

CATALOGUE OF THE DOLIIDAE IN THE RIJKSMUSEUM VAN NATUURLIJKE HISTORIE

by

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The present catalogue of the Doliidae has been composed in the same way as my former catalogues. I have entered in it, not only the *Dolium*-species present in the collections of the Rijksmuseum van Natuurlijke Historie, but also all the other species that I found mentioned in literature of which we have no material.

In Lamarck's time (1822) only 7 *Doliums* were known, while Reeve in 1849 described 15, which number has since grown to approximately 54 species or varieties.

Of all these species I give the principal synonyms and after those of which we possess material, follows a list of the specimens, stating 1) the letter under which it is entered and in the case of material on spirit the number of the bottle, 2) the number of specimens, 3) the locality; if this is wanting there is a point of interrogation, 4) the collector; when the collector's name is unknown I have placed a point of interrogation instead.

Genus **Dolium** Lamarck, 1801

I. Subgenus **Eudolium** Dall, 1889

D. aulacodes (Tomlin)

Eudolium aulacodes Tomlin, Ann. S. African Mus., vol. 25, p. 83, fig. 4 a; 1927. — Ann. Natal. Mus., vol. 6, p. 432; 1931.

D. crosseanum Monterosato

Dolium Crosseanum Monterosato, Journ. de Conch., vol. 17, p. 228, pl. 12, fig. 1; 1869.

Dolium Bairdii Verrill, Amer. Journ. Sci. (3), vol. 22, p. 296; 1881. — Trans.

Connecticut Acad., vol. 5, p. 515, & vol. 6, p. 253, pl. 29, figs. 2a, 2b; 1884 (fide Dall).

Eudolium Crosseanum, Dall, Reports "Blake", Bull. Mus. Comp. Zool. Cambridge, vol. 18, p. 232, pl. 15, fig. 5; 1889.

Doliopsis Crosseana, Monterosato, Conchiglie prof. mare Palermo, p. 23; 1890.

Doliopsis crosseana, Coen, Atti Istit. Veneto di Sci., vol. 90, p. 147, pls. 1, 2; 1930.

D. pyriforme Sowerby

Dolium pyriforme Sowerby, Ann. & Mag. of Nat. Hist., vol. 14, p. 37, pl. 2, fig. 14; 1914.

a. 1. Kii (Japan), H. C. Fulton.

Of this rare species we possess a fine piece, of which only the protoconch is a little damaged; the specimen corresponds exactly with the picture and description of Sowerby, and was collected at the same locality as his specimen.

D. solidior (Dautzenberg & Fischer)

Dolium (Eudolium) Crosseanum Monterosato var. *solidior* Dautzenberg & Fischer, Rés. Camp. Sci. Prince de Monaco, fasc. 32, p. 38, pl. 3, fig. 1; 1906.

D. verrillii (Dall)

Eudolium Verrillii Dall, Bull. Mus. comp. Zool., vol. 18, p. 233, pl. 35, fig. 12; 1889.

II. Subgenus **Cadium** Link, 1807**D. dentatum** Barnes

Dolium dentatum Barnes, Ann. Lyceum Nat. Hist. N. York, vol. 1, part 1, p. 135, pl. 9, fig. 3; 1824. — Ann. Lyceum Nat. Hist. N. York, vol. 1, part 2, p. 384; 1825.

Cassis ringens Sowerby, Catal. shells collect. Tankerville, p. 21; 1825.

Dolium personatum Menke, Synopsis meth. Moll., ed. 2; 1830. — Zeitschr. f. Malakozool., p. 138; 1845.

Malea latilabris Valenciennes, Humboldt & Bonpland, Recueil d'observ. de Zool., vol. 2, p. 325; 1833.

Dolium latilabre, Kiener, Icon. coq. viv., p. 14, pl. 4, fig. 7; 1835.

a. 3. Gulf of California, H. ten Kate. — b. 2. Peru, Cuming.

var. **crassilabris** (Valenciennes)

Malea crassilabris Valenciennes, Humboldt & Bonpland, Recueil d'observ. de Zool., vol. 2, p. 326; 1833.

Dolium plicosum Menke, Zeitschr. f. Malakozool., p. 138; 1845.

D. pomum (Linné)

Buccinum Pomum Linné, Syst. nat., ed. 10, p. 735, No 379; 1758. — Syst. nat., ed. 12, p. 1197, No 441; 1767.

Cassis labrosa Martini, Syst. Conch. Cab., vol. 2, p. 58, pl. 36, figs. 370, 371; 1773.

Dolium pomum, Lamarck, Anim. s. Vert., vol. 7, p. 261, No 5; 1822. — Anim. s. Vert., éd. Desh., vol. 10, p. 142, No 5; 1844.

Quimalea pomum, Iredale, Austral. Zool. Sydney, vol. 5, p. 345; 1929.

a. 10. Indian Ocean, Reinwardt. — b. 6. Amboyna, Hoedt. — c. 3. Misool (W. of New Guinea), ? — d. 1. Soëk, Von Rosenberg. — e. 4. Timor, Zijnen Wartel. — f. 2. Singapore, Buddingh. — g. 3. Red Sea, Ruysenaers. — h. 1. Geelvink Bay or Mapia Is. (New Guinea), P. E. Moolenburgh. — i. 3. Madura, from E. F. Jochim's collection. — j. 2. Moluccas, from E. F. Jochim's collection. — k. 1. Celebes, Miss E. J. Koperberg. — l. 1. Laran-toeka & Maoemere (Flores), Kroon. — m. 2. Banda Neira, J. Semmelink. — n. 2. Banda Is., ? — o. 1. Between P. Moena & P. Kabaëna, Zoölogisch Laboratorium Groningen. — p. 1. Nossi Bé (near Madagascar), Pollen & v. Dam. — q. 1. Menado (Celebes), from E. F. Jochim's collection. — r. 2. Poeloe Tello, Batoe Is. (W. of Sumatra), ?

var. **macgregori** Iredale

Quimalea pomum macgregori Iredale, Rec. Austral. Mus. Sydney, vol. 18, p. 215, pl. 23, fig. 22; 1931.

III. Subgenus **Dolium** s. s.

D. album Conrad

Dolium album Conrad, Proc. Acad. of Nat. Sci. Philadelphia, vol. 7, p. 31; 1854.

D. amphora Philippi

Dolium amphora Philippi, Abbild. u. Beschr. Conch., vol. 3, part 4, Dolium, p. 12; 1849.

D. ampullaceum Philippi

Dolium ampullaceum Philippi, Zeitschr. f. Malakozool., p. 147, No 1; 1845. —
Abbild. u. Beschr. Conch., vol. 3, part 4, Dolium, p. 11, pl. 2; 1849.
Dolium costatum, Tryon (pars), Manual of Conch., vol. 7, p. 264, pl. 4, fig. 20; 1885.
Tonna ampullacea, Hedley, Rec. Austral. Mus. Sydney, vol. 12, p. 330, pl. 44, fig. 7; 1919.

Tryon places this *Dolium* into the synonymy of *D. costatum* Mke., with which, however, it agrees neither by its size, nor in colour or sculpture.

Judging from the excellent photograph of this very rare *Dolium*, Hedley (pl. 44, fig. 7) represents under the name *Tonna ampullacea* (Phil.) a specimen whose sculpture is slightly different. The ribs are equidistant throughout, whereas Philippi states "superioribus distantibus"; indeed in Philippi's picture the upper ribs are farther apart, approaching each other towards the base and being only separated by an interval narrower than half the width of the ribs. Philippi further states "interstitiis superioribus stria prominula divisiss", from which follows, as is also shown by his picture,

that the intervals towards the base must be smooth; however, the ridge mentioned by the author in this quotation is in Hedley's specimen also present in the lowermost intervals.

a. i. ?, J. L. Storm van 's Gravesande.

