

Vol. 38, No. 2, June 2010

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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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AMERICAN CONCHOLOGIST, the official publication of the Conchologists of America, Inc., and issued as part of membership dues, is published quarterly in March, June, September, and December, printed by Cardinal Printing, 341 Vincennes Street, New Albany, IN 47150. All correspondence should go to the Editor. ISSN 1072-2440.

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In This Issue

Letters and Comments -----	3
Bocas del Toro revisited. A follow-up of Olsson & McGinty's report on the Panamanian Archipelago by Emilio F. García -----	4
A New Shell Display by Bobbi Cordy -----	12
In Memoriam -----	13
Dealer Directory -----	14
Pheasant Snails (<i>Phasianella</i>) by Robert Robertson -----	17
June Huie by Ardeth Hardin -----	22
What goes around comes around; Jacksonville Shell Club to fund annual COA Academic Grant by Harry G. Lee -----	23
2010 Shell Shows and Related Evenets (Aug - Dec) by Donald Dan -----	24
The World's Smallest (and Probably Ugliest) Shell Collector by Tom Eichhorst -----	25
Shell Show Winners -----	26
Last Call for Shellebration Boston: COA 2010 -----	30
Living Fossils by Zvi Orlin -----	33

Front cover: *Hydatina physis* (Linnaeus, 1758), photographed in shallow water off Leyte Island, Philippines. The shell is about 45mm in length. The striped paper bubble lives in tropical waters with a circumglobal distribution and feeds on polychaete worms and mollusks. It lacks an operculum and is unable to retract its entire body into the shell. This photograph is courtesy of Guido & Philippe Poppe. © Guido & Philippe Poppe - www.poppe-images.com

Back Cover: *Opisthostoma mirabile* E.A. Smith, 1893, 4.5mm, from a limestone outcrop in the Kinabatangan Valley, Sabah, Malaysia. This tropical rainforest dweller has an extremely limited range and entire populations, maybe species, can be limited to just a few rocks. Quarrying, fire, and logging have destroyed much of this unique land snail's habitat. Photograph courtesy of Simon's Specimen Shells, Ltd., www.simon's-specimen-shells.com

Editor's comments:

We have another eclectic gathering of articles for this issue, with hopefully something for everyone.

Emilio García reports on a trip to Bocas del Toro, a group of islands in the Atlantic Ocean, off the northwest coast of Panama, where few people have visited much less scientifically sampled for mollusks. As usual, he provides an interesting article and great images.

Next we have a short piece by Bobbi Cordy on a new shell display (Johnson/Cordy Hall of Mollusks) she and husband Jim have established at the Brevard Museum of History and Natural Science. Bobbi also mentions the upcoming Space Coast Seashell Festival in Melbourne, Florida, 15-16 January 2011 and the 2011 COA convention that will be held in Port Canaveral, Florida, 13-17 July 2011.

Sadly we have more members listed in the "In Memoriam" box.

The "Dealers Directory" does not have anyone new this issue, but I think it should be pointed out that these dealers support COA by their participation in shell shows and by purchasing ads in *American Conchologist*. They certainly deserve your consideration for business before a dealer who does not support our organization. We also have a reminder here of the Philadelphia Shell Show, 9-10 October 2010.

Next we have an entry by Robert Robertson. With his Curator Emeritus status from the Academy of Natural Sciences in Philadelphia, he seems to have more time to write for our publication, certainly our gain. This time he provides interesting insight into the intricately patterned and sometimes brightly colored pheasant shells. The color plates will go a long way toward explaining why this group can be so difficult to properly identify.

Our next entry is a most welcome report by Harry Lee, who tells us a bit of history of the Jacksonville Shell Club and then, after talking about club goals and activities, throws in an O'Henry ending by announcing that the club has established a \$10,000 research grant for COA. Thank you Jacksonville Shell Club!

We then have the Donald Dan report on upcoming shell shows around the world, followed by a short article on the smallest and ugliest shell collector. Then we have the recent winners at various shell shows and the last promotional piece for the 2010 COA convention. It looks like it will be a great event, see you there.

Finally we have an article from Zvi Orlin on "living fossils." We all think we know what this means, but maybe there will be something in this piece to surprise most readers. One of the "living fossils" mentioned by Zvi is *Spirula spirula*. I am sure this shell is known to most of us, but just in case, here is an image of a 20mm *S. spirula* that just didn't fit into the space for the article.



