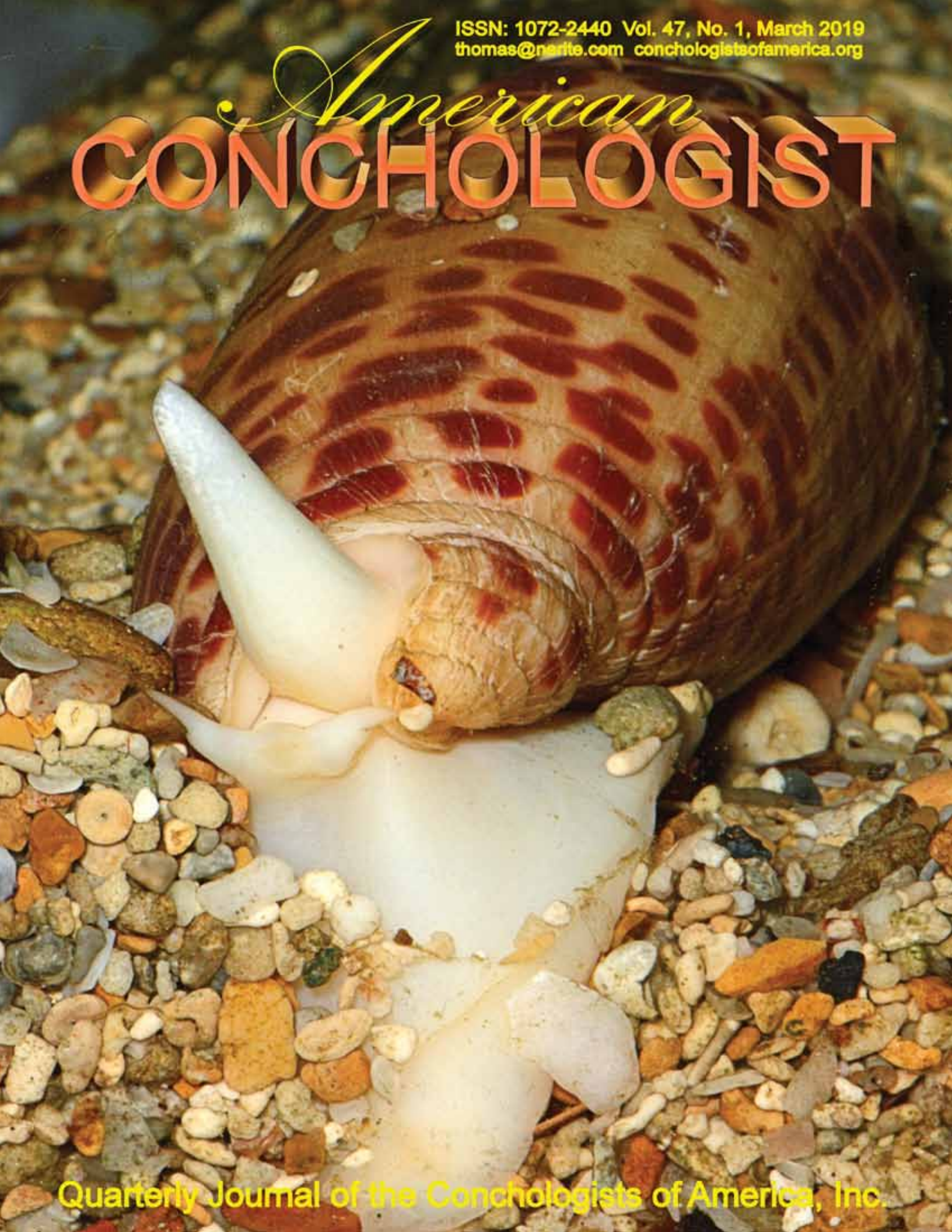


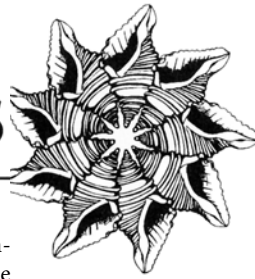
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*American*  
**CONCHOLOGIST**



Quarterly Journal of the Conchologists of America, Inc.

# CONCHOLOGISTS OF AMERICA, INC.



In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors; to the beauty of shells, to their scientific aspects, and to the collecting and preservation of mollusks. This was the start of COA. Our membership includes novices, advanced collectors, scientists, and shell dealers from around the world. In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological, and cultural importance to humans and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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**Front cover:** *Mitra papalis* (Linnaeus, 1758), photographed by David Massemin off New Caledonia. David has shared his wonderful photographs of New Caledonian fauna for years - to the delight of many fans.

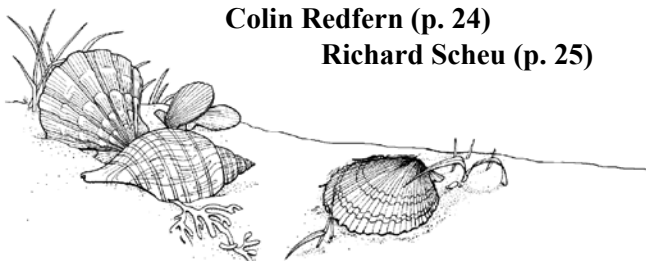
**Back cover:** The same species as it appears in collections, courtesy of H. Zell, Wikipedia.com.

**In memoriam:**

**Dennis Harris**

**Colin Redfern (p. 24)**

**Richard Scheu (p. 25)**



**Tucker Abbott Parade of Snails**



Enclosed in this issue are the registration forms for the upcoming COA Captiva Convention. Please fill them out and send in early as we need to get head counts for a couple

of very special activities. Remember, the cut off date for making hotel reservations is MAY 18th. After that, they will be no more allotted rooms.

On Thursday, June 20th, during the convention, we will celebrate Tucker with a special "Parade of Snails," featuring snail figurine categories for each of the letters in his name. Plan to come and enjoy Tucker's Snail Parade! Set-up will be early Thursday morning; balloting later that day. The convention booklet in your packet has the details.

Everyone registered can vote for his or her favorite snail in each category, as well as their favorite snail overall. In each of the six categories, the 1st and 2nd place snails will receive awards; T: Two's Company—a snail with a friend on the figurine; U: Useful—snails that lead a "double life," they have a useful purpose; C: Celebrate Tucker's Centennial—these snails festively dressed for this special celebration; K: Kid-Size—small snails, no larger than 3 inches; E: Exquisite—elegant, beautiful snails, and R: Real—the snails in this category must be made with an actual shell—(no, not alive!). One snail from all the entries in the parade will receive the special award: "Snail of the Show."

If you've never entered a "Snail Parade," now's the time. Let's all dust off our snails and select those which best fit in these categories. An application with all the details is in this issue of *American Conchologist*, or you can print one from the COA website ([www.conchologistsofamerica.org](http://www.conchologistsofamerica.org)). Select your snail entries, fill out the application, and mail it in no later than June 1st. Then pack your snails for their fun trip to Captiva!

Anne Joffe



In the June 2018 issue the COA Award winner for the 2018 Marco Island Shell Show was mistakenly reported as Mary Ann Duke. This should have read **Mary Ann Coke!**

# The varix — more variations on a theme

Emily H. Vokes

The word *varix* (pl. *varices*) is a Latin medical word for an enlargement, as in “varicose veins.” Malacologists are more accustomed to speaking of “varices” on gastropod shells, for a break in the forward growth of the shell, which is often used in describing taxa, to determine generic or specific differences.

Linnaeus (1758, p. 746) used only the term “suturis membranaceis,” as did Gmelin (1791, p. 3530). George Perry (1811), who predated Lamarck but was totally ignored for over 100 years, wrote only in English, but used a variety of words to describe the structure in question. His plate 7, *Triplex*, has “leafy spines,” plate 8, *Hexaplex*, includes three species of *Homalocantha*, as well as true *H. foliacea* [= *cichoreum* Gmelin], which are said to have “six septa;” and plate 9, *Polyplex*, includes two species of *Trophon*, which are said to have “membranaceous divisions.”