Our specimen, in excellent condition, except at the mouth, where it is badly damaged, measures 155 mm and agrees perfectly in shape and sculpture with the description and drawing of Philippi, from which it only differs by a somewhat higher spire and a number of 15 ribs, whereas Philippi in his diagnosis states 12 and I count 14 in his picture.

D. *cepa* (Bolten)

(?) *Bulla canaliculata* Linné, Syst. nat., ed. 10, p. 727, No 339; 1758 (fide Reeve & Hanley).

Dolium marmoreum, *Cepa dictum* Martini, Syst. Conch. Cab., vol. 3, p. 390; 1777.

Dolium Cepa Martini, Syst. Conch. Cab., vol. 3, p. 401, pl. 117, figs. 1076, 1077; 1777.

Dolium marmoreum Schröter, Namen-Register syst. Conch. Cab., p. 30; 1788.

Buccinum olearium (non Linné), Bruguière, Encycl. méth., Vers, vol. 1, p. 243, No 1; 1789 (1792).

Cadus cepa Bolten, Roeding, Mus. Boltenianum, p. 150; 1798.

Dolium olearium, Lamarck, Anim. s. Vert., vol. 7, p. 259, No 2; 1822. — Anim. s. Vert., éd. Desh., vol. 10, p. 140, No 2; 1844.

Tonna canaliculata, Hedley, Rec. Austral. Mus. Sydney, vol. 12, p. 335; 1919.

Hedley (Rec. Austral. Mus. Sydney, vol. 12, p. 335; 1919) names this species "*Tonna canaliculata* L." and adds on p. 336 "Hanley announced in 1859 his discovery that the Linnean *B. canaliculata* was what almost all conchologists had erroneously called *Dolium olearium*". I cannot find the statement by Hanley on which Hedley based his conclusion, but as he states in his synonymy "*Dolium cepa*, Hanley, Proc. Zool. Soc., 1859, p. 489", I presume that he means this paper by his words "Hanley announced in 1859". However, in the cited paper Hanley does not express himself at all positively, but writes very cautiously "The fry of this wellknown species *proves* ¹⁾ to be the long-lost *Bulla canaliculata* of Linnaeus, but, as the identity could not possibly have been discovered without an examination of the author's cabinet, the next earliest binomial appellation has been adopted."

As early as ten years previously Reeve (Conch. Icon., *Dolium*, sp. 14, pl. 8; 1849) wrote "From an observation of two young individuals of the Lamarckian *Dolium olearium* in the same collection (Museum of the Linnean Society of London), I am *inclined* ¹⁾ to think Linnaeus' *Bulla canaliculata*, which has never been identified, is this shell; there is,

1) italics by me.

however, one point in which the description of that species in the 'Systema Naturae' does not agree, namely, in respect of form 'cylindrica'. From this it is clear that Reeve, too, expresses himself very cautiously, and not long ago Dautzenberg (Faune des colonies françaises, vol. 3, Moll. test. marins Madagascar, p. 447, 1929) when dealing with *D. olearium* (Brug.) (= *D. cepa* Bolt.) gave as his opinion "Hanley n'est point parvenu à élucider l'espèce linnéenne."

Until this question has been sufficiently cleared, it seems to me unadvisable to follow Hedley's example and call this shell *Dolium canaliculatum* (L.). The name *D. olearium* (Brug.), 1789 cannot be maintained, as it is already preoccupied by *D. olearium* (L.), 1758, this *Dolium* now must be named *D. cepa* (Bolten).

a. 4. Indian Ocean, ? — b. 5. Amboyna, Hoedt. — c. 1. Flores, J. Semmelink. — d. 2. Roti Isl. (S. W. of Timor), H. ten Kate. — e. 1. Semaœ Isl. (near Timor), H. ten Kate. — f. 3. Misool (W. of New Guinea), ? — g. 6. Japan, ? — h. 2. Cape of Good Hope, ? — i. 3. Zanzibar, Derx. — j. 1. Nossi Falli (near Madagascar), Pollen & v. Dam. — k. 1. Red Sea, Ruysenaers. — l. 3. Nossi Bé (near Madagascar), Pollen & v. Dam. — m. 1. Banjoewangi (E. Java), ? — n. 2. Madjene (Celebes), F. H. Verschoor van Nisse. — o. 1. Nias Isl. (near Sumatra), E. E. W. G. Schröder. — p. 5. Madura, from E. F. Jochim's collection. — q. 2. Banda Is., from E. F. Jochim's collection. — r. 4. Amboyna, Ch. Jellema. — s. 1. Moluccas, W. A. Moreaux. — 1263. 1. Djeddah (Red Sea), J. A. Kruyt. — 1265. 2. Amboyna, Hoedt & Forsten.

D. cerevisina (Hedley)

Tonna cerevisina Hedley, Rec. Austral. Mus. Sydney, vol. 12, p. 330, pl. 39, fig. 1, pl. 40, fig. 2, pl. 41, fig. 3; 1919.

This species was separated by Hedley from *D. variegatum* Lm., on account of its larger size, deviating sculpture (no costellae in the intervals between the upper ribs), its more globose form, and thinner structure.

var. **haurakiensis** Hedley

Tonna cerevisina, var. *haurakiensis* Hedley, Rec. Austral. Mus. Sydney, vol. 12, p. 331; 1919.

D. chinense (Dillwyn)

Buccinum Dolium Australe seu Chinense Chemnitz, Syst. Conch. Cab., vol. 11, p. 85, pl. 188, figs. 1804, 1805; 1795.

Buccinum Chinense Dillwyn, Descr. catal. rec. shells, vol. 2, p. 585, No 7; 1817.

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- Dolium chinense*, Deshayes, Lamarck, Anim. s. Vert., éd. Desh., vol. 10, p. 146, No 10; 1844.
Dolium variegatum (non Lamarck) Philippi, Abbild. u. Beschr. Conch., vol. 3, part 2, Dolium, p. 36, No 2, pl. 1, figs. 2a, 2b; 1847.
Dolium australe Mörch, Catal. conch. Yoldi, p. 111, No 2061; 1852.
Dolium variegatum, Lam. Var. *Chinense*, Dillwyn, Tryon, Manual of Conch., vol. 7, p. 262, pl. 3, fig. 14; 1885.

Sohtsu G. King and Chi Ping (Hong Kong Naturalist, vol. 4; 1933) in their meritorious paper on the Mollusca of Hong Kong, give on p. 102, fig. 16, a picture of *D. chinense*. In my opinion this specimen differs from the typical *D. chinense*, a.o., 1) by the number of ribs, of which I count 16 or 17, being a much smaller number than that of *D. chinense*, which may have as many as 24, 2) by the intervals between the ribs being much greater, 3) by the whorl under the suture being flattened, 4) by only one rib at the same time being spotted, instead of the spot running over two adjacent ribs. All these characters give the shell a strong resemblance to *D. lischkeanum* Küster.

a. 2. China Sea, from Dalen's collection.

subspec. **magnifica** (Sow.)

Dolium magnificum Sowerby, Proc. Malac. Soc. London, vol. 6, p. 7, fig. in text; 1903.

a. 2. China, H. C. Fulton.

