Röding's Stromboidea (Caenogastropoda): the remains of the Bolten collection in the Museum der Natur Gotha (Germany), a critical review of Röding's taxa, and notes on the Schmidt catalogue

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We examined the collection in the Museum der Natur Gotha (mng) for specimens of Stromboidea, once in the collection of the German physicist Joachim Friedrich Bolten, first described in a sales catalogue by Peter Friedrich Röding in 1798 and subsequently auctioned in 1819. We were able to recognize nine specimens of Stromboidea originating from the Bolten collection with certainty, all once in the private collection of Friedrich Christian Schmidt, that is indicated as ex Bolten in the collection catalogue of mng. Apart from that, we discovered 45 specimens acquired possibly once being part of the Bolten collection. A critical listing of all Stromboidea we encountered in Röding's sales catalogue is added. Names attributed to Bolten (= Röding) by the compiler of the catalogue in mng are discussed. *Turris operosa* Röding, 1798 is the first available name for *Strombus turritus* Lamarck, 1822 (non Röding, 1798 nec Link, 1807) and is here recombined to *Doxander operosus* (Röding, 1798) comb. nov.. The family-level taxon Seraphsidae should be attributed to Gray, 1853 and the genus-level taxon *Terebellum* should be attributed to Bruguière, 1798. Lectotypes are designated for ; *Lambis velum*; *Lambis contorta*; *Tibia indiarum*; *Turris operosa*; and *Terebellum lineatum* all of Röding, 1798. There are two different printings of the Museum Boltenianum by Röding. Possible future research is briefly addressed.

Key words: Stromboidea, Röding, Bolten collection, putative syntype, lectotype, Gotha.

INTRODUCTION

The Hamburg physician Johann [Joachim] Friedrich Bolten (11 August 1718 - 6 January 1796) (Keferstein, 1862: 164) gathered a large collection of shells, nearly 7,000 gastropods and 1,300 bivalves (Dance, 1986: 65). As far as Stromboidea are concerned, in the catalogue compiled by Peter [Poles] Friedrich Röding (1767-1846), published in 1798, we counted (genera sensu Röding) seven species names of *Pyramis*, divided over eight lots; 68 species names of *Lambis*, including Aporrhaidae, divided over 110 lots, encompassing over 300 specimens; four species names of *Tibia*, divided over four lots, encompassing thirteen specimens; three species names of *Terebellum*, divided over three lots, encompassing ten specimens; four species names of Xenophoridae (under the generic name *Astraea* Röding, 1798) divided over four lots, encompassing six specimens. We also found two species names, with three specimens under the generic name *Turris*, which are strombids. There were no Struthiolariidae present in the Bolten collection.

A number of papers about the whereabouts of the Bolten collection have been published (vide infra). During the preparation of our previous paper (Kronenberg & Wieneke, 2018) we had contact with Ronald Bellstedt from Museum der Natur, Gotha, Germany (mng) to seek information about the Bolten collection, of which, according to Dance (1986: 65), large parts, if not the majority, was housed in mng. Based on his information, and information from other sources (Kronenberg & Wieneke, 2018: 18-19), we concluded that there could be a possibility that the original specimen of *Lambis vomer* Röding, 1798 (now allocated to the genus *Euprotomus*) from the Bolten collection, i.e., the specimen that appeared as lot 821 in the auction catalogue compiled by P.F. Röding (1798), is present in mng. One of us (uw) made a visit to mng and indeed managed to track down

the specimen that once was in the Bolten collection. Unfortunately, this information only became available after the publication of our 2018 paper. After this find, we decided to visit the museum once more to look for other stromboideans, including possible types that could be traced back to the Bolten collection. The results are presented below. In this paper, we include Xenophoridae as being part of the Stromboidea, following Simone (2005).

A brief history

The collection of J.F. Bolten was quite famous in its time, see e.g. Dance (1986) and Kohn (1975). Martini (1773) used some specimens from the Bolten collection as illustrations for his second volume of the Neues Systematisches Conchylien-Cabinet (1773). For this Bolten was acknowledged by Martini in his preface (1773: II) as "(...) durch das thätige Wohlwollen des Herrn Doctor Bolten in Hamburg (...)".

During his lifetime J.F. Bolten developed a classification system that differed from that of Linnaeus, as he believed that the Linnaean classification was too rude (Keferstein, 1862; Dall, 1915). After Bolten had passed away in 1796, his shell collection was to be sold as a whole during an auction (Dall, 1915; Joost, 1990). For this auction, the collection was catalogued by P.F. Röding (1798), a dealer in natural curiosities, also from Hamburg. In this catalogue the system developed by Bolten was adopted. Attempts to sell the collection as a whole failed. Subsequently, a second auction catalogue was compiled (Noodt, 1819), see also Dall (1915). The collection was auctioned and dispersed over several collectors as noted by Semper (1876: 122). Yet Dance (1986: 65), possibly following Stewart (1930: 35) indicated that the collection was acquired by Schmidt, a resident of Gotha, then in the duchy of Saxe-Gotha, now in Germany.

Röding's catalogue

When Linnaeus (1758) established the genus *Strombus*, this genus did not only include members of the Stromboidea. *Strombus* sensu Linnaeus also contained species nowadays allocated to different families, see Dodge (1956) for details. Although Röding (1798) did use the genus name *Strombus*, he used it for species for the most part now placed in Cerithioidea. The stromboideans in the Bolten collection were allocated to the genera *Pyramis*, *Lambis, Tibia* and *Terebellum*, all genera that were erected by Röding. Other genera that were introduced by Röding, contained additional species subsequently identified as Stromboidea, viz. taxa within *Astraea* and *Turris*.

Röding (1798) subdivided his genus *Lambis* into some infrageneric groups, just like he did with *Culcullus* (Kohn, 1975: 190), see Table 1. We concur with Kohn (1975: 190) that these, just like the infrageneric groups of Linnaeus (1758; 1767) and Gmelin (1791) have no status in nomenclature, but rather convey a general impression of the shape of the shells arranged under that circumscription.

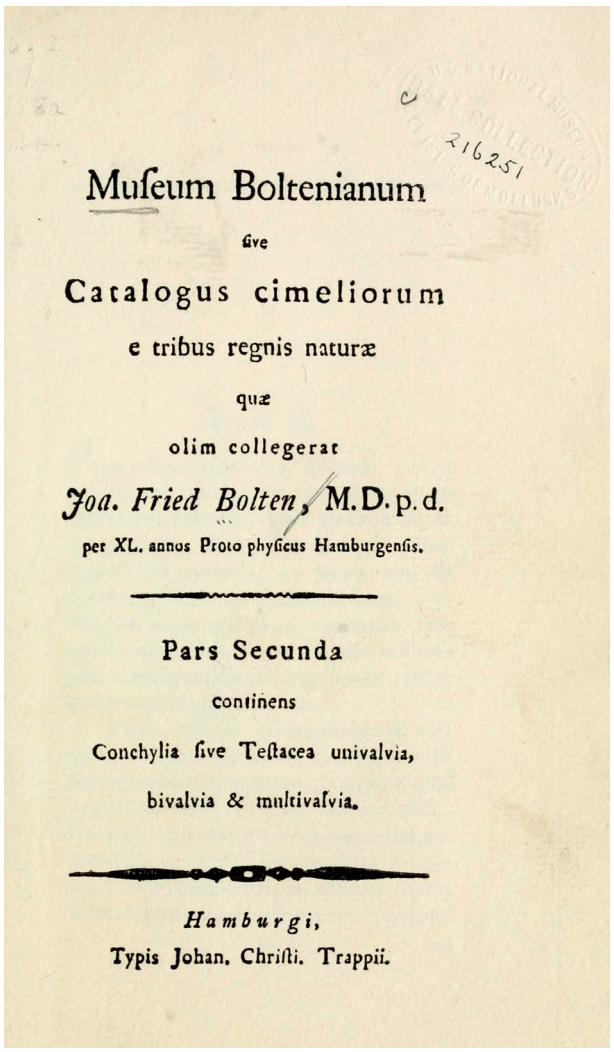
Lambis	1. Alis – retractis. Mit eingezogenem Flügel
	2. Alis expansis. Mit ausgedehnten Flügel
	3. Alis digitatis. Mit gespaltenen Flügel
	* Mit ofne Griffe
	4. Alis lobati laciniatis. Mit zerlapten Flügel

Table 1. Röding's infrageneric classification of the genus *Lambis*.

Röding (1798) principally referred to the 12th edition of the Systema Naturae by Gmelin (1791). Still, he must have realized that in a number of instances, Gmelin's references referred to more than one species under one name. Therefore Röding (1798), probably following notes made by Bolten, introduced a fairly large number of new names, sometimes with reference to existing illustrations, but also specimens without any reference at all. These latter names are to be considered nomina nuda. In a number of occasions, Röding was very clear about his intentions. When introducing *Lambis bulla* (now: *Euprotomus bulla*), he referred to Gmelin's concept of *Strombus aurisdianae* species number 12 but also mentioned Martini's (1777) pl. 84, fig. 840, clearly setting it apart from what Röding considered *L. aurisdianae*, as with the latter species, he referred to Gmelin's *S. aurisdianae* species number 12, but with reference to Martini's (1777) pl. 84, figs 838-839.

It should be noted that on many occasions, Röding haphazardly referred to published illustrations, e.g., in his references to *Tibia indiarum* he referred to the vignette in Chemnitz (1780: 344), but not to the illustration in the same volume that is on pl. 159 fig. 1500, which is the same species. When referring to illustrations, Röding (1798) mostly referred to the works by Martini (1773, 1777), sometimes abbreviated to "Mart.", and, to a lesser extent, Chemnitz (1788), sometimes abbreviated to "Chemn.". There are however a few exceptions where other sources of illustrations are mentioned. In our part dealing on the Röding taxa, all these references to illustrations will be discussed.

There are two versions of Museum Boltenianum, both available at the Biodiversity Heritage Library. The one that we have used for first reference is the hard copy of the Museum Boltenianum as reprinted by the American Malacological Union (1986) that is "produced from a microfiche copy of the facsimile reprint issued in 1906 by Sherborn & Sykes" (AMU version: unnumbered page). This microfiche copy is made from the copy that formerly belonged to J.C.H. Crosse, that eventually ended up in the Geological Library of the British Museum (now NHMUK) as stated in


Muſeum Boltenianum
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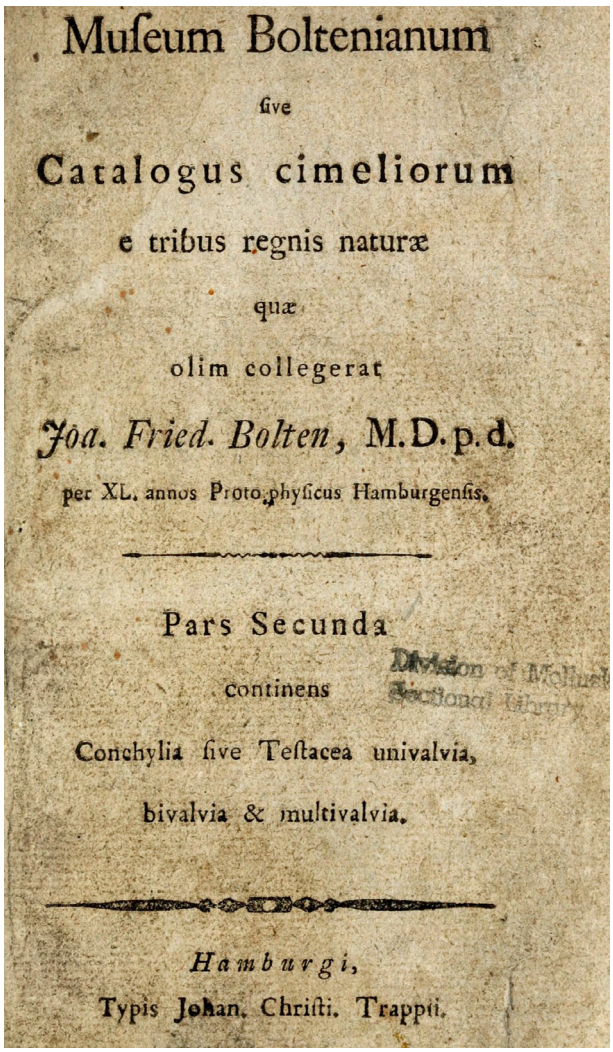
Catalogus cimeliorum
e tribus regnis naturæ
quæ
olim collegerat
Joa. Fried Bolten, M.D.p.d.
per XL. annos Proto phyſicus Hamburgenſis.
Pars Secunda
continens
Conchylia ſive Teſtacea univalvia,
bivalvia & multivalvia.
Hamburgi,
Typis Johan. Chriſti. Trappii.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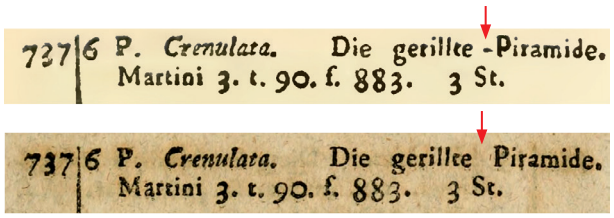
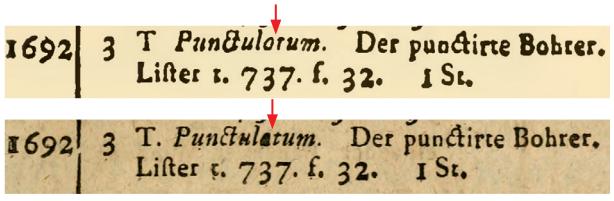
per XL. annos Proto phyſicus Hamburgenſis.
Pars Secunda
continens
Conchylia ſive Teſtacea univalvia,
bivalvia & multivalvia.
Hamburgi,
Typis Johan. Chriſti. Trappii.

Figs 1-2. Museum Boltenianum versions. **1.** Title page of the so-called "Crosse copy". Note the absence of a full stop after "Fried". **2.** Title page of the so-called "Pfeiffer copy". Note the presence of a full stop after "Fried".


737 6 P. Crenulata. Die gerillte -Piramide.
Martini 3. t. 90. f. 883. 3 St.
737 6 P. Crenulata. Die gerillte Piramide.
Martini 3. t. 90. f. 883. 3 St.

Figs 3-4. Caption to Röding (1798: 59 # 737) *P. Crenulata* (detail). **3.** Crosse copy, note hyphen. **4.** Pfeiffer copy, note missing hyphen.


1692 3 T Punctulorum. Der punctirte Bohrer.
Liſter t. 737. f. 32. 1 St.
1692 3 T. Punctulatum. Der punctirte Bohrer.
Liſter t. 737. f. 32. 1 St.

Figs 5-6. Caption to Röding (1798: 135 # 1692) detail. **5.** Crosse copy. **6.** Pfeiffer copy.

the introductory note by Sherborn & Sykes (1906), reprinted ad verbum in the AMU reprint. This copy is a digitalized copy of this facsimile reprint that once belonged to William Healy Dall, and is available through https://www.biodiversitylibrary.org/page/16231122, and referred to here as the "Crosse copy". The other copy is available through https://www.biodiversitylibrary.org/page/16230659 and is a copy of the Museum Boltenianum that also once belonged to the library of William Healy Dall, who wrote on his ex libris: "Only four copies of this book are known. Even the second edition [i.e. the 1819 Noodt edition, GCK UW] is very rare. This copy is from the library of L. Pfeiffer", and is referred to here as the "Pfeiffer copy". Note that this Pfeiffer copy is not a facsimile reprint. Both digitalized copies are present in the Smithsonian libraries. In the Smithsonian Libraries there is also a copy present that once belonged to S.S. Berry (J.J. ter Poorten, pers. comm. June 2020). This copy again agrees with the ex-Crosse copy.

The differences between the two printings are already visible at the title pages of the two versions (Figs 1-2).

Although the following is not exhaustive, we found in the entries related to Stromboidea the following three differences.

1) lot number 737: in the Crosse copy the entry reads: *P. Crenulata*. Die gerillte – Piramide (Fig. 3); in the Pfeiffer copy it reads: *P. Crenulata*. Die gerillte Piramide (Fig. 4), i.e. without a hyphen.
2) lot number 877: in the Crosse copy the second/third line of the entry reads: Gmel. *Stromb. lamb s*. sp. 5; in the Pfeiffer copy it reads: Gmel. *Stromb. lambis*. sp. 5, i.e. a correction to the epithet.
3) lot number 1692: in the Crosse copy the entry reads: *T. Punctulorum*. Der punctirte Bohrer (Fig. 5); in the Pfeiffer copy it reads: *T. Punctulatum*. Der punctirte Bohrer (Fig. 6), i.e. a completely different name.

In this paper we follow the Crosse copy, as the Pfeiffer copy only became widely available after 10 July 2009, the date it was scanned and became part of the Biodiversity Heritage Library, and the facsimile reprint as early as 1906.

We believe most 20th and many 21st century workers mostly relied on this Crosse copy of which 75 copies were made as a facsimile reprint, and the 1986 AMU-reprint thereof, rather than the 2009 digitalized Pfeiffer copy, that probably became slightly more available through the Smithsonian Library after the death of William Healy Dall (27 March 1927), and only widely available after digitalization. Taking into account that there are differences between these two printings, and that both are now easily accessible, it is important for workers to indicate which of the two versions they are using in their research when referring to Röding (1798).

Turner (1958: 284) noted that both O.A. Mörch and H. & A. Adams referred to the Museum Boltenianum, so they must have had access to a copy as well. This may however not be an "original" Röding copy, but a copy of the Noodt (1819) edition. It would be interesting to know whether these two copies are still in existence and if so, where they are housed at present, and if they indeed were "original" Röding copies. Note that Turner (1958: 284) attributed the 1819 edition by Noodt to Röding also, as "Second edition, pp. 1-156, 4 plates. [This edition was prepared specifically for the Bolten collection at auction.]". It would also be interesting to make further comparisons between the two printed versions, but addressing this is beyond the scope of the present paper.

Röding's (1798) work at first did not have many followers, and there has been discussion about the availability and validity of names introduced in the Museum Boltenianum, amongst them Fischer, 1858 [who had only access to the 1819 edition by Noodt]; Keferstein, 1862; Dall, 1915 and others. The matter became settled by a ruling of the ICZN with Opinion 96 (1926: 352-354), and authorship of the catalogue was also settled by the ICZN (1956). The only early work of some influence that adopted some of the system established by Röding we are aware of was Link (1807), who adopted e.g., *Lambis* more or less in the sense of Röding, i.e., *Strombus* plus *Lambis* sensu Abbott (1960; 1961). But on the other hand, Link also adopted the Lamarckian genera *Rostellaria* (Link, 1807: 129) and *Pteroceras* [sic!] (Link, 1807: 109). Curiously, Link (1807: 129) mentioned under *Rostellaria fusus* the epithet "*indiarum*", and recognized *Lambis curruca* (1807: 109) referring to Bolten, p. 64 (and others) stating: "Unterscheidet sich von der vorigen (= *Lambis gallus*) durch eine Falte, da wo die äußere Lippe oben anschließt" (Differs from the previus (= *Lambis gallus*) by a fold, where the outer lip at the upper part joins), both these names were coined by Röding.

H. & A. Adams (1853) however, did recognize some genus-level names originating from Röding, e.g., *Bursa* (H. & A. Adams, 1853: 105) and attributed the genus name to Bolten. Other names, first made available by Röding, such as *Harpa*, however, were attributed to the first one who published that name (in this case, Rumphius) and not to Röding (or Bolten) (H. & A. Adams, 1853: 139).

Stewart (1930: 35) claimed that: "Presumably the collection [= the Bolten collection, GCK & UW] is still preserved in Gotha, but it is only of historical interest, since the new species of the "Museum Boltenianum" were not diagnosed and are only identifiable through the figures cited by Röding.". Kohn (1975: 191) followed this opinion. We however disagree. Any specimen from the Bolten collection is, when named as new, together with the cited figures by Röding, considered to be a syntype, and therefore of scientific importance. Moreover, when a genuine ex Bolten specimen is still in existance, it would be much better to select that one as a lectotype, as such a specimen can really be examined, and is therefore a better representative as an illustration only.

For further details on the Museum Boltenianum, see Dall (1915), Turner (1958) and Kohn (1975).

Noodt's catalogue

Differences between the Röding version and Noodt were addressed by Iredale (1921) and subsequently discussed by Petit (2013). It should be noted that Noodt (1819: 95) used the epithet "*punctulatum*" for one of the *Terebellum* species, vide infra. From this it is obvious that Noodt had access to a "Pfeiffer copy" of the Röding catalogue. The differences, as pointed out by Petit, had no nomenclatorial effect on the Stromboidea, but there are a few more differences detected by us. In the Noodt issue (1) lot # 774 *Lambis luhuanus* it is added after "11 Stück": "wovon 1 Stück durchgeschnitten"; (2) lot # 820 which spells *L. avatrum* (= err. pro. *L. aratrum*), a typographical error and is here accepted as an incorrect subsequent spelling, and does not enter synonymy; (3) lot # 1581 *Tibia Insulae Choräb*, the spelling is changed into *Tibia*

Insulae Chorab (vide infra); (4) lot # 1583 *Tibia indiarum* it is added after "äusserst selten" (very rare) the words: "und schön" (and beautiful).

The numbering in the Noodt edition of the Museum Boltenianum runs parallel to the numbering in the Röding edition, just up to # 967, *Janthina cytherea*. After number 967, Röding continued with number 986, *Janthina pellucida* i.e., the numbers 6 and 8 interchanged, and Noodt continued with 968 for *Janthina pellucida*, keeping the correct count of the number of samples. The obvious error was not corrected by Röding, so after number 967, the numbering in the two catalogues runs no longer parallel.

There are more omissions in the numbering in the Röding catalogue. There are e.g., no sample numbers 1069; 1090; 1110 (but there are two number 1111). A further comparison of the two catalogues is beyond the scope of the present paper.

Schmidt's collections and catalogue

Friedrich Christian Schmidt (1755-1830) was Cammer-Commissionsrat, a public administrative function in the Duchy Saxe-Coburg and Gotha, in Gotha, Germany, and during his lifetime he built a collection of over 17.000 specimens. Apart from specimens from the Bolten auction, Schmidt, among others, also acquired other collections. Among these is the collection of the conchologist Johan Samuel Schröter (1735-1808). Another collection came from Carl Heinrich Wilhelm Anthing (11 November 1766 - 7 February 1823), Baron d'Anthing, or Von Anthing, was born in Gotha and served in the French army during the Napoleontic wars. He was given the title of Baron by Napoleon Bonaparte on 19 July 1813, and was later appointed to Governor General of Batavia (Dutch East Indies, now Djakarta, Indonesia) and commander in chief of the Dutch colonial forces. Because of bad health he was granted dismissal of his post and returned to Gotha with his collections of birds, butterflies, shells and ethnographica. Another collection came from the French painter Jacques-Gérard Milbert (1766-1840). This collection contained specimens collected on the first part of the voyage to Australia by the French explorer Nicolas Thomas Baudin (1754-1803) that took place from 1800-1803. Milbert abandoned that expedition in 1800 while being in Mauritius (Greppi, 2005: 29). Possibly during his stay on Mauritius, Milbert collected the specimen of *Ophioglossolambis violacea* (Swainson, 1821) now present in MNG (# 4934), labelled "*Pterocera multipes* mihi" a manuscript name given by Schmidt, but this is far from sure, as Milbert's collection also contained species that live further to the east. Schmidt also acquired shells from Röding that demonstrately are not part of the Bolten collection. Schmidt's collection was considered to be the second-best collection in Europe by Alexander von Humboldt, who saw the collection in 1826. Subsequently, the collection was acquired by Duke Ernst I (1784-1844) of Saxe-Coburg and Gotha, on 28 December 1826. For more details on the Schmidt collection and the malacological collection in MNG, see Joost (1990).