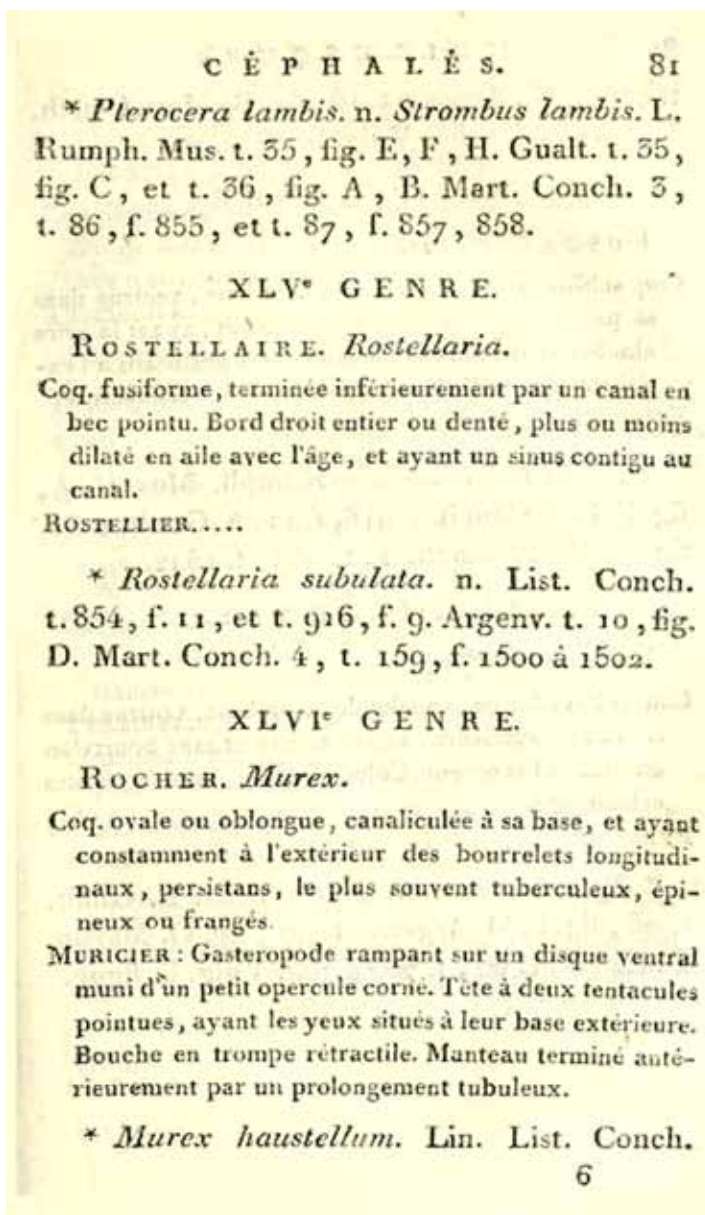
Lamarck (1803, p. 81), writing only in French, refers to “bourrelets\* longitudinaux.” The word “varix” in its malacological sense seems to first appear in Lamarck (1822); at least I know of none earlier. In his *Animaux sans Vertèbres* he discusses the genus *Murex* (“Rocher”) and describes the shell in French as having “Bourrelets triples ou plus nombreux sur chaque tour de spire,” which he then also cites in Latin as “Varices in anfractibus ternae vel plures” (1822, p. 155).



**Plate 7 and caption from George Perry’s *Conchology* (1811). His term, “leafy spines,” can be seen in the first paragraph, lines one and two. Varices were an important taxonomic factor for Perry.**

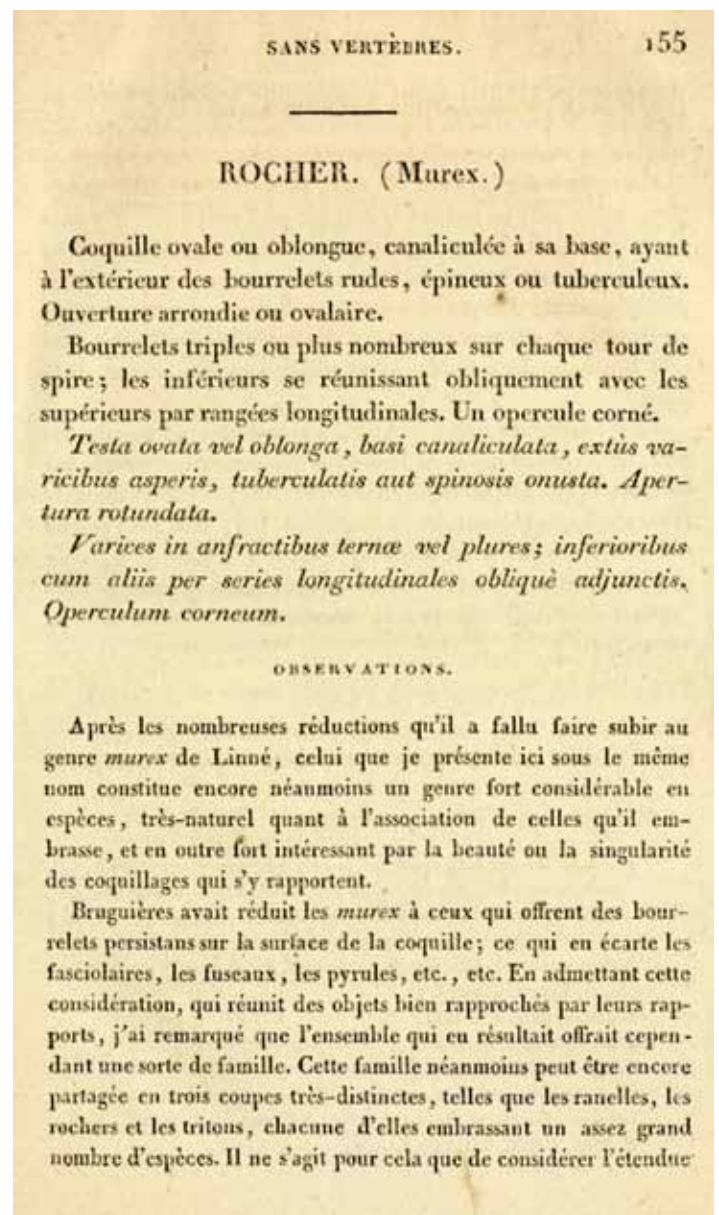
While the translation of “bourrelet” as “varix” is semantically correct for most of the gastropods, using the term for the Muricidae is rather questionable. In a definitive new study on the varix, Webster and Vermeij (2017) state that there are a number of similar structure types that they do not

\*bourrelet = ridge, bulge, or roll.



Page 81 from Lamarck's *Système des animaux sans vertèbres* (1803). His term, "bourrelets longitudinaux" can be seen in the first paragraph for *Murex*.

consider to be varices. These include those of members of the genera *Homalocantha* and *Trophon*, among others [Perry would be so happy!], as well as *Epitonium*. These structures they consider to be "lamellae," with no shell deposition or erect lip on the apertural side, and lacking an intervarical rib. These authors define a varix as a thickening on the outer shell surface that differs from the other axial sculptural elements; therefore, species with varices possess two sizes of axial sculpture. That is to say, if the shell is smooth between varices — they are not varices but lamellae; however, the shell is not necessarily smooth, as in *Nipponotrophon* and *Vasum*. I am not sure that I understand the subtle difference, and I doubt the idea will take over malacological description,



Page 155 from Lamarck's *Histoire naturelle des animaux sans vertèbres* (1822). His term (maybe the first printed conchological usage of varices), "Varices in anfractibus ternæ vel plures," begins the fourth paragraph.

it seems more a distinction than a difference. In any case, the use of the term "varix" in the Muricidae is so well established that I cannot imagine changing it.

Varices, true or otherwise, are assumed to function in reducing the risk of predation. This may be by way of deterrence — "spines and ridges are painful to soft-mouthed predators," obstruction — "large structures prevent gape/claw-limited predators from getting a grip on the shell," or structural — preventing breakage from shell-crushing or shell-peeling (*i.e.* calappid crabs) (*ibid.*, p. 734). Furthermore, the angular distribution makes the shell more likely to land upright; generally a dorsal protrusion will prevent the shell from landing upside down.



Plate 1 – according to Webster and Vermeij (2017) these are not varices but “axial lamellae.”