D. costatum Menke

- Dolium lactescens late sulcatum* Martini, Syst. Conch. Cab., vol. 3, p. 390; 1777.
Dolium late sulcatum Martini, Syst. Conch. Cab., vol. 3, p. 396 & p. 407, pl. 116, fig. 1072 & pl. 118, fig. 1082; 1777.
Dolium lactescens Schröter, Namen-Register syst. Conch. Cab., p. 30; 1788.
Buccinum dolium Bruguière (pars), Encycl. méth., Vers, vol. 1, p. 246, No 4; 1789 (1792).
Buccinum dolium, var. β Dillwyn, Descr. catal. rec. shells, vol. 2, p. 585; 1817.
Dolium costatum Menke, Synopsis meth. Moll., p. 63; 1828.
Dolium fasciatum Lm. var. Kiener, Icon. coq. viv., Dolium, p. 12, pl. 4, fig. 6; 1835.
Dolium lactescens Mörch, Catal. conch. Yoldi, p. 111, No 2066; 1852.
Dolium costatum, Tryon (pars), Manual of Conch., vol. 7, p. 263, pl. 4, fig. 19; 1885.
Tonna costata, Shirley, Proc. Roy. Soc. Queensland, vol. 23, p. 98; 1911.
Tonna allium, Iredale, Rec. Austral. Mus. Sydney, vol. 18, p. 215, pl. 23, fig. 23; 1931.

a. 9. Indian Ocean, Reinwardt. — b. 11. Amboyna, Hoedt. — c. 2. Banka Isl. (E. of Sumatra), v. d. Bossche. — d. 3. Badjowe (S. Celebes), Moens. — e. 1. Timor, Wienecke. — f. 1. Batjan Isl. (Moluccas), Bernstein. — g. 2. Misool (W. of New Guinea), ? — h. 2. Japan, P. F. von Siebold. — i. 1. Zanzibar Isl., L. de Priester. — j. 3. Djoemiang (Madura), from E. F.

Jochim's collection. — k. 1. Amboyna, from E. F. Jochim's collection. — l. 3. Banda Is., from E. F. Jochim's collection. — m. 1. Nossi Bé (near Madagascar), Pollen & v. Dam. — n. 3. Makasser (S. Celebes), W. C. v. Heurn. — o. 1. Bay of Bengal, H. B. Preston. — p. 16. Menado (Celebes), ? — q. 3. Boesak (N. Celebes), ? — 1264.2. Sumatra, ?

var. **picta** Hanley

Dolium latesulcatum Martini var. *picta* Hanley, Proc. Zool. Soc. London, p. 489; 1859.

D. cumingii Reeve

Dolium Cumingii Reeve, Conch. Icon., *Dolium*, sp. 13, pl. 8, figs. 13b, 13c; 1849.
Dolium olearium Brug. Var. *Cumingii*, Hanley, Tryon, Manual of Conch., p. 262, pl. 2, fig. 9; 1885.

var. **perselecta** (Iredale)

Tonna cumingii, Hedley, Rec. Austral. Mus. Sydney, vol. 12, p. 331; 1919.
Parvitonna perselecta Iredale, Rec. Austral. Mus. Sydney, vol. 18, p. 216, pl. 23, fig. 17; 1931.

D. deshayesii Reeve

Dolium olearium, Sowerby, Genera of Shells, vol. 2, pl. 242, fig. 1; 1820—1825.
Dolium olearium, Reeve, Conch. Syst., vol. 2, pl. 264, fig. 1; 1842.
Dolium Deshayesii Reeve, Conch. Icon., *Dolium*, sp. 15, pl. 8, fig. 13a; 1849.
Dolium olearium, Brug. Var. *Deshayesii*, Reeve, Tryon, Manual of Conch., vol. 7, p. 262, pl. 2, fig. 10; 1885.

a. 1. ? Australia, from the cabinet of Mr. Raye.

D. dolium (Linné)

Buccinum Dolium Linné, Syst. nat., ed. 10, p. 735, No 380; 1758. — Mus. Lud. Ulricae, p. 601, No 246; 1764.
Buccinum tessellatum Bory St. Vincent, Encycl. méth., Vers, Atlas, vol. 3, pl. 403, figs. 3a, 3b; An VI.
Dolium fimbriatum Sowerby, Genera of Shells, vol. 2, pl. 242, fig. 2; 1820—25.
Dolium minjac Deshayes, Lamarck, Anim. s. Vert., éd. Desh., vol. 10, p. 145, No 9; 1844.
Dolium costatum, Menke, Var. *fimbriatum*, Sowerby (pars), Tryon, Manual of Conch., vol. 7, 264, pl. 4, fig. 22 (non pl. 3, fig. 18); 1885.

In most monographs (Reeve, 1848, Küster, 1857, Tryon, 1885, etc.) *Buccinum dolium* L. (Syst. nat., p. 735, No. 380; 1758) is regarded as a synonym of *D. maculatum* Lm. This is done too by Hanley (Proc. Zool. Soc. London, p. 491; 1859), who mentions among the synonyms of *D. maculatum* Lm., a.o., "*Buccinum dolium*, Linn. Syst. Nat. ed. 10, chiefly", but he adds "not Mus. Ulric.", and in his paper "On the Linnean Manuscript of the 'Museum Ulricae'" (Journ. Linn. Soc. London, vol. 4, p. 70;

1860) he writes in connection with *B. dolium* "The *Dolium fimbriatum*... was assuredly the shell described in the 'Museum'".

What now did Linné mean by his *Buccinum dolium*?

Referring to the Syst. nat., ed. 10, p. 735, under *B. dolium*, we find that the diagnosis "B. testa ovata cincta sulcis obtusis remotis, cauda prominula", in its brevity, gives no decisive answer. The quotations following on the diagnosis, however, throw more light on the matter; I discuss them here in the order in which Linné gives them:

Rumph. mus. t. 27. f. A., represents a typical *D. fimbriatum* Sow., clearly recognizable by the high ribs and broadened outer lip. In his description on p. 90 Rumphius adds "langs de gieren met uitsteekende ribben, en aan den rand van den mond gekartelt". (having protruding ribs along the whorls and a fimbriated edge at the mouth).

Bonan. recr. 3. t. 17. pictures his specimen from the oral and from the dorsal side. It is true, he gives only 8 or 9 ribs on the last whorl, as in *D. maculatum* Lm., but owing to the fimbriate lip, widening towards the outside, as well as by the indication of a leaflike expansion of the columella, and in connection with the perfectly smooth intervals between the ribs, the general impression is that of a *D. fimbriatum* Sow. Moreover on page 115 this author writes "os valdé labrosum, & valvulis coronatum", which could never refer to *D. maculatum* Lm. Bonanni also characteristically describes the columellar lobe „ex eodem cuticula quaedam supra orbium maximum distenditur quasi glutine aptata" which does not hold good for *D. maculatum*, but is typical for *D. fimbriatum*.

Gualt. test. t. 39. f. E. Of the two specimens pictured by this author the right-hand one, seen from the oral side, certainly represents a *D. fimbriatum* Sow., the left-hand one, seen from the dorsal side, too, if we observe the form and the ribs; the spots, however, are here between the ribs instead of upon them.

Argenv. conch. t. 20. f. C. Linné possibly meant by this the 1st edition of the "Histoire Naturelle" (1744—1757) while Gmelin's quotation (t. 17. f. C.) refers to the 2nd edition (1757). Argenville shows us the shell from the dorsal side, the margin of the outer lip is invisible. The number of ribs is 12; as is known *D. maculatum* Lm. has 9 ribs on the last whorl, whereas *D. fimbriatum* Sow. on an average has 14 or 15 ribs, so that nothing positive can be concluded from this. The ribs of the *Dolium* of fig. C, however, are rather high, and while *D. maculatum* Lm. has at least in some interstices a raised stria, the intervals are here quite smooth. The specimen pictured therefore in these two points agrees completely with *D. fimbriatum* Sow.