Schmidt (1818) also wrote an extensive book on arranging a shell collection. In this book, Schmidt (1818: 209-238) presented an overview of his collection. On e.g. p. 212 he mentioned: "Geschlechte. Strombus. 447 Nummern, 48 Species, darunter 2 gegrabene, 53 Variat., 347 Spielarten und Doubl. die mehresten Arten von der erste Jugend an. Darunter 14 Stück chiragra bis 12 Zoll, millepeda γ, clavus, gallus ϑ, alatus, latissimus, spinosus, bryonia bis 11 Zoll, ater, vexillum, scorpius mit 8 Fingern, vittatus δ. gallus laciniatus, auris Dianae δ. und ε. L. " (Genus. Strombus. 447 numbers, 48 species, including 2 dug[?], 53 variants, 347 varieties and doublets. the most diverse species from the first youth on. Including 14 specimens of chiragra up to 12 inches, millepeda γ, clavus, gallus ϑ, alatus, latissimus, spinosus, bryonia up to 11 inches, ater, vexillum, scorpius with 8 fingers, vittatus δ. gallus laciniatus, auris Dianae δ. and ε. L.). Note that, although Schmidt advocated the Lamarckian system, he here uses the Linnaean system, as becomes evident from the names "ater", "vexillum", "clavus" and "scorpius". On page 215 Schmidt starts the chapter "Verzeichnis meiner Conchylien-Sammlung nach dem lamarkischen und andern Systemen geordnet" (Index of my conchylia collection ordered according to the Lamarkian and other systems), in which he gives more detail. Stromboidea are dealt with under different genera. On p. 221 he mentions genus XXVII, *Terebellum*, with reference to *Bulla terebellum* L.[innaeus], two species present in his collection; on p. 222 he mentioned genus XXIX, "ein unbekanntes Geschlecht ähnlich den Stümpchens von manchen Strombis und den Kegeln charakteristisch durch eine Schwiele oben an der Spindellippe" (an unknown genus similar to the stumps of some Strombis and the Cones, characterized by a callous at the top of the spindle lip) and continued with genus XXX, *Strombus*. On page 222 and 223 Schmidt mentioned more species as on p. 212, among others "lentiginosus, dito mit Schwarzer Mündung" (= *Lambis pipus* Röding, 1798), but also recognized the genera *Pterocera* (genus XXXI; including *Aporrhais*) and *Rostellaria* (genus XXXII). Subsequently, he mentioned genus XXXIII a "Unbestimmtes Geschlecht, Mittel zwischen Strombus und Buccinum" (Indefinite genus, mean between Strombus and Buccinum) and mentioning of the species *Buccinum stromboides* in this genus. On page 228 Schmidt mentioned genus LXXVI, the genus *Calcar*, Spornschnecken, in which he incorporated "(...) *solaris* und *conchyliopherus* L. [sic] letztere auch gegraben. Die letzten formiren billig ein eigenes Geschlecht" ((...) *solaris* and *conchyliopherus* L. [sic] the latter also dug. The last cheaply form an own genus). So it appears that very

early on Schmidt already realized that Xenophoridae did not belong to trochoideans. Also, note that this book was written before the auction of the Bolten collection, so it is not that surprising that Schmidt did not buy that many specimens during the auction (vide infra), as he already owned a large collection.

Before Schmidt sold his collection to the Duke and until his death on 26 December 1830, Schmidt worked on the collection, compiling a catalogue, handwritten, consisting of twelve volumes, the first five in "Reinschrift" (clean copy), the remaining seven in Schmidt's own, almost illegible, handwriting (compare Fig. 8 with Figs 39-40). Schmidt worked on volume 4, encompassing the genera *Conus*, *Strombus*, *Pterocera*, *Rostellaria* and *Columbella* (all sensu Lamarck, see Fig. 7) in 1827, as on the second page of the section on *Strombus*, he mentioned the date 15 February 1827. Throughout his catalogue, Schmidt used the Lamarckian system, so one will not find Rödings (1798) genus names *Tibia* or *Lambis*, but *Rostellaria*, *Strombus* and *Pterocera* instead. *Rostellaria* Lamarck, 1799 is an objective synonym of *Tibia*, and *Pterocera* Lamarck, 1799 is an objective synonym of *Lambis* Röding, 1798.

All specimens received an original number, written in pencil when possible, on the shells. This number corresponds with the number in the catalogue, and often there were some lines written in the catalogue with remarks on that particular specimen. In time, some of these pencil-written collection numbers are no longer present on the shells, and in 1981/1982, the collection was reviewed by Monika Joost. During this review, specimens that still had the collection number were indicated as "vorhanden" (present). Collection numbers that were no longer present on the shell were not registered as such and received a new collection number, written in ink on the shell. All these specimens were registered in a new catalogue of 100 pages with entries from 31 July 1981 - 12 May 1982 with an annotation "alter Bestand" (old stock), (pers. comm. Ronald Bellstedt to UW, March 2020).

Schmidt considered Bolten to be the compiler of the Museum Boltenianum, and hence he considered Bolten to be the author of the newly introduced names in the Museum Boltenianum. Most of these names were not adopted by Schmidt, and Schmidt only mentioned five names in the catalogue that he attributed to Bolten, viz. # 4554 *Strombus melanostomus* Boltenii; # 4590 *Strombus brunus* Boltenii; # 4664 *Strombus albidus* Boltenii; # 4708 *Strombus turturellus* Boltenii; and # 4742 *Strombus venustus* Boltenii, this is as far as Stromboidea are concerned. We didn't check other (super)families. Note that "Boltenii" does not stand for a subspecies, but means "of Bolten", i.e., the one who gave the name. We were able to locate three names that were really introduced in the catalogue compiled by Röding, viz. # 4708 (*Str. turturellus* Boltenii), ex Bolten collection, and therefore to be regarded as a genuine type specimen (vide infra), # 4664 (*Str. albidus* Boltenii), ex Schröter collection (vide infra), that appears as a nomen nudum, i.e., without any further reference, in the Röding catalogue, vide infra; and # 4742 (Abänderung [...] *Str. venustus* Boltenii), ex Röding (vide infra). *Lambis melanostomus* and *L. brunus* were mentioned in neither the Röding catalogue, nor the Noodt catalogue. *Strombus melanostomus* Boltenii is mentioned in the synonymy of *S. urceus* (= *Canarium urceus*), and three specimens identified by Schmidt as *S. brunus*, ex Schröter collection, are here identified as *Canarium labiatum* (Röding, 1798) and *C. urceus*, vide infra.

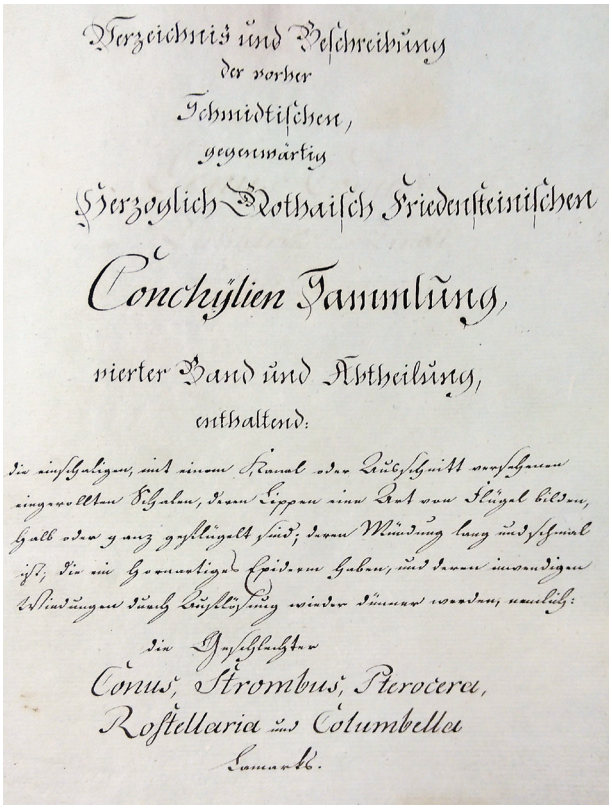

Verzeichnis und Beschreibung
der vorher
Schmidtischen,
gegenwärtig
Herzoglich Gothaisch Friedensteinischen
Conchylien Sammlung,
vierter Band und Abtheilung,
enthaltend:
die einschaligen, mit einem Kanal oder Ausschnitt versehenen eingerollten Schalen, deren Lippen eine Art von Flügel bilden, halb oder ganz geflügelt sind; deren Mündung lang und schmal ist; die ein hornartiges Epiderm haben, und deren inwendigen Windungen durch Auflösung wieder dünner werden, nemlich:
die Geschlechter
Conus, Strombus, Pterocera,
Rostellaria und Columbella
Lamarck.

Fig. 7. Front page of the "Schmidt"-catalogue, vol. 4. Text reads: "Verzeichnis und Beschreibung der vorher Schmidtischen gegenwärtig Herzoglich Gothaisch Friedensteinischen Conchylien Sammlung, vierter Band und Abtheilung, enthaltend: die einschaligen, mit einem Kanal oder Ausschnitt versehenen eingerollten Schalen, deren Lippen eine Art von Flügel bilden, halb oder ganz geflügelt sind; deren Mündung lang und schmal ist; die ein hornartiges Epiderm haben, und deren inwendigen Windungen durch Auflösung wieder dünner werden, nemlich: die Geschlechter *Conus*, *Strombus*, *Pterocera*, *Rostellaria* und *Columbella* Lamarcks." Photograph: Angela Biermann.

In his catalogue Schmidt adopted the Lamarckian system and hence used names introduced by Lamarck. From the introduction to the part on *Strombus,* it is clear that he had access to other works as well; next to the system used by Lamarck, he also mentioned Linnaeus, Bruguière, Montfort and Schuhmacher. Names of species generally fol-

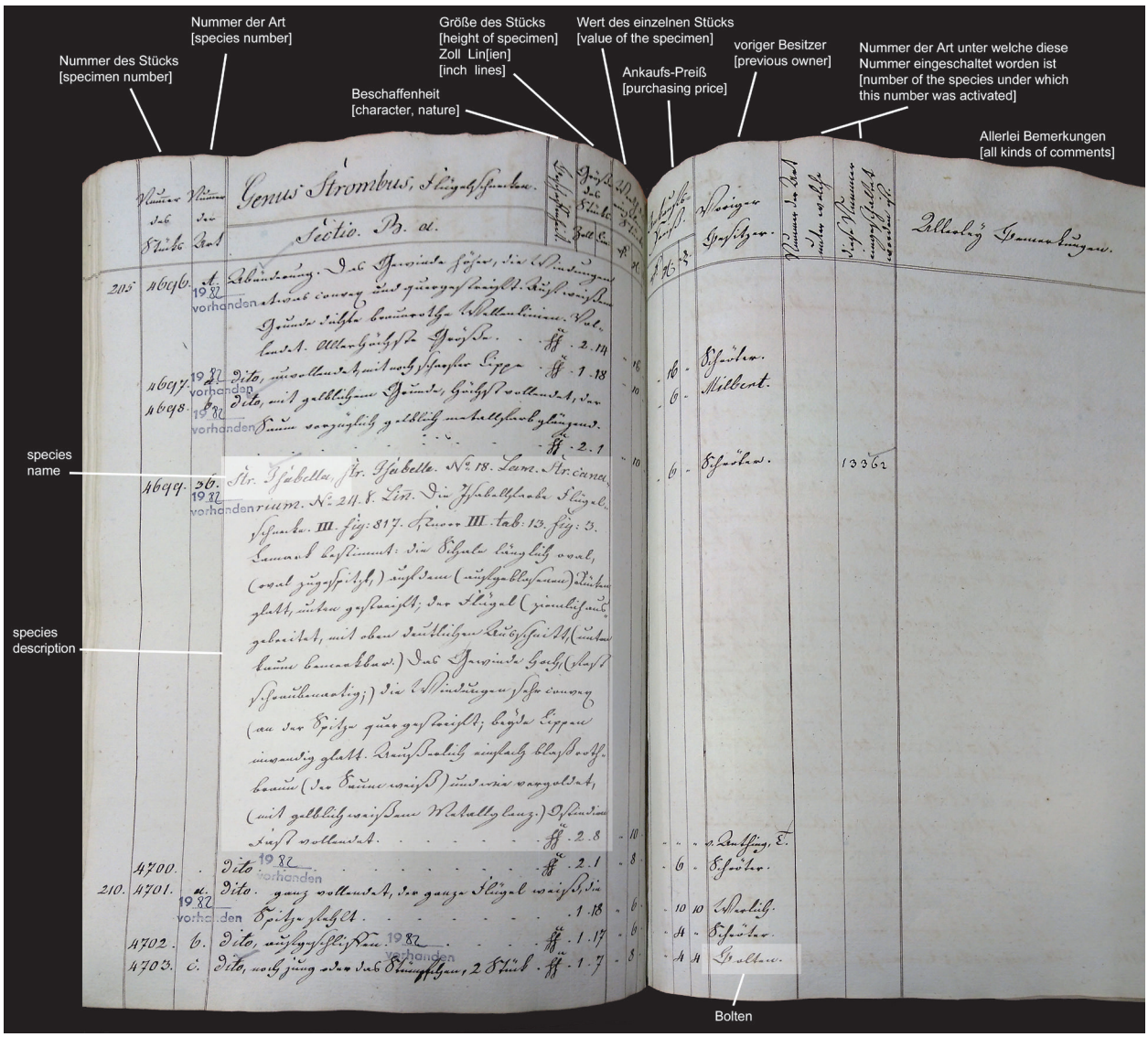


Fig. 8. Entries in the Schmidt-catalogue. Note the entry to # 4699, that reads "*Strombus Isabella*" with reference to Lamarck and other sources, followed by a description. The previous owner of # 4703 is indicated as "Bolten", i.e. a specimen acquired during the auction of the Bolten collection. Photograph: Angela Biermann.

low Linnaeus and Lamarck, and only if he could not find a name given by Lamarck (or Linnaeus or Gmelin) or had doubts (such as in the case of *Strombus isabella* / *S. turturella*), Schmidt used names coined by Röding or others. In other cases, Schmidt was convinced that in his collection he had species not named before, or Schmidt wasn't aware of existing names, and gave new names (accompanied by "mihi"). All these names are unavailable from Schmidt, as it are manuscript names only (i.e. they are mentioned only in the handwritten catalogue). For Stromboidea, we found:

4514 *Str*[*ombus*] *trigonus* mihi [do not confuse with *Strombus trigonus* Grateloup, 1834]

4543 *Str*[*ombus*] *gibbus* mihi [do not confuse with *Gallinula gibba* Schröter, 1788 (= *Laevistrombus canarium* (Linnaeus, 1758))]

4549 *Str*[*ombus*] *aurantius* mihi

4612 *Str*[*ombus*] *plicatissimus* mihi

4620 *Str*[*ombus*] *laevissimus* mihi; this entry is somewhat hidden under *Str*[*ombus*] *turritus* Schröteri

4621 *Str*[*ombus*] *acus* mihi

4632 *Str*[*ombus*] *australis* mihi *Str*[*ombus*] *vittatus australis* = *Doxander campbellii*

4636 *Str*[*ombus*] *vittatus* No 22δ Lin. *Str*[*ombus*] *marisrubri* mihi

4646 *Str*[*ombus*] *densestriatus* mihi

4675 *Str*[*ombus*] *notatus* mihi

4830 *Str*[*ombus*] *eburneus* mihi

4858 *Str*[*ombus*] *nivosus* mihi

4868 *Str*[*ombus*] *zeelandia novei* mihi [= *Euprotomus vomer* (Röding, 1798)]

4906 *Pterocera camelus* mihi

4914 *Pterocera* unbestimmt *Pterocera inflata* mihi
4927 *Pterocera novempeda* mihi [= *Ophioglossolambis digitata* (Perry, 1811)]
4934 *Pterocera multipes* mihi [= *Ophioglossolambis violacea* (Swainson, 1821)]
4946 *Rostellaria pesanseris* mihi
10471 *Stellaria orbiculata* mihi [= *Stellaria solaris*]

A further discussion on the identity of these species is beyond the scope of this paper. Only specimens named as above that are ex Bolten collection or ex Röding, when encountered in the MNG collection, are discussed below.

Note that the original spelling of the epithet "*campbellii*" in the nominal taxon *Strombus campbellii* in Griffith & Pidgeon (1833: pl. 25, fig. 6) ends with "*-ii*" [the original spelling is also with capital "*C*"]. The epithet "*campbellii*" is a correct original spelling (ICZN, 1999: Art. 32.2). A quick search however revealed that the majority of subsequent authors spelled the epithet as "*campbelli*", the only exceptions we found are Kiener (1843: 55, caption pl. 25 fig. 2 [as *Strombus cambellii* [sic!]); and Küster (1845: 68; note: pl. 15 fig. 2 is not this species) whereas G.B. Sowerby II (1842: 26); Reeve, 1851: caption to pl. 17; Chenu (1859: 257, caption fig. 1600); Tryon (1885: 115, 148 caption to pl. 5 fig. 46); Smith (1940: 34, 35); Abbott (1960: 38 caption to pl. 17, 114); Man in 't Veld & Visser (1993: 29); and Liverani (2013: 40) all used the spelling "*campbelli*". Although we did not conduct a thorough search though literature, it seems that the spelling "*campbelli*" is in prevailing usage according to the definition of the ICZN (1999: 121). However, according to ICZN, 1999 Art. 33.4 the original spelling may not be altered, so the correct spelling of the epithet is "*campbellii*".

Perhaps Schmidt intended to publish the complete catalogue as a printed work, as he discussed the systems mentioned here above, provided large introductions to and descriptions of genera and descriptions of species. If so, this never happened. Schmidt started to work on the part on *Strombus*, *Pterocera* and *Rostellaria* after 15 February 1827.

Schmidt grouped specimens in his catalogue hierachically: First "Genus" (e.g. *Strombus*, *Pterocera*, *Rostellaria*), each "Genus" was divided into several "Sectio" (e.g., "A. Mit schmalem Flügel oder Halbgeflügelte" (With small wing or halfwinged)), which were further subdivided into unnamed subsections "a", "b", ... (e.g., "b. Wenn Flügel sich oben an den Bauch, oder an die erste Windung anschließt und mit thurmförmigem Gewinde" (When the wing joins the belly (last whorl) or the first whorl and has a turreted spire)). The next subdivision is a catalogue entry like "4622.19. *Str. turritus* ...", which demonstrate Schmidt's species concept, with, in a lot of cases, additional information about a specific specimen (e.g. "Die Farbe weiß mit etwas gelb unterlaufen." (Colour white undershot with little yellow)). Further specimens in this species follow with the entry "dito" and often with specimen level details like "unvollendet" (unfinished, which could stand for juvenile, immature or subadult; for terminology see Savazzi (1991). These specimen level details often make it possible to identify specimens, which had lost the collection number. We were able in a few cases to identify shells taking these catalogue details into consideration (vide infra).

Schmidt gave for every shell the height measurement. The transfer of his measurements into metric measurements is connected to three error sources:

The system, that Schmidt used: At that time the standard measurement was in "Zoll" [Inches] and in "Linien" [Lines], with 12 Linien = 1 Zoll. (Langhof et al. 2006). But Schmidt although using "Zoll" and "Linien" seems to have used another system. The number of "Linien" in the catalogue goes up to 19 "Linien" for some shells, independent from the number of "Zoll". The conclusion is that he used a system of 20 Linien = 1 Zoll. This is confirmed by statistics of the measurements of shells, where we have both, the Schmidt measurement and a measurement in the metric system. Correlating both, you get that Schmidt uses a system, where "1 Zoll = 20 Linien", with 1 "Linie" = 1.3423 mm and 1 "Zoll" = 26.8460 mm (Coefficient of determination for the linear regression: $R^2 = 0.97$). This still results in an error of ±4 mm for an 80-100 mm shell.

The transcription of the original Schmidt draft catalogue to the "Reinschrift", whoever has done that, might include transcription errors.

Last but not least, the measurement itself may be faulty.

All three possible errors can accumulate and especially the second one can lead to high discrepancies between Schmidt's catalogue entry and the measurement of the real object. Consequently Schmidt's measurements have to be taken with care.

Auction of the Bolten collection

The auction was announced for 26 April 1819 (title page Noodt Catalogue) but was either held on two separate days, or delayed, as according to Semper (1876: 122), the auction was held on 21 June 1819. Among the buyers, there were in alphabetical order: von Bergen, Gorrissen, Hertz, Höhnert, Maltz, Meyer, Noodt, Röding (!), Schultz, and Schmidt (Semper, 1876). Noodt, as a buyer, may have been acting on behalf of persons not present (Semper, 1876: 123). In all probability, the Stromboidea did not yield high prices as they were not mentioned in the listing of high prices as given by Semper (1876: 123-124). Semper (1876: 123) also noted: "(...) ob von den Sammlungen, welche sich im Besitz der übrigen genannten befunden haben, heutzutage noch irgend etwas vorhanden sein mag, ist mir unbekannt. Nur die Röding'sche ist, wie ich glaube, zum grössten Theil in den Besitz des Hamburgischen Museums übergegangen.".

("... whether any of the collections in the possession of the others mentioned, are still in existence today, I do not know. Only Röding's, I think, has substantially become the property of the Hamburg Museum."). However, Röding as a dealer of natural curiosities may very well have sold specimens he acquired from the auction to other collectors, among them Schmidt, but also outside "Germany" (note: Germany was at that point in history not the political unit it is nowadays).

MATERIALS AND METHODS

In the first part, we present a listing of all species names we encountered in both editions of the Museum Boltenianum (Röding, 1798; Noodt, 1819) and discuss these briefly. In the second part, we are only listing those specimens found in MNG that are connected to the Bolten collection with certainty, or have a connection indicated as "Röding" or "Röding Naturalienhändler", following the same order as they appear in the catalogue compiled by Schmidt. We only accept specimens with an entry "Bolten" as specimens from the Bolten collection with 100% certainty. In the catalogue compiled by Schmidt, we can read under "Verzeichnis" at the end of the section on Strombus (No. 2): "Bolten, Cabinet, Auction". Specimens with an entry Röding (as "Naturalienhändler") cannot be accepted as such unreservedly, and therefore we list them as being putative ex Bolten.

Of all the entries in the Schmidt catalogue, only six specimens allocated to *Lambis* sensu Röding "Verzeichnis", second entry; two specimens allocated to *Tibia* sensu Röding; and one specimen of *Terebellum* sensu Röding were bought at the Bolten auction.

Unfortunately, we haven't been able to trace some of the Schmidt catalogue entries referred to as originating from the Bolten Auction. Some parts of the Schmidt collection could be reconstructed by using Schmidt's detailed catalogue entries. These all will be discussed at the respective places in which they appear in the Schmidt catalogue.

Specimens were photographed with a Canon EOS 700d. Photos of ventral and dorsal view were taken of all specimens having a catalogue number pointing to the Schmidt collection. All labels were documented. A scale (a coin) was added to the photos. Catalogue pages were photographed with mobile phone cameras.

Taxonomy largely follows Liverani (2013), who compiled the most recent comprehensive review of Stromboidea.

Abbreviations: GCK = Gijs C. Kronenberg; ICZN = International Code of Zoological Nomenclature; MHNG = Museum d'Histoire Naturelle Geneva, Switzerland; MNG = Museum der Natur, Gotha, Germany; NHMUK = Natural History Museum, London, UK; UW = Ulrich Wieneke; ZMUC = Zoological Museum University of Copenhagen, Denmark.

MUSEUM BOLTENIANUM

During the preparation of this paper, we found that some of the names introduced by Röding were not correctly interpreted by subsequent authors in their synonymies or chresonymies for some of the species, or never mentioned in synonymies or chresonymies. However, in a number of cases the identity of these species could be established. Many of Röding's names are indirect references, i.e., references to Gmelin (1791) only, but they constitute an indication of the species intended in the sense of ICZN Art. 12.2.1. Identifications for illustrations in Favanne referred to by Röding have been provided by Kronenberg (2012). For the other works, we identified the illustrations ourselves.