1. *Epitonium scalare* (Linnaeus, 1758), 2. *Homalocantha anatomica* (Perry, 1811), 3. *Nipponotrophon scitulus* (Dall, 1891), 4. *Paziella oregonia* (Bullis, 1964), 5. *Poirieria zelandica* (Quoy & Gaimard, 1833) WoRMS by Nat Hist Mus Rotterdam, 6. *Trophon geversianus* (Pallas, 1774), 7. *Vasum ceramicum* (Linnaeus, 1758). Images courtesy of femorale.com, except no. 3 from conchology.be, and no. 6 anon.



Plate 2 – according to Webster and Vermeij (2017) these are true varices.

1. *Aspella media* Houart, 1987, 2. *Bolinus brandaris* (Linnaeus, 1758), 3. *Bursa granularis* (Röding, 1798), 4. *Cassis tessellata* (Gmelin, 1791), 5. *Cirsoptrema dalli* Rehder, 1945, 6. *Colubraria tenera* (Gray, 1839) (was *Colubraria castanea* Kuroda & Habe, 1952), 7. *Dermomurex pauperculus* (C.B. Adams, 1850) (Neogene fossil), 8. *Eupleura caudata* (Say, 1822), 9. *Lindapterys sanderi* Petuch, 1987, 10. *Murex tenuirostrum* Lamarck, 1822, 11. *Neptunea cumingii* Crosse, 1862, 12. *Pteropurpura trialata* (Sowerby, 1834), 13. *Favartia (Pygmaepterys) dondani* (Kosuge, 1984), 14. *Tritonoharpa lanceolata* (Menke, 1828). Images courtesy of femorale.com, except no. 7 from neogeneatlas.net; nos. 9 & 12 from conchology.be; and nos. 10 & 12 from jaxshells.org.



(above): This is why all of the varied strategies for protecting the molluscan shell are needed – a ‘shell-crunching crab,’ also known as a ‘can-opener crab.’ In this case it is *Calappa gallus* (Herbst, 1803), called the lumpy box crab or poki poki in Hawaii. Varices make a shell stronger and, in essence, thicker. The area where the varix is acts as a thicker shell without having to actually expend the energy required of such. It also provides a surface that can be sacrificed to attack without damage to more critical shell areas. Image from Wikipedia.com.

(right): Even the thick shell of *Strombus alatus* Gmelin, 1791, the fighting conch, can prove vulnerable to crab predation. Image courtesy of COA member José Leal.



In addition, periodic growth minimizes the period of vulnerability so that the animal may build up resources for another growth spurt while the aperture is guarded by a varix. The cost of producing a continually thick shell is relatively high. Most importantly, in siphonate species it is not necessary to constantly remodel the siphon; it is functional most of the time without constant remodeling (*ibid.*, p. 737). Several authors have reported that there is a short growth period during varical formation, when the animal remains hidden, although this has not been verified in the laboratory, according to Webster and Vermeij. Certainly, in all my collecting of both fossil and Recent muricids, the number of shells found to have died “between varices” is exceeding low.

Webster and Vermeij present the evolutionary history of varices, beginning with a family by family evaluation of the development of the structure (*ibid.*, p. 737). Not surprisingly, they note that there is a complete lack of varical development in the Heterobranchia, which in the land-dwellers they attribute to the “increased cost of a weighty shell and reduced calcium availability.”

Within the Caenogastropoda they note there are a few groups that have developed varices, particularly the Certhiidae, and Epitoniidae (e.g., *Cirsotrema*). In particular the Tonnoidea have developed varices, especially with a pattern of development every 240° (Cassidae, Cymatiidae) or 180° (Bursidae, Ranellidae). It is in the Neogastropoda, especially in the Muricidae, however, that we see the greatest development of true varices. Using their definition of varices, Webster and Vermeij contend that the earliest varical development in the Muricidae is seen with the Paleocene genus *Timbellus*. In their eyes, species of Trophoninae for example, are not included. Neither are members of the muricine genera *Paziella* and *Poirieria*, but there are at

least two species, tentatively assigned to *Paziella*, described by Garvie (1991, 1992), from the Late Cretaceous of Texas, that certainly appear to me to have varices, including denticles on the inner side of the outer lip (*P. cretacea*, 1991; *P. duoclavus*, 1992).

Not including the groups that do not meet their strenuous definition, these authors estimate that there are seven different origins of varices in the Muricidae. These origins include one each for the Muricinae, Ocenebrinae, Ergalataxinae, Typhinae (+ Tripterotyphinae), Aspellinae, plus two within the Muricopsinae (*ibid.*, p. 742). The most common pattern found is three varices per whorl, but two, four or six may occur, and in one case (*Muricanthus*) there may be as many as 12 per whorl.

In the subfamily Muricinae, almost all species have varices, although the authors exclude those they consider “stem muricids” like *Attiliosa*, *Calotrophon*, *Flexopteron*, *Paziella*, and *Poirieria* (even though I would consider them “varicate”). True spiny varices occur only within the Muricinae, beginning with two species of *Bolinus* from the Oligocene-Miocene of Europe. These species are said to be variable in the number of both varices and ribs, which



we might expect in the earliest development (*ibid.*) Typical *Murex* s.s. are known from the Early Miocene of the Indo-Pacific and *Siratus* and *Vokesimurex* are known from the Early Miocene of the Western Atlantic. The authors state that the subfamily Aspellinae “is contested,” but they keep it separate, noting that the genus *Aspella*, with two varices per whorl, begins in the Late Oligocene. In *Dermomurex*, *Takia*, and *Viator*, the number varies with the species, but all extend back to the Oligocene (*ibid.*, p. 743).

Although the Muricinae have the largest number of varicate forms, the varicate Ergalataxinae include *Ergalatax*, *Cronia*, *Phrygiomurex*, *Daphnellopsis*, and *Lindapterys*. Webster and Vermeij consider that “few Muricopsinae have true varices, despite having some of the most elaborate axial sculpture among muricids,” adding, “most species actually have impressively elaborate lamellae like ... *Homalocantha anatomica*” (*ibid.*). They admit, however, that *Pygmaeptyrys* and *Caribiella* do have varices. Only the Typhinae and Tripterotyphinae all have varices, ranging from two, in *Distichotyphis*, to as many as five, although most have three or four.

Webster and Vermeij admit, “...it is difficult to separate the varicate and nonvaricate Ocenebrinae,” and conclude that the group probably arose in the Early Oligocene. About half of the ocenebrine genera have varices, which can vary from low and rounded to the huge alate varices of *Pteropurpura* and *Ceratostoma*. Most have three varices, but *Eupleura* has only two and *Ceratostoma rorifluum* (Adams and Reeve, 1849) has four (*ibid.*).

Other families are only scarcely varicate. Buccinidae includes a few fossil species that show some irregularly placed varices and most Colubrariidae have broad, rounded varices, the oldest from the Early Eocene. In the Nassariidae, almost all species are varicate with a single lateral varix, in addition to the terminal one. Many Cancellariidae, especially fossil forms, have varices, dating back to the Late Cretaceous, with a general trend of reducing varices in Recent species (*ibid.*, p. 744).

Given their obvious function of protecting the snail animal from predators it is not surprising that varices have evolved multiple times. In fact, the authors estimate that (even with their stringent definition) varicate shells have evolved independently 41 times (*ibid.*, p. 746). Furthermore, they note the distribution of varices is highly phylogenetically clumped. About 50% are represented by three or fewer genera and at least eight contain varicate taxa from only one geological period (*ibid.*). From their Fig. 4 (a composite evolutionary tree) it is evident that the bulk of the lower taxa (Potamidae, Cerithidae, Strombidae, Tonnoidea, etc.) originate in the later Cretaceous, but the higher taxa (Muricidae, Buccinidae, Columbidae, etc.) do not appear until the beginning of the Cenozoic or, in many cases, not until the Early Miocene. These patterns are thought to reflect the evolution of predators, especially those that break shells or enter through the aperture (*ibid.*).

Varicate genera are overwhelmingly found in warm, shallow waters of the Tropics. The large number of varicate taxa, they note (*ibid.*, Fig. 5) is due to a few diverse clades, especially Cerithiidae, Tonnoidea, and Muricidae. If one were to enlarge the definition of varices to include those dismissed as “axial lamellae” then the number of groups would be much larger; however, the conclusions would not be greatly changed. They would still be predominately Cenozoic and predominately Tropical.

