181. Cerata pale or bright pink or orange with white tips: *Coryphella* (3 species, part only)
C. gracilis Alder & Hancock; AH3,18; N3,70.03.
C. pedata (Montagu); AH3,20 *(landsburgi);* FH3,596 *(landsburgi);* J5,43 *(landsburgi);* M70; N3,70.00.
C. pellucida (Alder & Hancock); AH3,19; FH3,596; J5,42; M70; N3,70.05.

- Cerata orange with a white longitudinal line and white rings near the tips: *Coryphella lineata* (Lovén); AH3,16, FH3,594; J5,41; M70; N3,70.01.

- Cerata dull or dark reddish in colour with white tips: *Facelina drummondi* (Alder & Hancock); AH3,13; FH3,593; J5,39; N3,80.02.

- Cerata dark red with blue or black marks, only one white ring near the tips: *Facelina* (2 species, part only)
  F. auriculata (Müller); AH3,12 *(coronata);* FH3,592 *(coronata);* J5,39 *(coronata);* M71; N3,80.00 *(coronata).*
  F. elegans (Alder & Hancock); AH3,17; FH3,595; J5,40.

182. Cerata red-brown with white spots: *Facelina punctata* (Alder & Hancock); AH3,15; FH3,594; J5,40; N3,80.01.

- Cerata pink all over: *Favorinus carneus* (Alder & Hancock); J5,44 *(carnea);* N3,82.00 *(branchialis).*

- Cerata white with brown spots: *Favorinus branchialis* (Rathke); AH3,21 *(alba);* FH3,597 *(alba);* J5,43 *(alba);* M71; N3,82.00.

183. Dorsal and oral tentacles of equal length, cerata very numerous all over the back: *Fiona pinnata* (Eschscholtz); AH3,38a *(nobilis);* FH3,589 *(nobilis);* J5,35 *(nobilis);* N3,77.00.

- Oral tentacles longer than the dorsal tentacles 184

- Oral tentacles shorter than the dorsal tentacles 185

184. Fourteen rows of cerata; *Aeolidia papillosa* (L.); AH3,9; FH3,590; J5,37; M71; N3,84.00.

- Nine rows of cerata: *Aeolidiella* (2 species)
  A. glauca (Alder & Hancock); AH3,11; FH3,591; J5,38; N3,84.10 *(rubra).*
  A. inornata (Alder & Hancock); FH3,598; J5,46; N3,84.11.

184. Cerata fusiform, arranged in two longitudinal rows, body slender 186

- Cerata linear, ovate or short, in transverse rows, body slender or stout 187

185. Oral tentacles reduced to flat lobes: *Embletonia* (3 species)
  E. minuta (Forbes & Goodsir); E171; FH3,607; J5,36; M71.
  E. pallida (Alder & Hancock); AH *App.*(36); J5,36; M71.
  E. pulchra (Alder & Hancock); AH3,38; FH3,607; J5,36; M70; N3,76.70.

- Short oral tentacles: *Tergipes tergipes* (Forsskål); AH3,36 *(despecta);* FH3,605 *(despecta);* J5,56 *(despecta);* M72 *(despectus);* N3,76.60 *(despectus).*

187. Cerata few, mostly very long indeed: *Cumanotus beaumonti* (Eliot); E125; N3,74.00.

- Cerata numerous 188

188. First 3-4 rows of cerata grouped closer together than the rest:
Trinchesia (6 species)
T. aurantia (Alder & Hancock); AH3,27 *(aurantiaca);* FH3,600 *(aurantiaca);* J5,48 *(aurantiaca);* N3,76.40.
T. caerulea (Montagu); AH *App.*(30); E130; FH3,603 *(coerulea);* J5,51; N3,81.00.
T. foliata (Forbes & Goodsir); AH3,26 *(olivacea);* FH3,599 *(olivacea);* J5,47 *(olivacea);* N3,81.03.
T. glotensis (Alder & Hancock); AH3,29 *(glottensis);* FH3,601 *(glottensis);* J5,51 *(glottensis);* N3,81.01 *(glottensis).*
T. stipata (Alder & Hancock); AH3,22; FH3,597; J5,46; N3,81.05.
T. viridis (Forbes); AH3,32; FH3,603; J5,52; N3,81.02.

- Rows of cerata evenly spaced 189

189. Cerata present in front of the dorsal tentacles: *Cuthona* (2 species, part only, and *Precuthona peachii* (Alder & Hancock); AH3,10; FH3,591; J5,45; N3,76.10 *(peachi).)*
C. concinna (Alder & Hancock); AH3,25; FH3,598; J5,47; N3,81.11.
C. nana (Alder & Hancock); AH3,25; FH3,599; J5,45; N3,76.20.

- Cerata all posterior to the dorsal tentacles 190

190. Cerata ovate, pointed: *Eubranchus* (4 species, part only)
E. exiguus (Alder & Hancock); AH3,37 *(exigua);* FH3,606 *(exigua);* J5,56 *(exigua);* M70; N3,74.30 *(exigua).*
E. farrani (Alder & Hancock); AH3,35; FH3,605; N3,74.20 *(tricolor).*
E. pallidus (Alder & Hancock); AH3,33 *(picta);* FH3,603 *(picta);* J5,54 *(picta);* M70; N3,74.21.
E. tricolor Forbes; AH3,34; FH3,604; J5,54; M70; N3,74.10 *(viridula).*

- Cerata fusiform, knobbly, diverging at the tips:
Eubranchus cingulatus (Alder & Hancock); AH3,28 *(cingulata);* FH3,600 *(cingulata);* J5,53 *(cingulata);* M70; N3,74.25.

- Cerata linear 191

191. Cerata spotted: *Cuthona* (3 species, part only)
C. amoena (Alder & Hancock); AH3,30; FH3,602; J5,50; N3,81.10.
C. couchii (Cocks); AH *App.*(27); J5,49.
C. pustulata (Alder & Hancock); AH3,45; J5,49; N3,81.15.

- Cerata not spotted: *Eubranchus vittatus* (Alder & Hancock); AH3,29 *(vittata);* FH3,601 *(vittata);* J5,53 *(vittata);* M70; N3,74.24.

Shell absent, animal interstitial or parasitic in habit

192. Animal worm-like 193

- Animal with a distinct mantle 194

193. Animal with a distinct head, and papillae somewhat like cerata at intervals down the sides: *Pseudovermis boadeni* Salvini-plawen & Sterrer; Boaden (1961) (cf. *schultzi).*

- Animal with no distinct organ except gonads. Parasitic in Holothuria: *Enteroxenos ostergreni* Bonnevie; Morton (1967) (genus only).