Here we list all entries of the Museum Boltenianum of species now allocated to Stromboidea, including Xenophoridae, in the order as they appeared in that catalogue. Note that subdivision into "groups" by Röding in his Museum Boltenianum is by no means an attempt to discriminate subgenera, but rather an indication of the character of the outer lip. Each entry starts with the sample number of the Bolten collection in the Röding catalogue, followed (after the vertical line) by the species number (as given by Röding) of the genus under discussion. Thereafter, sample and species number as it appeared in the Noodt catalogue is added in square brackets, followed by the entry as it appears in the Röding catalogue. For the exact citation of the Röding catalogue, we used the electronic version from the Biodiversity Heritage Library (https://www.biodiversitylibrary.org/bibliography/10588), which is of better quality compared to the reprint.

Pyramis. Die Piramide

Pyramis Röding, 1798: 58. Type species by subsequent designation Winckworth (1945: 144) *Pyramis striata* Röding, 1798 (= *Strombus pugilis* Linnaeus, 1758). Non *Pyramis* Schumacher, 1817 [= *Tectus* Montfort, 1810 a genus in Trochoidea, Tegulidae], nec *Pyramis* Otto, 1823 [= *Abylopsis* Chun, 1888 a genus in Cnidaria, Abylidae], nec *Pyramis* T. Brown, 1827 [a taxon inquirendum in Pyramidelloidea, Pyramidellidae].

Remarks. — Dall (1906) mentioned Röding genera and presented equivalents by Lamarck or subsequent authors. In his listing, Dall (1906: 294) lists *Pyramis* as:

"Pyramis (*immature shells*). **Strombus* Linné, 1758."

Dall (1906: 294) used the asterisk: "When the equivalence is exact, the prior name is preceded by an asterisk as an indication that it will take precedence.". In other words, Dall (1906) considered *Pyramis* Röding, 1798 to be a junior synonym of *Strombus* Linnaeus, 1758, but did not designate a type species.

Winckworth (1945: 144) literally wrote: "Type, here designated *P. striata* R.[öding] = young *Strombus pugilis* L., 1758 from the figure quoted. The other reference, *Murex conchlidium* Gmelin is incorrect: possibly it should have been attached to the preceding species, *P. harpa* R.[öding]. *Pyramis* is thus an exact synonym of *Strombus* L., 1758.".

730 | 1 [730...1]. *P. Lucifer* Das Kamehl–Horn. Gmel. *Strombus lucifer* sp. 19. Martini 3. t. 90 f 881. 13 St.
Remarks. — The figure in Martini (1777: pl. 90 fig. 881) is identified here as a juvenile of *Strombus gigas* Linnaeus, 1758. *Strombus lucifer* Linnaeus, 1758 is generally accepted as a juvenile of *S. gigas*, currently assigned to *Lobatus* Swainson, 1837.

731 | [731...—]. ——— α. ——— 5 St.
Remarks. — No additional reference to distinguish it from # 730.

732 | 2 [732...2]. *P. Gallica* Die französische Piramide. d'Argenv. 33. fig. 10 6 St.
Remarks. — Plate 33 in Dezallier d'Argenville (1742) is titled "Coquillage fossils", and the image was identified by Pacaud & Pons (2013: 22) as *Athleta* (*Volutospina*) *spinosus* (Linnaeus, 1758), family Volutidae.

733 | 2 [733...2]. **P. Harpa* Die Harfen – Piramide. 1 St.
Remarks. — Nomen nudum.

734 | 3 [734...3]. *P. Striata* Die gestreifte Piramide Gmel. *Murex cochlidium*. sp. 63. Martini 3. t. 90 f. 882. 5 St.
Remarks. — The additional reference to Martini (1777: pl. 90 fig. 882) shows a juvenile *Strombus pugilis* Linnaeus, 1758. *Pyramis striata* Röding, 1798 is a junior subjective synonym of *S. pugilis*.

735 | 4 [735...4]. *P. Volutata*. Die eingerollte Piramide. Knorr 5 t. 9 fig. 5. 6 St.
Remarks. — The reference to Knorr (1757: pl. 9 fig. 5) shows a juvenile strombid, here tentatively identified as *Lobatus raninus* (Gmelin, 1791).

736 | 5 [736...5]. *P. Conoidea*. De kegelförmige Piramide. Martini 3. t. 91. f. 893. 4 St.
Remarks. — The reference to Martini (1777: pl. 91 fig. 883) is identified here as a juvenile of *Lobatus raninus* (Gmelin, 1791).

737 | 6 [737...6]. *P. Crenulata*. Die gerillte - Piramide. Martini 3. t. 90. f. 883. 3 St.
Remarks. — The reference to Martini (1777: pl. 90 fig. 883) is surely a juvenile strombid. It cannot be identified with 100% certainty, but it is very likely to be a juvenile of *Strombus alatus* Gmelin, 1791. The Pfeiffer version reads: Die gerillte Piramide.

Lambis. Die Flügel-Schnecke.

Lambis Röding, 1798: 61. Type species by tautonomy *Lambis lambis* Röding, 1798 (= *Strombus lambis* Linnaeus, 1758)

1. *Alis – retractis*. Mit eingezogenem Flügel.

768 | 1 [768...1]. *L. Pugilis*. Der Fechter. Fleisch-Schn. Gmel. *Strombus pugilis*. sp 13. Martini 3. t. 84. f. 838. 39. 4 St.
Remarks. — The additional reference to Martini (1777: pl. 84 figs 838-839) is puzzling, as these figures clearly depict *Euprotomus aurisdianae* (Linnaeus, 1758), see also # 816. *Strombus pugilis* is illustrated in Martini (1777) on pl. 81, figs 830-831. *Strombus pugilis* Linnaeus, 1758 is a valid species; it is the type species of the genus *Strombus*.

769 | [769...—]. ——— α. ——— 8 St.
Remarks. — No additional reference to distinguish it from # 768.

770 | [770...—]. ——— β. ——— 2 St.
Remarks. — No additional reference to distinguish it from # 768.

771 | [771...—]. ——— γ. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 768.

772 | 2 [772...2]. *L. Venusta*. Die gebandete Flügel-Schn. Gmel. *Strombus pugilis*. sp. 13. 1 St.
Remarks. — Clench & Abbott (1941) did not list *Lambis venusta* in any of their synonymies on either *Strombus pugilis* Linnaeus, 1758 or *S. alatus* Gmelin, 1791. To our knowledge, the name *Lambis venusta* never re-appeared in malacological literature. The vernacular name "Die gebandete Flügel Schn.", in combination with the reference to Gmelin implies a specimen of *S. pugilis* Linnaeus, 1758 with a banded pattern. We thus consider *Lambis venusta* Röding, 1798 a junior synonym of *S. pugilis*.

773 | 3 [773...3]. *L. Elegantissima*. Die sehr schöne Flü-Schnecke Gmel. *Strombus fasciatus*. sp 9. Martini 3. t 78. f 800-802. Chemn. 10. t. 155. f. 1483. 1484. 7 St.
Remarks. — Both Röding's references are illustrations of *Strombus fasciatus* Born, 1778. Apart from specimens present in the Imperial collection, Born (1778: 275) referred to Martini 3, pl. 78 figs 800-802, the same figures as Röding's first reference. *Lambis elegantissima* Röding, 1798 is a junior synonym of *S. fasciatus* Born, 1778, currently known as *Conomurex fasciatus* (Born, 1778). Gmelin's references – among others to Martini (1777: pl. 82 figs 833-834) – are knobbed specimens of *Strombus latus* Gmelin, 1791, currently allocated to *Persististrombus* Kronenberg & Lee,

2007. *Strombus fasciatus* Gmelin, 1791 is a junior homonym of *S. fasciatus* Born, 1778.

774 | 4 [774...4]. *L. Luhuana.* Die Löhonische Flügel-Schnecke. Gmel. *Strombus luhuanus.* sp. 16. Martini 3 t. 77. f 789 790. 11 St.

Remarks. — The additional reference to Martini (1777: pl. 77 figs 789-790) clearly show *S. luhuanus* Linnaeus, 1758. *Strombus luhuanus* is the type species of *Conomurex* and is currently known as *Conomurex luhuanus* (Linnaeus, 1758). The Noodt entry extends the Röding entry by adding: "wovon 1 Stück durchgeschnitten" (of which one is cut through).

775 | [775...—]. ——— α. ——— Martini 3. t. 77. f. 791. 7 St.

Remarks. — The reference to Martini (1777: pl. 77 fig. 791) shows a dorsal view of a specimen of *Conomurex luhuanus* without colour pattern, i.e. completely white.

776 | [776...—]. ——— β. ——— 2 St.

Remarks. — No additional reference to distinguish it from # 774 or # 775.

777 | 5 [777...5]. *L. Decora*. Die zierliche Flügel Schneeke. Gmel. *Strombus luhuanus.* sp. 16 γ. Chemn. 10. t. 157. f. 1499. 1500. 6 St.

Remarks. — Of the additional references to Chemnitz (1788: pl. 157 figs 1499-1500), fig. 1499 has been re-illustrated by Kronenberg et al. (2009: figs 1-2). It clearly shows this species, and has been designated as representing the lectotype of *Lambis decora* by Kronenberg et al. (2009: 660). One juvenile specimen of *Lambis decora*, ex Bolten collection, is present in MNG, collection number 4512. The whereabouts of the other specimens from the Bolten collection is unknown. See section under the collection in MNG for further discussion. This is a valid species, currently allocated to the genus *Conomurex* as *Conomurex decorus* (Röding, 1798). The German spelling Schneeke is clearly an error for Schnecke. In Noodt (1819: 44) this spelling was corrected.

778 | [778...—]. ——— α. ——— 1 St.

Remarks. — No additional reference to distinguish it from # 777. Röding made this a "var.". In doing so, he may have intended the juvenile specimen that is present in MNG, where the pink colour inside the aperture is not present, vide infra.

779 | 6 [779...6]. *L. Carinata*. Die ausgehöhlte Flügel-Schnecke. Gmel. *Strombus marginatus.* sp. 15. Chemn 10. t. 156. f. 1489. 1490 Martini 3. t. 79. f. 816. 4 St.

Remarks. —Both Martini (1777: pl. 79 fig. 816) and Chemnitz (1788: pl. 156 figs 1489-1490) depict a specimen of *Strombus marginatus* Linnaeus, 1758. *Lambis carinata* Röding, 1798 is a junior subjective synonym of *Margistrombus marginatus* (Linnaeus, 1758), the type species of *Margistrombus* Bandel, 2007. The specimen illustrated in Chemnitz (1788: pl. 156, fig. 1489) was designated lectotype of *L. carinata* by Visser & Man in 't Veld (2005: 58).

780 | [780...—]. ——— α. ——— 1 St.

Remarks. — No additional reference to distinguish it from # 779.

781 | 7 [781...7]. *L. Succincta*. Die kanarien Flügel-Schn. Gmel. *Strombus succinctus.* sp. 26. Martini 3. t. 79. f. 815. 8 St.

Remarks. — The name *Strombus succinctus* has been extensively discussed by Kronenberg (2008). The illustration by Martini (1777: pl. 79 fig. 815), referred to by Röding does not show the dorsal hump, a character of *Margistrombus succinctus* auct., but is, like the majority of Linnaeus' (1767) references a specimen of what is currently known as *Margistrombus septimus* (Duclos, 1844).

782 | 8 [782...8]. *L. Gibberula*. Die puckligte Flügel Schn. Gmel. *Strombus gibberulus.* sp. 17. Martini 3. t. 27. f. 795. 796. Knorr 2. t. 14. f. 3. & 3. t. 13. f. 4. 9 St.

Remarks. — Röding's reference to Martini pl. 27 is in error. Figures 795 and 796 are in the third volume of Martini (1777) on pl. 77. These are indeed the nominal species *Strombus gibberulus* Linnaeus, 1758. In contrast, the illustration in Knorr (1757: part 2, pl. 14 fig. 3) is a specimen of *Canarium mutabile* (Swainson, 1821) and the other illustration in Knorr (1757: part 3, pl. 13 fig. 4 seems to be a specimen of *Margistrombus robustus* (G.B. Sowerby III, 1875).

This is *Strombus gibberulus* Linnaeus, 1758, a valid species and type species of *Gibberulus* Jousseaume, 1888, currently known as *Gibberulus gibberulus* (Linnaeus, 1758).

783 | [783...—]. ——— α. ——— 1 St.

Remarks. — No additional reference to distinguish it from # 782.

784 | [784...—]. ——— β. ——— 2 St.

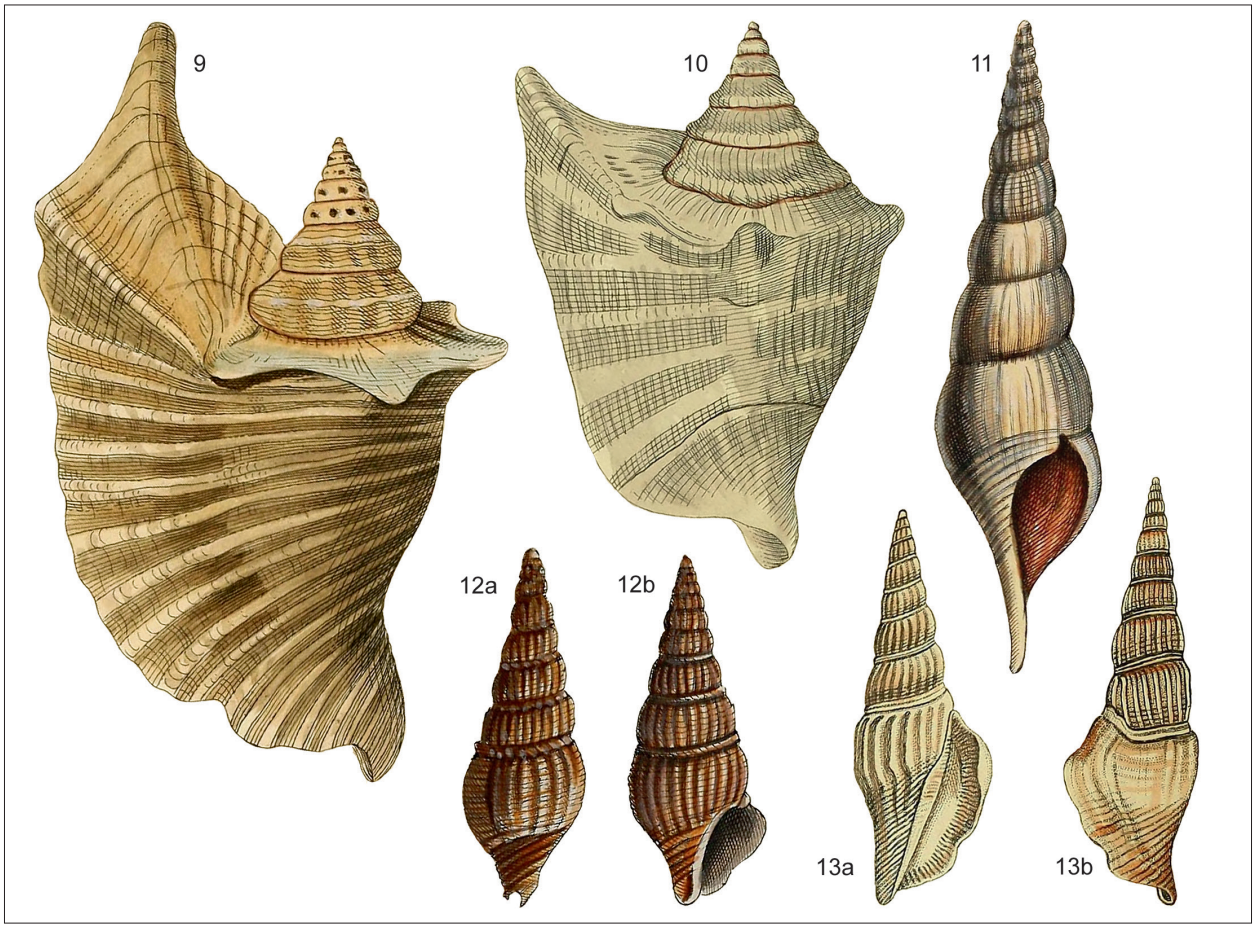
Remarks. — No additional reference to distinguish it from # 782.

785 | [785...—]. ——— γ. ——— 1 St.

Remarks. — No additional reference to distinguish it from # 782.

786 | 9 [786...9]. *L. Gibbosa* Die höckrigte Flügel-Schn. *Strombus gibberulus.* sp. 17. Martini 3. t. 27. f. 794. 11 St.

Remarks. — Röding's reference to Martini pl. 27 fig. 794 is in error. Figure 794 is in the third volume of Martini (1777)



Figs 9-13. Illustrations representing type specimens of names coined by Röding (1798) within Stromboidea. **Fig. 9.** *Lobatus gallus* (Linnaeus, 1758), figure from Martini (1777: pl. 85 fig. 846), representing lectotype, designated herein, of *Lambis velum* Röding, 1798, locality and measurements unknown. **Fig. 10.** *Tricornis tricornis* ([Lightfoot], 1786), figure from Martini (1777: pl. 85 fig. 847), representing a paralectotype of *Lambis velum* Röding, 1798, locality and measurements unknown. **Fig. 11.** *Tibia fusus* (Linnaeus, 1758), juvenile, figure from Chemnitz (1780: pl. 159 fig. 1502), representing lectotype, designated herein, of *Lambis contorta* Röding, 1798; locality and measurements unknown. **Figs 12a-b.** ? *Crassispira* sp. **12a.** Figure from Chemnitz (1780: pl. 159 fig. 1503), representing a paralectotype of *Lambis contorta* Röding, 1798, locality and measurements unknown. **12b**. Figure from Chemnitz (1780: pl. 159 fig. 1504), probably the same specimen as Fig. 12a. **Figs 13a-b.** *Doxander operosus* (Röding, 1798) comb. nov.. **13a.** Figure from Chemnitz (1788: pl. 155 fig. 1482, apertural view), representing the lectotype of *Turris operosa* Röding, 1798, locality and measurements unknown. **13b.** Figure from Chemnitz (1788: pl. 155 fig. 1481, dorsal view), probably another view of the specimen figured in Chemnitz (1788: pl. 155 fig. 1481).

on pl. 77. Abbott (1960: 144) noted: "To our knowledge no type exists". Although we did not find a specimen directly linked to the Bolten collection in MNG, this does not necessarily mean that there are no syntype specimens in existence. Röding (1798: 62) noted eleven specimens in the Bolten collection, and the whereabouts of these specimens and the specimen referred to by Röding, viz. Martini (1777: pl. 77 fig. 794) are at present unknown. Valid species, currently allocated to the genus *Gibberulus* Jousseaume, 1888 as *Gibberulus gibbosus* (Röding, 1798).

787 | [787...—]. ——— α. ——— 6 St.
Remarks. — No additional reference to distinguish it from # 786.

788 | [788...—]. ——— β. ——— 3 St.
Remarks. — No additional reference to distinguish it from # 786.

789 | 10 [789...10]. *L. Albida*. Die weisse Flügel-Schnecke. 6 St.
Remarks. — Nomen nudum. The German vernacular name accompanying this entry, "Die weisse Flügel Schnecke" provides no real clue to its possible identity. However, taking its place in the catalogue into account, i.e., directly after *L. gibbosa*, this may reflect the species currently known as *Gibberulus albus* (Mörch, 1850), a Red Sea endemic. It should be noted however, that not all specimens of *G. albus* are white (as suggested by the name), and specimens of *G. gibberulus* can be white (pers. obs. GCK, UW). Vide infra.

790 | 11 [790...11] *L. Dentata*. Die gezähnelte Flügel-Schnecke. Gmel. *Stromb. clavus*. sp. 7. Chemn. 10. t. 157. f. 1501. 1502. 2 St.

Remarks. — Gmelin's references depict two different species. In the original description of *Strombus clavus* (Linnaeus 1771: 549) reference was only made to a figure in Dezalier d'Argenville (1742, pl. 13 fig. D) which is a juvenile species of *Tibia* (see Kronenberg, 2012: 8). Gmelin (1791: 3510, species 7) referred to Linnaeus' Mantissa (1771); the figure in Dezalier d'Argenville (1742), and added a reference to Chemnitz (1788: pl. 157 figs 1501-1502). This is rather puzzling, as Chemnitz's figures clearly depict another species, i.e., the nominal species *Strombus dentatus* Linnaeus, 1758. *Lambis dentata* Röding, 1798 is a secondary homonym and a synonym of *Strombus dentatus* Linnaeus, 1758, the type species of the genus *Tridentarius* Kronenberg & Vermeij, 2002.

791 | [791...—]. ——— α. ——— 2 St.

Remarks. — No additional reference to distinguish it from # 790.

792 | 12 [792...12]. *L. Fragilis*. Die zerbrechliche Flügel-Schnecke. Gmel *Strombus tridentatus* sp 30. Chemn. 10. t. 157. f. 1503. 3 St.

Remarks. — The additional reference to Chemnitz (1788: pl. 157 fig. 1503) clearly shows this species and should be regarded as an illustration of a syntype of *Lambis fragilis*. The whereabouts of the specimens from the Bolten collection are unknown. *Lambis fragilis* is the type species of the genus *Terestrombus* Kronenberg & Vermeij, 2008, currently known as *Terestrombus fragilis* (Röding, 1798).

793 | 13 [793...13]. *L. Picta*. Die gemahlte Flügel-Schn. Gmel. *Stromb. latissimus*. sp. 21. Martini 3. t. 89. f. 874. 2 St.

Remarks. — Gmelin (1791: 3516) discriminated a var. α and a var. β. In his var. α, Gmelin referred to an illustration in Seba, and the illustration in Martini (1777: pl. 89 fig. 874) referred to by Röding. The illustration in Martini is a juvenile specimen of the nominal species *Strombus latissimus* Linnaeus, 1758, and once was in the Bolten collection (Martini, 1777: 167) as "*Alaria luxurians* in juventute". *Lambis picta* Röding, 1798 represents a juvenile of *S. latissimus* and is a junior subjective synonym of *S. latissimus*, as already indicated by Martini (1777: 167) and Abbott (1960: 58). Currently allocated to *Sinustrombus* Bandel, 2007.

793[a] | 13 [793[a]...13]. α *L. Ventricosa*. Die bauchigte Flügel-Schnecke. 1 St.

Remarks. — Nomen nudum. The German vernacular name accompanying this entry, "Die bauchigte Flügel-Schnecke", provides no real clue to its possible identity. It may be possible that this was first seen as a variety α of the preceeding species, i.e. *Lambis picta*, but after a change of mind got a new name. The entry "13a" as such is also a bit confusing. There are two possibilities: (1) Röding made a miscount. Both sample number "793" and species number "13", i.e., the thirteenth species recognized by Röding, appears for the second time. This was solved by inserting an "a" after the number, so copied by Noodt,. The other possibility (2) is that Röding realized that *L. ventricosa* was the same as *L. picta*.

794 | 14 [794...14]. *L. Rosea*. Die rosenrothe Flügel-Schnecke. 1 St.

Remarks. — Nomen nudum. The German vernacular name accompanying this entry, "Die rosenrohte Flügel-Schnecke", provides no real clue to its possible identity.

795 | [795...—]. ——— α. ——— 1 St.

Remarks. — Nomen nudum; no (additional) reference to distinguish it from # 794.

796 | 15 [796...15]. *L. Lentiginosa*. Die Sommersprosse. Gmel *Strombus lentiginosus*. sp. 8. Martini 3. t. 91. f. 892. 3 St.

Remarks. — Gmelin (1791: 3510, sp. 8) distinguished three distinct forms, viz. "typical"; var. α; and var. β, all three with references to published illustrations. In this case, the reference added by Röding to *L. lentiginosa*, an illustration in Martini (1777: pl. 91 fig. 892), is most important for the identification of what is intended. This reference is the same as one of the references added by Gmelin (1791) for his var. α, which is a juvenile shell, that cannot be identified with certainty. However, it may very well represent a juvenile of *Strombus lentiginosus* Linnaeus, 1758. Until the specimen illustrated by Martini is discovered, it is not clearwhat the identity is of Röding's species. See also # 802.