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# The story behind the Portland Catalogue

Jim & Linda Brunner



**Margaret Cavendish Bentinck, Duchess of Portland (1715-1785), styled Lady Margaret Harley before 1734, Duchess of Portland from 1734 to her husband's death in 1761, and Dowager Duchess of Portland from 1761 until her own death in 1785. She grew up surrounded by books, paintings, sculptures, natural history objects, and famous authors and other notables. She was reportedly the richest woman in Great Britain and owned the most extensive natural history collection in the country. To care for her collection she employed the chaplain, botanist, and librarian, John Lightfoot, and the botanist and naturalist, Daniel Solander.**



**Daniel Charles Solander<sup>1</sup> (1733-1782), was born in Sweden and was schooled at the Upsala University in 1750 where his professor of botany was Carl Linnaeus. Impressed with his student's abilities, Linnaeus convinced Solander's father to allow Solander to study natural history. Solander traveled to Britain in 1760 to promote the Linnean system of classification and was soon responsible for cataloging the natural history collections in the British Museum. He took a leave of absence from the museum to accompany Joseph Banks on James Cook's first Pacific voyage on the *HMS Endeavour*.**

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<sup>1</sup>Daniel Solander (1733-1782) and Joseph Banks (1743-1820) were botanists on Cook's voyage, but Banks, having 'made his name' on an earlier voyage to Newfoundland and Labrador (1766) was the senior member of the team – and remained so throughout their mutual endeavors. Banks was an aristocrat (Sir Joseph Banks, 1st Baronet) and quite wealthy and helped support Solander through much of his career. Upon returning from the voyage of the *HMS Endeavour*, in 1771, Solander wrote a manuscript of the plant species discovered during the six months they spent in New Zealand. The MS, titled, *Primitiae Florae Novae Zelandiae* [Beginnings of a New Zealand Flora], with 700 plates that were to be prepared by Banks, was never published. Later, Solander collaborated with Banks on the *Florilegium*, also delayed waiting for illustrations by Banks and also never published. Solander died at the Banks residence at the age of 49. Solander was a noted naturalist, an elected 'Fellow of the Royal Society,' and curator ('Keepership of the Natural History Department') at the British Museum, where his unpublished manuscripts are still stored to this day. The Solander box, a protective clamshell book covering still in use, was invented by Daniel Solander. New Zealand's Cape Solander and Solander Islands are named after him.

Shell collecting is sometimes about shells and sometimes about the people that collect them. Such is the case of the Portland Catalogue, published in 1786. By all accounts Margaret Cavendish Bentinck (1715-1785), the second Duchess of Portland, was a beautiful, intelligent woman with an intense interest in all aspects of natural history (including shells). She used her wealth to amass a huge collection of natural history items (called the Portland museum), including a small zoo, gems, minerals, and an extensive shell collection. Many of these items came from ships involved in the “voyages of discovery” to the South Seas, including those of Captain James Cook (1728-1779).

Like most amassers of “cabinets of curiosities” (i.e. Curio Cabinets) the Duchess found her collection in nomenclatural disarray following Carl von Linnaeus’ (1707-1778) publication of the binomial classification system (a genus name followed by a species name, *Conus imperialis* for example) in 1758. To develop a ‘modern’ arrangement of her shells into families, genera, and species, she enlisted the services of Daniel Solander, a gifted student of Linnaeus and a botanist on Cook’s *HMS Endeavour* voyage to the South Seas (1768 to 1771). Solander began work on 7 January 1778, and continued until the spring of 1781, (albeit for only one day a week). He had almost completed the bivalves and started on the gastropods when he stopped for the summer, fell ill, and died early in 1782. He wrote descriptions for the examined shells, but none of this work was ever published and did not enter into the scientific lore.



**The Portland Catalogue, a 194 page anonymous auction catalogue containing natural history specimens (insects, gems, shells, crustaceans, etc.) and fine objects of art owned by the Duchess of Portland. 24 April 1786 is indicated on the title page, but the auction did not take place until a month later.**

In 1785, the Duchess herself fell ill and died on 17 July at age 71. While she was undoubtedly disturbed that her collection had never been completely described, little did she realize that her death would enshrine her name in the minds of shell collectors forever. Her death and the debts that she had acquired meant that her collection had to be auctioned. For this, an auction catalogue would have to be prepared. If the listed items in such a work (published before 1931) used binominal nomenclature and showed or referenced a figure or description, it served as a legitimate



**(left & above): Some of the shells listed in the Portland Catalogue – credited to Lightfoot (1786).**

foundation for the naming of the shells under International Commission on Zoological Nomenclature (ICZN) rules (Article 12) and this is indeed what happened with the Portland Catalogue.

This task fell to the Reverend John Lightfoot (1735-1788), who, beginning in 1767, was the chaplain and librarian to the Duchess and an accomplished conchologist in his own right. Lightfoot and Banks were friends, and it is entirely possible that Lightfoot introduced Solander to his friend Banks before the two of them sailed off with Captain Cook (Bowden, 1989). The task took at least six months to complete and the catalogue was published in early 1786 with the auction of some 4,156 lots beginning on 24 April and continuing for 38 days. Today we see the notation (Lightfoot, 1786) for the valid shells contained in the collection. Unfortunately the good Reverend's health began to decline soon after he finished the catalogue and he too died in February 1788.

The fly in the ointment is that the Portland Catalogue does not have a listed author. The author is listed only as 'the compiler,' who states that species with 'S' for the author are those described by Solander in an unpublished manuscript. Throughout the following century and more, the catalogue was either ignored or Solander was listed as the author. Eventually, noted malacologists argued for the interpretation that credited Solander. Iredale (1916: 88) stated, "I think that as Solander drew up the descriptions and named the specimens in the Portland Museum and 'the Compiler' [the unknown author of the catalogue] simply saw that there was no discrepancy[,] the credit must belong to Solander." Just a few years later, Dall (1921: 98) added that the "...anonymous editor of the Catalogue added a few names on his own account and was apparently a conchologist of some note, but from his classification not E. M. Da Costa. According to Dillwyn (1817) it was George Humphrey." Neither individual seems to have been involved, although the avid shell collector George Humphrey attended the auction and purchased quite a number of shells (Dance, 1962). Even the august Charles Davies Sherborne, in his 10 volume index of every animal species, living and extinct, named between 1758 and 1850, credits Solander with the names, but lists each as *nomen nudum* [lacking a palpable description or referenced illustration]. So just how did we end up crediting Lightfoot with the Portland Catalogue names?

In 1962, Peter S. Dance wrote, "The authorship of the Portland Catalogue" in the *Journal of the Society for the Bibliography of Natural History*. In this short, four page pa-



A copy of a page from the catalogue which has notations as to the buyers and amounts paid for the listed items. You can see that the dealer, George Humphrey, bought several of the shell lots. Note that Lightfoot references Linnaeus with an "L." (item 3824, *Turbo petholatus* Linnaeus, 1758). He uses an "S." for a name from the Solander manuscripts (3825, *Cardium protrusum* Lightfoot, 1786 - synonymized by Rehder to *Corculum impressum* Lightfoot, 1786). A specimen with no author attached is credited to Lightfoot (item 3828, *Turbo undulatus* Lightfoot, 1786). Note also that Lightfoot gives an illustration reference for this specimen (as he does for many others) making the entry valid according to the IZCN.

per, Dance successfully argued that John Lightfoot was the author of the Portland Catalogue and that while he incorporated some of Solander's MS names in the catalogue (giving credit with an 'S'), he none-the-less changed many descriptions and added some of his own, demonstrating Lightfoot's authorship rather than Solander's.

William Clench, writing in 1964, disagreed with Dance's conclusions about the authorship of Lightfoot, calling the evidence circumstantial.