Calceol. Mus. 40. t. 41. The shell strongly suggests *D. galea* L., in form as well as in colour, deeply impressed suture, form of the columella, and by the number of ribs of the body whorl, which amount to about 22 (*D. galea* L. has from 22 to 24 ribs). Ceruti, describing the Cabinet of Calceolarius, holds this *Dolium* to be identical with the "*Concha rugosa, & umbilicata*" of Rondelet ("ut cum Rondeletio Concha rugosa, & umbilicata nominari possit"). The specimen of which Rondelet shows us on p. 106 a figure, is not *D. maculatum* Lm. or *fimbriatum* Sow., but by shape, number of ribs (25), as well as by the colour stated by this author as yellowish, it resembles more a *D. galea* L. In the ed. 12 Linné quotes „Calc. Mus. 30. t. 41.", but this must be due to a printer's error, as the text on p. 40 refers to the picture of p. 41, as Ceruti plainly states "ut in apposita imaguncula inferius videre licet"; on p. 30, however, four quite different shells (bivalves) are dealt with. Gmelin takes over in his edition the printer's error of ed. 12.

The locality "Mare Siculum", stated by Linné for his *B. dolium*, is neither applicable to *D. fimbriatum* Sow., nor to *D. maculatum* Lm., but, as with numerous localities in the old literature, we cannot attach too much value to this statement.

If we leave Calceolarius, who pictures an entirely different species of *Dolium*, out of consideration, we see that the pictures of the remaining authors refer to *D. fimbriatum* Sow. and that consequently Linné must have meant by this species *B. dolium* and not *D. maculatum* Lm.

Beside the typical specimen of *D. fimbriatum* Sow. which Reeve pictures in Conch. Icon., pl. 3, fig. 3b, he represents in fig. 3a a specimen that is certainly not a *D. fimbriatum* Sow. For the *Dolium* of fig. 3a has the intervals between the ribs filled in with ridges, whereas in *D. fimbriatum* these spaces are smooth, or at most, chiefly between the topmost ribs, carry a raised stria. The size, too, is very considerable for a *D. fimbriatum* Sow., and, moreover, there is no trace of a widening of the outer lip or of the fimbriate margin, which in full-grown specimens should also be visible from the dorsal side, it being inconceivable that Reeve's specimen, given its size, should not be full-grown. Lischke's supposition (Jap. Meeres-Conch., vol. 2, p. 58; 1871) that the *Dolium* of fig. 3a should be a *D. lischkeanum* Küst. is not improbable.

Reeve (Conch. Icon., sp. 3, pl. 3; 1848) writes "M. Adanson named this shell after the Minjac or Muntjak, a spotted (?) animal of the deer tribe"; this, however, is not correct, Adanson (Hist. nat. Sénégal, Coquillages; 1757) having merely borrowed the name from Rumphius, as appears from the statement on p. 110 "cette espèce que j'appelle Minjac, du nom malabare que le célèbre Rumphe nous a laissé dans ses écrits". Originally, how-

ever, it is not a Malabar name, but a Malay name, which Rumphius has borrowed from the natives of Amboyna, as appears from p. 90 "I. *Cochlea striata sive olearia*. Mal.(ayan) Bia minjac" and four lines lower down "deze Slek word veel gebruikt bij de Amboineezen om de Klappes Oly af te scheppen, wanneer dezelve gekookt word, waar van ze de naam heeft" (this snail is much used by the Amboynese to scum the coco-nut oil, when this is being boiled, from which it derives its name). This proves, moreover, that the name is not derived from the muntjak (*Cervulus muntjac* Zimm.), but from "minjak", the Malay word for oil.

a. 1. Java, Junghuhn. — b. 2. Amboyna, Hoedt. — c. 1. Misool (W. of New Guinea), ? — d. 8. ?, from Hoogeveen's & Tobias' collections. — e. 1. Zanzibar, Sowerby & Fulton. — f. 2. Ternate (Moluccas), from E. F. Jochim's collection. — g. 2. Nias Isl. (near Sumatra), E. E. W. G. Schröder. — h. 1. Tapa Toean, Atjeh (Sumatra), H. E. Wempe. — i. 1. Philippines, E. Deyrolle. — j. 3. Menado (Celebes), from E. F. Jochim's collection. — k. 1. Madura, Mangold. — l. 3. Nossi Bé (near Madagascar), Pollen & v. Dam. — m. 2. Painan (W. Sumatra), from E. F. Jochim's collection. — n. 1. Celebes, Miss E. J. Koperberg. — o. 2. Boesak (N. Celebes), ? — 1267. 3. Indian Ocean, Reinwardt & Kuhl & v. Hasselt.

var. **natalensis** Smith

Dolium fimbriatum Sowerby. Var. *natalensis* Smith, Ann. Natal Govern. Mus., vol. 1, p. 41, pl. 7, fig. 10; 1906.

var. **parvula** Tapparone-Canefri

Dolium fimbriatum, Küster, Martini & Chemnitz, Syst. Conch. Cab., vol. 3, part 1, Dolium, pl. 62, fig. 2; 1857.

Dolium fimbriatum Sowerby, var. *parvulum*, Tapparone-Canefri, Bull. soc. zool. France, vol. 3, p. 257, No 125, pl. 6, fig. 4; 1878.

Tonna parvula, Iredale, Rec. Austral. Mus. Sydney, vol. 18, p. 215, pl. 23, fig. 24; 1931.

D. dunkeri Hanley

Dolium dunkeri Hanley, Proc. Zool. Soc. London, p. 431, No 4; 1859.

D. fasciatum (Bruguière)

Dolium fasciatum Martini, Syst. Conch. Cab., vol. 3, p. 391 & p. 406, pl. 118, fig. 1081; 1777.

Buccinum fasciatum Bruguière, Encycl. méth., Vers, vol. 1, p. 247, No 5; 1789 (1792).

Cadus fasciatus, Bolten, Roeding, Mus. Boltenianum, p. 151; 1798.

Buccinum sulcosum (non Born) Dillwyn, Descr. catal. rec. shells, vol. 2, p. 584, No 5; 1817.

Dolium fasciatum, Lamarck, Anim. s. Vert., vol. 7, p. 260, No 4; 1822. — Anim. s. Vert., éd. Desh., vol. 10, p. 142, No 4; 1844.

a. 5. Indian Ocean, ? — b. 2. Amboyna, Hoedt. — c. 1. Makasser (S. W. Celebes), Piller. — d. 2. Badjowe (S. Celebes), Moens. — e. 1. Djoemiang (Madura), from E. F. Jochim's collection. — f. 2. Madura, from E. F. Jochim's collection. — 1226. 1. Japan, P. F. von Siebold.

Among the specimens marked a there is one, 85 mm high, with 20 ribs on the last whorl instead of 16—17; also among b there is a specimen, 90 mm high, having 20 ribs too. In the specimen e, band 1 and 4 are in their normal places, approximately on the 4th rib and on the 14th rib from the top respectively, but instead of there being two bands present between these, there is only one band at about equal distances from the two, while there is a new band on the columella.

D. favanii Hanley

Dolium favanii Hanley, Proc. Zool. Soc. London, p. 430, No 3; 1859.

Dolium favannei Hanley, Proc. Zool. Soc. London, p. 490; 1859.

Dolium Favannei, Tryon, Manual of Conch., vol. 7, p. 264; 1885.