797 | 16 [797...16]. *L. Rubiginosa*. Die rostfarbene Flügel-Schnecke. 2 St.

Remarks. — Nomen nudum. The German vernacular name accompanying this entry, provides no real clue to its possible identity.

798 | 17 [798...17]. *L. Coriacea*. Die leberfarbene Flügel-Schnecke. 1 St.

Remarks. — Nomen nudum. The German vernacular name accompanying this entry, provides no real clue to its possible identity.

799 | 18 [799...18]. ! *L. Puellaris*. Die jugendliche Flügel-Schnecke. 1 St.

Remarks. — Nomen nudum. Despite the fact that this entry is accompanied by an exclamation mark in Rödings catalogue (1798: 63), indicating something extraordinary, there is no further reference to this specimen. The German ver-

nacular name accompanying this entry, might indicate a juvenile specimen.

800 | 19 [800...19]. *L. Grisea*. Die graue Flügel Schnecke. 2 St.
Remarks. — Nomen nudum. The German vernacular name accompanying this entry, "Die graue Flügel-Schnecke", provides no real clue to its possible identity.

801 | 20 [801...20]. ! *L. Cingulata*. Die gegürtelte Flügel-Schnecke. 2 St.
Remarks. — Nomen nudum. Two specimens were present in the Bolten collection, but despite the fact that this entry is accompanied by an exclamation mark in Röding's catalogue (1798: 63), indicating something extraordinary, there is no further reference. The German vernacular name accompanying this entry, provides no real clue to its possible identity.

802 | 21 [802...21]. *L. Rana*. Der Frosch Gmel. s*tromb. lentiginosus.* sp 8. Martini 3. t. 80. 81. f. 827 828. 7 St.
Remarks. — Röding's reference to Martini (1777) is somewhat inaccurate. The figs 827 and 828 both appear on pl. 81 (not 80!), and represent a specimen of the nominal taxon *Strombus lentiginosus* Linnaeus, 1758.

Abbott (1960: 118) listed *L. rana* in the synonymy of *S. lentiginosus* Linnaeus, 1758, considering it a replacement name by Röding for *S. lentiginosus*. This statement is considered not to be correct, as Röding did use the epithet "*lentiginosus*", vide supra, # 796, with a different additional reference, which is an indication that Röding considered his *L. rana* distinct from his *L. lentiginosa* (item 796). *Lambis rana* Röding, 1798 is a junior synonym of *S. lentiginosus* Linnaeus, 1758, the type species of *Lentigo* Jousseaume, 1886. The whereabouts of both Bolten's specimen and the specimen illustrated by Martini (1777: pl. 81 figs 827-828) are unknown.

Martini (1777: pl. 80 figs 825-826 and pl. 81 figs 827-828) illustrated specimens of respectively *Lentigo pipus* and *L. lentiginosus*, both represented in two views of one specimen. One of these specimens came from the Bolten collection (Martini, 1777: 118), although it is not clear which one. Oddly enough, Martini considered these two species conspecific as "*Alata lentiginosa*".

803 | [803...—]. ——— α. ——— 2 St.
Remarks. — No additional reference to distinguish it from # 802.

804 | 22 [804...22]. *L. Pipa*. Die Kröte. Gmel. *stromb. lentiginosus.* sp. 8. [additional reference to] Martini 3. t. 80. f. 825. 826. 2 St.
Remarks. — The additional reference to Martini (1777, pl. 80 figs 825-826) is an illustration of what is now accepted as *Lentigo pipus* (Röding, 1798).

805 | [805...—]. ——— α. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 794.

806 | 23 [806...23]. *L. Labiata*. Die Dicklippe. Gmel. *stromb. urceus* sp. 29 Martini 3. t. 78. f 804. 805. 8 St.
Remarks. — The additional reference to Martini (1777: pl. 78 fig. 804) shows the apertural view of a species that is currently known as *Canarium labiatum* (Röding, 1798). Martini's (1777: pl. 78 fig. 805 cannot be identified with certainty, although it may very well represent a specimen of *C. labiatum*.

807 | 24 [807...24]. *L. Urceus*. Der Schwarzmund. Gmel. s*trombus urceus.* sp. 29. Martini 3. t. 78. f. 803 – 6. Knorr 3. t. 13. f. 5. 7 St.
Remarks. —Röding's addition "Der Schwarzmund" is an indication that here the black mouthed morph of *Canarium urceus* (Linnaeus, 1758), viz. *C. ustulatum* Schumacher, 1817 is intended. And indeed, Martini's (1777: pl. 78 fig. 803) illustration shows such a specimen. The other figure referred to by Röding, viz. Martini pl. 78 fig. 806 looks more like a specimen of *C. labiatum*, but cannot be identified with certainty. The reference to Knorr (1757: part 3, pl. 13 fig. 5) is also the black mouthed morph of *C. urceus*. *Canarium ustulatum* is the type species of *Canarium* by monotypy (Abbott, 1960: 63). Röding's use of the specific epithet "*urceus*" as a noun agrees with the conclusion already made by Willan & Kronenberg (2004).

808 | 25 [808...25]. *L. Carnea*. Die hornigte Flügel-Schnecke. Gmel. s*tromb. fasciatus.* sp. 9. Martini 3. t. 82. f. 833. 834. 8 St.
Remarks. — The reference is not to *Strombus fasciatus* of Born (1778) which is a primary homonym of *S. fasciatus* Gmelin, 1791. Röding's additional reference to Martini (1777: pl. 83 figs 833-834) are without doubt illustrations of specimens of *Strombus latus* Gmelin, 1791, currently allocated to *Persististrombus* Kronenberg & Lee, 2007.

809 | 26 [809...26]. *L. Carnaria*. Die Fleischfarbene Flügel-Schnecke. Gmel. *Stromb. fasciatus.* sp. 9. Martini 3. t. 91. f. 893. 3 St.
Remarks. — The reference is not to *Strombus fasciatus* of Born (1778) which is a primary homonym of *S. fasciatus* Gmelin, 1791. Röding's additional reference to Martini (1777: pl. 91 fig. 893) is an illustration of a juvenile strombid. Abbott (1960: 123) considered this to be a juvenile specimen of *Persististrombus latus* (Gmelin, 1791). In our opinion, this identification is likely to be correct, taking its placement in the Röding catalogue into account, but we are not able to identify this illustration with certainty. Until the specimen illustrated by Martini is discovered, the name *Lambis carnaria* Röding should be considered a nomen inquirendum.

2. *Alis expansis*. Mit ausgedehnten Flügel.

810 | 27 [810...27]. *L. Turrita*. Die gethürmte Flügel-Schnecke. Martini 3. t 84. f. 841. 42. 1 St.
Remarks. — The reference to Martini (1777: pl. 84 figs 841-842) is an illustration of the nominal taxon *Strombus gallus* Linnaeus, 1758. *Lambis turrita* Röding, 1798 was not cited in the synonymy of *Aliger gallus* by Rosenberg (2009), see http://www.malacolog.org/search.php?nameid=2202 [accessed 26 July 2019]. However, Abbott (1960: 113) already indicated that *L. turrita* was a junior synonym of *S. gallus*, which was followed by Man in 't Veld & Visser (1993: 19). They indicated in their synonymy of *Strombus* (*Doxander*) *vittatus apicatus* that "*Strombus turritus* Lamarck, 1822: 212 [non Roeding, 1798 (*S. gallus*), (...)". We concur with these authors that *Lambis turrita* is a junior subjective synonym of *S. gallus*, currently allocated to the genus *Lobatus* Swainson, 1837. See also # 822.

811 | [811...—]. ——— α. ——— 1 St.
Remarks — No additional reference to distinguish it from # 810.

812 | 28 [812...28]. *L. Curruca*. Die Mücke Gmel. *Stromb. gallus*. sp. 11. Martini 3 t. 83. f. 836. 37. Favanne Tb. 21. fig. A. 4. 4 St.
Remarks. — The name *Lambis curruca* Röding, 1798 has been discussed by Kronenberg (2012). A lectotype for *L. curruca* has been designated by Landau et al. (2010). *Lambis curruca* is a junior subjective synonym of *Strombus raninus* Gmelin, 1791, the type species of *Lobatus* Swainson, 1837.

813 | [813...—]. ——— α. ——— 6 St.
Remarks — No additional reference to distinguish it from # 812.

814 | 29 [814...29]. *L. Bulla*. Der Kampfhahn Gmel. *Stromb. auris Dianae*. sp. 12. Martini 3. t. 84. f. 840. 7 St.
Remarks. — Martini's figures (1777: pl. 84 fig. 840) illustrate the dorsal side of a not fully adult specimen of Strombidae with a smooth dorsum, densely covered with whitish spots. Abbott (1960: 129) discussed the nomenclature of this species. It is accepted as a valid species, currently allocated to *Euprotomus* Gill, 1870, i.e. *Euprotomus bulla* (Röding, 1798). The whereabouts of the specimen illustrated by Martini and the seven specimens from the Bolten collection are unknown.

815 | 30 [815...30]. *L. Stiva*. Die Pflugsterze. Gmel. *Stromb. auris Dianae*. sp. 12. 2 St
Remarks. — Abbott (1960: 127) placed this name into the synonymy of *Strombus* (*Euprotomus*) *aurisdianae* Linnaeus, 1758, as being a substitute name for this species. *Lambis stiva* Röding, 1798 is considered a junior synonym of *Strombus aurisdianae*, currently known as *Euprotomus aurisdianae* (Linnaeus, 1758).

816 | 31 [816...31]. *L. Auris Diana*. Der Dianen-Flügel. Gmel. *Stromb. auris Dianae*. sp. 12. Martini 3. t. 84. f. 838, 839. 3 St.
Remarks. — Martini's figures (1777: pl. 84 figs 838-839) illustrate, without doubt, the nominal taxon *Strombus aurisdianae* Linnaeus, 1758, type species of *Euprotomus*, and currently known as *Euprotomus aurisdianae* (Linnaeus, 1758).

817 | [817...—]. ! ——— α. ——— sehr selten. 1 St.
Remarks. — No additional reference to distinguish it from # 816. Röding (1798: 64) added an exclamation mark and noted: "sehr selten" (very rare) to this specimen.

818 | [818...—]. ——— β. ——— 5 St.
Remarks. — No additional reference to distinguish it from # 816.

819 | 32 [819...32]. *L. Buris*. Das Eselsohr. Gmel. *Stromb. auris Dianae*. sp. 12. 3 St.
Remarks. — Abbott (1960: 127) put this name into the synonymy of *Strombus* (*Euprotomus*) *aurisdianae* Linnaeus, 1758, as being a substitute name for this species. *Lambis buris* Röding, 1798 is considered a junior synonym of *Strombus aurisdianae*, currently known as *Euprotomus aurisdianae* (Linnaeus, 1758).

820 | 33 [820...33]. *L. Aratrum*. Der Pflug. Gmel. *Stromb. auris Dianae*. Martini 1487. 1488. 1 St.
Remarks. — The additional reference by Röding is in error. Figures 1487 and 1488 are in Chemnitz (1788: pl. 156). These figures clearly show the species currently known as *Euprotomus aratrum* (Röding, 1798). An error was made by Noodt (1819: 46) with item 820: the spelling of the epithet *aratrum* is changed into *avatrum*. *Lambis avatrum* Noodt, 1819 is an incorrect subsequent spelling of *L. aratrum* Röding, 1798.

821 | 34 [821...34]. *L. Vomer*. Das Pflugschareisen. Gmel. *Stromb. auris Dianae*. Martini 1485. 1486. 1 St.
Remarks. — Röding's (1798: 64) reference to the work by Martini (1777), copied by Noodt (1819: 46), is in error. The figs 1485 and 1486 are on pl. 156 in the work by Chemnitz (1788), see also Kronenberg & Wieneke (2018). Lectotype designated by Kronenberg & Wieneke, 2018; vide infra.

822 | 35 [822..35]. *L. Gallus*. Der Engelsflügel. Gmel. *Stromb. gallus*. sp. 11. Martini 3. t. 84. f. 841. 842. Knorr 4. t. 12. f. 1. 5 St.
Remarks. — Martini's (1777) figures undoubtedly represent

the nominal species *Strombus gallus* Linnaeus, 1758. Oddly enough, Röding also referred to this illustration for his *L. turrita*, see # 810. The reference to Knorr (1757: part 4, pl. 12 fig. 1) is beyond doubt the same species. Currently allocated to *Lobatus* Swainson, 1837 as *Lobatus gallus* (Linnaeus, 1758).

823 | 36 [823...36]. *L. Velum*. Das Segel. Gmel. *strombus. gallus*. sp. 11. Martini 3. t. 85. f. 846. 847. 3 St.
Remarks. — Liverani (2013: 26) put *Lambis velum* in the synonymy of *Lobatus gallus*, following Rosenberg (2009), who referred to both illustrations in Martini (1777: pl. 85, figs 846-847) in his synonymy of *Aliger gallus*. Martini's figures cited by Röding (1798: 65) however, refer to two species; viz. fig. 846, which is a specimen of the nominal species *S. gallus* Linnaeus, 1758, here refigured Fig. 9, and fig. 847, which is a specimen of the nominal species *S. tricornis* [Lightfoot], 1786, here refigured Fig. 10. Neither Clench & Abbott (1941) in their review of living Western Atlantic Strombidae, nor Abbott (1960) in his review of Indo-Pacific Strombidae mentioned *Lambis velum* in their synonymies. To unambiguously fix the identity of *Lambis velum* Röding, 1798, the shell illustrated in Martini 1777, pl. 85 fig. 846, is here designated as lectotype (Fig. 9). This selection is in agreement with the synonymy, as published by Rosenberg (2009) and Liverani (2013). The present whereabouts of this specimen is unknown. The specimen illustrated in Martini 1777, pl. 85 fig. 847 becomes a paralectotype of *L. velum* by default (Fig. 10). The whereabouts of the three paralectotypes from the Bolten collection are unknown.

824 | [824...—]. ——— α. ——— 2 St.
Remarks — No additional reference to distinguish it from # 823.

825 | 37 [825...37]. *L. Velamen*. Die eingerollte bunte Flügel-Schnecke. Gmel. *strombus gallus*. sp 11. 2 St.
Remarks. — *Lambis velamen* Röding, 1798 is considered a junior synonym of the nominal species *S. gallus* Linnaeus, 1758, currently allocated to *Lobatus* Swainson, 1837.

826 | 38 [826...38]. *L. Lobata*. Die zerrissene Flügel-Schn. Gmel. *stromb. gallus* sp. 11. Chemn. 10. t 158. f 1506. 1507 2 St.
Remarks. — Chemnitz's (1788: pl. 158 figs 1506-1507) figures refer to the nominal species *Strombus sinuatus* [Lightfoot], 1786, as already noted by Abbott (1960: 60); it is the type species of *Sinustrombus* Bandel, 2007. This item should be confused with # 872 (Röding, 1798: 68), *Lambis lobata*, which is a synonym of *Lambis lambis* (Linnaeus, 1758), vide infra; non *Strombus lobatus* Swainson, 1823 (= *Strombus raninus* Gmelin, 1791).

827 | 39 [827...39]. *L. Latissima*. Die grosse Flügel-Schnecke, mit breitumschlagener Lippe. Gmel. *Stromb. latissimus*. sp. 21. Mart. 3. t. 82. f. 832. 833. 1 St.
Remarks. — Rödings additional reference again (see # 823) represents two distinct species, viz. the nominal species *S. latissimus* (Martini, 1777: pl. 82 fig. 832) and *S. latus* Gmelin, 1791 (Martini, 1777: pl. 82 fig. 833). The latter reference is probably an error by Röding, and intended is fig. 835 on pl. 83, that illustrates the apertural view of the same specimen as in fig. 832. This specimen is from the Bolten collection (Martini, 1777: 124) who named it "*Alaria luxurians & replicata*". See also # 793.

828 | 40 [828...40]. *L. Canarium*. Das Täubchen. Gmel. *Stromb. canarium*. sp. 24. Mart. 3. t. 79. f 817. 18. Knorr 1. t. 18. f. 5. 3 St.
Remarks. — Rödings additional reference to Martini (1777: pl. 79 figs 817-818) is quite strange, as fig. 817 is also referred to in the listing of *Lambis turturella* (Röding, 1798: 65, # 833, see discussion there). Martini's fig. 818 is an illustration of a specimen of the nominate species *Strombus canarium* Linnaeus, 1758. The reference to Knorr (1757: part 1, pl. 18 fig. 5) is undoubtedly this species. Type species of *Laevistrombus* Abbott, 1960, and currently known as *Laevistrombus canarium* (Linnaeus, 1758).

829 | [829...—]. ——— α. ——— 6 St.
Remarks — No additional reference to distinguish it from # 828.

830 | 41 [830...41 *L. Canariensis*. Der Canarienvogel. 1 St.
Remarks. — Nomen nudum; taking its place in the catalogue into account, this is probably a species of *Laevistrombus*.

831 | 42 [831...42]. *L. Canaria*. Der weisse Canarienvogel. 1 St.
Remarks. — Nomen nudum. The German vernacular name, "Der weisse Canarienvogel", implies a white specimen, and its place in the catalogue probably a species of *Laevistrombus*.

832 | [832...—]. ——— α. ——— sehr monstrôse. 1 St.
Remarks. — Nomen nudum. The addition by Röding (1798: 65), "sehr monstrô[ö]se", might indicate a monstrosity or an exceptionally large specimen; in the Noodt version (1819: 46), the spelling of this addition is altered to "monströs".

833 | 43 [833...43]. *L. Turturella*. Das Turteltäubchen. Gmel. *Stromb. canarium*. sp. 24. Martini 3. t. 79. f. 817. 2 St.
Remarks. — Man in 't Veld & De Turck (1998) selected Röding's additional reference to Martini's (1777: pl. 79 fig. 817) figure as lectotype of *Lambis turturella*. In retrospect, we consider these actions as somewhat unfortunate, as we

discovered one of Bolten's original specimens in MNG, vide infra. to *L. turturella* as lectotype of this species. They also selected the same illustration in Martini (1777: pl. 79 fig. 817) as lectotype of *Strombus isabella* Lamarck, 1799. In retrospect, we consider these actions as somewhat unfortunate, as we discovered one of Bolten's original specimens in MNG, vide infra. In all probability, Lamarck's specimen(s) on which the name *S. isabella* was based, are present in MHNG. Valid species, currently allocated to the genus *Laevistrombus* Abbott, 1960).

834 | 44 [834...44]. *L. Epidromis*. Das Besamssegel. Gmel. *Stromb. epidromis*. sp. 22. Martini 3. t. 79. f. 821. 7 St.
Remarks. — Although Martini's figure (1777: pl. 79 fig. 821) is somewhat unfortunate, as the outer lip (wing) in the illustration is not as expanded as one might expect, Martini's additional figure is *Strombus epidromis* Linnaeus, 1758, the type species of the genus *Labiostrombus* Oostingh, 1925.

835 | 45 [835...45]. *L. Plicata*. Der Wetterhahn. Gmel. *Stromb. vittatus*. sp. 25.δ. Chem. 10. t. 157 f 1496. 2 St.
Remarks. — The additional reference to Chemnitz (1788: pl. 157 fig. 1496) is the *Strombus plicatus* (Röding, 1798) of subsequent authors. A valid species, currently assigned to the genus *Dolomena* Wenz, 1940. This assignment may, however, turn out to be incorrect, taking into account the differences between this species and the type species of *Dolomena*, *Strombus pulchellus* G.B. Sowerby II, 1842.

836 | 46 [836...46]. *L. Minimus*. Die kleine Flügel-Schnecke. Gmel. *Stromb. minimus*. sp. 23. Chemn. 10. t. 156 f. 1491. 1492. 2 St.
Remarks. — The additional reference to Chemnitz (1788: pl. 156 figs 1491-1492) is the *Strombus minimus* Linnaeus, 1771 of subsequent authors. This valid species is currently assigned to *Dolomena* Wenz, 1940, or, alternatively, to *Ministrombus* Bandel, 2007.

837 | [837...—]. ——— α. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 836.

838 | 47 [838...47]. *L. Vittata*. Die Windfahne. Gmel. *Stromb. vittatus*. sp. 25 γ. Mart. 3. t. 822. f. 823. Chemn. 10. t. 155. f. 1481. 82. 6 St.
Remarks. — The additional reference to Martini (1777) contains an error; pl. 822 doesn't exist in this volume. Intended is fig. 822, which is, like fig. 823, on pl. 79 in Martini's work. Man in 't Veld & Visser (1993: 12, caption to pl. 1) erroneously listed figs 821-822 as representing *S. vittatus* Linnaeus, 1758.

The reference in Martini (1777: pl. 79 figs 822-823) shows two different views of probably the same specimen, with a smooth, slightly swollen last whorl, and strong axial plicae on the earlier whorls; this is the nominal species *Strombus vittatus* of subsequent authors, and correctly identified by Man in 't Veld & Visser (1993: 12, caption to pl. 1) as representing *S. vittatus*. The reference in Chemnitz (1788: pl. 155 figs 1481-1482; Figs 13a-b), as already been indicated by Man in 't Veld & Visser (1993), shows, probably in two different views, another specimen with a relatively higher spire, and strong axial folds on the ventral side of the last whorl. This is a figure of the nominal taxon *Strombus* (*Doxander*) *vittatus apicatus* Man in 't Veld & Visser, 1993, introduced as a new name for *Strombus turritus* Lamarck, 1822 [non Röding, 1798 = *S. gallus*], but there is an earlier available name for this taxon, viz. *Turris operosa*, vide infra Museum Boltenianum catalogue entry # 1607 further details and discussion. *Strombus vittatus* is the type species of the genus *Doxander* Wenz, 1940. At present, there is a discussion whether there is one very variable species *Doxander vittatus* (Linnaeus, 1758), as is suggested by Abbott (1960), or a complex of closely related (sub)species as is advocated by Barney (1982), Man in 't Veld & Visser (1993) and Liverani (2013). We consider the taxon hitherto known as *S.* (*D.*) *v. apicatus* a full species rather than a subspecies, vide infra.

839 | 48 [839...48]. *L Contorta*. Der Thurmflügel. Gmel. *Stromb. clavus*. sp. 7. Mart. 4. t. 159. f. 1502. 3. 4. 3 St.
Remarks. — The additional references by Röding to Martini 4 are actually published by Chemnitz (1780), and these references represent two species. Plate 159 fig. 1502 is a juvenile specimen of a species of *Tibia* (here refigured, Fig. 11), also referred to by Röding for his catalogue number 1584 (vide infra), which is "*Strombus clavus*", a name given by Linnaeus (1771: 549) for a juvenile of *Tibia fusus* (Linnaeus, 1758). The other two illustrations, however, viz. Chemnitz (1780: pl. 159 figs 1503-1504) show a completely different species. This is probably a *Crassispira* sp. (Conoidea, Pseudomelatomidae, pers. comm. Koen Fraussen) (Figs 12a-b). We don't understand Röding's action as he again referred to Chemnitz's (1780: pl. 159 fig. 1502) under *Tibia clavus*, see # 1584. To unequivocally establish the identity of *Lambis contorta*, we hereby designate the illustration in Chemnitz (1780: pl. 159 fig. 1502, here refigured, Fig. 11) as representing the lectotype of *Lambis contorta*. Thus, *Lambis contorta* Röding, 1798 becomes a junior synonym of *Tibia fusus* (Linnaeus, 1758). The whereabouts of the lectotype is unknown.