Alison Kay (1965: 11) reviewed the available evidence and concurred with Dance, stating, "...that neither the traditional citing of Solander as author of those species designated by the letter "S" in the Catalogue, nor Kohn's (1964) citation of "Solander in Lightfoot" is appropriate. The lack of congruence between the manuscripts and the Catalogue which was pointed out by Dance (1962) mitigates against considering Solander the sole author of the "S" species, while in Kohn's (*op. cit.*) usage there is implicit resort to a manuscript, but manuscripts have no legitimacy in nomenclature practice. Thus I favor the suggestion of Dance (*op.*

rare, in a glass case, for GEORGE HUMPHREY			
Humphrey	3842	A very large and fine specimen of Argonauta Argo, L. or Paper Nautilus, from the Mediterranean—very rare	1. 1
do	3843	A very complete specimen of a fine purple and orange variety of Spondylus Gæderopus, L. with ramified spines from China—rare	2. 2
do	3844	A very perfect specimen of Conus pulcher, an undescribed species from the Coast of Guinea—extremely scarce, Lf. 772	3. 3

Here is one of the later pages from the Portland Catalogue (day 36 of the auction) and it highlights several points discussed here. This shows three lots, 3842, 3843, and 3844 – all purchased by George Humphrey. Lot 3844, *Conus pulcher* is noted as undescribed and there is no author listed (L. for Linnaeus or S. for Solander), thus this description is by the Catalogue ‘compiler,’ John Lightfoot. He provides a locality ‘Gulf of Guinea,’ as well as a reference, “List. 772,” (Lister (1770) tab. 772). This satisfies ICZN requirements for a publication prior to 1931.



*Conus (Kalloconus) pulcher* [Lightfoot], 1786, 128mm, as it is represented today. Image from Wikipedia.com, by Merlin Charon.



The illustration in Lister (1770: tab 772) referred to by Lightfoot for his *Conus pulcher*.

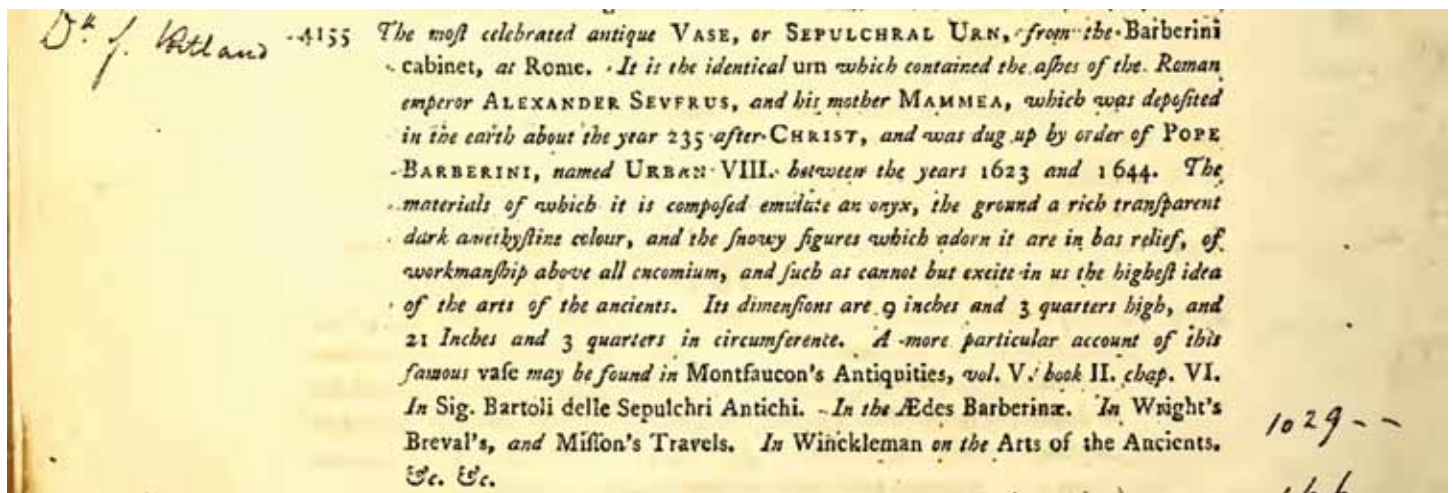
cit.) because it patently reduces the possibility of future confusion.” Kay goes on to support her argument and provides a comparison of the Catalogue names with an “S” to the Solander MS names. Almost 50% of these differ between the Solander MS name and description and the Lightfoot Portland Catalogue name and description.

Rehder (1967) concurred with both Dance and Kay that the Catalogue author was Lightfoot and that he should be cited and not Solander. He goes on to list the valid names found in the Portland Catalogue.

Sadly, this document, with its binominal nomenclature, was almost totally overlooked in the 18th and 19th centuries and the names fell into obscurity until rescued by William Iredale and W. H. Dall in the early 1900’s. Dr. Harald Rehder (1967) did an exhaustive study of the Portland Catalogue and concluded that there were two new valid genera (*Isognomon* and *Placuna*) and 120 species first “validly proposed” in the Portland Catalogue. Of the 120 species names, 111 were mollusks (the others were echinoderms, brachiopods, crustaceans, etc.), 9 were *nomina dubia*, 3 junior homonyms, and 46 junior synonyms. This left 62 valid names to

be assigned to Lightfoot, of which 46 were in use (credited to Solander, Humphrey, or Lightfoot), 9 were used as senior synonyms and thus available, and 6 he considered *nominata oblita* as accepted senior synonyms in the literature. The valid Lightfoot names include some of the most elegant and popular shells in collections today. Among these are: *Lambis truncata*, *Cypraea pantherina*, *Murex pecten*, *Oliva incrassata*, *Sinustrombus sinuatus*, *Turbinella angulata*, *Melomelomphora*, *Aulica imperialis*, *Cymbium pepo*, *Conus auger*, *Conus pulcher*, *Umbraculum umbraculum*, *Atrina rigida*, *Dinocardium robustum*, *Macrocallista nimbosa*, *Argonauta hians*, *Argonauta nodosa*, and *Nautilus scrobiculatus*.

One bright footnote to the story is that Lightfoot gave credit to Solander for some of the catalogue’s descriptions. If not for this, Daniel Solander’s name might well be lost in conchological history. Of course, this crediting is responsible for much of the controversy surrounding the Authorship of the Portland Catalogue. Some (Dance, Kay, Rehder) would say that because of the lack of publication, Solander’s name should never be listed as a shell’s author. If ‘publish’ means printed then this is true. Lightfoot, in his introduction to the Portland Catalogue, refers to an unpub-



The most expensive item in the auction was lot 4155, the second to last item listed. This “most celebrated antique,” called the Portland Vase, sold for £1,029 (approximately £165,000 or \$216,000 today). This truly unique glass vase has a bit of a story (see below). The Portland Vase was purchased by the Duchess’s son, William Cavendish-Bentinck, 3rd Duke of Portland. The final tally for the auction was £3,684.26 (approximately \$700,000 today).

## Portland Vase



The Portland Vase is a Roman cameo glass (a design etched and carved through fused layers of differently colored glass), a process developed and used from about 60BC to AD20 (these dates vary wildly according to different experts). Knowledge of this original process is estimated to have only lasted a couple of generations, after which it was lost, to be revived for a short time from late AD200 to early AD300. Such works are quite delicate and thus very rare. The British Museum estimates the Portland Vase was constructed sometime between AD1 and AD25. The vase was discovered in the late 1500s, and from 1626 to the late 1700s, it was owned by the Barberini family of Italy (one of whom was Pope Urban VIII). It was sold in the late 1700s, ended up in Britain, and sold to the Duchess of Portland in a private sale in 1784 (one year before her death). The Duchess’s son, the 3rd Duke of Portland, bought the vase at his mother’s estate auction. He lent the vase to Josiah Wedgwood who spent five years making a porcelain copy (repeating the work in glass was at the time impossible). When not with Wedgwood, the vase was on loan to the British Museum. A friend of the Forth Duke of Portland broke the base of the vase and the duke gave the vase, as is, to the British Museum in 1810. In 1845, William Lloyd (a.k.a William Mulcahy) broke the vase into hundreds of pieces when in a drunken state he smashed the glass case in which it was kept. It was restored in 1845, except for 37 pieces which were lost until 1948. The vase was restored again in 1949 (the glue was failing and discolored). Then in 1988-89, again with failing and discolored glue, the vase was disassembled and restored once more. This is the restoration shown here. The scenes depicted have had various interpretations, again dependent upon the expert consulted. [https://en.wikipedia.org/wiki/Portland\\_Vase](https://en.wikipedia.org/wiki/Portland_Vase)

lished Solander manuscript that he used for reference purposes in creating the catalogue. This document (actually a series of 3 x 6 inch parchment cards gathered in leather binders) was in existence beginning in 1781 and was certainly known to two or more members of the English collecting community (including Banks and Humphrey). Would this constitute 'publication,' i.e. the act of making public? Not according to the ICZN (Article 8.4. "Works issued as physical copies. Printing on paper and optical disc are the only recognized formats for works issued as physical copies.").