D. galea (Linné)

Buccinum Galea Linné, Syst. nat., ed. 10, p. 734, No 377; 1758. — Syst. nat., ed. 12, p. 1197, No 439; 1767.

Dolium costatum, magnum Martini (pars), Syst. Conch. Cab., vol. 3, p. 393, pl. 116, fig. 1070; 1777.

Dolium galea, Lamarck, Anim. s. Vert., vol. 7, p. 259, No 1; 1822. — Anim. s. Vert., éd. Desh., vol. 10, p. 139, No 1; 1844.

Dolium tenue Menke, Synopsis meth. Moll., p. 143; 1830.

This shell should be according to Tryon (Manual of Conch., vol. 7, p. 294; 1885) identical with *D. olearium* (non Brug.) (L.) and Reeve writes in his "Conchologia Iconica" (*Dolium*, sp. 14, pl. 8; 1849): "The shell upon which Linnaeus founded his *Buccinum olearium*, preserved in the museum of the Linnaean Society of London, proves on examination to be nothing more than a very young specimen of the *D. galea*". This assertion seems to be endorsed by the diagnosis of *B. olearium* by Linné himself "B. testa subrotunda cincta sulcis obtusis: lineola elevata interstinctis". *Buccinum olearium*, No 376, in Systema Naturae, ed. 10, stands before *B. galea*, No 377, so that, if the above should be correct, the former name should have priority.

The cited previous descriptions of *B. olearium*, however, do not agree with Linné's diagnosis; he first mentions:

Pet. gaz. t. 99. f. 11. This author gives a copper-plate, showing a typical *D. fimbriatum* Sow., plainly recognizable by the reflected, fimbriately

toothed lip, the spotted ribs, about 15 in number, and an obscure ridge being visible in the upper intervals ¹⁾. In contradistinction to this:

Rumph. mus. t. 27. f. D? (sic) is a typical *D. olearium* (Brug.)

Gualt. test. t. 44. t. T. represents a shell, seen from the oral and the dorsal side, the flattened ribs of which are separated by linear grooves, without intervening ridges. The habitus is entirely that of *D. olearium* (Brug.), except that the aperture has no incision for the canal, it looks as if the mouth were broken off and subsequently smoothed with a file.

None of these quotations, therefore, refers to *D. galea*. In the editio 12 Linné adds no new bibliographic references to those mentioned above. I leave the locality, stated by Linné (O. Indicus), out of consideration, as these records often are little reliable and therefore cannot furnish any evidence either for or against the identity of *B. olearium* with *B. galea*.

Gmelin (Syst. nat., ed. 13, p. 3469, No 1; 1790), who, it may be assumed, to some extent must have been acquainted with what Linné meant by his species, is convinced that it is a shell from the Indian Ocean; *D. galea* (L.), as is known, lives in the Mediterranean, and the variety in the West Indies. To Linné's diagnosis he adds, a.o., "fusca aut subfusca crebro maculis nebulisque obscurioribus varia", which suggests *B. olearium* Brug. rather than *B. galea*, as does also its size "vix ultra 4 pollices longa". He further borrows the quotation "Rumpf. mus. t. 27. f. D.", referring to *B. olearium* Brug., which Linné had mentioned with a point of interrogation; the latter is omitted by Gmelin, from which we may conclude that he considers his *B. olearium* as identical with *D. olearium* (Brug.) pictured by Rumphius.

The further quotations added by Gmelin to Linné's, do not elucidate this matter. Some refer to *D. olearium* (Brug.), as: Knorr Vergn. 5 (errore pro 4). t. 12. f. 1; Martin. Conch. 3. t. 117. f. 1076. 1077. Others: List. Conch. t. 985. f. 44, with "Jamaica" as locality, and Klein ostr. t. 4. f. 74, who reproduced Lister's picture, probably represent a young specimen of *D. antillarum* Mörch, the American form of *D. galea* (L.), while Adanson's figure (Adans. Seneg. I. t. 7. f. 6. Minjac) refers to a *D. fimbriatum* Sow.

Thus we see that both Linné's and Gmelin's conception of *B. olearium* is very confused. Especially in connection with the lack of agreement between diagnosis, quotations and types — the latter on the authority of Reeve — it seems to me safer to retain the usual name *D. galea* (L.) which, moreover, precludes any confusion.

1) According to Hanley (Journ. Linn. Soc. London, vol. 4, p. 70; 1860) this figure of Petiver (Gaz. t. 99. f. 11) was quoted by Linné, in the manuscript of the "Museum Ultricae", in relation to *B. dolium* (= *D. fimbriatum* Sow.).

a. 2. Mediterranean, F. Cantraine. — b. 4. ? Indian Ocean, Reinwardt. — c. 1. Red Sea, Ruysenaers. — d. 3. ?, Smitsaard. — e. 1. Troyes (France), Beima. — f. 2. ?, ? — 1798. 1. Mediterranean, F. Cantraine.

The locality "Red Sea" for the specimen c, is for a shell that has its area of distribution in the Mediterranean, very doubtful. As donor is stated Ruysenaers, no initial is given; probably one Ruysenaers is meant who about 1856 was consul-general of the Netherlands at Cairo. In Ruysenaers' time the Suez Canal had not yet been opened, so that a penetration of *D. galea* through the canal into the Red Sea is out of the question. Hanley (Proc. Zool. Soc. London, p. 488; 1859) also mentions a specimen (*D. olearium* L. var. *tenebrosa* Hanl.) which was asserted to come from the Red Sea, but in connection with a possible interchange of labels caution remains advisable here.

The recorded locality Troyes (France) for one of the specimens (e), is somewhat surprising; Troyes (dep. Aube), not being situated on the sea. This *Dolium* may have been obtained from the cabinet of natural history, existing in this town in the last century.

subspec. **antillarum** (Mörch)

Dolium galea (non Linné) Krebs, West Indian mar. shells, p. 35; 1864.

Dolium antillarum Mörch, Malakoz. Bl., vol. 24, p. 41; 1877.

Dolium antillarum, Kobelt, Synopsis moll. viv., p. 15; 1878.

I fail to perceive any considerable differences between this *Dolium* and *D. galea* (L.) either in form, whorls, suture or in the number of ribs; the latter number is stated by Mörch as 19 for *D. antillarum*; the same number, however, also occurs in *D. galea*. The only difference which our specimen shows is a thickened, somewhat recurved outer lip. In connection with the above it seemed to me more advisable to consider this *Dolium* as a subspecies of *D. galea* (L.).

a. 1. Surinam (West Indies), W. C. v. Heurn.

var. **brasilliana** Mörch

Dolium antillarum Mörch var. *brasilliana* Mörch, Malakoz. Bl., vol. 24, p. 42; 1877.

Dolium antillarum Mörch var. *brasilliana*, Kobelt, Synopsis moll. viv., p. 15; 1878.

var. **epidermata** de Gregorio

Dolium galea (L.) var. *epidermata* de Gregorio, Bull. soc. malac. Ital., vol. 10, p. 115; 1884.

var. **spirintrorsum** de Gregorio

Dolium galea (L.) var. *spirintrorsum* de Gregorio, Bull. soc. malac. Ital., vol. 10, p. 114; 1884.

var. **tardina** de Gregorio

Dolium galea (L.) var. *tardina* de Gregorio, Bull. soc. malac. Ital., vol. 10, p. 114; 1884.

var. **tenebrosa** Hanley

Dolium galea (Linnaeus) var. *tenebrosa* Hanley, Proc. Zool. Soc. London, p. 488; 1859.