840 | 49 [840...49]. *L. Accipitrina*. Der Habichtsflügel. Gmel. *Stromb. costatus*. sp. 32. Mart. 3. t. 81. f. 829. 2 St.
Remarks. — The additional reference to Martini (1777: pl. 81 fig. 829) shows an illustration of a somewhat distorted shell, yet clearly recognizable as the nominal species *Strom-*

bus costatus Gmelin, 1791. Rosenberg (2009), see http://www.malacolog.org/search.php?nameid=2194 [accessed 25 August 2019] already noticed this. *Lambis accipitrinus* Röding, 1798 is a junior synonym of *Strombus costatus*, currently assigned to the genus *Lobatus* Swainson, 1837 and known as *Lobatus costatus* (Gmelin, 1791).

841 | [841...—]. ——— α. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 840.

842 | 50 [842...50]. *L. Gigas*. Die grosse Flügel-Schnecke. Gmel. *Stromb. gigas*. sp. 20. Mart. 3. t. 80. f. 824. 2 St.
Remarks. — The additional reference to Martini (1777: pl. 80 fig. 824) shows undoubtedly an illustration of the nominal species *Strombus gigas* Linnaeus, 1758, currently assigned to the genus *Lobatus* Swainson, 1837.

843 | [843...—]. ——— α. ——— 2 St.
Remarks. — No additional reference to distinguish it from # 842.

3. *Alis digitatis*. Mit gespaltenen Flügel.

844 | 51 [844...51]. *L. Lambis*. Die Krabbe. Gmel. *Stromb. lambis*. sp. 5. Mart. 3. t. 86 f. 855. & t. 91. f. 888. 12 St.
Remarks. — The additional reference to Martini (1777: pl. 86 fig. 855) clearly shows an adult female specimen (cfr. Abbott, 1961: pl. 123 and caption) of the nominal species *Strombus lambis* Linnaeus, 1758, and the reference to Martini (1777: pl. 91 fig. 888) shows a juvenile specimen of *S. lambis*. It is quite difficult to understand why in this case, Röding included a juvenile specimen in his references, as in another case, see e.g. # 793 *Lambis picta*, he chose to introduce a new name for this juvenile specimen of his nominal taxon *L. latissima*., or even (see e.g. # 730, *Pyramis lucifer*) in another genus. *Lambis lambis* is the type species of the genus *Lambis* Röding, 1798 by absolute tautonomy.

845 | 52 [845...52]. *L. Lamboides*. Der Krebs. Gmel. *Stromb. lambis*. sp. 5. 2 St.
Remarks. — Röding gave no additional reference to distinguish this species from # 844. Therefore, *Lambis lamboides* Röding, 1798 is considered a junior synonym of *Strombus lambis* [= *Lambis lambis*].

846 | 53 [846...53]. *L. Cerea*. Der weisse Krebs. Gmel. *Stromb. lambis*. sp. 5. 1 St.
Remarks. — Röding gave no additional reference to distinguish this species from # 844. Therefore, *Lambis lamboides* is considered a junior synonym of *Strombus lambis* [= *Lambis lambis*].

847 | 54 [847...54]. *L. Davilae*. Die Lumpenkrabbe.
Remarks. — Nomen nudum. This entry is most peculiar as it is only followed by a German vernacular name, without any reference or indication to its identity in the form of a reference to a figure, while two varieties do have references, vide infra. No number of specimens is indicated.

848 | [848...—]. ——— α. ——— Davillae [sic] Pl. 14 f. 2 St.
Remarks. — The illustration in Dávila (1767: pl. 14) clearly depicts the dorsal view of a fully adult specimen of the complex of species containing the nominal taxa *Strombus truncatus* [Lightfoot], 1786; *Pterocera sebae* Kiener, 1843; and *Pterocera sowerbyi* Mörch, 1872, currently assigned to the genus *Lambis*. We are unable to identify the illustration of this specimen with certainty. Note that this name, as it is indicated as "α" is unavailable.

849 | [849...—]. ——— ß. ——— Davilla [sic] Pl. 13. f. Chemn. 10. t. 158. f. 1512. 1 St.
Remarks. — The illustration in Dávila (1767: pl. 13) clearly depicts the dorsal view of an immature (terminology following Savazzi, 1991) specimen, i.e., the digits on the outer lip have just begun to develop. The specimen represents one of the under # 848 mentioned complex of species. The reference to Chemnitz (1788) is in error; fig. 1512 is on pl. 159. In Noodt (1819: 47) the spelling "Davilla" is altered into "Davillae", i.e., the same as it is in # 848.

Liverani (2013: 18-19, pls 135-138) briefly discussed and illustrated the differences between the above mentioned three nominal taxa. Judging from the height of the spire, the Chemnitz figure (Chemnitz, 1788, pl. 159 fig. 1512) represents a specimen of *Lambis sowerbyi* (Mörch, 1872). Note that this name, as it is indicated as "ß" is unavailable.

850 | [850...—]. ——— γ. ——— 3 St.
Remarks. — No additional reference to distinguish it from # 847 or any of the other varieties of *Lambis davilae*.

851 | 55 [851...55]. *L. Bryonia*. Die abgestumpfte Flügel-Schecke. Gmel. *Stromb. bryonia*. sp. 33. Mart. 3. t. 93. f. 904 905. 2 St.
Remarks. — The illustration in Martini depicts a juvenile specimen of the nominal taxon *Strombus truncatus*, currently known as *Lambis truncata* ([Lightfoot], 1786).

852 | [852...—]. ——— α. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 851.

853 | 56 [853...56]. *L. Radix*. Die Wurzel. Gmel. *Stromb. bryonia*. sp. 33. a. Chemn. 10. t. 159. f. 1514. 15. 2 St.
Remarks. — The additional reference to the illustrations in Chemnitz (1788: pl. 159 figs 1514-1515) depict probably two

views of a juvenile specimen of the nominal taxon *Strombus truncatus*, currently assigned to *Lambis* as *Lambis truncata* ([Lightfoot], 1786).

854 | 57 [854...57]. *L. Maculata*. Der bunte Krebs. Gmel. *Stromb. lambis* sp. 5. ß. Martini 3. t. 87. f. 858. 59. 2 St.
Remarks. — The additional reference to Martini (1777: pl. 87 figs 858-859) depicts two views of probably the same specimen of what is now known as *L. lambis*; see also # 844. *Lambis maculata* Röding, 1798 is a junior subjective synonym of the nominal taxon *Strombus lambis*. Do not confuse with *Strombus maculatus* G.B. Sowerby II, 1842.

855 | 58 [855...58]. *L. Millepeda*. Der Kellerwurm. Gmel. *Stromb. millepeda.* sp. 6. Martini 3. t. 88. f. 861. 862. 4 St.
Remarks. — The additional reference to Martini (1777: pl 88 figs 861-862) depicts a specimen of what is now known as *Lambis millepeda* (Linnaeus, 1758), with the digits on the outer lip although fully developed, not yet filled with shell material.

856 | 59 [856...59]. *L. Chiragra*. Der Podagra-Krebs. Gmel. *Stromb. scorpius.* sp. 4. Mart 3. t. 88 f. 860. 4 St.
Remarks. — The additional reference to Martini (1777: pl. 88 fig. 860) clearly represents the nominal taxon *Strombus scorpius* Linnaeus, 1758. *Lambis chiragra* Röding, 1798 is a junior subjective synonym of *S. scorpius*, as already indicated by Abbott (1961: 164); and a secondary homonym of *S. chiragra* Linnaeus, 1758. This species is currently assigned to the genus *Lambis*.

857 | 60 [857...60]. *L. Scorpius*. Der Scorpion. Gmel. *Stromb. lambis* Chemn. 10. t. 158. f. 1508. 1509. 3 St.
Remarks. — This is the only entry – as far as Stromboidea are concerned – that Röding does mention a species name by Gmelin, but fails to mention the species number. The additional reference to Chemnitz (1788: pl. 158 figs 1508-1509) shows a specimen of the nominal species *Pteroceras crocatus* Link, 1807. Röding's name is preoccupied by *Strombus scorpius* Linnaeus, 1758 (see # 856), and Link's name is the first available name for this species, as already indicated by Abbott (1961: 158). Currently allocated to the genus *Lambis* as *Lambis crocata* Link, 1807.

858 | 61 [858...61]. *L. Arthritica*. Die kleine Teufelsklaue. Gmel. *Stromb. chiragra.* sp. 3. Mart. 3. t. 87. f. 857. 2 St.
Remarks. — The additional reference to Martini (1777: pl 87 fig. 857) shows a specimen of what is now known as *Harpago arthritica* (Röding, 1798), a valid species.

859 | [859...—]. ——— α. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 858.

860 | 62 [860...62]. *L. Harpago*. Der Botsmannshacken. Gmel. *Stromb. chiragra.* sp. 3. 4 St.
Remarks. — *Lambis harpago* is considered a junior synonym of *Strombus chiragra* Linnaeus, 1758, the type species of the genus *Harpago* Mörch, 1852, currently known as *Harpago chiragra*.

861 | [861...—]. ——— α. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 860.

* *Mit ofne Griffe.*

862 | [862...—]. *L. Harpago.* 1. ——— 2 St.
Remarks. — No additional reference to distinguish it from # 860. We do not understand Röding's reasons to suddenly start with numbers instead of using Greek letters to indicate varieties; as far as Stromboidea are concerned, this is only done in the case of *Lambis harpago*, see also entries 863-867. In this case he also repeated the species name as well.

863 | [863...—]. ——— 2. ——— Martini 3. t. 92. f. 895. 896. 3 St.
Remarks. — Martini's figures (1777: pl. 92 figs 895-896) show an immature female specimen of *Harpago chiragra* (Linnaeus, 1758).

864 | [864...—]. 3. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 860.

There is no entry 865.

866 | [866...—]. *L. Harpago.* 4. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 860.

867 | [867...—]. *L.* ——— 5. ——— 3 St.
Remarks. — No additional reference to distinguish it from # 860.

There is no entry 868.

869 | 63 [869...63]. *L. Pes Pelicani*. Die Fünffinger-Schnecke. Gmel. *Stromb pes pelicani.* sp. 2. Mart. 3. t. 85 f. 848.-850. 10 St.
Remarks. — The epithet *pespelicani,* as used by Röding, is an incorrect subsequent spelling of *pespelecani* as used by

Linnaeus (1758: 742 sp # 422), and correctly used by Gmelin (1791: 3507, sp. 2). The reference to the illustrations in Martini (1777: pl. 85 figs 848-850), of which figs 849, 850 might be two views of the same specimen, is, without doubt, the same species. Currently known as *Aporrhais pespelecani* (Linnaeus, 1758).

870 | [870...—]. ——— α. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 869.

871 | [871...—]. ——— ß. ——— 2 St.
Remarks. — No additional reference to distinguish it from # 869.

4. *Alis lobato laciniatis*. Mit zerlapten Flügel.

872 | 64 [872...64]. *L. Lobata*. Die Flügel-Schnecke mit gefaltener Lippe. Gmel. *Stromb. lambis.* sp. 5 b. Mart. 3. t. 92. f. 902 1 St.
Remarks. — The additional reference to Martini (1777: pl. 92 fig. 902) clearly depicts a subadult specimen of the nominal species *Strombus lambis* Linnaeus, 1758, the type species of the genus *Lambis* Röding, 1798.

This item should not be confused with # 826, *Lambis lobata* (Röding, 1798: 65), which is a synonym of the nominate species *Strombus sinuatus* [Lightfoot], 1786, currently known as *Sinustrombus sinuatus*, vide supra. It should also not be confused with *Strombus lobatus* Swainson, 1823, a junior synonym of *Strombus raninus* Gmelin, 1791, the type species of the genus *Lobatus* Swainson, 1837.

873 | 65 [873...65]. *L. undulata*. Die Flügel-Schnecke mit wellenförmiger Lippe. Gmel. *Stromb. lambis.* sp. 5. Mart. 3. t. 92. f. 898. 2 St.
Remarks. — The additional reference to Martini (1777: pl. 92 fig. 898) clearly depicts a juvenile species of *Harpago*; the identity of the species itself cannot be determined from the figure.

874 | [874...—]. *L.* ——— α. ——— verstümmelte Exemplare. 5 St.
Remarks. — No additional reference to distinguish it from # 873.

875 | 66 [875...66]. *Lambis Hermaphrodita*. Eie Zwitter Flügel-Schnecke. Gmel. *Stromb. lambis.* sp. 5 1 St.
Remarks. — *Lambis hermaphrodita* Röding, 1798 is considered a junior synonym of *Strombus lambis* Linnaeus, 1758, the type species of *Lambis*. Noodt (1819: 48) changed the spelling of the epithet into *hermaphroditae*. This is an unnecessary emendation of the original spelling by Röding.

876 | [876...—]. ——— α. ——— 1 St.
Remarks. — No additional reference to distinguish it from # 875.

877 | 67 [877...67]. *L. laciniata*. Die Flügel-Schnecke mit gerunzelter Lippe. Gmel. *Stromb. lamb s.* sp. 5.a. 1 St.
Remarks. — *Lambis laciniata* Röding, 1798 is considered a junior synonym of *Strombus lambis* Linnaeus, 1758, the type species of *Lambis*, as already indicated by Abbott (1961: 153). The item should not be confused *Strombus laciniatus* Dillwyn, 1817, a junior subjective synonym of *Strombus sinuatus* [Lightfoot], 1786, a species currently assigned to the genus *Sinustrombus* Bandel, 2007. The Pfeiffer version reads: *Stromb. lambis*.

878 | [878...—]. ——— ——— uncomplete Exemplare. Mart. 3. t. 91. f. 888. 889. 7 St.
Remarks. — Martini's (1777) pl. 91 fig. 888 is a juvenile of *Lambis lambis*, which is probably also true for fig. 889, but this cannot be determined with certainty.

Astraea. Das Sonnenhorn

Astraea Röding, 1798: 79. Type species by subsequent designation of Suter (1913: 166) *Trochus imperialis* Gmelin, 1791 = *Astraea heliotropium* (Martyn, 1784).

1030 | 3 [1010...3]. *A. Polaris.* Das Sonnenhorn des Rumpfs. Gmel. *Trochus solaris.* sp. 15. Chemn. 5. t. 173. f. 1700. 1701. 3 St.
Remarks. — Ponder (1983: 50) noted that the epithet "polaris" is possibly an error for "solaris". We concur with that opinion. Looking e.g. at Schmidt's handwriting (Fig. 39), the second line of Schmidt's entry reads "Lam. Troch. Solaris (...)." The letter "s" of the word "solaris" could be mistaken for a "p". See also Kronenberg & Wieneke (2018) on the origin of the spelling "pavifrons". The additional reference to Chemnitz (1781: pl. 173 figs 1700-1701) clearly depict this species. Currently known as *Stellaria solaris* (Linnaeus, 1764).

1040 | 10 [1020...10]. *A. Lapidifera*. Der Steinträger. Gmel. *Trochus conchiliophorus.* sp. 110. Chemn. 5. t. 172. f. 1688. 1789. 1 St.
Remarks. — Ponder (1983: 19) synonymized this species with *Xenophora* (*Xenophora*) *conchyliophora* (Born, 1780). Ponder also noted that the fig. reference "1789" is an error for "1689". Oddly enough, Röding did not refer to the figure in Favanne (1780: pl. 12 fig. c 2) that would have been an excellent representation of a "lapidifera" in contrast to a "conchyliophora" or "corallophora", vide infra. *Astraea lapidifera* Röding, 1798 is a junior subjective synonym of *Xenophora conchyliophora* (Born, 1780).

1041 | 11 [1021...11]. *A. Conchyliophora*. Der Schneckenträger. Gmel. *Trochus conchyliophorus*. sp. 110. Chemn. 5. t. 172. f. 1688 – 90. Favanne Pl. 12. fig. C. 1. 1 St.

Remarks. — It is quite remarkable that Röding used the same reference in Chemnitz with yet an additional figure. The specimens figured in Chemnitz (1781: figs 1689-1690) both show a view of the base of the shell, and clearly represent two species, of which fig. 1689 is here identified as *X. conchyliophora* (Born, 1870), and fig. 1690 tentatively identified as *X. corrugata* (Reeve, 1842).

1042 | 12 [1022...12]. *A. Corallophora*. Der Corallentrâger. Gmel. *Trochus conchiliophorus* sp. 110. 1 St.

Remarks. — Ponder (1983: 19) listed this name in the synonymy of *Xenophora* (*Xenophora*) *conchyliophora* (Born, 1780) as a numen nudum. This is not correct, as Röding clearly made reference to Gmelin. Junior synonym of *X. conchyliophora* (Born, 1780).

Tibia. Die Flöthe

Tibia Röding, 1798: 123. Type species by subsequent designation of Dall (1906: 295) *Murex fusus* Linnaeus, 1758 = *Tibia fusus* (Linnaeus, 1758)

1581 | 1 [1553...1]. *T. Insulae Choräb*. Die grosse dicke Stern-Nadel. Gmel. *Strombus fusus*. sp. 1. Martini 4. t. 158. f. 1495. 96. 4 St.

Remarks. — The reference to Martini's figures is in error. Plate 158 with figs 1495-1496 is in the fourth volume of the "Systematischen Conchylien Cabinet" by Chemnitz (1780). These are undoubtedly illustrations of *Tibia insulaechorab* of modern authors. The confusion surrounding the name *Murex fusus* Linnaeus, 1758 has been discussed at length by Dodge (1956: 238-244) and Kronenberg & Burger (2002: 46), who designated Chemnitz's (1780) fig. 1495 as lectotype of *T. insulaechorab*. See also # 1583.

Note that the original spelling of the epitaph by Röding is *Insulae Choräb*, i.e. with an "umlaut". In all probability this refers to (part of) Mount Sinaï, see e.g. Lepsius (1845: 12-13, 48) for further remarks. Röding might have heard of the name pronounced as "Choreb", which in German language may be transcribed as either "Choraeb" or "Choräb", and may therefor have spelled it like "choräb". The spelling of the epithet should be altered into "insulaechoraeb", see ICZN Art. 32.5.2.1. In the Noodt catalogue the spelling was changed into "Insulae Chorab" (Noodt, 1819: 87), i.e. without an "umlaut". We are not aware of any subsequent paper that retained this umlaut, and therefore we accept "insulaechorab" as the spelling that is in prevailing usage, see ICZN Art. 33.3.1, and the spelling "insulaechorab" is deemed to be the correct original spelling.

There is no entry 1582.

1583 | 3 [1554...2]. *T. Indiarum*. Die Ostindische Stern-Nadel. Gmel. *Strombus fusus*. sp. 1. γ. äusserst selten. Favanne 34. fig. B. 3. Martini 4. vign. 41. P. 344. 1 St.

Remarks. — The reference to Martini's figures is in error. The vignette on p. 344 is in Chemnitz (1780). Favanne's (1780: pl. 34 fig. B 3) reference is, without doubt, a specimen of *Tibia fusus* (Linnaeus, 1858), as already indicated by Kronenberg (2012: 10). *Tibia indiarum* is a junior subjective synonym of *Murex fusus* Linnaeus, 1758, currently known as *Tibia fusus* (Linnaeus, 1758). Lectotype designated herein, vide infra.

1584 | 4 [1555...3]. *T. Clavus*. Die ungezähnte Stern-Nadel. Gmel. *Strombus clavus*. sp. 7. Martini 4. t. 159. f. 1501. 1502. 3 St.

Remarks. — The additional reference to Martini's figures is in error. Plate 159 with figs 1501-1502 is in Chemnitz (1780), see # 1583. Röding haphazardly referred to published illustrations. It is clear from his additional references to Favanne (1780) in other instances, that Röding had access to this work. Favanne (1780: pl. 34 fig. B 2) also illustrated a juvenile specimen (a copy of the illustration in Dezallier d'Argenville, 1742, see Kronenberg, 2012: 10), but Röding did not refer to this illustration.

1585 | 5 [1556...4]. *T. Fissurella*. Die gespaltene Stern-Nadel. Gmel. *Strombus fissurella*. sp. 28. Martini 4. t. 158. f. 1498. 1499. 1 St. Verkalkte. 5 St.

Remarks. — The additional reference to Martini's figures is in error. Plate 158 with figs 1498-1499 is in Chemnitz (1780), see # 1583. These figures show beyond doubt the species currently known as *Rimella fissurella* (Linnaeus, 1767).

Turris Der Thurm.

Turris Batsch, 1789: 691. Type species by subsequent designation Dubois & Bour (2010: 171) *Murex babylonius* Linnaeus, 1758.

Remarks. — For a long time, the generic name *Turris* was attributed to Röding (1798). The first introduction of the generic name that is available under the provisions of the ICZN, however, was by Batsch (1789: 691) who provided a very brief description:

"CCCXIV Gattung Nadelschnecken und Bohrer. [h)]
be) aufgeblasene und am Grunde mit einem Kanal versehene"
[CCCXIV Genus needle snails and drills. [h)]
be) inflated and at the bottom provided with a channel.]

The superscript [h)] refers to a footnote on the same page: "h) Turris."

After the attribution of *Turris* to Batsch was revived by

Dubois & Bour (2010: 171), this was subsequently accepted by Scarponi et al. (2011); Kilburn et al. (2012); and Bouchet et al. (2011).

As the type species of both *Turris* Batsch, 1789 and *Turris* Röding, 1798 are the same, viz. *Murex babylonius* Linnaeus, 1758, the action by Dubois & Bour (2010) does not affect the use of that generic name.

Dall (1906: 295) did not explicitly designate a type for *Turris* Bolten (= Röding). Dall (1906: 294) clearly states: "I have not included the Linnean genera adopted by Bolten and in which no change will occur, but only the names introduced by Bolten, their type (*t.*), or first species (1), and their next subsequent equivalents from Lamarck or his successors. When the equivalence is exact, the prior name is preceded by an asterisk as an indication that it will take precedence."

The entry for *Turris* in Dall (1906) is:

**Turris* (1. babylonius *Gmel.*) Pleurotoma *Lam.*, 1799.

1607 | 18 [1578...18] *T. Operosa*. Der künstliche Thurm. Gmel. *Strombus vittatus.* sp. 25. γ. Favanne t. 20. f. A. 8. Chemn. 10. t. 155. f. 1481. 82. 2 St.

Remarks. — We were very puzzled by this entry. The reference to Chemnitz (1788: pl. 155 figs 1481-1482) was also used in Röding's concept of *Lambis vittata*, see # 838. Favanne's (1780: pl. 20 fig. A 8) was used by Lamarck (1822: 212) as a reference with a question mark on his concept of *Strombus turritus*. Lamarck (1822: 212) also referred to an illustration in Lister (1688: pl. 855 fig. 12b) with a question mark, and to Chemnitz's (1788: pl. 155 figs 1481-1482; Figs 13a-b) figures, so there is little doubt that Röding (1798: 125, number # 1607) and Lamarck (1822: 212, species 51) had the same species in mind. *Strombus turritus* Lamarck, 1822 is a secondary homonym of *Lambis turrita* Röding (see # 810) as already been demonstrated by Man in 't Veld & Visser (1993). Man in 't Veld & Visser (1993: 19) introduced *Strombus* (*Doxander*) *vittatus apicatus* as a new name for *S. turritus* Lamarck, 1822, non Röding 1798, nec Link, 1807. Man in 't Veld & Visser (1993: 25, fig. 10) designated a lectotype for *S. turritus* Lamarck, viz. the specimen present in MHNG, collection number 1100/71/2, despite the differences in sizes between the specimen (about 61.6 mm) and the indication made by Rosalie de Lamarck (about 65 mm), so acknowledged by Man in 't Veld & Visser.

The specimen illustrated by Chemnitz (1788: pl. 155 figs 1481-1482) came from the Chemnitz collection (1788: 208) and might be present in ZMUC.

We are not aware of any use of the name *Turris operosa* after 1899, but under the current code, the name *Turris operosa* is an available name. It should take precedence over *Strombus* (*Doxander*) *vittatus apicatus* as the requirements for ICZN Arts. 23.9.1 and 23.9.2 cannot be met. Therefore, this taxon should be called *Doxander operosus*. Vide infra.