As a final note to this issue, the Lightfoot listings on WoRMS all have Lightfoot in brackets [ ], following Recommendation 51D of the ICZN which states that the name of an author of a taxon published anonymously, "...if the authorship is known or inferred from external evidence, the name of the author, if cited, should be enclosed in square brackets to show the original anonymity."

How much did Lightfoot rely on Solander's work in preparing the catalogue? The document itself was 194 pages long and contained 4,156 sales lots. Of these approximately 1,949 contained one or more shells. About 1/3 of these lots were lumped together into boxes or were affixed to "cards" and were offered with no designation in the catalogue of author or other citation. Of the remaining, approximately 1300 lots were referenced, 360 used Solander as an authority. Only the works of Linnaeus were used more widely in citation in the Catalogue. Clearly Lightfoot leaned heavily on Solander in his efforts.

Shells and those who collect them are intertwined in many different ways. Often the story of the people is more interesting than the shells themselves.

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# Nanomollusk novelty: a sinistral *Punctum vitreum* (H.B. Baker, 1930) a.k.a. glass spot

Lori Schroeder & Harry Lee

The shell in the companion image is a full-grown 1.3 mm example of one of the smallest land snails in the USA, but that's just the beginning of the story. I (LS) found this sinistral shell December 11, 2018, in a drift sample I collected March 19, 2016, a few weeks after a major flood event along Harrison Creek in Bernheim Arboretum and Research Forest (BARF) near Louisville, Kentucky. This relatively pristine 16,000 plus acre tract has been the focus of our collecting for nearly a decade (Lee and Schroeder, 2012). The sample originated in a massive quarter-acre debris field, the likes of which I've not seen before or since. My small sample, amounting to three kitchen trash bags, represents a tiny, tiny fraction of this alluvium. After culling tens of thousands of mostly tiny shells, I'm not yet through processing.

It seems that this unpretentious tiny mutant, reverse-coiled shell, has characteristics that make it a giant in the annals of conchology in that:

1. It is the first left-handed specimen of its family, Punctidae Morse, 1864, ever found in the Americas.
2. It is the smallest mutant reverse-coiled adult land snail shell ever found.
3. It is the second specimen of a reverse-coiled land snail ever reported from the state of Kentucky.
4. It is the second specimen of a reverse-coiled land snail from a single county in Kentucky.

Here are some comments on these prodigious benchmarks:

1. Of some relevance is the fact that Punctidae, found pretty much around the globe, has a **normally exclusively** sinistral lineage of four or five species living in southeastern Australia, the genus *Miselaoma* Iredale, 1933 (Schileyko 2002: 1036-1037; Kevin Bonham, personal communication 18 Feb., 2010).
2. This assertion is based on reference to a large body of scattered reports on mutant coiling reversal in the published (and unpublished) literature assembled by the junior author.
3. Likewise, including Pilsbry (1940, 1946, 1948), the first was *Triodopsis vulgata* Pilsbry, 1940, found in October, 2014, **also** in Nelson Co., BARF (Lee, 2016; and <http://www.jaxshells.org/vul26.htm>).

I (LS) am still reeling from this nonpareil discovery. Knowing that this conchological *hapax legomenon* is not a mainstream collector's item, and not likely to bring "fame and fortune" as, say, a much more common sinistral chank might. Once again the haunting posit of Robert Louis Stevenson: "It is perhaps a more fortunate destiny to have a taste for collecting shells than to be born a millionaire." (Stevenson, 1911: 45), resonates in my consciousness –

and helps keep my eyes glued to the stereomicroscope in anticipation of the next conchological epiphany.

Acknowledgement:

William Frank, Jacksonville, FL photography edits.

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# A day out with conchological royalty

Paul Callomon

In the archives of the American Malacological Society at the Academy of Natural Sciences of Drexel University in Philadelphia, I found two sheets of small monochrome photographs commemorating a lost afternoon in a bygone conchological era. Through the camera's lens – and the somewhat variable angles suggest this was a handheld model – we see seven of the giants of the science enjoying a fine day at the Falls of the Potomac above Washington DC, in May of 1910.

From the professional world, the Academy's own Henry Augustus Pilsbry (1862-1957) was joined by William Healey Dall (1845-1927) of the Smithsonian Institution and his assistant Paul Bartsch (1871-1960). With them that day were four of the leading amateurs of the age: George Hubbard Clapp (1858-1949), Truman Heminway Aldrich (1848-1932), John Brooks Henderson Jr. (1870-1923), and Bryant Walker (1856-1936).

The group traveled to the Great Falls Tavern in some style (Fig. 2). Once there, they took to the river in a boat (fig. 3), strolled the banks of the Chesapeake and Ohio Canal (Fig. 4), and refreshed themselves with spring water (Fig. 5). There was some collecting in the surrounding woods too (Fig. 6) and time to discuss things over a pipe in the garden (Fig. 7).

These were major collectors: Clapp, who lived in Pittsburgh, was one of the founders of the Aluminum Company of America (Alcoa) and donated over 100,000 specimens to the Carnegie Museum of Natural History. Walker was a lawyer in Detroit, who as a hobby specialized in freshwater mollusks; much of his collection is now at the University of Michigan, of which he was an alum. John B. Henderson Jr was the son of the co-author of the thirteenth amendment, a lawyer and diplomat, and one of the Regents of the Smithsonian, where his extensive collection eventually landed. Finally, Truman Aldrich was a successful civil engineer, mining company executive, and one-term Congressman whose collecting interests latterly turned to fossils but not before he had amassed a large mollusk collection that is now in the Florida Museum of Natural History. The Great Falls Tavern still exists largely unchanged, incidentally, and is open for business!



**1. The group poses atop the C&O lock gate in front of the Great Falls Inn. Left to right: Dall, Aldrich, Walker, Pilsbry, Henderson and Clapp. Bartsch presumably took the picture; he appears in another less-well-posed version of this same pose.**



**2. The party in their cars: the main party in a 1910 Matheson Silent Six, complete with uniformed driver (L), and Henderson's own 1909 Oldsmobile Runabout.**

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3. Seven men in a boat. Apparently Bartsch is rowing.



4. On the canal towpath, left to right: Aldrich, Pilsbry, and Henderson.



5. Taking the waters, left to right: Dall, Aldrich, Walker, Bartsch, Pilsbry and Clapp.



6. Clapp (L) and Henderson compare finds.



7. Left to right: Pilsbry, Dall, and Walker relax at the Tavern.



8. The Great Falls Tavern as it stands today.

## Rusti Stover's Miniature Shell Show

Years ago we had some images of miniature shell dioramas constructed by COA member Rusti Stover, and when I saw an image of her more recent work I thought it ought to be shared in *American Conchologist*. Rusti's brief note accompanying the images said, "Here are more pix and a short note on the crafts. I made that mini quilt and pillow with some teeny printed fabric, it is actually quilted and the pillow stuffed. The lampshade I made by hand, and those are real, teeny scallop shells glued to the lampshade. Next to that craft table in the first photograph are some very tiny fossil shells in one display, actual Brazos River fossil shells, really that tiny - standing in, of course, for much larger Florida fossil shells. I have a large collection of miniature shells from all kinds of sources! Oh and if you want to know, I do work under one of those desk-mounted lighted magnifying glasses!"





Captions are really unnecessary with these images, but a few notes of explanation are probably warranted. The complete diorama shown on page 22 can be easily packed up in just a few boxes as indicated in the last image. If the object in a case, or on a table, or in a jar is a shell, then it is a real shell. Other objects like sandwiches and such are made of clay. Rusti has not shown her work in quite a few years, but is considering entering a few shows in 2019.