D. lischkeanum Küster

Dolium Lischkeanum Küster, Martini & Chemnitz, Syst. Conch. Cab., vol. 3, part 1, Dolium, p. 71, No 11, pl. 62, fig. 62, fig. 1; 1857.

Dolium Lischkeanum, Lischke, Jap. Meeres-Conch., vol. 2, p. 57; 1871.

Dolium costatum, Menke, Var. *fimbriatum*, Sowerby (pars), Tryon, Manual of Conch., vol. 7, p. 264, pl. 3, fig. 18 (non pl. 4, fig. 22); 1885.

a. 2. Indian Ocean, Reinwardt. — b. 1. Billiton Isl. (E. of Sumatra), ? — c. 3. Djoemiang (Madura), from E. F. Jochim's collection.

Küster (p. 71) states for this species, concerning the spaces between the ribs of the last whorl, "alle sind durch ein schwach erhobenes Reifchen zweitheilig" and this is amplified by Lischke's description (p. 57) "in deren Zwischenräumen noch je eine, in den obersten auch wohl zwei ferne Leistchen verlaufen". Deviating from this the two specimens marked a, one of 120 mm and one of 76 mm, have all but smooth spaces between the ribs of the last whorl, so that at first sight, they might be taken for individuals of *D. fimbriatum* Sow. The flat ribs, the form of the outer lip and of the columella, however, are indications that they should be classified under *lischkeanum*; moreover, in one specimen, under favourable illumination, the ridge in the spaces between the ribs is vaguely perceptible.

D. luteostomum Küster

Dolium luteostomum Küster, Martini & Chemnitz, Syst. Conch. Cab., vol. 3, part 1, Dolium, p. 66, No 6, pl. 58; 1857.

Dolium variegatum (non Lamarck), Küster (pars), Martini & Chemnitz, Syst. Conch. Cab., vol. 3, part 1, Dolium, p. 74, No 14, pl. 63, fig. 1 (non 2); 1857.

Dolium Japonicum Dunker, Novitates Conch., p. 104, No 118, pls. 35, 36; 1858—1870.

Dolium variegatum (non Lamarck), Schrenck, Moll. Nordjapan. Meeres, p. 401; 1867.

Dolium luteostoma, Tryon, Manual of Conch., vol. 7, p. 261, pl. 1, fig. 6 & pl. 2, fig. 7; 1885.

a. 7. Japan, P. F. von Siebold. — b. 1. Kanagawa (Japan), Noordhoek Hegt. — c. 21, ?, ?

var. **procellarum** (Euthyme)

Dolium procellarum Euthyme, Bull. Soc. Malac. France, vol. 2, p. 247; 1885.

D. maculatum Lamarck, partim, Deshayes

Dolium in costis maculatum Martini (pars), Syst. Conch. Cab., vol. 3, p. 390 & p. 397, pl. 117, figs. 1073, 1074; 1777.

Dolium maculatum Schröter (pars), Namen-Register syst. Conch. Cab., p. 30; 1788.

Dolium maculatum Lamarck (pars), Anim. s. Vert., vol. 7, p. 260, No 3; 1822. — Anim. s. Vert., éd. Desh., vol. 10, p. 140, No 3; 1844.

Dolium cassis Mörch, Catal. conch. Yoldi, p. 111, No 2067; 1852.

Dolium costatum, Menke. Var. *maculatum*, Lam., Tryon, Manual of Conch., vol. 7, p. 264, pl. 4, fig. 21; 1885.

For a long time the differences between *D. maculatum* Lm. and *fimbriatum* Sow. were not sufficiently established; Deshayes in the 2nd edition of "Animaux sans Vertèbres" showed that the two are distinct species.

a. 3. Indian Ocean, Reinwardt. — b. 4. Japan, P. F. von Siebold. — c. 1. Sumatra, ? — d. 5. ?, from Hoogeveen's collection. — e. 3. Ceylon, M. M. Schepman. — f. 6. Tapa Toean, Atjeh (Sumatra), H. E. Wempe. — g. 13. Djoemiang (Madura), from E. F. Jochim's collection. — h. 1. Batang Kwis, Deli (Sumatra), W. C. v. Heurn. — i. 1. Djask (Gulf of Oman), Ottens. — j. 1. Deli (Sumatra), W. C. v. Heurn. — k. 3. Sambodja (E. Borneo), Kampmeindert. — l. 2. Pendawa (N. O. Sumatra), Technische Hoogeschool Delft. — m. 1. Moluccas, ?

D. marginatum Philippi

Dolium variegatum jeune, Kiener, Icon. coq. viv., Dolium, pl. 2, fig. 3a; 1835.

Dolium marginatum Philippi, Zeitschr. f. Malakozool., p. 147, No 2; 1845.

D. melanostomum Jay

Dolium melanostomum Jay, Catal. of Shells, 3rd edit., p. 124, pls. 8, 9; 1839. — Catal. of Shells, 4th edit., p. 357; 1852.

Dolium melanostoma, Brazier, Proc. Zool. Soc. London, p. 585; 1871.

Dolium melanostoma, Tryon, Manual of Conch., vol. 7, p. 261, pl. 1, fig. 4; 1885.

D. perdix (Linné)

Buccinum Perdix Linné (pars), Syst. Nat., ed. 10, p. 734, No 378; 1758. — Syst. Nat., ed. 12, p. 1197, No 440; 1767.

Dolium pennatum, Perdix Martini, Syst. Conch. Cab., vol. 3, p. 390; 1777.

Dolium perdix, Martini (pars), Syst. Conch. Cab., vol. 3, p. 403, pl. 117, fig. 1079 (non 1078, 1080); 1777.

Dolium pennatum Schröter, Namen-Register syst. Conch. Cab., p. 30; 1788.

Cadus perdix, Bolten, Roeding, Mus. Boltenianum, p. 150; 1798.

Perdix reticulatus Montfort, Conchyl. Syst., vol. 2, p. 447, fig. p. 446; 1810.

Dolium perdix, Lamarck, Anim. s. Vert., vol. 7, p. 261, No 7; 1822. — Anim. s. Vert., éd. Desh., vol. 10, p. 144, No 7; 1844.

Helix sulphurea Adams, Contr. to Conch., No 5, p. 33 & p. 41; 1849. — Contr. to Conch., No 6, p. 98; 1850.

Tonna perdix, Oliver, Trans. & Proc. N. Zealand Inst., vol. 47, p. 529; 1914.

Iredale assumes that the name "*perdix*" should be restricted to the West Indian species and writes (Austral. Zool. Sydney, vol. 5, p. 345; 1929) "forms are found in the West Indies, as well as in the Pacific Ocean... The Linnean species name should be restricted to the former".

As far as I have been able to ascertain, however, Linné's quotations in ed. 10 point to exactly the other direction, we find stated by him:

Column. aqu. t. 69. f. 5. *Cassida neritoides minor variegata*. In the place quoted a *Harpa* is figured under the name "*Concha Νηριτώδης altera minor variegata*". In the whole of the cited work I cannot find any figure resembling a *Dolium*.

Bonan. recr. 3. t. 191. pictures a specimen of rather slender form with few ribs (about 12) and with a pattern of dark spots, leaving open a distinct light network, in harmony with the description on p. 137 "foris reticulatis fasciis superinduitur, inter quas roseus color rubescit", consequently, in my opinion, more in accordance with the pattern found in the East Indian form.

List. conch. t. 899. f. 19. By the number (about 8) of its spotted ribs, between which here and there an obscure ridge is to be seen, by the whorls being markedly flattened at the suture and the form of the columella, the shell pictured here, strongly resembles *D. maculatum* Lm. It is, indeed, peculiar that Linné especially refers to this figure, while pl. 984, fig. 43, shows a plain picture of *D. perdix*.