194. Head transparent, mantle only contains distinct spicules:
Hedylopsis (2 species)
H. brambelli Swedmark; Swedmark (1968)
H. suecica Odhner; N3,1101.

- Both head and mantle contain spicules 195

195. Animal white, perhaps with bl ack spots: *Philinoglossa helgolandica* Hertling; N3,11.30.

- Animal white with yellow and brown internal organs: *Microhedyle lactea* Hertling; N3,11.11.

IV. TROCHIDAE

1. Shell has a strong tooth or protuberance on the columella: *Monodonta lineata* (da Costa); FH2,525; *(lineatus);* J3,317 *(lineatus);* M28; N1,12.03.

- Shell has no such tooth 2

2. Shell depressed (Fig. 1j): juvenile *Gibbula* (easily confused with *Skenea* (see 54, p. 9)

- Shell conical, with a flat base, whorls keeled (Fig. 1d, 3a) 3

- Shell helicoid, whorls rounded (fig. 1a) 14

Spire blunt 4

- Spire pointed 8

4. Suture slight (Fig. 1d) 5

- Suture marked, shell angulated above and below the periphery 7

5. Umbilicus absent: *Gibbula pennanti* (Philippi); FH2,521 *(umbilicatus* var.); J3,313 *(agathensis);* M29; N1,11.21.

- Umbilicus present (Fig. 3d) 6

6. Shell about as high as wide, more than 10 (usually 14) spiral ridges on the base: *Gibbula cineraria* (L.); FH2,516 *(cinerarius);* J3,309 *(cinerarius);* M28; N1,11.20.

- Shell less high than wide, fewer than 10 (usually 8) spiral ridges on the base: *Gibbula umbilicalis* (da Costa); FH2,519 *(umbilicatus);* J3,312 *(umbilicatus);* M29; N1,11.22 *(Fig. 3d).*

7. Shell about as high as wide, less than 10mm. high, ornament consists of fine radial striae or riblets: *Gibbula tumida* (Montagu); FH2,513 *(tumidus);* J3,307 *(tumidus);* M28; N1,11.14.

- Shell rather less high than wide, generally over 10mm. high, with tubercles or short wide longitudinal ribs on the upper shouldered parts of the whorls: *Gibbula magus* (L.); FH2,522; J3,305; M28; N1,11.00 *(Fig. 3a).*

8. Shell taller than wide 9

- Shell as tall as wide 11

9. Suture channelled, whorls slightly shouldered (Fig. 3a): *Cantharidus montagui* (2. Wood); FH2,511; J3,320 *(montacuti);* M27; N1,12.23.

- Suture very slight 10

10. Four spiral ribs occur above the periphery on each whorl: *Cantharidus exasperatus* (Pennant); FH2,505 *(exiguus);* J3,324; M27; N1,12.20.

- More than 4 such ribs: *Cantharidus striatus* (L.); FH2,508; J3,322; M28; N1,12.21.

11. Outer lip produced into a distinct point at the keel: *Cantharidus clelandi* (W. Wood); FH2,502 *(millegranus);* J3,325 *(millegranus);* M28; N1,10.40 *(millegrana).*

- Not so 12

12. Ornament consists of spiral granulate ribs: *Calliostoma papillosum* (da Costa); FH2,499 *(granulatus);* J3,327 *(granulatus);* M27; N1,10.10 *(granulatum).*

- Ornament consists of smooth spiralbribs and fine radial lines 13

13. Shell solid, the peripheral rib thicker than the others: *Calliostoma zizphinum* (L.); FH2,491 *(zizyphinus);* J3,330 *(zizyphinus);* M27; N1,10.01 *(zizyphinus) (Fig. 1d).*

- Shell not solid, the spiral ribs sharply defined: *Calliostoma occidentale* (Mighels); FH2,497 *(alabastrum);* J3,333 *(occidentalis);* M27; N1,10.04.

14. Ornament very marked: *Solariella amabilis* (Jeffreys); J3,300; M27; N1,09.50.

- Ornament fine or lacking, shell very small 15

15. Ornament consists of very fine spiral lines, on the base only: *Margarites helicinus* (Fabricius); FH2,531; J3,295; M26; N1,09.00 *(helicina).*

- Ornament consists of fine spiral lines covering the whole of the shell: *Margarites olivaceus* Brown; FH2,535 *(olivacea);* M27; N1,09.03 *(argentata).*

- Ornament consists of fine spiral lines and subsutural puckers: *Margarites groenlandicus* (Gmelin); FH2,528 *(undulatus);* J3,298; M27; N1,09.01 *(undulata).*

V. RISSOIDAE

1. Shell rather globular, the body whorl more than ⅔ the total height of the shell 2

- Shell medium-spired, the body whorl less than ⅔ the total height of the shell 7

2. Shell smooth 3

- Shell with fine, maybe microscopic, spiral striae 5

3. Suture deep, marked umbilicus: *Cingulopsis fulgida* (J. Adams); FH3,128; J4,43; M37; N1,29.30; N3R,15.001.

- Umbilicus absent, or present only as a slight chink 4

4. Shell uniformly coloured greenish-brown, suture deep: *Cingula inflata* (Monterosato); M33; N3R,21.052.

- Shell has 4 rows of brownish spots, suture deep: *Cingula pulcherrima* (Jeffreys); FH3,129; J4,42; M33; N1,25.04; N3R,22.003.

5. Suture slight: *Cingula semistriata* (Montagu); FH3,117; J4,46; M33; N1,25.02; N3R,22.023.

- Suture deep 6

6. Colour buff to yellow, spire bluntly pointed: *Cingula alderi* (Jeffreys); FH3,131 *(soluta);* J4,45 *(soluta);* M33; N1,25.21 *(soluta);* N3,21.041.

- Colour white with or without rows of brownish spots, last whorl expanded considerably towards the aperture, spire obtusely pointed, *Cingula pulcherrima* (Jeffreys) (see 4, p. *33*)

7. Shell smooth or ornamented with very fine spiral striae, uniformly coloured reddish-brown or white or with a wide spiral colour band, shallow suture, no umbilicus: *Barleeia unifasciata* (Montagu); FH3,120 *(rubra);* J4,56 *(rubra);* M37; N1,29.00 *(rubra);* N3R,20.000 *(rubra).*

- Shell smooth, white or with colour or colour marking other than those above 8

- Shell ornamented 11

8. Shell horn-coloured, aperture very large: *Rissoa membranacea* (J. Adams); FH3,109 *(labiosa);* J4,30; M36; N1,28.80; N3R,25.210 and N3R,25.211 *(labiosa).*

- Not so 9

9. Suture very deep, whorls rounded: *Rissoa albella* (Lovén); FH3,115 *(albula);* J4,29; M36; N1,28.20; N3R,25.010 *(benzi).*

- Suture distinct but not deep 10

10. Six to seven whorls completed in about 2mm. of height: *Rissoa inconspicua* (Alder); FH3,113; J4,26; M36; N1,28.34; N3R,25.000.