Rusti Stover  
wordmerchantrusti@att.net



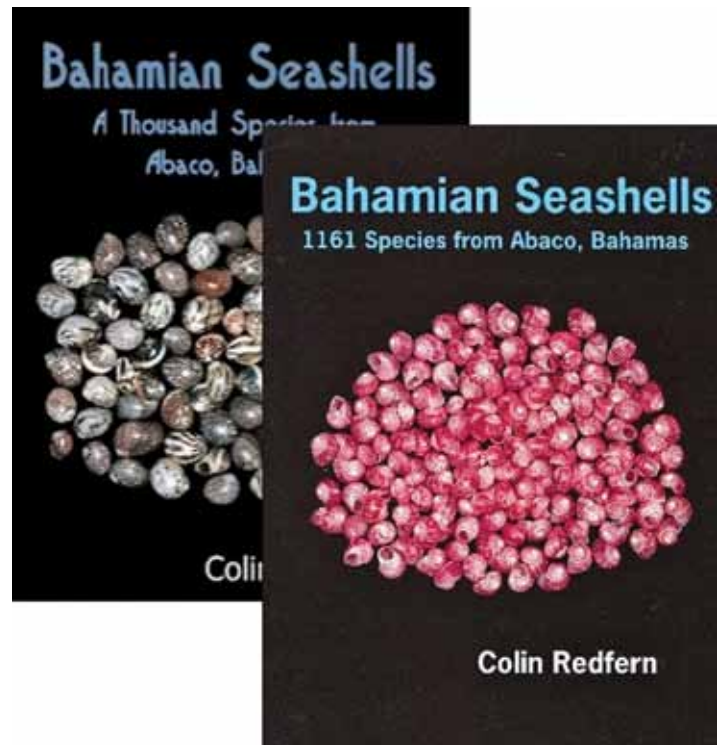
Colin & Janet Redfern in the Bahamas.

## Colin Redfern (1938-2019)

It is with great sadness that I inform that great friend and collaborator Colin Redfern passed away in a life-care facility in his hometown of Boca Raton, Florida. Born in Great Britain, Colin spent a big part of his life in Abaco, Bahamas. He was a classically trained professional pianist and productive citizen scientist who focused on collecting shells and mollusks on that Bahamian island, where he started to gather data and photographs for what eventually became the two editions of his well-respected “Bahamian Seashells” books. The first edition, from 2001, was subtitled “1000 species from Abaco, Bahamas,” and the second (2013) was an entirely new book, subtitled “1161 species from Abaco, Bahamas.” Colin’s books are, in my opinion, among the best regional molluscan biodiversity guides ever produced. Colin was a member and strong supporter of the Bailey-Matthews National Shell Museum, and, in 2014, completed the donation of his 10,000-lots collection of Bahamian seashells and preserved mollusks to the organization. As part of his outstanding contribution to the Museum, Colin volunteered to enter the data for the entire collection in the Museum catalog. Colin’s collection also includes literally thousands of specimens illustrated in his two magnificent reference works. He was a founding participant of Florida United Malacologists, and future FUM gatherings won’t be the same without him. In 2014, Colin received the prestigious *Neptunea* award from Conchologists of America for his many contributions to the science of Malacology and the scientific interests of COA. Colin is survived by his wife Janet of Boca Raton.

José H. Leal, Ph.D.

Dr Leal and Conch-L: Thank you for the sad notification. I was just looking at Colin’s massive work, which was a labor of love over many decades. Along with



his wife Janet, and Rodger and Mary Jo Bunnell of Merritt Island and later Sanibel, FL, and Ed and Sue Bayer, who I remember from the shell club in St. Louis, MO, have left a tremendous legacy about the richness of the mollusks of the Bahamas. My saddest thought is trying without success over several Florida United Malacologists (FUM) meetings to get this remarkably modest person to speak to the group. We can all be so happy that his rich collection is preserved at the Bailey Matthews National Shell Museum for posterity.

Alan Gettleman  
Merritt Island, FL

“ Colin’s books are, in my opinion, among the best regional molluscan biodiversity guides ever produced”. Very true; in fact I cannot recall anything better. A quick search in MolluscaBase:

Species co-authored by Colin:

- Lodderena janetmayae* Rubio, Rolán & Redfern, 1998
- Lodderena bunnelli* Redfern & Rolán, 2005
- Triphora abacoensis* Rolán & Redfern, 2008
- Triphora portoricensis* Rolán & Redfern, 2008
- Agathotoma asthenika* Rolán, Fernández-Garcés & Redfern, 2012
- Agathotoma eduardoi* Rolán, Fernández-Garcés & Redfern, 2012
- Agathotoma kirshi* Rolán, Fernández-Garcés & Redfern, 2012
- Agathotoma prominens* Rolán, Fernández-Garcés & Redfern, 2012



*Haplocochlias minusdentatus* Rubio, Rolán & Redfern, 2013  
*Cheilea americana* Rolán, Redfern & Fernández-Garcés, 2014  
*Rissoella abacoensis* Caballer, Ortea & Redfern, 2014  
*Rissoella edbayeri* Caballer, Ortea & Redfern, 2014  
*Rissoella kennethi* Caballer, Ortea & Redfern, 2014  
*Rissoella sanguinea* Caballer, Ortea & Redfern, 2014

## Eponyms:

*Sinezona redferni* Rolán, 1996 (= *Scissurella redferni* (Rolán, 1996)  
*Macromphalina redferni* Rolán & Rubio, 1998  
*Rissoina redferni* Espinosa & Ortea, 2002  
*Similipekten redferni* Dijkstra, 2002  
*Strictispira redferni* Tippett, 2006  
*Vitreolina colini* Espinosa & Ortea, 2006  
*Spiricella redferni* da Silva & Landau, 2008  
*Suturocythara redferni* García, 2008  
*Dentimargo redferni* Espinosa, Ortea & Moro, 2012  
*Lodderena redferni* Landau, Van Dingenen & Ceulemans, 2017 †  
*Hyalina redferni* Espinosa & Ortea, 2002 (temporary name)

Marien Faber

I'm sad also on hearing the news that Colin's gone. I regret too that I didn't get to meet him in person and that I didn't get around to buying his music CD.

"Bahamian Seashells" 1st edition was an astounding achievement for one person. As I understand it, he did almost all the collecting, very careful research, photography, writing, layout, and self-publication; this was a shell book of highest quality in my opinion. I wrote to him in praise of his book—with one complaint, that I'd used it so much that the binding fell apart.

When I ordered his second edition I was just expecting some additions to the first, since he'd set such a high bar for quality, but no, he actually surpassed that standard by a lot. The photos were now in color - large, crisp color images - and not only the shells but the animals - and so many nudibranchs! And lots of painstaking research on shells like the cysticids that if I were to ever undertake such a book I would have missed them or skipped them if I had noticed. And he even managed to figure out how to make the layout so that nearly every description had the species image on the same or facing page—that alone is impressive.

Colin inscribed my copy of the second edition "With best wishes to David, who didn't judge the previous book by its binding!..."

Thanks, Colin! In gratitude,  
 David Kirsh, LPC, RN

## Richard Victor Scheu (1940-2019)



Richard Victor Scheu of Louisville passed

away Friday evening, at the age of 78. Richard was born in Lancaster, Ohio to Theodore and Adriane Scheu. He served in the Navy during the Cuban missile crisis, and married his wife, Lynn McLaughlin Scheu not long after graduating from The Ohio State University in 1966. He moved his wife and two young sons to Louisville to start a new business, Compensation Tax Management. In 1997 he created his first wooden Kentucky Snow ornament, which started his second career and passion that filled his days until his death. These intricately carved snowflakes of various common and rare woods were beautiful to behold and quite popular at every craft show in which he participated. Richard was a competitive swimmer at Lakeside Swim Club, a member of the Kyana Woodworking Club, and was active with the YMCA. He is survived by his wife Lynn and sons Michael (of Eugene, Oregon) and David (of Saint Louis). Richard was respected and adored by people from every corner of his life; we continue to be amazed at the outpouring of love that his friends have expressed for him.