Tom Eichhorst

Bocas del Toro revisited. A follow-up of Olsson & McGinty's report on the Panamanian Archipelago

Emilio Fabián García

Bocas del Toro is an archipelago located off the northwestern coast of Panama, approximately 9°20'N, 82°15'W. It is composed of five larger islands, with the main town of Bocas located on Isla Colón. In 1917 the well-known malacologist Axel A. Olsson went to the archipelago on a collecting trip because he thought the malacological fauna of the area was being ignored. He returned to the archipelago in 1920 to augment the previous collection, and a third and final time in 1953. On this last trip he was accompanied by Tom McGinty and Jay Weber. In 1958 Olsson and McGinty published the results of their collection efforts, which included the description of more than 30 new species of mollusks.

As the authors pointed out in their publication, their best collecting was on the east side of Isla Colón. Much of the material collected in this zone consisting of "...beach drift, carefully selected in the field, and which on sorting and picking proved extremely rich, especially in the smaller species..." adding, "...it is evident from the large number of species obtained by us in a relatively small time that the Bocas fauna is unusually rich and would repay more extensive work be done." (p.9). I decided to follow their advice more than 50 years after their last expedition.

I had traveled to Panama on several collecting trips in the 1990s, and tried to visit Bocas del Toro on two occasions, but never succeeded. My opportunity arrived in August 2004 when a group of colleagues from the Biology Department at the University of Louisiana at Lafayette and I were invited for a Marine Invertebrate Taxonomy Workshop by Dr. Rachel Collin, director of the Bocas del Toro Research Station of the Smithsonian Tropical Research Institute (STRI). We stayed for a week at the station in Isla Colón, where the Smithsonian maintains splendid research facilities. I had studied Olsson & McGinty's paper carefully every time I thought I was going to make it to Bocas, so thanks to the authors' thoroughness I knew exactly where to go. They stated, "...at this time our best collecting grounds were found to be along the east side of the island [Colón], between Puss Head Point and Long Bay Point or about five to six kilometers north of the city of Bocas del Toro." (p.9) As it turned out, this location was approximately three kilometers (a short bike ride) from the STRI station.

Olsson & McGinty also warned the reader about the poorer areas: "In contrast to the excellent collecting found on the east side of the island, that of the lee shore, which is fringed by mangrove, proved poor." (p.9) They were correct, but I did some snorkeling in the area and discovered some unreported species. Nevertheless, every morning after breakfast my first chore was to get on the bicycle provided by STRI and pedal the three muddy kilometers to the area where little beaches with great drift were to be found. I would use the remainder of my available time (if I was not going on other collecting jaunts with the group) looking under the microscope, "sorting and picking" as Olsson and McGinty had

done, probably only two kms south of where I was, thinking, as they had, how "extremely rich" the drift was.

My main desire for going to Bocas del Toro was to find some of the species described by the authors in their *locus typicus*, and to see if the area was still as rich as they had experienced it to be. Both of these goals were attained, but also a welcome *lagniappe* resulted from this collection. A *lagniappe*, by the way, is an unexpected "extra" given to a person by a merchant at the time of a purchase. It is a commonly used word in Cajun country (AKA "who dat" country), in southwestern Louisiana, where I live.

The material I gathered in the in Bocas during my week-long stay (actually only about five full days) in 2004 was augmented in 2008 when Will Schmidt, a colleague who works in the same lab where I do my photography, went to Bocas and brought me a pound of "grunge" from the exact area where I had collected in 2004. he added to this in 2009, when he and Natalia Arakaki, another colleague, brought me two more pounds.

Approximately 207 species belonging to 65 families have been catalogued. The best represented were Columbelloidea (18) and Fissurellidae (16), and 42 families were represented by only 1 or 2 species. Because I dedicated a large portion of time in gathering and sorting shells collected at the drift line, the paucity of larger species, when compared with Olsson & McGinty's finds, should not surprise anyone. For example, while the authors list 9 species for Ranellidae and 20 for Muricidae, I list 1 and 5 respectively. On the other hand, I list six species for Triphoridae vs. four by them. The *lagniappe* that resulted from my few days of collecting and two separate single trips to the beach by my two colleagues was very much of a surprise, as 37 of the fully identified species had not been reported by Olsson and McGinty. These, as well as other rather arbitrarily selected species that I was not able to identify are marked in the list that follows by one asterisk. The latter were obviously not found in the authors' list, either because of generic placement or unusual conchological features. Other unidentified species were left unmarked; however, some of them, when identified, may eventually turn out to be new for the area. The 33 species that had not been reported from Panama before are marked with two asterisks. All boldfaced taxa are pictured in this article