- Six to seven whorls requiring about 5mm. of height: *Rissoa parva* var. *interrupta* (J. Adams); FH3,100; J4,24; N1,28.11; N3R,25.025.

11. Ornament consists of spiral striae only 12

- Ornament consists of longitudinal ribs only, or longitudinal ribs and very fine spiral striae 15

- Ornament comprises both longitudinal ribs and spiral striae or ribs, or a reticulate or punctate pattern, not necessarily on all whorls 19

12. Shell considerably more than twice as high as wide, suture distinct 13

- Shell about twice as high as wide 14

13. Shell solid, spiral striae clearly visible without a hand lens: *Cingula proxima* (Forbes & Hanley); FH3,127; J4,39; M33; N1,26.20; N3R,22.400.

- Shell thin, semitransparent, spiral lines very fine and only visible under magnification: *Cingula vitrea* (Montagu); FH3,125; J4,40; M33; N1,26.10; N3R,22.300.

14. Shell whitish with numerous spots or blotches encircling the upper and lower parts of the whorls: *Cingula semistriata* (Montagu) (see 5, p. *33*)

- Shell has dark spiral colour bands: *Cingula cingillus* (Montagu); FH3,122; J4,48; M33; N1,26.40; N3R,22.700.

15. Shell has a single, possibly obscure, tooth or fold on the columella, aperture very large: *Rissoa membranacea* (J. Adams) (see 8, p. *33*)

- No tooth, aperture not large 16

16. At least 20 longitudinal ribs per whorl, not necessarily on all whorls: *Rissoa inconspicua* Alder (see 10, p. *34*)

- Fewer than 15 longitudinal ribs per whorl 17

17. Twelve to Twenty-five longitudinal ribs per whorl, not necessarily on all whorls, no thick labial rib or varix: *Rissoa sarsii* (Lovén); FH3,115 *(tenuis);* J4,29; M36; N1,28.22; N3R,25.014 *(sarsi).*

- Thick labial rib present on adult specimens 18

18. Usually fewer than 12 longitudinal ribs per whorl, not necessarily on all whorls, comma-shaped mark behind the aperture; *Rissoa parva* (da Costa); FH3,98; J4,23; M35; N1,28.10; N3R,25.024.

- Usually more than 12 longitudinal ribs per whorl, not necessarily on all whorls, no comma-shaped mark: *Rissoa albella* (Lovén) (see 9, p. *33*)

19. Upper whorls smooth 20

- Upper whorls ornamented 23

20. Ornament comprises a reticulate pattern of fine punctations, on the last whorl only: *Rissoa porifera* Lovén; J4,33; N1,28.43; N3R,25.313; Smith (1971).

- Ornament comprises a reticulate pattern of fine punctations, longitudinal ribs also present, not necessarily on all whorls 21

21. Ten longitudinal ribs per whorl, colouring consists of longitudinal brown streaks between the ribs and possibly a brownish zigzag pattern on the last whorl: *Rissoa guerini* Récluz; FH3,103 *(costulata);* J4,35 *(costulata);* M36 *(guerinii);* N1,28.56; N3R,25.300.

- At least 13 longitudinal ribs per whorl 22

22. Fewer than 15 longitudinal ribs per whorl, shell grey to lilac coloured: *Rissoa lilacina* Récluz; M36; N1,28.41; N3R,25.310; Smith (1971).

- More than 15 longitudinal ribs per complete whorl, or only 8 or so longitudinal ribs on part of the last whorl: *Rissoa rufilabrum* Alder; N1,28.42; N3R,25.312 *(rufilabris);* Smith (1971)..

The descriptions in FH3,106 *(rufilabrum)* and J4,33 *(violacea)* do not clearly distinguish these species.

23. Ornament comprises fine spiral ribs, and longitudinal ribs or puckers not extending to the base of the whorls 24

- Not so 25

24. Longitudinal ribs occur just below the suture only: *Cingula semicostata* (Montagu); FH3,94 *(striata);* J4,37 *(striata);* M33; N1,26.30 and N3R,22.500 (striata).

Longitudinal ribs extend to the periphery: *Alvania abyssicola* (Forbes & Hanley); FH3,86; J4,19; M35; N1,27.82 *(subsoluta);* N3R,24.143 *(subsoluta)* and N3R, 24.144.

25. Ornament comprises distinct longitudinal ribs with spiral lines between the ribs: *Alvania crassa* (Kanmacher); FH3,92 *(costata);* J4,22 *(costata);* M34; N1,26.60 *(costata);* N3R,23.301.

- Ornament comprises strong spiral ribs with longitudinal striae between ribs 26

- Ornament more or less reticulate 27

26. Shell rotund, aperture ½ the total height of the shell: *Alvania carinata* (da Costa); FH3,73 *(striatula);* J4,5 *(striatula);* M35; N1,27.10 *(striatula);* N3R,24.010.

- Shell not rotund, aperture about ⅓ the total height of the shell: *Alvania jeffreysi* (Waller); J4,15; M34; N1,27.42; N3R,24.004.

27. Ornament fine, longitudinal ribs and spiral striae very numerous, last whorl large, suture slight: *Alvania lactea* (Michaud); FH3,76; J4,7; M35; N1,27.20; N3R,24.100.

- Not so 28

28. Suture deeply channelled: *Alvania cimicoides* (Forbes); FH3,88 *(sculpta);* J4,14; M34; N1,27.60; N3R,24.130.

- Not so 29

29. Suture deep, whorls rounded, reticulate ornament fine, giving a pitted appearance: *Alvania punctura* (Montagu); FH3,89; J4,17; M35; N1,27.70; N3R,24.020.

- Suture moderate, ornament bold 30

30. Ornament very bold, comprising 4 spiral ribs on the body whorl (apart from those on the base) crossed by equally prominent longitudinal ribs: *Alvania zetlandica* (Montagu); FH3,78; J4,20; M34; N1,27.50; N3R,23.400.