Rumph. mus. t. 27. f. C. gives an obvious picture of the typical East Indian form, which might be expected, as he describes exclusively shells from the East Indies (neighbourhood of Amboyna).

Gualt. test. t. 51. f. F. Here are given two good pictures of the oral and dorsal side of a rather slender specimen, with a fairly strongly bent columella and sharply defined spots.

Argenv. conch. t. 20. f. A. The specimen has the typical pattern as found in the East Indian forms.

We may conclude from this that among all these pictures there is none representing the West Indian form. It would seem that Linné in editio 10, though he states as place of origin America, chiefly, if not exclusively had in view the East Indian form in his description of *Buccinum perdix*. The name "*perdix*" must therefore be retained for it.

a. 3. Amboyna, Hoedt. — b. 2. Roti Isl. (S. W. of Timor), H. ten Kate. — c. 1. Timor, Wienecke. — d. 1. Banka Isl. (E. of Sumatra), Buddingh. — e. 3. Waigeo Isl. (near N. Guinea), Bernstein. — f. 3. Poeloe Tello, Batoe Is. (W. of Sumatra), ?. — g. 1. Poeloe Tello, from E. F. Jochim's collection. — h. 1. Doreh Bay (N. New Guinea), from E. F. Jochim's collection. — i. 2. Samoa Is., W. von Bulow. — j. 1. Amboyna, from E. F. Jochim's collection. — k. 1. ? Haiti, Ricord. — l. 6. ?, Hoogeveen & J. E. G. van Emden. — m. 2. Madura, Mangold. — n. 2. Banda Is., from E. F. Jochim's collection. — o. 1. Nias Isl. (near Sumatra), E. E. W. G. Schröder. — p. 5. Madura, from E. F. Jochim's collection. — q. 1. Indian Ocean, ? — r. 1. ?, ?. — s. 1. Seroei, Isl. Japèn (N. New Guinea), L. de Priester. — t. 3. ?, from Cosijn's collection. — 1789. 2. Mediterranean, F. Cantraine.

The specimen q on account of its pattern and the somewhat deeper sulci between the ribs, bears some resemblance to the subspecies *pennata* (Mörch). However, it differs from the latter, besides by the place of origin, by its form, which is more that of a typical *perdix*, with which it also agrees in the thickness of the shell. Moreover the ribs are not so much raised and consequently the sulci are shallower than in the subspecies.

subspec. **pennata** (Mörch)

Dolium perdix Martini (pars), Syst. Conch. Cab., vol. 3, p. 403, pl. 117, fig. 1078 (non 1079, 1080); 1777.

Dolium pennatum Mörch, Catal. conch. Yoldi, p. 110, No 2058; 1852.

Dolium perdix L. *occidentalis* a var.? Mörch, Malakoz. Bl., vol. 24, p. 42; 1877.

The subspecies of *D. perdix* (L.) occurring in the West Indies was first clearly recognized by Mörch, and designated by the name *Dolium pennatum*; in his description he refers to a picture of Martini (3. f. 1078), representing a not yet full-grown, but well recognizable specimen of this form. For the specimens occurring in the East Indies he retains the name *D. perdix* (L.).

It is true that as early as 1830 Green described an American *Dolium* under the name *D. plumatum*, in "On the Dolia of the United States" (Trans. Albany Inst., vol. 1, p. 132; 1830) but he did not give a picture and did not state whether it was collected at the East or at the West coast of the United States. It was presumed that this *Dolium* should be the West Indian form of *D. perdix*, as, a.o., Tryon (Manual of Conch., vol. 7, p. 264; 1885) states "Dr. Jacob Green, many years ago described a shell as *D. plumatum* which has been supposed to be the West Indian *D. perdix*". Paetel, for instance, (Cat. Conch. Samml., vol. 1, p. 222; 1887) considered it as a synonym of *D. perdix* (L.). A compatriote of Green's who lived about the same time, viz., Jay, states (Catal. of Shells, 4th ed., p. 358;

1852) as place of origin of *D. plumatum* "Pacific Ocean", so it could not be the West Indian form of *D. perdix*. Hanley (Proc. Zool. Soc. London, p.489; 1859), places this *Dolium* among the synonyms of: "*Dolium cepa*, Martini" a.o.: "*Dolium plumatum*, Green, Albany Instit. 1. p. 132, probably", and adds on p. 490 "Reeve has figured in his 'Iconica' a very beautiful, but unusual variety, which I take to be the *D. plumatum* of Green,—a species which has indeed been referred to *perdix*, but whose described suture harmonises far better with that of the present *Dolium*". In connection with the uncertainty about this *D. plumatum* it seems to me advisable to use the name *pennatum* Mörch.

The specimens of *D. perdix* (L.) from the West Indies (Pl. II fig. 2) are indeed distinguished from the East Indian form (Pl. II fig. 1) by their smaller size and by their thicker shell, the ribs are higher with sharply cut sulci, while in the East Indian specimens the ribs are gently sloping into the shallow intervals, which in this form are often light-coloured. The colour and pattern of the specimens from the West Indies is also different, mostly these are tinted with very light yellowish-brown and irregularly tessellate with darker spots, the squarish blotches merging into larger blots. As a rule in West Indian specimens the whorls are somewhat more convex and sometimes a little flattened at the suture, while the columella does not taper towards the base as in the East Indian specimens, but remains rather broad and heavy, and the expansion of the columellar lip is more reflected over the umbilicus.

The name "*pennata*", already used before Linné by Rumphius for *D. perdix* from the East Indies (*Cochlea pennata*, pl. 27, fig. C) does not acquire any nomenclatorial value, because Linné (Syst. nat., ed. 10, p. 734, No 378; 1758) places it among the synonyms of *D. perdix*. No more is *Dolium pennatum* Mörch, 1852, a homonym of *Dolium pennatum* Martini, 1777 (Syst. Conch. Cab., vol. 3, p. 390) and of *Dolium pennatum* Schröter, 1788 (Namen-Register syst. Conch. Cab., p. 30), as these authors are not strictly binominal and their names are therefore valueless from the standpoint of the binary nomenclature. The name *Dolium pennatum* Mörch can therefore be retained for the West Indian forms.

a. 9. ?, Hoogeveen & J. E. G. van Emden. — b. 2. Aruba (West Indies), A. J. van Koolwijk. — c. 1. Curaçao (West Indies), A. J. van Koolwijk. — d. 1. Paramaribo (Surinam), W. C. v. Heurn. — e. 1. Saint Thomas (West Indies), ? — f. 1. West Indies, Kraepelin & Holm. — g. 1. Caracas Bay (Curaçao), M. J. de Graag. — h. 5. ?, ? — i. 2. Japan, P. F. von Siebold. — j. 1. Puerto Cabello (Venezuela), L. de Priester. — k. 7. ?, from Cosijn's collection.

Though "Japan" is stated as place of origin, I can but identify this specimen i, as subspecies *pennata*; the locality may have been recorded erroneously.

var. **rufa** (Blainville)

Dolium rufum Blainville, Dict. Sci. Nat., vol. 32, p. 503; 1824.

a. 2. ?, Hoogeveen & J. E. G. van Emden. — b. 1. Curaçao (West Indies), A. J. van Koolwijk.

D. reevii Hanley

Dolium reevii Hanley, Proc. Zool. Soc. London, p. 493; 1859.