Readers of *American Conchologist* may not know, but Richard spent the last few decades selflessly as an unsung worker for COA. His wife Lynn became editor of the *COA Bulletin* in 1987, which she almost immediately renamed *American Conchologist*. As editor, Lynn was also responsible for mailing the journal to our readers. This meant that four times a year, a 300lb pallet of *American Conchologist* would arrive at her door, to be carried in, broken down, stuffed in envelopes, inserts added as necessary, labels correctly applied, divided by zip code, and then carried to the local post office for mailing. A part of this labor fell on husband Richard. When Lynn gave up the editorship in 2002, she kept the mailing chore, but a traffic accident and other issues eventually meant that instead of the two of them mailing out each issue - the manual labor type duties fell primarily on Richard. I had a few conversations with both of them about giving up this rather physical job, but both felt it kept them in touch with COA and they wanted to continue as long as they were able. That is truly three plus decades of service to COA. Thank you both.

Tom Eichhorst

**Review: The Seashells of an Iconic Public Artwork: Diversity and Provenance of the Mollusks of the Watts Towers**  
 by B. Pernet, E.R. Silverman & P.V. Scott. *Journal of Conservation and Museum Studies* 17(1): 1-11, 2019.



**Research paper online at: <https://doi.org/10.5334/jcms.177>**  
**Appendix (Pictorial Guide to the Mollusks of the Watts Towers) online at: <https://doi.org/10.5334/jcms.177.s1>**

The Watts Towers of Simon Rodia State Historic Park is “...an iconic Los Angeles artwork created by Sabato Rodia in 1921-1954.” This unique set of 17 interconnected towers, arches, walls, and other structures took 33 years to construct and is a designated National Historic Landmark, a California Historical Landmark, a Los Angeles Historic-Cultural Monument, and one of nine folk art sites listed in the National Register of Historic Places in Los Angeles. The Watts Towers park is located at 1765 E. 107th Street, Watts, Los Angeles. These unique and (let’s be honest) bizarre sculptures made from scrap rebar, scrap glass, volcanic rock, tile shards, sea shells, and other objects, all held in place by the artist’s own mixture of concrete, would deservedly escape the notice of readers of *American Conchologist*, except for one facet of their design – thousands (maybe 10,000) of imbedded sea shells. As these shells have been exposed to the elements for 70 some years, all but the most ardent collector would maybe nod at such as an interesting, but of little import, fact.

Not so the authors. B. Pernet, E.R. Silverman, and P.V. Scott set out to identify the mollusk species used by Rodia and thus determine where he collected them. They found 34 species, all but 5 of which are native to southern California. The most commonly used shells were bivalves (24 species), while gastropods totaled less than 1/3 of the total (10 species). The authors’ research is in depth and covers a myriad of facts they discovered about the use (and collection) of sea shells in this sculpture. It makes interesting reading, but I could not help wondering if there was anything here beyond that. Well, there is. One of the conclusions of the paper demonstrated how the shells used in the Watts Towers are yet another indication of how the fauna of southern California has changed since the 1950s.



**A street-side view of the Watts Towers with protective fencing. Image from Wikipedia.com.**

The authors found that the Watts Towers shells came mostly from three habitats in southern California: exposed sandy beaches, exposed rocky habitats, and bays and estuaries. Shells from the first two habitats can be fairly



Doorway detail with embedded rocks, sea shells, tile shards, and other objects the artist collected from trash and other sources. Image from Wikipedia. com.

readily replaced in restoration work (an ongoing project since the towers are exposed to the elements and the construction is certainly not up to ‘code’). Shells from the third habitat, bays and estuaries, are not so easily replaced with southern California shells, however. A scary little fact presented in their research is that a 2009 study in the Colorado Lagoon of Alamitos Bay, found that **90%** of the bivalve species were non-indigenous! The vast majority of the invasive bivalve species in the bay at present (88%) are *Venerupis (Ruditapes) philippinarum* (Adams & Reeve, 1850), a commercial Pacific species of India and Asia introduced by accident and on purpose throughout many parts of the world. The *Chione* species collected in bulk by Rodia for his sculpture are now a rarity in the lagoon.

There is also an appendix, “Pictorial Guide to the Mollusks of the Watts Towers.” Each species is shown in color, “*in situ*,” meaning in this case, embedded in concrete. The data presented for each species are thorough enough for any shell iconography. This article is an unusual and intriguing study, well worth reading. It is open source at: <https://doi.org/10.5334/jcms.177>

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*Amiantis callosa* (Conrad, 1837) located a gazebo rib in the Watts Towers. The authors provide the following information for each species: scientific name, common name, geographic range, habitat, [shell] characteristics, and distribution [within the Watts Towers].



Gazebo wall. Note the shells embedded in the wall on the top left and in the arching ribs above the main structure. Image from Wikipedia.com.

# Sarasota Shell Club's Scientific Awards

## February 8-10, 2018

Ron Bopp



The Sarasota Shell Club's Shell Show was held on February 8 to 10, 2018, at the Potter Building (adjacent to Robert's Arena) in central Sarasota. The attendance was good over the three days and the exhibits were even better. We had 18 scientific entries vie for several awards. Our judges were the most qualified Harry Lee and José Leal. Judging was held on Friday afternoon and the awards formally handed out on Saturday evening at the Judges Dinner. A bonus at the dinner was the celebrating of José's birthday!

COA: Vicky Wall, "A Shell Collector's Journey with "The Best Shell Book Ever Written," photo 1.

DuPont: Pat & Bob Linn, "A Sampling of the Olividae Family," photo 2.

Mote Gold: Dave & Linda Green, "World Wide *Haliotis*,"

Best Small Scientific Exhibit: Harry Barryman, "Family Harpidae."

Sarasota Shell Club Members Award: Duane Kauffmann, "Skyway North Club Field Trip."

Hertweck Best Fossil Award: Ron Bopp, "Bermont Formation."

Best Self-Collected Exhibit: Vicky Wall, "Adventures in the Western Atlantic."

Peggy Williams Memorial Award: Duane Kauffman, "Student Guide to Miniatures," photo 3.

Fossil Shell of the Show: Ron Bopp, *Vasum floridanum*, photo 4.

Shell of the Show: Dave & Linda Green, *Haliotis cracherodii cracherodii*, photo 5.

Scientific Judges: Harry Lee & José Leal, photo 6.



Vicky Wall – COA Award.



2. Pat & Bob Linn – DuPont Award.



3. Duane Kauffman – Peggy Williams Memorial Award.



4. Ron Bopp – Fossil Shell of the Show.



5. Dave & Linda Green – Shell of the Show.



Scientific Judges: Harry Lee & José Leal.

**-Other COA Award Winners-**

- Doug Thompson of Lynn Haven, FL, "Pride of the Panhandle," Sanibel/Captiva Shell Festival, March 2018.
- Albert van den Bruele of Breda, The Netherlands, "Mollusca Shell Dump Cape Canaveral," May 2018.
- Gene Everson of Louisville, KY, "The Naticidae," Gulf Coast Shell Show, June 2018.
- Kim Bishop of Cherrybrook, NSW, "*U. hesitata* variation from southern Queensland to South Australia," Sydney Shell Collectors Club Shell Show, Oct 2018.
- Bob and Alice Pace of Miami, FL, "The Genus *Heliophanta* (sic) Found in Madagascar," The Astronaut Trail Shell Club Seashell Festival, Jan. 2019.

## Comparison of *Macrocypraea zebra* (Linnaeus, 1758) and *Macrocypraea cervus* (Linnaeus, 1771)

Carole P. Marshall



Although these two *Macrocypraea* species are very close to the same length, you can see they are very different in profile. *M. zebra* (on left in all photos), is 79.1 mm. and *M. cervus* (on right in all photos), is 80.3 mm. *M. zebra* is narrower with very dark “teeth.” Occasionally *M. cervus* will have dots along the edge, but *M. zebra* will always have them. When live, *M. zebra* has some split or forked papillae, while in *M. cervus* the papillae are cone shaped. Bottom left *M. zebra* (with eggs) courtesy of Colin Redfern. This specimen from the Bahamas has strongly spatulate forked papillae. Bottom right *M. cervus* courtesy of Ariane Dimitris.



José and Marcus Coltro

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