- Main spiral ribs on the body whorl number more than 4, usually 6-8 31

31. Suture deep, ornament somewhat tuberculate or prickly, peristome area heavy with marked ridges on the inside of the outer lip: *Alvania cancellata* (da Costa); FH3,80 *(crenulata);* J4,8; M35; N1,27.30; N3R,24.200.

- Suture moderate, ornament not tuberculate, ridges on the inside of the outer lip fine: *Alvania beanii* (Thorpe); FH3,84; J4,12 *(reticulata);* M34; N1,27.00 *(reticulata);* N3R,24.121 *(beani);* N3R,24.120. *(reticulata);* N3R,24.122 *(calathus).*

VI. PYRAMIDELLIDAE

Shells of this family are difficult to identify and should if possible be compared with named specimens. The textbook descriptions are not always diagnostic and in some cases are conflicting.

1. Shell tall-spired, body whorl generally less than ⅓ the total height of the shell — 2

- Shell medium-spired, body whorl ½ or more than ½ the total height of the shell — 17

2. Shell has a prominent tooth or fold on the columella, adult shell has less than 8 whorls — 3

- Tooth absent or very obscure, adult shell generally has more than 8 whorls — 5

3. Shell smooth: *Odostomia plicata* (Montagu); FH3,271; J4,137; M64; N3P,1.630.

- Shell ornamented with longitudinal ribs and fine spiral striae, rather cylindrical — 4

4. Ornament comprises about 25 longitudinal ribs and 12 spiral striae per whorl: *Chrysallida decussata* (Montagu); FH3,303; J4,145; M61; N3P,0.080.

- Ornament comprises about 20 longitudinal ribs and 3 spiral striae per whorl: *Chrysallida clathrata* (Jeffreys); FH3,258; J4,148; M61; N3P,0.048.

5. Shell smooth or almost so — 6

- Shell ornamented — 8

6. Whorls rounded, suture deep: *Eulimella* (2 species, part only)
   E. gracilis Jeffreys; J4,171 *(ventricosa);* M66; N3P,2.224 *(ventricosa).*
   E. nitidissima (Montagu); FH3,223; J4,173; M66; N3P,2.300.

- Whorls flattened, suture slight — 7

7. Whorls angulated at the periphery, somewhat keeled: *Eulimella macandrei* (Forbes); FH3,309 *(scillae);* J4,169 *(scillae);* M65; N3P,2.220 *(scillae).*

- Whorls rounded at the periphery: *Eulimella* (2 species, part only)
   E. compactilis Jeffreys; J4,169; M65; N3P,2.221 *(superflua).*
   E. laevis (Brown); FH3,311 *(acicula);* J4,170 *(acicula);* M65; N3P,2.222 *(acicula).*

8. Whorls strongly shouldered — 9

- Whorls flattened or somewhat rounded — 10

9. Twenty-five to thirty longitudinal ribs on the body whorl: *Turbonilla jeffreysi* (Forbes & Hanley); FH3,251 *(scalaris);* J4,160 *(scalaris);* M63 *(jeffreysii);* N3P,3.100 *(scalaris).*

- About 20 longitudinal ribs on the body whorl: *Turbonilla rufescens* (Forbes); FH3,253; J4,161; M63; N3P,3.100 *(scalaris,* var).

10. Three spiral ribs prominent at the periphery: *Turbonilla fenestrata* (Jeffreys); FH3,249; J4,156; M63; N3P,3.130.

- Not so 11

11. Shell cylindrical, longitudinal ribs curved, fading out below the periphery: *Turbonilla innovata* Monterosato; FH3,244 *(pusilla);* J4,167 *(pusilla);* M62; N3P,3.030.

- Shell an elongated cone, longitudinal ribs straight 12

- Shell an elongated cone, longitudinal ribs oblique and curved 13

12. Microscopic spiral striae present: *Turbonilla multilirata* Monterosato; M62; N3P,3.120.

- No such striae: *Turbonilla verticalis* Marshall; M62; N3P,3.042.

13. Longitudinal ribs curved in a clockwise direction when viewed from the apex of the shell (Fig. 3f), shell usually white 14

- Longitudinal ribs curved in an anticlockwise direction when viewed from the apex of the shell (Fig. 3e), 4-6 multiple spiral lines above the periphery, shell usually brown 16

14. Longitudinal ribs project at the suture: *Turbonilla delicata* Monterosato; M62; N3P,3.030.

- Longitudinal ribs do not project at the suture 15

15. Adult shell has 12 whorls: *Turbonilla elegantissima* (Montagu); FH3,242; J4,164 *(lactea);* M62; N3P,3.000 *(lactea).*

- Adult shell has 9 whorls: *Turbonilla acuta* (Donovan); FH3,244 *(gracilis);* M62; N3P3.030 *(delicata).*

16. Whorls flattened: *Turbonilla crenata* Brown; FH3,245 & 4,276 *(rufa);* J4,162 *(rufa);* M63; N3P,3.081.

- Whorls rounded: *Turbonilla fulvocincta* (Thompson); FH3,245 and FH4,276; J4,163; M63; N3P,3.080 *(interrupta).*

17. Ornament composed of longitudinal ribs and spiral ribs or striae 18

- Sculpture absent or microscopically fine 21

- Dominant sculpture composed of fine spiral striae 31

18. Distinctive ornament composed of longitudinal ribs above the periphery and spiral ribs below the periphery; *Chrysallida spiralis* (Montagu); FH3,299; J4,154; M61; N3P,0.090.

- Ornament reticulate 19

- Not so 20

19. Ornament wholly reticulate: *Chrysallida excavata* (Philippi); FH3,305; J4,158; M61; N3P,0.070.

- Reticulate ornament present just above the periphery: *Chrysallida eximia* (Jeffreys); FH4,278; J4,155; M61; N3P,0.081.

20. Ornament consists of numerous fine longitudinal ribs and finer spiral striae: *Chrysallida indistincta* (Montagu); FH3,255; J4,149; M62; N3P,0.051.

- Ornament consists of about 20 longitudinal ribs cut at the periphery by 2-3 fine spiral striae: *Chrysallida obtusa* (Brown) FH3,296 *(interstincta);* J4,151 *(interstincta);* M62; N3P,0.040 *(interstincta).*

21. Shell very glossy and thin 22

- Shell not glossy, fairly solid 23

22. Shell cylindrical: *Menestho clavula* (Lovén); FH3,314; J4,118; M64; N3P,1.402.

- Shell spindle-shaped: *Menestho diaphana* (Jeffreys); J4,141; M63; N3P,1.008.