D. schepmani nom. nov.

Dolium pictum Schepman, Notes Leyden Mus., vol. 15, p. 276; 1893.

The name *pictum* has already been used by Hanley (Proc. Zool. Soc. London, p. 489; 1859) for a variety of *D. costatum* Mke., I would therefore name this *Dolium*: *D. schepmani*. At the same time I avail myself of this opportunity to give a picture of the type (Pl. II fig. 3), there being none in existence.

a. 1. ? Australia, from the cabinet of Mr. Raye (type specimen).

D. testardi Montrouzier

Dolium Testardi Montrouzier, Journ. de Conch., vol. 11, p. 75 & p. 166, pl. 5, fig. 6; 1863.

Dolium olearium, Brug. Var. *Testardi*, Montr., Tryon, Manual of Conch., vol. 7, p. 263, pl. 2, fig. 11; 1885.

This *Dolium* differs from *D. olearium* (Brug.), a.o., in the colour of the first whorls, which in the former is dark "apice nigricante", in the latter yellowish; further *D. testardi* is rather robust, *D. olearium* thin. The columella in *D. testardi* is more strongly twisted and the suture not canaliculate, the number of ribs on the last whorl is 23, they become wider towards the top, *D. olearium* has 16—18 about equal and flat ribs. In the intervals of the topmost ribs in *D. testardi* there is a narrow ridge, which is not found in *D. olearium*. Finally the pattern and colour of these two *Dolium*'s is totally different. All these differences, in my opinion, are too great to allow us to consider this *Dolium* as a variety of *D. olearium* (Brug.), as is done by Tryon.

a. 1. Banda Is., from E. F. Jochim's collection.

D. tetracotula (Hedley)

Tonna tetracotula Hedley, Rec. Austral. Mus. Sydney, vol. 12, p. 332, pl. 42, fig. 4 & pl. 43, fig. 5; 1919.

D. varicosum Preston

Dolium varicosum Preston, Rec. Indian Mus. Calcutta, vol. 5, p. 34, fig. 3; 1910.

In our collection there is one specimen bought from H. B. Preston in 1912. The label, written in the same hand as that of all our material originating from Preston, reads "*Dolium varicosum* Preston, Bay of Bengal (Deep water)". However, in every respect: general form, colour, form of the columella and the outer lip, number and form of the ribs, it agrees completely with *D. costatum* Mke. Preston's specimen, however, shows a distinct varix at some distance (circa 14 mm) before the labrum, at the region in which in some specimens of this species an obscure ridge is found, or a raised line of growth (as in one of our specimens a), or an unevenness (the specimen e), or a thickening (another specimen of a), pointing to a rest period in growth, Preston's specimen shows a distinct varix. As Preston's specimen appears to be an anomaly of *D. costatum* Mke. only, I have placed it under this species.

That the last but one rest period in growth is still to be seen as a line or a thickening or an inception of a varix, occurs repeatedly in species of *Dolium*. One of our specimens of *D. lischkeanum* Küst. (our specimen c), e.g., shows at some distance from the aperture also a beginning of varix formation; the same occurs in a juvenile specimen (q) in our collection of *D. costatum* Mke.

The specimen described and pictured by H. B. Preston as *D. varicosum* is, as far as can be judged from the picture and the description, certainly quite a different thing from the specimen in our collection, were it only by the greater number of ribs. Preston does not mention the number in his diagnosis, but I counted in the picture 19, while *D. costatum* Mke. has 13 or 14, which, moreover, are flat.

D. variegatum Lamarck

Dolium variegatum (non Philippi) Lamarck, Anim. s. Vert., vol. 7, p. 261, No 6; 1822. — Anim. s. Vert., éd. Desh., vol. 10, p. 143, No 6; 1844.

Dolium variegatum, Kiener, Icon. coq. viv., Dolium, p. 9, No 5, pl. 2, fig. 3 (non 3a); 1835.

Dolium Kieneri Philippi, Abbild. u. Beschr. Conch., vol. 3, part 2, Dolium, p. 36, No 3; 1847.

Tonna variegata, Hedley, Rec. Austral. Mus. Sydney, vol. 12, p. 332, pl. 44, fig. 6; 1919.

a. 2. Shark Bay (W. Australia), ?

In the larger of our two specimens the words „Baie des Chiens marins Nlle Hde”, written in ink, are barely legible; it consequently originates from the same locality, from which Lamarck describes his specimen. This piece has a great similarity to that pictured by Hedley (Rec. Austral. Mus. Sydney, vol. 12, pl. 44, fig. 6; 1919), save for the tessellate bands being far less distinct. Our smaller specimen in form and pattern perfectly corresponds with Kiener's figure (Icon. coq. viv., *Dolium*, pl. 2, fig. 3; 1835), except that the columella is far less curved; in this respect it agrees more with the columella of the *Dolium* pictured by Hedley.

var. **angusta** Hanley

Dolium variegatum, Reeve, Conch. Icon., *Dolium*, pl. 5, fig. 7b; 1849.

Dolium variegatum Lamarck var. *angusta* Hanley, Proc. Zool. Soc. London, p. 491; 1859.

var. **tankervillei** Hanley

Dolium variegatum Lamarck var. *tankervillei* Hanley, Proc. Zool. Soc. London, p. 490; 1859.

D. zonatum Green

Dolium zonatum Green, Transact. Albany Inst., vol. 1, p. 131, pl. 4; 1830.

Dolium crenulatum Philippi, Zeitschr. f. Malakozool., p. 148, No 3; 1845. — Abbild. u. Beschr. Conch., vol. 3, part 2, *Dolium*, p. 35, No 1, pl. 1, fig. 1; 1847.

Hedley (Rec. Austral. Mus. Sydney, vol. 12, p. 336; 1919) writes „Hanley announced in 1859 his discovery... that the real *Buccinum olearium* was that Japanese species which Philippi had so beautifully figured as *Dolium crenulatum*”. Hedley probably means by Hanley's statement in 1859 the synonyms and remarks of the latter author in Proc. Zool. Soc. London, p. 488; 1859, under *D. zonatum* Green, which he considers as identical with *D. crenulatum* Philippi, “Neue Conch. III. Dol. pl. 1. f. 1”. In this paper, however, Hanley expresses himself with the utmost caution, and does not utter a positive assertion. Among the synonyms of *D. zonatum* Green he places, a.o. “*Buccinum olearium*, Linn. Syst. Nat. *probably*¹⁾”; Wood, Index Testac. pl. 22. f. 1, *possibly*¹⁾”; *Dolium olearium*, Crouch., Illust. Lam. pl. 19. f. 2 (1827)”, and adds at the end “Although Crouch may have rightly divined the Linnean species, the Linnean definition was *too obscure to ensure certainty*¹⁾”. Accordingly he maintains as name of the

1) italics by me.

species *D. zonatum* Green and not *D. olearium* (L.), as one might conclude from Hedley's statement.

a. 1. Zanzibar, Derx. — b. 2. ?, from Dalen's & Hoogeveen's collections.
— c. 1. ?, G. Sootweg.

D. haemastomum Philippi, nom. nud.

Dolium haemastomum Philippi, Zeitschr. f. Malakozool., p. 147; 1845. — Abbild. u. Besch. Conch., vol. 3, part 4, Dolium, p. 11; 1849.

EXPLANATION OF PLATE II

Fig. 1. *Dolium perdix* (L.). $\times \frac{2}{3}$.

Fig. 2. *Dolium perdix* (L.) subsp. *pennata* (Mörch). $\times 1$.

Fig. 3. *Dolium schepmani* nom. nov. $\times 1\frac{1}{3}$.