The use by Link (1807: 129) of *Strombus turritus* is, in all probability, not a stromb. It appears along with species nowadays allocated to Cerithioidea. Moreover, contrary to what is claimed by Man in 't Veld & Visser (1993: 19), *S. turritus* Link, 1807 is not a nomen nudum as there is a short description in Link (1807: 129) that reads: "*Gethürmte St. [rombus]. Nähert sich* Cerithium aluco. *Glatt, an der Basis Querstreifen, jede Windung mit einer Querreihe von Buckeln. Weiß mit Bräunlichen Wolken. 1½ Zoll lang.*". Digging further into the identity of *S. turritus* Link, 1807 is beyond the scope of this paper.

1608 | 18*[1579...19]. *T. Clathrata*. Die gegitterte Thurm. Gmel. *Strombus vittatus* sp. 25. var. 1 St.

Remarks. — There is no additional reference to distinguish *Turris clathrata* from the concept of *Strombus vittatus* var. sensu Gmelin. Therefore, *Turris clathrata* Röding, 1798 is an unnecessary replacement name for *Strombus vittatus* Linnaeus, 1758.

Terebellum Der Bohrer.

Terebellum Bruguière, 1798: pl. 360, caption of plate [29 April 1798]. Type species by absolute tautonomy *Conus terebellum* Linnaeus, 1758.

Terebellum Röding, 1798: 135 [after 1 September 1798]. Type species by tautonomy *Conus terebellum* Linnaeus, 1758.

Remarks. — Both the introduction in Latin by Lichtenstein [in Röding, 1798: iii-vi] as the "Vorrede" by Röding (1798: vii-viii] are dated as of September 1798. *Terebellum,* as introduced by Bruguière (1798), was overlooked by Dodge (1947), but Evenhuis (2003: Appendix III) demonstrated that Bruguière's (1798: pl. 360) plate was published in a series of plates, pls 287-390, on 29 April 1798. We are not sure about the exact date of publication of Röding's catalogue, but it must be after 1 September 1798, and therefore the name *Terebellum* should be attributed to Bruguière, 1798. Rehder (1945: 50) demonstrated that Röding's paper was printed and available for distribution before 16 January 1799, quoting from the "Intelligenzblatt der Allgemeinen Literatur-Zeitung" from that date.

1690 | 1 [1705...1]. *T. Nebulosum*. Der gebandete Bohrer. Gmel. *Bulla terebellum.* sp. 22. Martini 2. t. 51. f. 568. 569. Lister t. 736. f. 30. 6 St.

Remarks. — The illustrations in Martini (1773: pl. 51 figs 568-569) and the illustration in Lister (1688: pl. 736 fig. 30) depict in our opinion all three the nominal taxon *Conus terebellum* Linnaeus, 1758, currently known as *Terebellum terebellum*, type species of *Terebellum* Bruguière, 1798.

1691 | 2 [1706...2]. *T. Lineatum*. Der liniirte Bohrer. Gmel. *Bulla terebellum.* sp. 22. β. Lister t 736. f. 31. 3 St.

Remarks. — The additional reference to Lister (1688: pl. 736 fig. 31) clearly depicts what is now known as the lined colour morph of *Terebellum terebellum*, but vide infra. Lister's (1688) figs 30 and 31 are in one frame, but the following one, also a specimen of *T. terebellum*, is left outside this frame. Lectotype designated herein, vide infra.

1692 | 3 [1707...3]. *T. Punctulorum*. Der punctirte Bohrer. Lister t. 737. f. 32. 1 St.

Remarks. — The additional reference to Lister (1688: pl. 737 fig. 32) clearly depicts what is now considered to be a spotted colour morph of *Terebellum terebellum*.

In the Crosse copy the epithet is clearly spelled as "*punctulorum*" (Fig. 5), yet in the Pfeiffer copy it is spelled as "*punctulatum*" (Fig. 6) as it is in the Noodt (1819: 95) copy. (https://www.biodiversitylibrary.org/page/59289503). It is not clear which of the two spellings, viz. "*punctulorum*" or "*punctulatum*" was really intended by Röding, and therefore we have a unique case of two different correct original spellings. In our opinion both names are available from Röding (1798) and although we did not conduct a complete search of the use of the epithet, it appears that the spelling "*punctulorum*" is in prevailing usage (ICZN Art. 33.3.1), as in subsequent literature, e.g. Jung & Abbott (1967: 446 caption to plate, 449 synonymy; Caze et al. (2010: 419, 421 captions to plates), the epithet is spelled as "*punctulorum*". For the sake of stability, if found to be a distinct species, the spelling "*punctulorum*" is deemed to be the correct spelling of the epithet, the name *T. punctulorum* should be used. For some further details, vide supra, see also discussion under *T. terebellum*, vide infra.

THE COLLECTION IN MUSEUM DER NATUR, GOTHA

Specimens acquired from the Bolten auction

Remarks. — The catalogue volume that contains *Strombus*, *Pterocera* and *Rostellaria* was completed after 15 February 1827, i.e., roughly eight years after the Bolten collection was auctioned. The parts with *Terebellum* and Xenophoridae are from a later date and in a different, Schmidt's own, handwriting.

Family Strombidae Rafinesque, 1815
Genus *Conomurex* P. Fischer, 1884

Conomurex decorus (Röding, 1798)

(Figs 14a-b)

Lambis decora Röding, 1798: 62. [#777. *L. Decora*. Die alerliche Flügel Schnecke. Gmel. *Strombus luhuanus*. sp. 16 γ. Chemn. 10. t. 157. f. 1499. 1500. 6 St.; # 778. ——— α ——— 1 St.]

Remarks. — The MNG collection holds 10 sample numbers (4505-4514) of what was identified by Schmidt as *Strombus mauritianus* Lamarck, 1822, a junior synonym of *Lambis decora*. The entry to 4505 has a description in German.

The Bolten collection held two lots of this species, with respectively six and one specimens, the latter indicated as var. α. We found only one specimen of the nominal species *Lambis decora* ex Bolten collection in MNG, collection number 4512, measuring 29.6 mm. The entry to the ex Bolten specimen reads: "*#4512. Abänderung. Das Gewinde glatt, convex, ohne Falten oder Knoten. Noch jung. 1 Zoll 6 Linien. Bolten.*" We are not sure whether this juvenile specimen is one of the lot # 777 of six specimens or the single specimen from the Bolten lot # 778, i.e., the var. α. Röding however, often gave different names to juvenile specimens, even as a completely new genus, cfr. *Pyramis* vide supra, and therefore it seems likely that this is the specimen from lot # 778. ICZN Art. 72.4.1. states: "The type series of a nominal species-group taxon consists of all the specimens included by the author in the new nominal taxon (whether directly or by bibliographic reference), except any that the author expressly excludes from the type series [Art. 72.4.6], or refers to as distinct variants (e.g., by name, letter or number), or doubtfully attributes to the taxon.". This would exclude the single specimen of var. α from the syntypes. It must, however, be stressed that not all specimens from the samples in the Bolten collection remained together after they were sold. In the case of *Terebellum lineatum* Röding, 1798, only one specimen, from an original lot of three, was found. It is not clear whether Schmidt bought the lot of three, or only one of the specimens auctioned. We only found one specimen in the Ducal collection (vide infra).

The figure in Chemnitz (1788: pl. 157 fig. 1500) has been designated as representing the lectotype of *Lambis decora* by Kronenberg et al (2009: 660). The status of this specimen in MNG is at best to be considered a possible paralectotype of *Lambis decora*.

Genus *Doxander* Wenz, 1940

Doxander operosus (Röding, 1798) comb. nov.

(Figs 15-17)

Lambis vittata Röding, 1798: 66 [# 838. *L. Vittata*. Die Windfahne. Gmel. *Stromb. vittatus*. sp. 25 γ. Mart. 3. t. 822 f. 823. Chemn. 10. T. 155 f. 1481. 82. 6 St.].

Turris operosa Röding, 1798: 125 [# 1607. *T. Operosa*. Die künstliche Thurm. Gmel. *Strombus vittatus*. sp. 25 γ. Favanne t. 20 f. A. 8. Chemn. 10. t. 155. f. 1481. 82. 2 St.].

Remarks. — The MNG collection holds 4 samples, each containing one specimen, with collection numbers (4622, 4622a, 4622b & 4623) of what was identified by Schmidt as

Strombus turritus Lamarck, 1822. One of these, viz. # 4622, originates from the Bolten collection. Two samples, viz. # 4622a & # 4622b may also have been part of the Bolten collection. To identify these three specimns in the collection, we used the specimen level details given by Schmidt (" Die Farbe weiß mit etwas gelb unterlaufen." (Colour white undershot with little yellow)), which only fits with # 4622 and # 4623. As Schmidt added # 4623 "unvollendet" (subadult), only the adult shell as figured in Figs 15a-b could be # 4622. For entering additional specimens to the collection, Schmidt had a section in his catalogue with one or more empty pages, named "Nachtrag" (addendum). There the new shells got a new number. We found only two exceptions to this procedure, viz. #4622a and # 4622b. The most probable reason for this, is in our opinion, that Schmidt was adding two shells, that he had acquired in the Bolten auction, but forgotten to include them in the catalogue. The only way to identify these shells, is to identify all *Doxander*-like shells sensu Schmidt in the Schmidt-collection. We were able to do this and the shells are figured as Figs 15-17, 27-32.

As already demonstrated by Man in 't Veld & Visser (1993), vide supra, the epithet "turritus" (as turrita) had already been used by Röding (1798) and Link (1807).

As Röding (1798) referred to Chemnitz's (1788: pl. 155 figs 1481-1482) illustrations for both his concept of *Lambis vittatus* and *Turris operosa*, we cannot be sure under which name the specimens were acquired by Schmidt, at the time of the auction of the Bolten collection still a private collector. Therefore we cannot be sure whether the specimen MNG # 4622, #4622a or # 4622b originally were part of the sample of the six specimens as noted by Röding (1798: 66) of *Lambis vittata* or of the two as noted by Röding (1798: 125) as *Turris operosa*, or even, for that matter as *Turris clathrata*, vide supra, section on Museum Boltenianum # 1608. Therefore, the specimens in MNG are possible syntypes of *T. operosa*.

We hereby select the specimen illustrated in Chemnitz (1788: pl. 155 fig. 1482) here refigured Fig. 13a as lectotype of *Turris operosa*, the first available name for *Strombus turritus* Lamarck, 1822, non Röding, 1798 nec Link, 1807, for which Man in 't Veld & Visser (1993) introduced *Strombus* (*Doxander*) *turritus apicatus* as a nomen novum. As Chemnitz (1788: 208) clearly indicated: "Tab. 155 Fig. 1481. 1482.: Ex museo nostro" we conclude that his figures are from the same specimen, here refigured Figs 13a-b. This specimen is probably in ZMUC.

Genus *Dolomena* Wenz, 1940

Dolomena minima (Linnaeus, 1771)

Lambis minimus Röding, 1798: 65, 66 [# 836. *L. Minima*. Die kleine Flügel-Schnecke. Gmel. *Stromb. minimus*, sp. 23. Chemn. 10. t. 156. f. 1491. 1492. 2 St.; # 837. ——— α ——— 1 St.].

Remarks. — In the catalogue, compiled by Schmidt, there are two entries, viz. # 4684 and # 4685, both indicated as ex Bolten that are named *Strombus troglodytes*, a name coined by Lamarck (1822), a junior synonym of *Strombus minimus* Linnaeus, 1771. In the description that goes with # 4682, a specimen originally from another collection Schmidt also refers to Linnaeus' *Strombus minimus*, clearly indicating that he was aware of the synonymy between the two. Unfortunately, we haven't been able to find these two specimens in the MNG collection. The Schmidt catalogue indicates another specimen, # 4686, indicated as originating from Röding, vide infra.

Genus *Euprotomus* Gill, 1870

Euprotomus vomer (Röding, 1798)

(Figs 18a-b)

Lambis vomer Röding, 1798: 64 [# 821. *L. Vomer*. Das Pflugschareisen Gmel. *Stromb. auris Dianae*. Martini 1485.

> **Figs 14-22.** Ex Bolten collection specimens present in MNG. **Figs 14a-b.** *Conomurex decorus* (Röding, 1798). Possible paralectotype of *Lambis decora* Röding, 1798, ex Bolten collection MNG 4512, no locality, l. 29.6 mm. **14a.** Apertural view. **14b.** Dorsal view. **Figs 15-17.** *Doxander operosus* (Röding, 1798). **15a-b.** Possible paralectotype of *Turris operosa* Röding, 1798, ex Bolten collection MNG 4622 (re-numbered MNG 9205), no locality, l. 94.9 mm. **15a.** Apertural view. **15b.** Dorsal view. **16a-b.** Possible paralectotype of *Turris operosa* Röding, 1798, ex Bolten collection MNG 4622a (re-numbered MNG 9205), no locality, l. 99.9 mm. **16a.** Apertural view. **16b.** Dorsal view. **17a-b.** Possible paralectotype of *Turris operosa* Röding, 1798, ex Bolten collection MNG 4622b (re-numbered MNG 9205), no locality, l. 95.3 mm. **17a.** Apertural view. **17b.** Dorsal view. **Figs 18a-b.** *Euprotomus vomer* (Röding, 1798). Paralectotype of *Lambis vomer* Röding, 1798, ex Bolten collection, MNG 4869, no locality, l. 70.2 mm. **18a.** Apertural view. **18b.** Dorsal view. **Figs 19a-b**. *Laevistrombus turturella* (Röding, 1798). Paralectotype of *Lambis turturella* Röding, 1798, ex Bolten collection, MNG 4708, no locality, l. 59.4 mm. **19a.** Apertural view. **19b.** Dorsal view. **Figs 20a-b.** *Tibia fusus* (Linnaeus, 1798). Lectotype of *Tibia indiarum* Röding, 1798, ex Bolten collection, MNG 4947, no locality, l. 147.2 mm. **20a.** Apertural view. **20b.** Dorsal view. **Figs 21a-b.** *Rimella fissurella* (Linnaeus, 1767). Specimen ex Bolten collection, MNG 4961, no locality, l. 19.6 mm. **21a.** Apertural view. **21b.** Dorsal view. **Figs 22a-b.** *Terebellum terebellum* (Linnaeus, 1758) f. *lineatum* Röding, 1798. Lectotype of *Terebellum lineatum* Röding, 1798, designated herein, ex Bolten collection, MNG 3274, no locality, l. 41.7 mm. **22a.** Apertural view. **22b.** Dorsal view. All photographs: UW.


19a
15a
15b
16a
16b
19b
14a
17a
17b
18a
14b
18b
20a
20b
22a
22b
21a
21b

1486. 1 St.].

Remarks. — The MNG collection holds 2 sample numbers (# 4868 and # 4869) of this species. The Bolten collection held only one specimen, now present in MNG, collection number 4869, measuring 70.2 mm. It is, as such, clearly indicated in the catalogue compiled by Schmidt. At the time the catalogue was compiled by Röding, this species would, in all probability, be considered a rarity. There is one other specimen present in MNG, viz. collection number 4868. This first entry in the catalogue is accompanied by a description made by Schmidt. The entry in the MNG catalogue to the Bolten specimen reads: *"# 4869. Dito, vollendet. 2 Zoll 13 Linien. Bolten."*

Euprotomus vomer has a scattered distribution in the western Pacific, with records from Japan (Nansei Shoto); southern Vietnam; New Caledonia; Fiji; Tonga; New Zealand; and the Kermadec Islands. The latter has been named *E. kiwi* by Bozetti & Sargent (2011), but not accepted by Liverani (2013: 43). A discussion on this is beyond the scope of the present paper. However, we cannot exclude the possibility that populations of what is now considered to be one species by most authors with the exception of Bozzetti & Sargent, is a complex of several closely related (sub)species. One of the earlier names, now considered to be a subjective synonym of *E. vomer*, could be an earlier name for *E. kiwi* if proven to be distinct. A lectotype for *L. vomer* has been designated by Kronenberg & Wieneke, 2018: 19. By doing so, they established *Strombus chemnitzii* Pfeiffer, 1840 as an objective synonym of *L. vomer*. In retrospect, we consider this action as somewhat unfortunate, as we now discovered this original ex Bolten specimen in MNG, which, by default is now a paralectotype of *L. vomer*.

Genus *Laevistrombus* Abbott, 1960

***Laevistrombus turturella* (Röding, 1798)**
(Figs 19a-b)

Lambis turturella Röding, 1798: 65 [# 833 *L. Turturella*. Das Turteltäubchen. Gmel. *Stromb. canarium*. sp. 24 Martini 3. t. 79. f. 817. 2 St.].

Remarks. — We found in the catalogue of MNG some entries "*Strombus Isabella*", one of them, # 4703, a specimen with "Bolten" indicated as previous owner. Röding (1798) never described a species as *Lambis isabella*, and coming from the Bolten collection, it must have been renamed as *S. isabella* by Schmidt. *Strombus isabella* is an objective synonym of *Lambis turturella*, as Man in 't Veld & De Turck (1998: 99) selected the same illustration in Martini (1777: pl. 79, fig. 817) as lectotype for both *Lambis turturella* and *Strombus Isabella*.

For *Strombus isabella*, Schmidt made a description, accompanying # 4699. Catalogue number 4703 is an ex Bolten specimen, with the following remark by Schmidt:

"# 4703. dito, noch jung oder das Stümpfchen, 2 Stück. 1 Zoll, 7 Linien. Bolten."

(# 4703. dito, still young or the little stub, 2 specimens. 1 Zoll, 7 Linien. Bolten.)

Unfortunately, we could not trace this specimen in MNG among the specimens of *S. isabella* sensu Schmidt. As the Schmidt catalogue provides no name given by Röding to these missing specimens, we can only guess which name Röding had given originally to these specimens. Röding (1798: 65) provided four names and two varieties that are probably referable to the current concept of the genus *Laevistrombus* Abbott, 1960, vide supra. Two of these names and one variety are nomina nuda (*Lambis canariensis* "Der Canarienvogel", one specimen present in the Bolten collection; *L. canaria* "Der weisse Canarienvogel", also one specimen present in the Bolten collection; and *L. canaria* var α "sehr monstrôse", again one specimen).

As *Lambis canaria* is referred to in the German vernacular name by Röding, and Schmidt makes no mention of this white colour, we rule out the possibility that these two specimens are *Lambis canaria* sensu Röding. Moreover, of each of these was only one specimen present, which is also true for *L. canariensis*. Therefore, we also rule out the possibility that one of these missing specimens was *L. canariensis* sensu Röding. As far as *L. turturella* is concerned, vide infra.

"# 4708. Abänderung. Str. turturellus Boltenii. Das Gewinde sehr hoch, mehr als bey der Ganzen, die obersten Windungen quergestreift; bräunlich gelb. Noch nicht vollendet. 2 Zoll 17 Linien. Bolten."

4708. Variation. The spire is very high, more than in the whole, the top whorls turns streaked; brownish yellow. Not yet completed. 2 Zoll 17 Linien. Bolten.

For # 4709, vide infra.

In retrospective we consider the lectotype designations by Man in 't Veld & De Turck (1998) unfortunate, as we discovered this genuine ex Bolten collection specimen, and it is also widely known that the Lamarck collection is present in Muséum d'Histoire Naturelle Genève (Switzerland), where (a) type specimen(s) of *S. isabella* may very well be present.

Family Rostellariidae Gabb, 1868
Genus *Tibia* Röding, 1798

***Tibia fusus* (Linnaeus, 1758)**
(Figs 20a-b)

Tibia indiarum Röding, 1798: 123 [# 1583 *T. Indiarum*. Die Ostindische Stern-Nadel. Gmel. *Strombus fusus*. sp. 1 γ.

äusserst selten. Favanne 34. Fig. B. 3. Martini 4. vign. 41. P. 344. 1 St.].

Remarks. — The Bolten collection had four lots of species of *Tibia*, the second species being *Tibia indiarum*, erroneously numbered "3" by Röding (1798: 123). This error was corrected by Noodt (1819: 87), who listed it as the second species. Furthermore, Noodt added after the word "selten": "und schön".

The other species in the Bolten collection were identified by Röding as *Tibia insulaechorab*; *T. clavus*; and *T. fissurella*, all accompanied by a direct reference to an illustration, vide supra. The Favanne illustration has been discussed by Kronenberg (2012: 8), who pointed out that the illustration in Favanne (pl. 34, fig. B3) is a copy of an earlier illustration in Dezaillier d'Argenville (1742: pl. 13 fig. D). Kronenberg & Burger (2002: 46) selected the illustration in Dezaillier d'Argenville as lectotype of *Murex fusus* Linnaeus, 1757 [= *Tibia fusus*]. Dodge (1956) discussed the early confusion of the identity of *Murex fusus* and its confusion with *Rostellaria rectirostris* Lamarck, 1799 extensively. He also provided a synonymy but did not mention *Tibia indiarum*.

The specimen, once owned by Bolten, is now present in MNG, collection # 4947, as *Rostellaria rectirostris*, is accompanied by a description by Schmidt. There is a clear indication that this specimen is ex Bolten, and therefore to be considered as a syntype of *Tibia indiarum* Röding, 1798. We hereby designate the specimen in MNG 4947 as lectotype of *T. indiarum*, thus formalizing the existing synonymy. Interestingly, the next entry in the catalogue compiled by Schmidt, # 4948, is also listed as also *Rostellaria rectirostris*, and is ex Röding, vide infra.

Subfamily Rimellinae Stewart, 1927

Remarks. — Stewart (1927) in his treatmend of American fossil species, only gave the name (Stewart (1927: 366) as a subfamily of Strombidae. In his subsequent discussion (Stewart, 1927: 367-369) there was no further diagnosis nor a description. However, in this subsequent discussion the name *Rimella* is mentioned as a valid genus, and therefore the introduction by Stewart meets the requirements of ICZN Art. 12.2.4. Rimellinae has been accepted as an available name by subsequent authors, e.g. Kronenberg & Burger (2002); Bouchet & Rocroi (2005); Burger & Kronenberg (2006) Bandel (2007); and Squires (2013). Whether or not this taxon should be regarded as a family of its own or not and its relationship to other Stromboidea is beyond the scope of this paper.

Genus *Rimella* Agassiz, 1840

***Rimella fissurella* (Linnaeus, 1767)**
(Figs 21a-b)

Tibia fissurella Röding, 1798: 123 [# 1585 *T. fissurella*. Die gespaltene Stern-Nadel. Gmel. *Strombus fissurella*. sp. 28. Martini 4. t. 158. f. 1498. 1499. 1 St. ; Verkalkte. 5 St.].

Remarks. — The Bolten collection held six specimens. In MNG, we found four samples, catalogue numbers 4958-4961, of which the last one originates from the Bolten collection. It was distinguished from the other specimens, all ex Schröter, by a brief description. This is *Rimella fissurella* of all subsequent authors. As Röding clearly referred to Gmelin, we do not consider this specimen, or any of the other specimens ex Bolten collection if still in existence, a type specimen.

Family Seraphsidae Gray, 1853

Remarks. — There are two problems connected to this family-level taxon. The first is the authorship. Caze et al. (2010) attributed this taxon to Jung, 1974, without any further reasoning. The attribution to Jung was followed by Maxwell et al. (2018). Only in Maxwell et al. 2018 a reasoning for this action was provided by referring to ICZN Art. 35.5 and also to Art. 50.3.1. Gray (1853: 131) introduced Seraphsidae (as Seraphina) as a subsection of Strombidae. Jung (1974) was unaware of Gray's 1853 paper and introduced Seraphsidae as a new name for Terebellinae De Gregorio, 1880, non Grube, 1851. The name Seraphsidae, attributed to Gray, 1853, was resurrected by Ponder & Warén (1988: 299) as Seraphidae, an emended spelling of Seraphina. The subsequent action by Bouchet & Rocroi (2005: 157) is a correction to the spelling by Ponder & Warén and retained in Bouchet et al. (2017: 224). As the action by Ponder & Warén (1988) took place before 2000, ICZN Art. 35.5 cannot be invoked, and following to ICZN Art. 50.3.1, authorship of Seraphsidae should be attributed to Gray (1853).