23. Shell angulated at the periphery, spire pointed 24

- Shell rounded at the periphery 27

24. Umbilicus present 25

- No umbilicus 26

25. Aperture round or oval, less than ⅓ the total height of the shell, umbilicus conspicuous: *Odostomia acuta* Jeffreys; FH3,269; J4,130; M64; N3P,1.603.

- Aperture rhomboidal, more than ½ the total height of the shell, umbilicus very small: *Odostomia conspicua* Alder; FH3,263; J4,132; M64; N3P,1.600.

26. Whorls slightly rounded, turretted: *Odostomia turrita* Hanley; FH3,267; J4,135; M64; N3P,1.631.

- Whorls flattened: *Odostomia unidentata* (Montagu); FH3,264; J4,134; M64; N3P,1.606.

27. Shell cylindrical, aperture oval, suture deep, umbilicus small: *Odostomia lukisi* Jeffreys; J4,120; M65 *(lukisii);* N3P,1.623.

- Shell spindle-shaped, aperture oblong, no umbilicus: *Odostomia eulimoides* Hanley; FH3,273; J4,124 *(pallida);* M65; N3P,1.617 *(ambigua).*

- Shell oval 28

- Shell bluntly conical 29

28. Adult shell forms 3 whorls only: *Odostomia oblongula* Marshall; M65; N3P,1.403 *(pistillus).*

- Adult shell forms 5 whorls: *Odostomia scalaris* Macgillivray; FH3,284 *(rissoides);* J4,122 *(rissoides);* M65; N3P,1.610 *(rissoides).*

29. No umbilicus: *Odostomia albella* (Lovén); FH3,286; J4,121; M65; N3P,1.619.

- Small umbilicus present 30

30. Grooves like rifling present inside the aperture: *Odostomia conoidea* (Brocchi); FH3,260; J4,127; M65; N3P,1.601.

- No such grooves inside the aperture: *Odostomia umbilicaris* (Malm); J4,129; M65; N3P,1.620.

31. No umbilicus 32

- Umbilicus present 33

32. Fine spiral striae are uniformly present all over the shell, whorls turretted: *Odostomia truncatula* Jeffreys; FH3,294; J4,117; M64; N3P,1.100.

- Spiral striae strongest on the base, whorls rounded: *Menestho obliqua* (Alder); FH3,291; J4,142; M64; N3P,1.003.

- Two or three strong spiral striae lie at the periphery, another below the suture: *Odostomia nivosa* (Montagu); FH3,287 *(cylindrica);* J4,116; M64; N3P,1.660.

33. Shell oval, of 3 whorls only, very fine wavy striae present: *Menestho dolioliformis* (Jeffreys); FH3,301; J4,144; M63; N3P,1.200.

- Shell cylindrical, spiral lines most prominent on the lower part of the whorls: *Menestho divisa* (J. Adams); FH3,289 *(insculpta);* J4,139 *(insculpta);* M63; N3P,1.011.

- Shell conical, spiral lines strongest on the base: *Menestho warreni* (Thompson); FH3,292 *(warrenii);* J4,143; M64; N3P,1.010.

VII. PTEROPODA

Animals pelagic, rather small and delicate, with or without shells, which if coiled are sinistral.

1. Animal has a shell 2

- Animal has no shell 8

2. Shell cartilaginous, transparent, boat-shaped: *Cymbulia peroni* Blainville; N3,30.00; Spoel (1972); Tesch (1949).

- Shell calcareous, coiled, straight or slightly curved dorsally 3

3. Shell coiled sinistrally 4

- Shell not coiled 5

4. Columella of shell prolonged into a twisted beak, animal has a short proboscis: *Peracle* (3 species)
   P. bispinosa Pelseneer; Spoel (1972); Tesch (1949)
   P. moluccensis Tesch; vS25; Spoel (1972); Tesch (1949).
   P. reticulata (Orbigny); N29.00; Spoel (1972); Tesch (1949).

- No such beak, umbilicus generally distinct, animal without proboscis: *Spiratella* (4 species)
   S. bulimoides (Orbigny); FH2,385 *(macandrei);* Spoel (1972).
   S. inflata (Orbigny); N3,27.04; vS50; Spoel (1972).
   S. lesueurii (Orbigny); N3,27.05; vS52; Spoel (1972).
   S. retroversa (Fleming); FH2,384 *(flemingii);* J5,115; M66; N3,27.02; vS43; Spoel (1972); Tesch (1949).

5. Shell widest at the aperture 6

- Shell widest behind the aperture 7

6. Aperture rounded: *Styliola subula* (Quoy & Gaimard); vS63; N3,28.70.

- Aperture rather triangular: *Clio* (3 species)
   C. cuspidata (Bosc); N3,28.01; vS73; Spoel (1972); Tesch (1949).
   C. polita (Pelseneer); N3,28.02; vS75; Spoel (1972); Tesch (1949).
   C. pyramidata L.; J5,119; N3,28.00; vS67; Spoel (1972); Tesch (1949).

7. Shell ends in a straight hind stalk, dorsal aperture thickened: *Diacria trispinosa* (Lesueur); Tesch (1949); vS84; N3,28.20.

- Shell ends in a curved hind stalk, aperture not thickened: *Cavolinia* (2 species)
   C. inflexa (Lesueur); vS101; Spoel (1972); N28.34; Tesch (1949).
   C. tridentata (Forsskal); N28.30 *(telemus);* vS94; Spoel (1972).

8. Animal has suckers and posterior and/or lateral external gills, body narrowed but not sharply tapered behind: *Pneumodermopsis* (2 species)
   P. ciliata (Gegenbaur); Morton (1957a); N3,32.20.
   P. paucidens (Boas); Morton (1957a); N3,32.21.

- No suckers 9

9. Body has a short tapered tail, head separated by a distinct neck: *Clione limacina* (Phipps); FH3,292 *(borealis);* M66; Morton (1957b); N3,34.00.

- Body rounded or bluntly pointed, no distinct neck, no posterior gill or gullet bladders: *Cephalobrachia* (2 species).
  C. bonnevii Massy; Massy (1917).
  C. macrochaeta (Bonnevie); Morton (1957b); N3,34.20.

Fig. 1. Stylized diagrams of gastropod shells

a. Globose shell with aperture entire and an umbilicus *(Natica catena)*

b. Medium-spired shell with an anterior canal *(Neptunea antiqua)*

c. Shell with a slit in the outermost part of the lip *(Scissurella crispata)*

d. Conical shell *(Calliostoma zizyphinum)*

e. Medium-spired shell *(Littorina littorea)*

f. Juvenile of a medium-spired shell with a tongue at the base of the aperture (juvenile *Littorina saxatilis)*

g. Last whorl occupying almost the whole shell, but the shell not involute *(Velutina velutina)*

h. Involute shell *(Cylichna cylindracea)*

i. Depressed shell with the peristome entire *(Skeneopsis planorbis)*

j. Depressed shell with the peristome not entire *(Omalogyra atomus)*

Fig. 2. Stylized diagrams of gastropod shells

a. Tall-spired shell, coiled dextrally, ornament composed of spiral lines *(Turritella communis)*

b. Tall-spired shell, coiled sinistrally, ornament tuberculate *(Triphora perversa)*

c. Medium-spired shell with the anterior canal covered, ornament composed of longitudinal ribs and spiral ribs *(Ocenebra erinacea)*

d. Shell not coiled, ornament chiefly composed of radial ribs *(Patella vulgata)*

e. Interior of not-coiled shell, to show the waisted muscle scar *(Patella vulgata)*

f. Interior of not-coiled shell, to show the non-waisted muscle scar *(Patina pellucida)*

g. Shell not coiled, pierced at the apex, reticulate ornament *(Diodora apertura)*

h. Shell not coiled, slit at the posterior margin *(Emarginula reticulata)*

i. Shell medium-spired, apex coiled sinistrally, with a tooth on the columella *(Odostomia)*

j. Shell tubular *(Caecum)*

k. Shell loosely coiled *(Philine)*

Fig. 3. Stylized diagrams of gastropod shells

a. Conical shell with the aperture oblique, whorls shouldered, tuberculate *(Gibbula magus)*

b. Medium-spired shell with the aperture straight, ornament of low longitudinal ribs and spiral striae *(Buccinum undatum)*

c. Medium-spired shell with an anterior canal and a notch at the top of the aperture, reticulate ornament *(Philbertia linearis)*

d. Basal view of a shell to show the umbilicus, aperture and spiral ribs *(Gibbula)*

e. Tall-spired shell (Pyramidellid) showing longitudinal ribs curved anticlockwise *(Turbonilla)*

f. Tall-spired shell showing longitudinal ribs curved clockwise *(Turbonilla)*

g. Shell with the anterior canal drawn out into a long spout, aperture round *(Trophon truncatus)*

h. Shell with the aperture somewhat elongated, whorls shouldered, reticulate ornament *(Lora turricula)*

i. Shell with an elongate aperture, whorls rounded, body whorl more than half the total height of the shell *(Mangelia attenuata)*

Fig. 4. Stylized diagrams of soft parts of gastropods

a. Pteropod showing the swimming lobes

b. Animal with free tentacles

c. Animal with tentacles united into a head shield, foot produced into wide swimming lobes *(Haminoea)*

d. Animal of Dorid type showing typical features

e. Animal with cerata

f., g. and h. Varieties of gill pattern.

RE 20164 2m 9/73 TCL

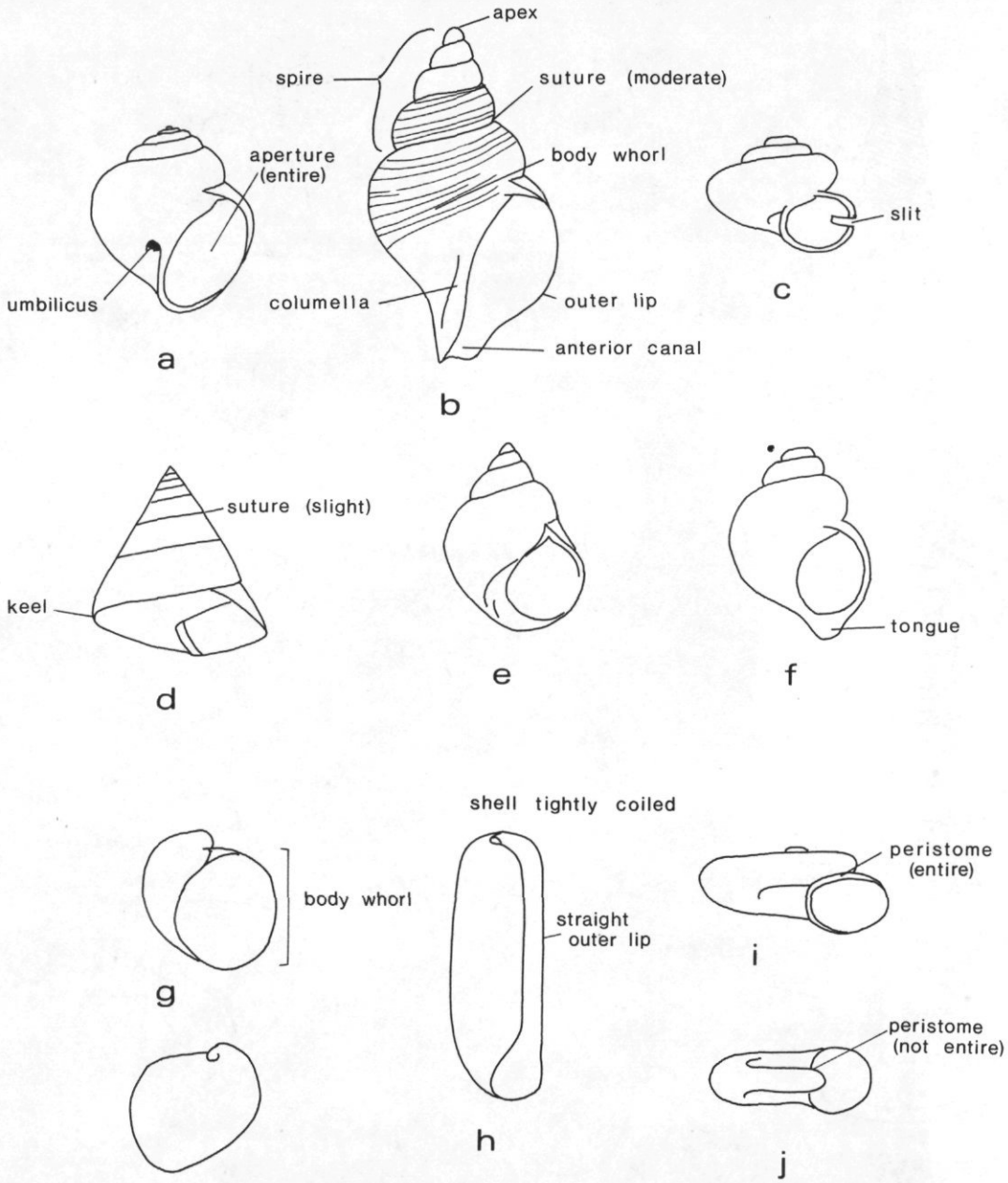
apex
spire
suture (moderate)
aperture
(entire)
body whorl
slit
umbilicus
columella
outer lip
anterior canal
a
b
c
suture (slight)
keel
d
e
f
tongue
shell tightly coiled
body whorl
straight
outer lip
peristome
(entire)
g
h
i
peristome
(not entire)
j