The second problem is on the spelling of the family name: Seraphidae or Seraphsidae. Both spellings are present in the literature (e.g. Ponder & Warén, 1988 as Seraphidae and Jung, 1974 as Seraphsidae). Discussing this into detail is beyond the scope of this paper. As stated in the section materials and methods, we follow Liverani (2013: 6, 14) who used Seraphsidae, just like Bouchet et al. (2017: 224).

Genus *Terebellum* Bruguière, 1798

***Terebellum terebellum* (Linnaeus, 1758)**
(Figs 22a-b)

Terebellum lineatum Röding, 1798: 135 [# 1690 *T. Lineatum* Der Liniirte Bohrer. Gmel. *Bulla terebellum*. sp. 22 β. Lister t. 736. f. 31. 3 St.].

Remarks. — The Bolten collection held three specimens identified by Röding (1798) as *Terebellum lineatum*. Only one of these specimens ended up in MNG, viz. #3274.

Traditionally, both *T. punctulorum* Röding, 1798 and *T. lineatum* Röding, 1798 have been considered as colour morphs of *T. terebellum* (Linnaeus, 1758), e.g. Jung & Abbott (1967: 449). However, Caze et al. (2010: 417) concluded in their study on fossil Seraphsidae that "the residual colour patterns represent an important taxonomic tool in addition to the traditional study of the shell shape.", and they discriminated one new fossil species, viz. *Seraphs peterjungi* Caze, Merle, Pacaud & Saint Martin, 2010 from *S. chilophorus* (Cossmann, 1889) solely on colour pattern. We have no reason to believe that this conclusion could not be valid for living Seraphsidae. Recently Liverani (2013: 15, pl.132 figs 1-4), expanded by Maxwell et al. (2018), argued that *T. delicatum* Kuroda & Kawamoto, 1956, up to then generally considered to be a colour morph of *T. terebellum* (e.g., Jung & Abbott, 1967) is a species distinct from *T. terebellum*. This argument is based on the form of the columellar callus and a constant colour pattern that differs from all colour morphs of *T. terebellum*. Note that in the text of Liverani (2013: 15), the year of description by Kuroda & Kawamoto is indicated as 1961, whereas the year on the caption to the plate (pl. 132) is given as 1956. In recent years, two more species of *Terebellum* were discriminated, viz. *T. hubrechti* Poppe & Tagaro 2016 and *T. simoni* Dekkers, Maxwell & Congdon, 2019. Both these latter two species also have a constant colour pattern that differs from all known colour morphs of *T. terebellum*, as well as some morphological differences.

Caze et al. (2010: figs 1-2, not fig. 1A and 2E [= *T. delicatum*]) illustrated the great variability of the colour pattern of what is considered the living species *T. terebellum*, including the forma *punctulorum* (figs 1B, H, I, 2A-D) and forma *lineatum* (figs 1C-D), but also deviating lined patterns (figs 1E-F) and a specimen combining *punctulorum* and *lineatum* colour pattern (fig. 1G).

The MNG collection holds two specimens referable to *T. terebellum* f. *lineatum*, viz. one # 3274 and 3275. The specimen with MNG # 3274 is ex Bolten collection and has no number on the shell. The other specimen has the number 3275 and is indicated in the catalogue as "beschädigt" (damaged) and indeed misses the adapical part of the outer lip. Here we designate the specimen MNG # 3274 as lectotype of *Terebellum lineatum* Röding, 1798 to establish the identity of this taxon unequivocally.

REFERENCES TO BOLTEN AS AUTHOR IN THE SCHMIDT MNG COLLECTION CATALOGUE

We encountered some entries in the catalogue compiled by Schmidt that, in our opinion, are references to names (allegedly) given by Röding. These are discussed here below. We stress that these names are not introduced here as names for taxa, or replacement names for existing taxa.

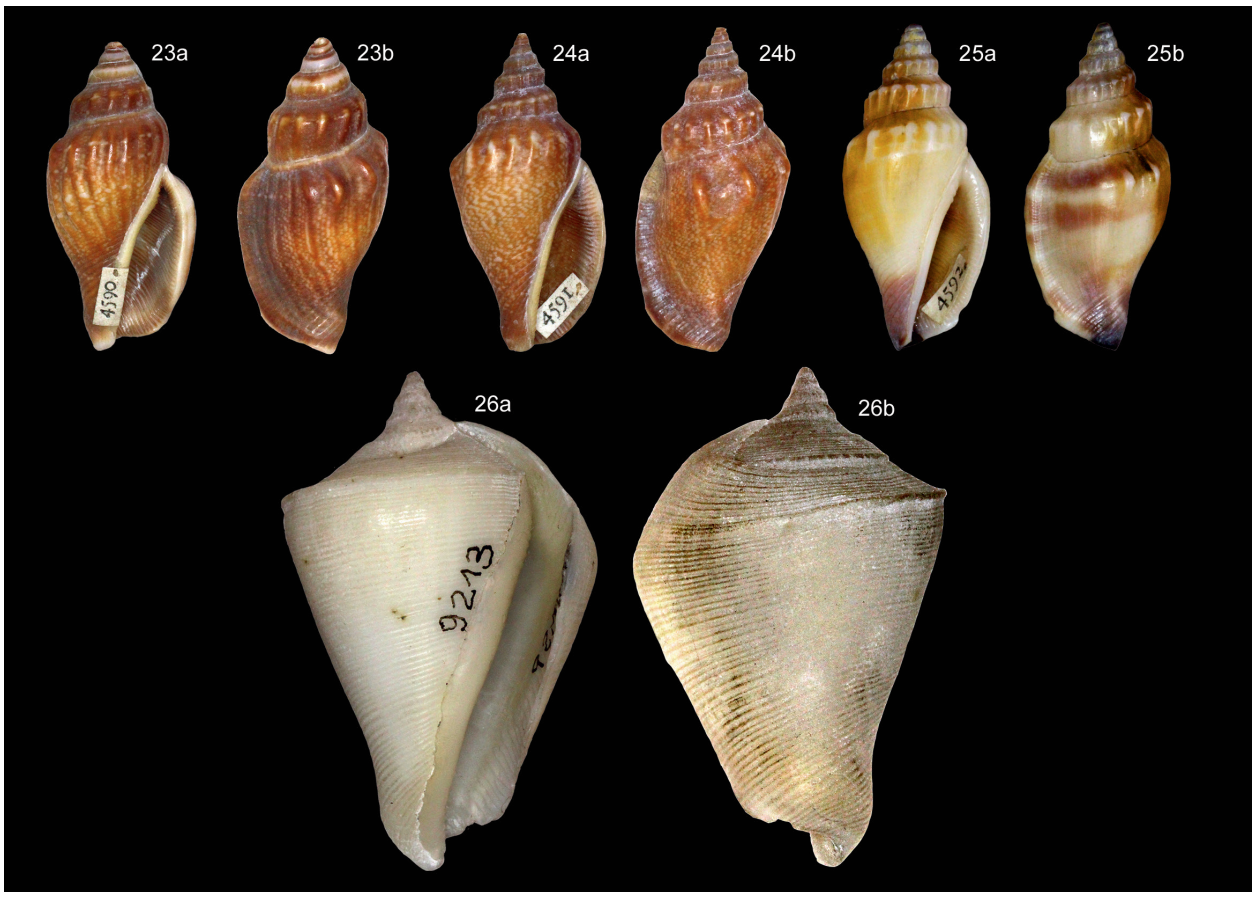
MNG catalogue # 4554, "*Str.[ombus] melanostomus Boltenii*". This entry starts with "*Str[ombus] urceus, Str[ombe] bouche noir No. 25 Lamarck, Str[ombus] urceus No. 29 Lin.[naeus]*", followed by the reference to Bolten. In other words, this name appears as a synonym in the catalogue. Röding never introduced a "*Lambis melanostoma*", but this is probably a translation of the German vernacular name "Schwartzmund" # 807 in Röding (1798). The name *Strombus melanostomus* is not an available name from Schmidt (ICZN Art. 8.1.3), and is not to be considered as a senior synonym of *Strombus melanostomus* G.B. Sowerby I, 1825, a junior synonym of *Lambis aratrum* Röding, 1798, currently known as *Euprotomus aratrum* (Röding, 1798). This specimen came from the Schröter collection but was not found by us during our visit. This might be due to renumbering of some of the specimens.

MNG catalogue # 4590 / 4591 / 4592, "*Str.[ombus] brunus Boltenii*" (Figs 23-25).

Directly following entries on *Str.*[*ombus*] *floridus* Lamarck [1822] (collection numbers 4580-4589) – with references to Lamarck (1822); figs 807-9 [from Martini (1777)]; and Lister (1688) pl. 848 fig. 3 and pl. 857 fig. 13 – there is a sample 4590 indicated as "*Str.[ombus] brunus Boltenii*", followed by 4591 ("*Dito, vollendet*"), and 4592 ("*Abänderung*") of the same species. In this sense, this specimen is not intended as a subspecies, but as a name given by Bolten (= Röding) according to Schmidt. We did not encounter the name *Lambis brunus* or the epithet "*brunus*" with reference to a figure of a stromboid in Röding (1798). There is only one reference given by Schmidt in the MNG catalogue for this name, viz. under # 4592 to III fig. 806 (= Martini (1777: pl. 78 fig. 806). This illustration is a figure of *Strombus mutabilis* Swainson 1821, of which *Strombus floridus* Lamarck, 1822 is considered a junior synonym. Although the name *Strombus brunus* is accompanied by a description in the catalogue, and reference is made to existing figures, it is not an available name (ICZN Art. 8.1.3). None of these three specimens came from the Bolten collection.

We have found all three specimens in MNG.

The specimen with the collection number MNG 4590 came from the von Anthing collection and is here identified as *Canarium labiatum* (Röding, 1798) (Figs 23a-b); the specimen with the collection number MNG 4591 came from the Schröter collection and is also identified here as *C. labiatum* (Figs 24a-b); the specimen with the collection number MNG 4592 also came from the Schröter collection and is identified here as a specimen of *C. urceus* (Linnaeus, 1758) (Figs 25a-b).



Figs 23-26. Specimens in the Schmidt collection with names attributed to Bolten (= Röding), neither mentioned in Röding (1798) nor Noodt (1819). The Schmidt names are nomenclaturally unavailable as they are mentioned only in the handwritten catalogue (nomen museorum). **Figs 23-24.** *Canarium labiatum* (Röding, 1798). **23.** Ex Von Anthing collection, MNG 4590, locality unknown, l. 30.6 mm, referred to by Schmidt as *Strombus brunus*. **23a.** Apertural view. **23b.** Dorsal view. **24.** Ex Schröter collection, MNG 4591, locality unknown, l. 30.7 mm, referred to by Schmidt as *Strombus brunus*. **24a.** Apertural view. **24b.** Dorsal view. **Figs 25a-b.** *Canarium urceus* (Linnaeus, 1758), ex Schröter collection, MNG 4592, locality unknown, l. 30.7 mm, referred to by Schmidt *as Strombus brunus*. **25a**. Apertural view. **25b.** Dorsal view. **Figs 26a-b.** *Margistrombus marginatus* (Linnaeus, 1758), probably the former MNG 4664, ex Schröter collection, MNG 9213, locality unknown, l. 47.2 mm, referred to by Schmidt as *Strombus albidus*. **26a**. Apertural view. **26b**. Dorsal view. All photographs: UW.

MNG catalogue # 4664 "*Str*[*ombus*] *albidus Boltenii*" ex Schröter collection (Figs 26a-b).

In Röding's (1798: 62, # 789) *Lambis albidus* is a nomen nudum, vide supra. We checked a number of Schröter's papers to seek for this name, but we failed to find this name in any of Schröter's publications.

We haven't been able to find the specimen with MNG catalogue # 4664, but there is, however, a specimen that received a new collection number, provided by Joost in 1982. This specimen is renumbered 9213 and has an old label with only the name *Strombus albidus* written on it. It is identified here as *Margistrombus marginatus* (Linnaeus, 1758) (Figs 26a-b). As there is only one entry "*Str*[*ombus*] *albidus* Boltenii", we conclude that this new number 9213 is the old collection number 4664, i.e., the specimen that came from the Schröter collection.

In the Röding catalogue (1798: 62) the name *Lambis albida* appears directly after *Lambis gibbosus* (= *Gibberulus gibbosus* (Röding, 1798), and directly before *Lambis dentata*, vide supra. In the Schmidt catalogue, the name *Strombus albidus* appears directly after ten entries identified by Schmidt as *Strombus marginatus*, registered as MNG collection numbers 4654-4663. Therefore we conclude that *Lambis albida* sensu Röding is not the same species as *Strombus albidus* sensu Schmidt. This, however, has no consequences at all, as both *Lambis albida* and *Strombus albidus* are not available names from either Röding or Schmidt.

MNG catalogue # 4742 "*Str*[*ombus*] *venustus Boltenii*" ex Röding.

In Röding (1798: 61, # 772) *Lambis venusta* refers to Gmelin (1791: species # 13) *Strombus pugilis* as "Die gebandete Flügelschnecke", and appears directly after a number of specimens of *S. pugilis* (Linnaeus, 1758) starting at # 4719 and directly before # 4743, *S. pyrulatus* Lamarck, 1822, a


27a
27b
28a
28b
29a
29b
30a
30b
34a
34b
36b
32
35a
36a
33a
31
33b
35b
37a
37b
38a
38b

junior synonym of *S. alatus* Gmelin, 1791. This specimen was acquired from Röding, and may once have been part of the Bolten collection, but was not found by us during our visit, probably due to renumbering.

SPECIMENS ACQUIRED FROM RÖDING (NATURALIENHÄNDLER)

Here we list specimens, and discuss some of them briefly, from the Schmidt collection acquired from Röding at some point, but not during the auction of the Bolten collection. As Röding himself bought shells during the auction (Semper, 1876: 122), these specimens may have been part of the Bolten collection, but at present, there is no way to prove this. Yet, it cannot be proven the other way around, i.e., that these are not specimens once part of the Bolten collection. These may include syntype specimens of names made available by Röding (1798). Therefore we consider such specimens as possible type specimens and illustrate them (Figs 33-35, 37-38). Apart from these, we also illustrate ex Röding specimens that were given a name by Schmidt (Figs 27, 31-32, 36) in his catalogue. As explained earlier, these names are but unavailable from Schmidt. We also illustrate three specimens of *Doxander* (Figs 28-30), renumbered by Joost (1982), that we were able to trace back to Röding based on the detailed descriptions by Schmidt in his catalogue when searching for possible type specimens of *Doxander operosus* comb. nov., vide supra.

All these specimens have entries in the Schmidt catalogue as "Röding", and on the last page after completion of the genus, sometimes further indicated as "Röding Naturalienhändler". We treat these specimens in the same order as they appear in the Schmidt catalogue. Unfortunately, from the total of 48 specimens indicated as ex Röding by Schmidt, we have only been able to trace 16 specimens in the collection of MNG bearing the original collection numbers. In all probability the missing specimens had lost collection numbers written on them and have subsequently been renumbered by Joost in 1982, as is the case with the *Doxander*.

Strombidae

Genus *Strombus* sensu Schmidt

• MNG 4504 *Strombus luhuanus*.

Remarks. — This is *Strombus luhuanus* Linnaeus, 1758, type species of *Conomurex* P. Fischer, 1884. Currently known as *Conomurex luhuanus* (Linnaeus, 1758). Specimen present in MNG.

• MNG 4570 *Strombus urceus*.

Remarks. — Specimen not found during our visit (June 2019) to MNG.

• MNG 4577 *Strombus urceus*.

Remarks. — Specimen not found during our visit (June 2019) to MNG.

• MNG 4593 *Strombus plicatus*.

Remarks. — Specimen not found during our visit (June 2019) to MNG.

• MNG 4621 *Strombus acus* mihi (Figs 27a-b).

Remarks. — Specimen renumbered by Joost as MNG 9205.

• MNG 4627 *Strombus vittatus* (Figs 28a-b).

Remarks. — Specimen subsequently erroneously renumbered to MNG 4631 by Joost.

• MNG 4629 *Strombus vittatus* (Figs 29a-b).

Remarks. — Specimen renumbered by Joost as MNG 9163.

• MNG 4630 *Strombus australis* mihi (Fig. 30).

Remarks. — Specimen renumbered by Joost as MNG 9163.

• MNG 4634 *Strombus australis* mihi (Fig. 31).

< **Figs 27-38**. Specimens acquired from Röding by Schmidt. **Figs 27a-b**. *Doxander* cf. *vittatus* (Linnaeus, 1758). Ex Röding, specimen labelled as "*Strombus acus* mihi", ex MNG 4621 (renumbered MNG 9205 by Joost), locality unknown, l. 81.4 mm. **27a**. Apertural view. **27b**. Dorsal view. **Figs 28a-b**. *Doxander entropi* (Man in 't Veld & Visser, 1993). Ex Röding, specimen labeled as "*Strombus vittatus*", MNG 4627 (subsequently erroneously MNG 4631), locality unknown, l. 79.6 mm. **28a**. Apertural view. **28b**. Dorsal view. **Figs 29-30**. *Doxander vittatus* (Linnaeus, 1758). Ex Röding. **29a-b.** Specimen labeled as "*Strombus vittatus* Abänderung [var]", ex MNG 4629 (renumbered MNG 9163 by Joost), locality unknown, l. 74.9 mm. **29a**. Apertural view. **29b**. Dorsal view. **30a-b**. Specimen labeled as "*Strombus vittatus* Abänderung [var]", ex MNG 4630 (renumbered MNG 9163 by Joost), locality unknown, l. 72.9 mm. **30a**. Apertural view. **30b**. Dorsal view. **Figs 31-32**. *Doxander campbellii* (Gray in Griffith & Pidgeon, 1833). Ex Röding. **31**. Specimen labeled as "*Strombus australis* mihi", ex MNG 4634, locality unknown, l. 46.9 mm, dorsal view. *Strombus australis* is unavailable from Schmidt, and does not enter synonymy. **32**. Specimen labeled as "*Strombus australis* oder *vittatus australis*", ex MNG 4870, locality unknown, l. 44.7 mm, dorsal view. **Figs 33a-b**. *Laevistrombus turturellus* (Röding, 1798). Ex Röding, possible paralectotype of *Lambis turturella* Röding, 1798, MNG 4709, locality unknown, l. 53.5 mm. **33a**. Apertural view. **33b**. Dorsal view. **Figs 34-35**. *Lentigo pipus* (Röding, 1798). **34a-b**. Ex Röding, possible syntype of *Lambis pipa* Röding, 1798, MNG 4790, locality unknown, l. 59.7 mm. **34a**. Apertural view. **34b**. Dorsal view. **35a-b**. Ex Röding, possible syntype of *Lambis pipa* Röding, 1798, MNG 4791, locality unknown, l. 47.0 mm. **35a**. Apertural view. **35b**. Dorsal view. **Figs 36a-b**. *Tricornis tricornis* ([Lightfoot], 1786). Ex Röding. Specimen labled as "*Strombus eburneus* mihi", MNG 4831, locality unknown, l. 86.9 mm. *Strombus eburneus* is unavailable from Schmidt, and does not enter synonymy. **36a**. Apertural view. **36b**. Dorsal view. **Figs 37-38**. *Euprotomus aratrum* (Röding, 1798). **37a-b**. Ex Röding, possible syntype of *Lambis aratrum* Röding, 1798, MNG 4857, locality unknown, l. 77.7 mm. **37a**. Apertural view. **37b**. Dorsal view. **38a-b**. Ex Röding, possible syntype of *Lambis aratrum* Röding, 1798, MNG 4856, locality unknown, l. 82.6 mm. **38a**. Apertural view. **38b**. Dorsal view. All photographs: UW.

• MNG 4652 *Strombus succinctus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4654 *Strombus marginatus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4655 *Strombus marginatus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4657 *Strombus marginatus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4658 *Strombus marginatus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4659 *Strombus marginatus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4667 *Strombus epidromis*.
Remarks. — This is *Strombus epidromis* Linnaeus, 1758, type species of *Labiostrombus* Oostingh, 1925. Currently known as *Labiostrombus epidromis* (Linnaeus, 1758). Specimen present in MNG.
• MNG 4675 *Strombus notatus* mihi.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4686 *Strombus troglodytes*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4709 *Strombus turturellus* (Figs 33a-b).
Remarks. — Possible paralectotype of *Lambis turturella* Röding, 1798, currently known as *Laevistrombus turturellus* (Röding 1798). Specimen present in MNG.
• MNG 4711 *Strombus lineatus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4731 *Strombus pugilis*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4736 *Strombus pugilis*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4742 *Strombus venustus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4788 *Strombus accipitrinus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4790 *Strombus papilio* (Figs 34a-b).
Remarks. — Name given by Dillwyn (1817: 661), junior subjective synonym of *Lambis pipa* Röding, 1798 = *Lentigo pipus* (Röding, 1798). This is a possible syntype of *Lambis pipa* Röding, 1798. Specimen present in MNG.
• MNG 4791 *Strombus papilio* (Figs 35a-b).
Remarks. — Name given by Dillwyn (1817: 661), junior subjective synonym of *Lambis pipa* Röding, 1798 = *Lentigo pipus* (Röding, 1798). This is a possible syntype of *Lambis pipa* Röding, 1798. Specimen present in MNG.
• MNG 4804 *Strombus latissimus*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4805 *Strombus latissimus*.
Remarks. — This is *Strombus latissimus* Linnaeus, 1758, currently known as *Sinustrombus latissimus* (Linnaeus, 1758). Specimen present in MNG.
• MNG 4807 *Strombus* unbestimmt.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4824 *Strombus tricornis*.
Remarks. — This is *Strombus tricornis* [Lightfoot], 1786, type species of *Tricornis* Jousseaume, 1886. Currently known as *Tricornis tricornis* ([Lightfoot], 1786). Specimen present in MNG.
• MNG 4827 *Strombus tricornis*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4831 *Strombus eburneus* mihi (Figs 36a-b).
Remarks. — Schmidt's catalogue mentions three specimens, viz. numbers 4830; 4831; and 4832]. Specimen # 4830 was not found by us, the other two, 4831 and 4832, are specimens of *Tricornis tricornis*. *Strombus eburneus* is not an available name from the Schmidt catalogue.
• MNG 4844 *Strombus gallus*.
Remarks. — We do not understand this identification by Schmidt. There are a number of specimens present in MNG that are indeed this species, but the specimen labelled as such with the number # 4844 is a specimen of *Tricronis tricornis*. This specimen was in one box, co-labelled with # 4835 as "*Strombus gallus*", which indeed is *Lobatus gallus* (non ex-Röding collection) with locality indicated as "Ost Indien Asien West Indien". Specimen present in MNG.
• MNG 4856 *Strombus auris Dian*ä Abänderung (Figs 38a-b).
Remarks. — Possible syntype of *Lambis aratrum* Röding, 1798, currently known as *Euprotomus aratrum* (Röding, 1798). Röding (1798: 64, # 820) mentioned only one specimen in the Bolten collection. Schmidt noted that this is "adusta", referring to the Tableaux encyclopedique (Lamarck, 1816, pl. 409, figs 3a-b [figure in mirror image]). Specimen present in MNG.
• MNG 4857 *Strombus auris Dianä* Abänderung (Figs 37a-b).
Remarks. — See under MNG 4856. Specimen present in MNG.
• MNG 4869 *Strombus Peru*.
Remarks. — We do not understand this entry. Possibly, *Strombus peruvianus* Swainson, 1823 (currently allocated to *Lobatus* as *L. peruvianus*) is intended, but it is more likely that it was a specimen that came from Peru (as a locality, as

such indicated by Röding) as "Peru" is written with a capital "P". We have neither found a specimen of *L. peruvianus*, nor did we find a specimen with the number 4869 during our visit (June 2019) to MNG.