Figure 1

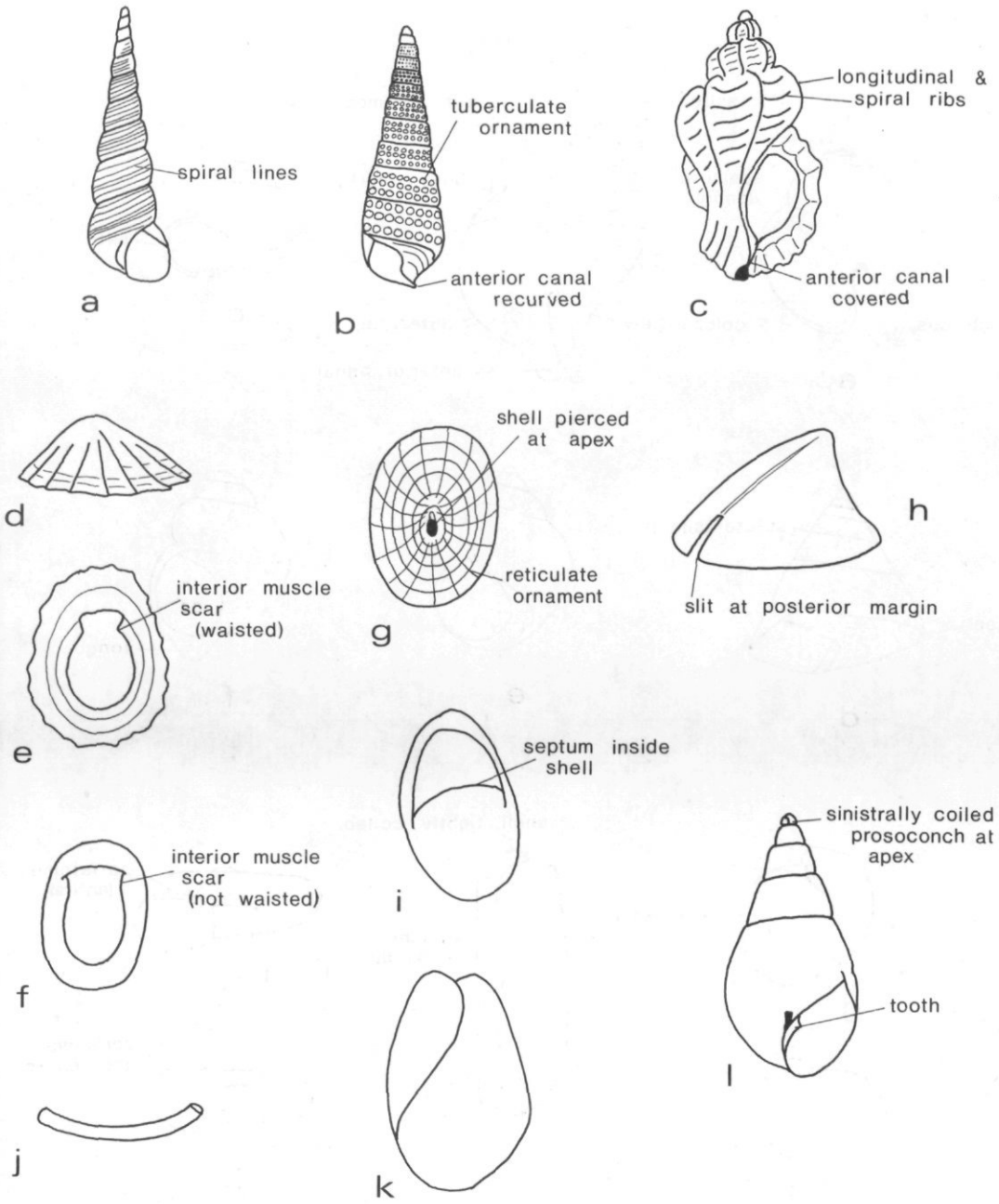
spiral lines
a
tuberculate ornament
anterior canal recurved
b
longitudinal & spiral ribs
anterior canal covered
c
d
shell pierced at apex
reticulate ornament
g
h
slit at posterior margin
interior muscle scar (waisted)
e
septum inside shell
i
interior muscle scar (not waisted)
f
sinistrally coiled prosoconch at apex
tooth
l
j
k

Figure 2

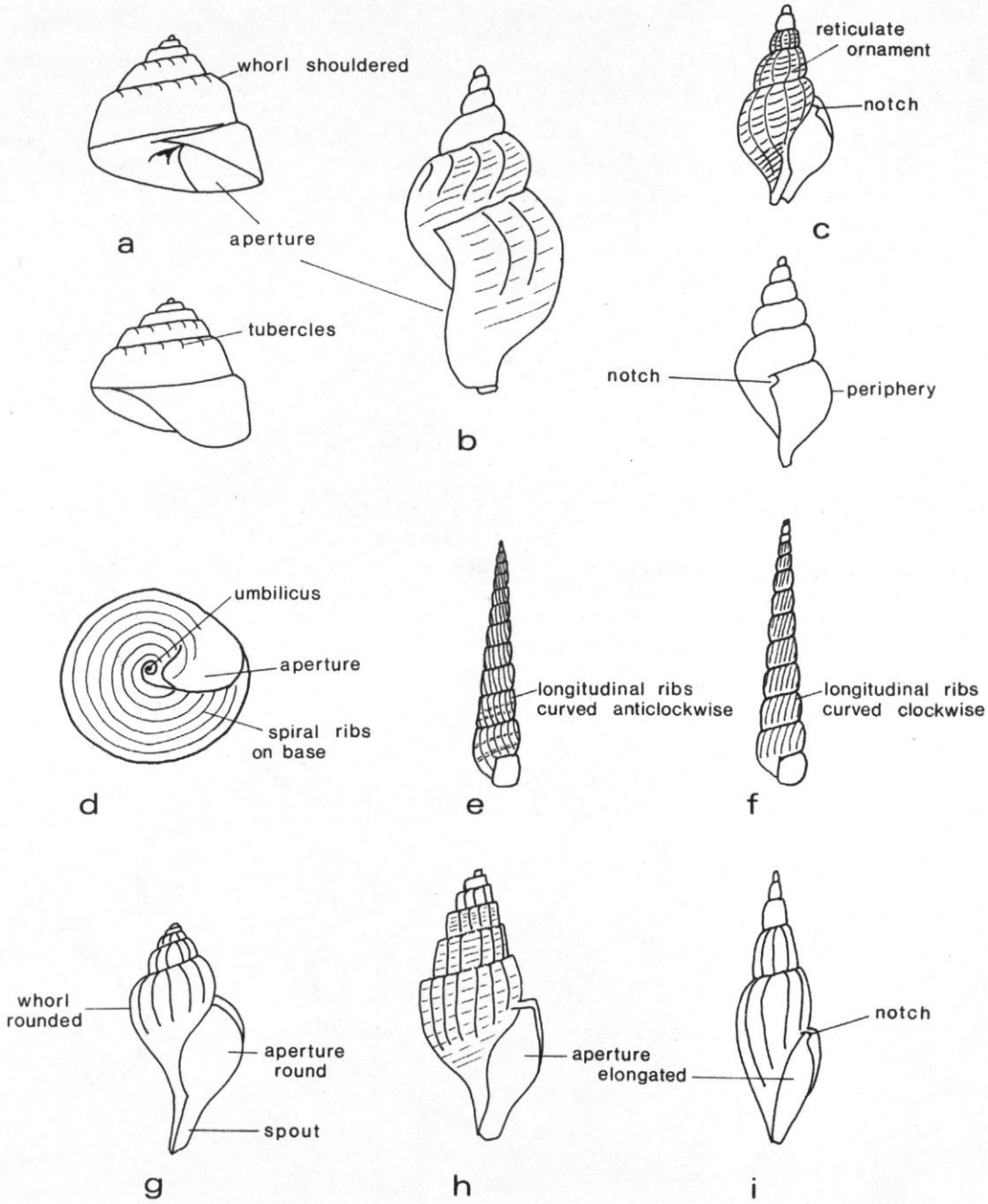
whorl shouldered
aperture
a
tubercles
b
reticulate ornament
notch
c
notch
periphery
umbilicus
aperture
spiral ribs on base
d
longitudinal ribs curved anticlockwise
e
longitudinal ribs curved clockwise
f
whorl rounded
aperture round
spout
g
aperture elongated
h
notch
i

Figure 3

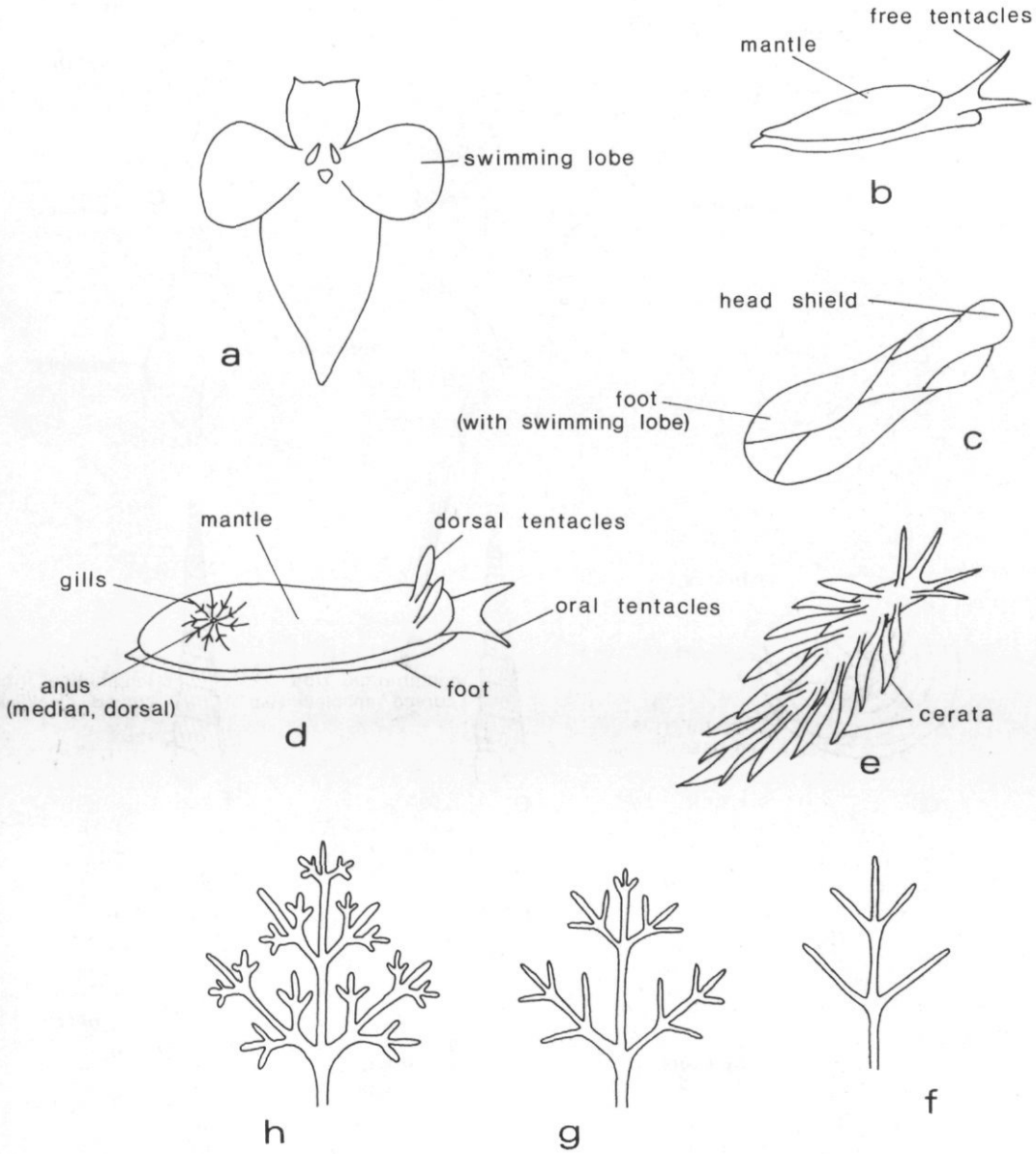
free tentacles
mantle
swimming lobe
b
a
head shield
foot
(with swimming lobe)
c
mantle
dorsal tentacles
gills
oral tentacles
anus
(median, dorsal)
foot
d
cerata
e
h
g
f

Figure 4