• MNG 4870 *Strombus australis* oder *vittatus australis* (Fig. 32).
Remarks. Specimen renumbered by Joost as MNG 9202.

Genus *Lambis* sensu Schmidt
• MNG 4916 *Pterocera truncata*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4924 *Pterocera scorpio*.
Remarks. — Specimen present in MNG.
• MNG 4928 *Pterocera millepeda*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4930 *Pterocera millepeda*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 5197 *Pterocera lambis*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.

Rostellariidae
Genus *Rostellaria* sensu Schmidt
• MNG 4948 *Rostellaria rectirostris*.
Remarks. — This cannot be a syntype of *Tibia indiarum* Röding, 1798, as there was only one specimen present in the Bolten collection during the auction that was already acquired for the Schmidt collection, vide supra. Specimen present in MNG.
• MNG 4949 *Rostellaria rectirostris*.
Remarks. — See under MNG 4948. Specimen present in MNG.
• MNG 4955 *Rostellaria curvirostris*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• MNG 4956 *Rostellaria curvirostris*.
Remarks. —This specimen is not fully grown, as noted by Schmidt: "Dito noch unvollendet, (...) ohne Zähne.". Name coined by Lamarck (1816: 4 (Liste), pl. 411 figs 1a-b), junior subjective synonym of *Tibia insulaechorab* Röding, 1798, see also discussion in Dodge (1956). A lectotype for *T. insulaechorab* has been designated by Kronenberg & Burger (2002), viz. the specimen illustrated in Chemnitz (1780: pl. 158 fig. 1495). Specimen present in MNG.

Xenophoridae
Genus *Phorus* sensu Schmidt
• 10464 *Phorus agglutinans*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• 10465 *Phorus agglutinans*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• 10466 *Phorus agglutinans*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• 10467 *Phorus agglutinans*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.
• 10469 *Phorus agglutinans*.
Remarks. — Specimen not found during our visit (June 2019) to MNG.

Genus *Stellaria* sensu Schmidt
• 10471 *Stellaria orbiculata* mihi (Figs 41a-c).
Remarks. — The genus-level taxon *Stellaria* is based on a manuscript name given by Schmidt, and first made available through Möller (1832: 130), see Ponder (1983: 50) for details.

Interestingly, this entry was first made under the genus name *Phorus* as the first entry of a second group "B ohne fremde Körper (...)", but Schmidt changed his opinion and the description to # 10471 was crossed out (Fig. 39). A few pages further are new entries for # 10470 and 10471 (Fig. 40). On this page Schmidt first introduced the epithet "*radiata* mihi", changed his mind again and replaced the epithet by "*orbiculata*" leaving the word "mihi" in place, yet he referred to *Trochus solaris* Linnaeus (Fig. 40). We do not understand why Schmidt renamed this species.

The ex Röding specimen has the collection number 10471 (Figs 41a-c).

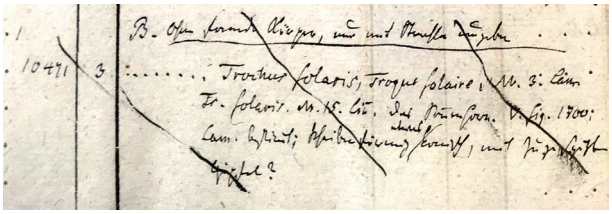


Fig. 39. Detail of page from the Schmidt catalogue with deleted entry on *Trochus solaris*. Photograph: GCK.

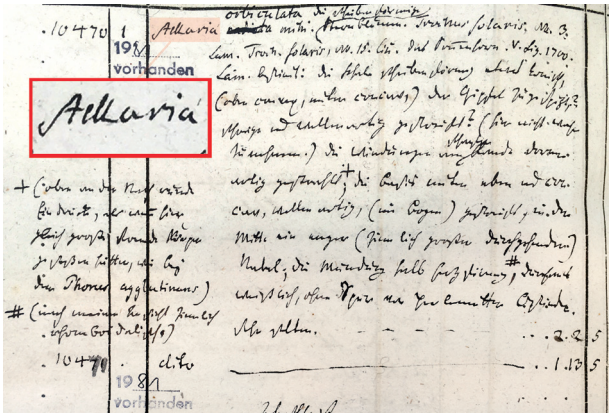
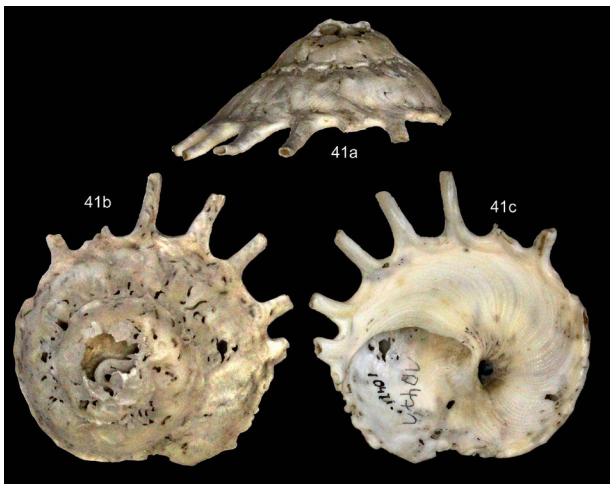


Fig. 40. Detail of page from the Schmidt catalogue with introduction of *Stellaria orbiculata* mihi. Photograph: GCK.



Figs 41a-c. *Stellaria solaris* (Linnaeus, 1764), ex Röding collection, MNG 10471, locality unknown, h. 39.9 mm, referred to by Schmidt as *Stellaria orbiculata*, the genus name *Stellaria* being the only name in Stromboidea coined by Schmidt and made available by Möller (1832). **41a**. Lateral view. **41b.** Apical view. **41c**. Basal view. All photographs: UW.

DISCUSSION

Quite a number of Rödings names have survived. As far as Stromboidea are concerned, the genus level names *Lambis* (type species *Lambis lambis* by tautonomy) and *Tibia* (type species *Murex fusus* Linnaeus, 1758) are in use. In the Bolten catalogue, Röding introduced/listed 67 species names in the genus *Lambis*, of which 19 were introduced by earlier workers as Linnaeus or Gmelin; 9 names introduced by Röding are considered to be valid; 29 are considered to be junior synonyms; and 10 are considered to be nomina nuda.

Including this paper, a total of 12 lectotypes of the 38 available names for Stromboidea introduced by Röding, are now designated. In this paper we also designated lectotypes for 2 homonyms introduced by Röding, as in some instances – among them these two – Röding referred to another species as originally intended by an earlier worker. For convenience we have listed all of Röding's stromboidean taxa, including figure references by Röding and lectotype designations herein and by other workers in Table 2.

As far as we could trace, only six specimens, allocated to *Lambis* sensu Röding, in this case, equal to *Strombus* sensu Abbott and no specimens allocated to *Pterocera* Lamarck, in this case, the current concept of *Lambis* sensu Abbott were bought at the Bolten auction. Apart from that, only one specimen of *Tibia*, one specimen of *Rimella* and one specimen of *Terebellum* that came from the Bolten auction, ended up in the Schmidt collection, now present in MNG.

This is in sharp contrast with both the statement made by Sherborn (1940: 19) "Bolten, J.F. 'Mus. Boltenianum', 1798, in B.M. [= British Museum, now NHMUK, GCK & UW]" and the statement made by Dance (1986: 65) "Most of the shells were bought by Friedrich Christian Schmidt and were acquired, after his death, by the Art and Natural History Museum of Gotha.".

As far as Sherborn's claim is concerned, Andreia Salvador (NHMUK, pers. comm. to GCK 17 December 2019) noted: "According to my records we don't have any Bolten material in the collection". And, as can be concluded, only a small fraction of the stromboideans was acquired by Schmidt during the auction of the Bolten collection, and ended up in MNG.

FURTHER RESEARCH

Parts of the Bolten collection went via the Hamburg's Patriotische Gesellschaft (Patriotic Society and the Akademisches Gymnasium) (academic high school of the Johanneum) to end up in the Hamburger Naturhistorisches Museum, see Bieler & Petit (2012: 11) and references therein. The Hamburger Naturhistorisches Museum was burned out during World War 2 air-raids by allied bombers that destroyed most of the city in July 1943. The dry molluscan collection, which at that time was considered one of the largest in the world and contained the specimens of Godeffroy, Röding, Otto Semper, and many others, was completely lost (Bieler & Petit, 2012: 12). This was confirmed by Dr. Bernhard Hausdorf from the University of Hamburg (e-mail 28 July 2019), who informed us that: "(...) die Trockensammlung des Naturkundemuseums Hamburg ist einschließlich der Kataloge und Aufzeichnungen zerstört worden. Es sind nur wenige Stücke der Trockensammlung, die z.B. verliehen waren, sowie das Alkoholmaterial erhalten. [...]. Von Bolten/Röding haben wir leider nichts." ("(...) the dry collection of the natural history museum in Hamburg, including catalogues and notes, has been destroyed. There are only a few specimens from the dry collection, that were e.g. on loan, and the alcohol material preserved. [...] From Bolten/Röding we have nothing unfortunately."). Therefore, specimens that ended up in the Hamburger Naturhistorisches Museum must be considered lost.

We cannot rule out the possibility that specimens originating from the Bolten collection have been acquired indirectly by other museums, and have been preserved in those museums, in or outside Germany, but there is no proof of that. And searching outside MNG would in all probability looking for the proverbial needle in a haystack, with poorer chances of success, as we don't even know where the haystack is.

Joost (1990: 50, appendix 4) mentioned, apart from Kohn who visited the museum (or had contact with the staff of the museum) in 1967, 1974, 1975, 1979, 1983) and Verhecken (1988), contact or visits for research in search for ex Bolten specimens by Cernohorsky (1965, Mitridae); Nuttall (1972, *Bullia*); Gründel (1977; Cerithioidea); and Félix-Alves (1983; *Oliva*).

Taxon	Additional image reference	Current status	Lectotype designation and reference
Pyramis lucifer	Martini, 1777: fig. 881	*Lobatus gigas* (Linnaeus, 1758)	
Pyramis harpa		Nomen nudum	
Pyramis striata	Martini, 1777: fig. 882	*Strombus pugilis* Linnaeus, 1758	
Pyramis volutata	Knorr, 1757: pl. 9 fig. 5	? *Lobatus raninus* (Gmelin, 1791) nomen inquirendum	
Pyramis conoidea	Martini, 1777: fig. 883	*Lobatus raninus* (Gmelin, 1791)	
Pyramis crenulata	Martini, 1777: fig. 883	*Strombus alatus* Gmelin, 1791	
Lambis pugilis	Martini, 1777: figs 838-839	*Strombus pugilis* Linnaeus, 1758	
Lambis venusta	none	*Strombus pugilis* Linnaeus, 1758	
Lambis elegantissima	Martini, 1777: figs 800-802; Chemnitz, 1788: figs 1483-1484	*Conomurex fasciatus* (Born, 1778)	
Lambis luhuana	Martini, 1777: figs 789-790	*Conomurex luhuanus* (Linnaeus, 1758)	
Lambis decora	Chemnitz, 1788: figs 1499-1500	*Conomurex decorus* (Röding, 1798)	Chemnitz, 1788: figs 1499-1500, Kronenberg et al. 2009: 660
Lambis carinata	Martini, 1777: fig. 816; Chemnitz, 1788: figs 1489-1490	*Margistrombus marginatus* (Linnaeus, 1758	Chemnitz, 1788: fig. 1489 Visser & Man in 't Veld, 2005: 58
Lambis succincta	Martini, 1777: fig. 815	*Margistrombus septimus* (Duclos, 1844)	
Lambis gibberula	Martini, 1777: figs 795-796; Knorr, 1757: pl. 14 fig. 3; Knorr, 1757: pl. 13 fig. 4	*Gibberulus gibberulus* (Linnaeus, 1758)	
Lambis gibbosa	Martini, 1777: fig. 794	*Gibberulus gibbosus* (Röding, 1798)	
Lambis albida		Nomen nudum	
Lambis dentata	Chemnitz, 1788: figs 1501-1502	*Tridentarius dentatus* (Linnaeus, 1758)	Chemnitz, 1788: fig. 1501, herein
Lambis fragilis	Chemnitz, 1788: fig. 1503	*Terestrombus fragilis* (Röding, 1798)	
Lambis picta	Martini, 1777: fig. 874	*Sinusstrombus latissimus* (Linnaeus, 1758)	
Lambis ventricosa		Nomen nudum	
Lambis rosea		Nomen nudum	
Lambis lentiginosa	Martini, 1777: fig. 892	? *Lentigo lentiginosus* (Linnaeus, 1758)	
Lambis rubiginosa		Nomen nudum	
Lambis coriacea		Nomen nudum	
Lambis puellaris		Nomen nudum	
Lambis grisea		Nomen nudum	
Lambis cingulata		Nomen nudum	
Lambis rana	Martini, 1777: figs 827-828	*Lentigo lentiginosus* (Linnaeus, 1758)	
Lambis pipa	Martini, 1777: figs 825-826	*Lentigo pipus* (Röding, 1798)	
Lambis labiata	Martini, 1777: fig. 804	*Canarium labiastum* (Röding, 1798	
Lambis urceus	Martini, 1777: fig. 803, 806; Knorr, 1757: pl. 13 fig. 5	*Canarium urceus* (Linnaeus, 1758)	
Lambis carnea	Martini, 1777: figs 833-834	*Persististrombus latus* (Gmelin, 1791)	
Lambus carnaria	Martini, 1777: fig. 893	? *Persististrombus latus* (Gmelin, 1791) nomen inquirendum	
Lambis turrita	Martini, 1777: figs 841-842	*Lobatus gallus* (Linnaeus, 1758)	
Lambis curruca	Martini, 1777: figs 836-837	*Lobatus gallus* (Linnaeus, 1758)	Martini, 1777: fig. 836, Landau et al., 2010: 97
Lambis bulla	Martini, 1777: fig. 840	*Euprotomus bulla* (Röding, 1798)	

Taxon	Additional image reference	Current status	Lectotype designation and reference
Lambis stiva	none	*Euprotomus aurisdianae* (Linnaeus, 1758)	
Lambis aurisdianae	Martini, 1777: figs 838-839	*Euprotomus aurisdianae* (Linnaeus, 1758)	
Lambis buris	none	*Euprotomus aurisdianae* (Linnaeus, 1758)	
Lambis aratrum	Chemnitz, 1788: 1487-1488	*Euprotomus aratrum* (Röding, 1798)	
Lambis vomer	Chemnitz, 1788: figs 1485-1486	*Euprotomus vomer* (Röding, 1798)	Chemnitz, 1788: figs 1485-1486[1], Kronenberg & Wieneke, 2018: 19
Lambis gallus	Martini, 1777: figs 841-842; Knorr, 1757: pl. 12 fig. 1	*Lobatus gallus* (Linnaeus, 1758)	
Lambis velum	Martini, 1777: figs 846-847	*Lobatus gallus* (Linnaeus, 1758)	Martini, 1777: fig. 846, herein
Lambis velamen	none	*Lobatus gallus* (Linnaeus, 1758)	
Lambis lobata	Chemnitz, 1788: figs 1506-1507	*Sinustrombus sinuatus* ([Lightfoot], 1786)	
Lambis latissima	Martini, 1777: figs 832-833	*Sinusstrombus latissimus* (Linnaeus, 1758)	Martini 1777: fig. 832, herein
Lambis canarium	Martini, 1777: figs 817-818; Knorr, 1757: pl. 18 fig. 5	*Laevistrombus canarium* (Linnaeus, 1758)	
Lambis canariensis		Nomen nudum	
Lambis canaria		Nomen nudum	
Lambis turturella	Martini, 1777: fig. 817	*Laevistrombus turturella* (Röding, 1798)	Martini, 1777: fig. 817[2], Man in 't Veld & De Turck, 1998: 99
Lambis epidromis	Martini, 1777: fig. 821	*Labiostrombus epidromis* (Linnaeus, 1758)	
Lambis plicata	Chemnitz 1788: fig. 1496	*Dolomena plicata* (Röding, 1798)	
Lambis minimus	Chemnitz, 1788: figs 1491-1492	*Dolomena minima* (Linnaeus, 1771)	
Lambis vittata	Martini, 1777: figs 822-823; Chemnitz, 1788: figs 1481-1482	*Doxander vittatus* (Linnaeus, 1758)	
Lambis contorta	Chemnitz, 1780: 1502	*Tibia fusus* (Linnaeus, 1758)	Chemnitz 1780: fig. 1502, herein
Lambis accipitrina	Martini, 1777: fig. 829	*Lobatus costatus* (Gmelin, 1791)	
Lambis gigas	Martini, 1777: fig. 824	*Lobatus gigas* (Linnaeus, 1758)	
Lambis lambis	Martini, 1777: figs 855, 888	*Lambis lambis* (Linnaeus, 1758)	
Lambis lamboides	none	*Lambis lambis* (Linnaeus, 1758)	
Lambis cerea	none	*Lambis lambis* (Linnaeus, 1758)	
Lambis davilae		Nomen nudum	
Lambis davilae var. α	Dávila, 1767: pl. 14	*Lambis truncata* ([Lightfoot,] 1786) species complex	No nomenclatural status, i.e. not available
Lambis davilae var. ß	Dávila, 1767: pl. 13; Chemnitz, 1788: fig. 1512	*Lambis sowerbyorum* (Mörch, 1872)	No nomenclatural status, i.e. not available
Lambis bryonia	Martini, 1777: figs 904-905	*Lambis truncata* ([Lightfoot,] 1786)	
Lambis radix	Chemnitz, 1788: figs 1514-1515	*Lambis truncata* ([Lightfoot,] 1786)	
Lambis maculata	Martini, 1777: figs 858-859	*Lambis lambis* (Linnaeus, 1758)	
Lambis millepeda	Martini, 1777: figs 861-862	*Lambis millepeda* (Linnaeus, 1758)	
Lambis chiragra	Martini, 1777: fig. 860	*Lambis scorpius* (Linnaeus, 1758)	
Lambis scorpius	Chemnitz, 1788: figs 1508-1509	*Lambis crocata* (Link, 1807)	
Lambis arthritica	Martini, 1777: fig. 857	*Harpago arthritica* (Röding, 1798)	
Lambis harpago	Martini, 1777: figs 895-896	*Harpago chiragra* (Linnaeus, 1758)	
Lambis pespelicani	Martini, 1777: figs 848-850	*Aporrhais pespelecani* (Linnaeus, 1758)	
Lambis lobata	Martini, 1777: fig. 902	*Lambis lambis* (Linnaeus, 1758)	

Taxon	Additional image reference	Current status	Lectotype designation and reference
Lambis undulata	Martini, 1777: fig. 898	*Harpago* sp.	
Lambis hermaphrodita		*Lambis lambis* (Linnaeus, 1758)	
Lambis laciniata		*Lambis lambis* (Linnaeus, 1758)	
Astraea polaris	Chemnitz, 1781: figs 1700-1701	*Stellaria solaris* (Linnaeus, 1764)	
Astraea lapidifera	Chemnitz, 1781: figs 1688, 1789	*Xenophora conchyliophora* (Born, 1780)	
Astraea conchyliophora	Chemnitz, 1781: figs 1688-1690; Favanne, 1780: pl. 12 fig. C 1	*Xenophora conchyliophora* (Born, 1780) and *X. corrugata* (Reeve, 1842)	
Astraea corallophora		*Xenophora conchyliophora* (Born, 1780)	
Tibia insulaechorab	Chemnitz, 1780: fig. 1495-1496	*Tibia insulaechorab* Röding, 1798	Chemnitz, 1780: fig. 1495, Kronenberg & Burger, 2002: 46
Tibia indiarum	Favanne, 1780: pl. 34 fig. B 3; Chemnitz, 1780: 344 (vignette)	*Tibia fusus* (Linnaeus, 1758)	MNG Schmidt no. 4947, herein
Tibia clavus	Chemnitz, 1780: figs 1501-1502	*Tibia fusus* (Linnaeus, 1758)	
Tibia fissurella	Chemnitz, 1780: figs 1498-1499	*Rimella fissurella* (Linnaeus, 1767)	
Turris operosa	Chemnitz, 1788: figs 1481-1482	*Doxander operosus* (Röding, 1798)	Chemnitz, 1788: fig. 1482, herein
Turris clathrata		*Doxander vittatus* (Linnaeus, 1758)	
Terebellum nebulosum	Martini, 1773: figs 368-369; Lister, 1688: pl. 736 fig. 30	*Terebellum terebellum* (Linnaeus, 1758)	
Terebellum lineatum	Lister, 1688: pl. 736 fig. 31	*Terebellum terebellum* (Linnaeus, 1758)	MNG Schmidt no. 3274, herein
Terebellum punctuloratum	Lister, 1688: pl. 737 fig. 32	*Terebellum terebellum* (Linnaeus, 1758)	

[1] Also lectotype of *Strombus chemnitzii* Pfeiffer, 1840.
[2] Also lectotype of *Strombus isabella* Lamarck, 1822.

Table 2. Stromboidean taxa described by Röding or names sensu Röding and their current status. *Pyramis gallica* is not included as this is a species in Volutidae.

The results by Kohn have been published (Kohn, 1975) and neither the inquiries made by Verhecken on the four syntypes of *Cantharus triplicatus* Röding, 1798 (= *Bivetiella cancellata* (Linnaeus, 1767), nor the visit by Jan Johan ter Poorten and Markus Huber in September 2010, who conducted a search among all bivalves, yielded any result, i.e. they didn't find any specimen that could unequivocally be connected with the Bolten collection. This latter agrees well a visit by Ilya Tëmkin looking for Pterioidea (around 2007, pers. comm. Alan Beu to GCK, February 2020), who had no results either.

Kohn (1975: 192) reported the presence of 27 species, represented by 45 specimens of *Conus* [Röding's genus *Culcullus*], present in Gotha. Kohn found the holotype of *Culcullus terebellum* Röding, 1798, a junior subjective synonym of *Conus circumcisus* Born, 1778 (Kohn, 1975: 221) in MNG, but did not provide a photograph of it but reproduced Martini's (1773: 52, fig. 572) figure (Kohn, 1975: pl. 3 fig. 58). Kohn further designated the illustrations in Chemnitz (1788) of specimens, once being part of the Bolten collection, as representing the lectotypes for *Culcullus geographus* (= *Conus cedonulli* Linnaeus, 1758 fide Kohn); *Culcullus gloriamaris* (= *Conus textile* Linnaeus, 1758 fide Kohn); *Culcullus leoninus* (= *Conus spurius* Gmelin fide Kohn); *Culcullus magus* (= *Conus augur* [Lightfoot], 1786 fide Kohn); *Culcullus papilio* (= *Conus genuanus* Linnaeus, 1758 fide Kohn); *Culcullus pardus* (= *Conus literatus* Linnaeus, 1758 fide Kohn); and *Culcullus purpuratus* (= *Conus circumcisus* Born, 1778 fide Kohn) all of Röding, 1798. He (Kohn) also indicated that a specimen of *Culcullus vicarius* Röding, 1798 (= *Conus locumtensis* Blumenbach, 1791 fide Kohn) once was present in the Bolten collection. Despite the relatively high number of 27 species and 45 specimens, except about the presence of the holotype of *Culcullus terebellum* Röding, 1798, Kohn (1975) made no further notes on which species were present in MNG, and whether these were type specimens or not, and if these were actually bought at the Bolten auction, or bought at another time from Röding. We conducted no further enquiries on this, neither did we make inquiries about the results of the other workers mentioned above.

Although there is no reason for big optimism, it is likely that in the collections of MNG more ex Bolten specimens, from other molluscan families, can be found. On a third

visit in February 2020 UW also looked into the parts of the Schmidt collection related to Tonnoidea. He found several catalogue entries pointing to Bolten / Röding. The results are still awaiting further processing and analysis will show whether there is any type material of Tonnoidea present in MNG. We hope that other workers will make inquiries, and, when appropriate, visit the museum in Gotha for further research.

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