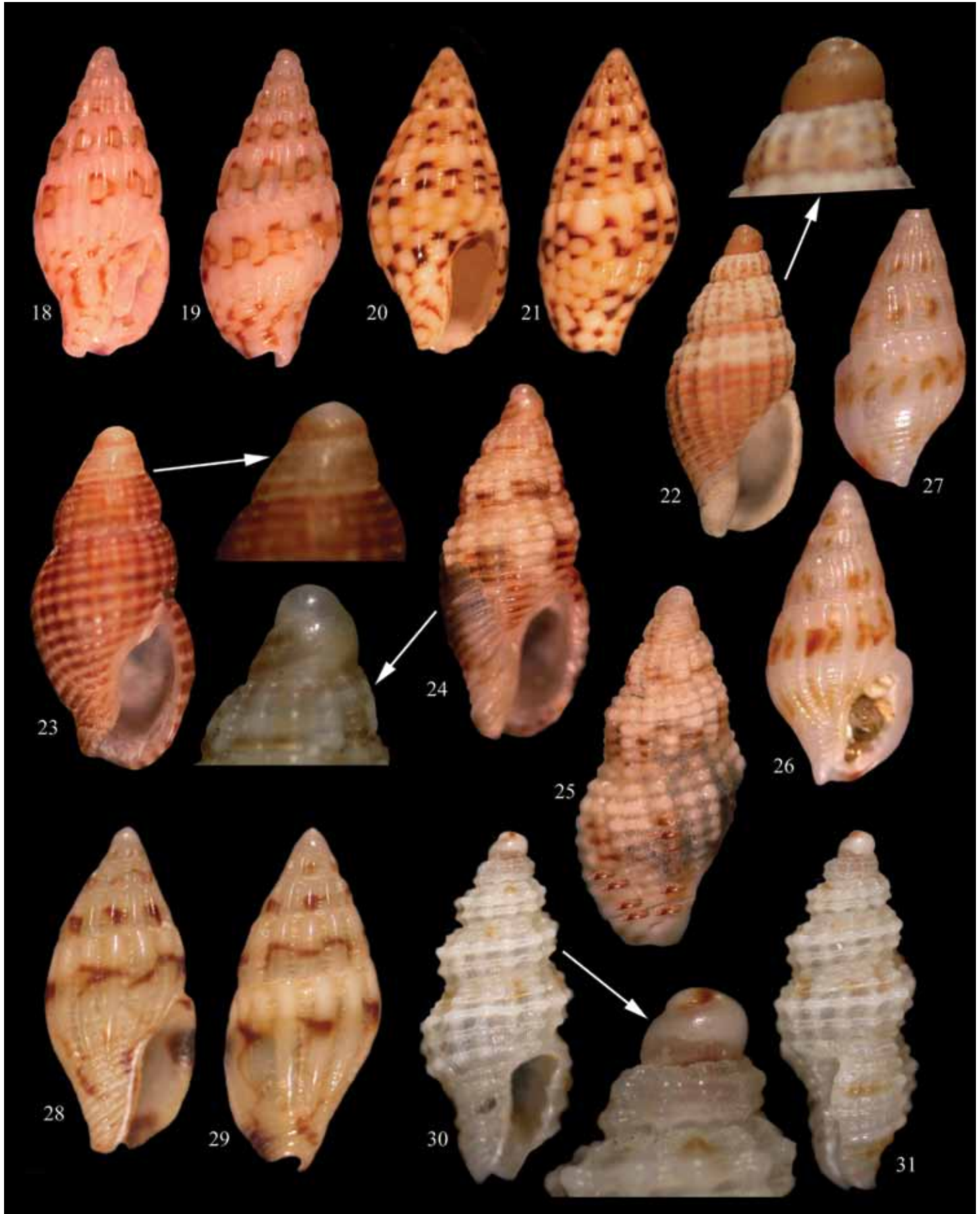
Of particular interest is *Parvanachis* sp. aff. *nisitella* (Duclos, 1840) (figs. 28-29), which seems to be an unidentified species. Olsson & McGinty must have collected it, as it is common in the drift, but they may have identified it as "*Anachis obesa* (C. B. Adams)." *Parvanachis obesa* does inhabit Bocas del Toro, but it has a different profile from its congener. Compare figs. 26-27 and 28-29).

Another interesting species is *Decipifus sixaolus*, one of

Bocas del Toro Plate 1



Bocas del Toro Plate 2



Bocas del Toro Plate 3



Bocas del Toro Plate 4



Plate 1, Figures 1-17

1. *Hemitoma emarginata* (Blainville, 1825), 9°19'52.6"N, 82°15'17.7"W, 1-1.5m, 15.3mm (EFG 26842). 2-3. *Arene tamsiana* (Philippi, 1852), 9°22.027'N, 82°14.336'W, Colón Is., drift, 5.9mm (EFG 25599). 4. *Turritella marianopsis* Petuch, 1990, 9°22.027'N, 82°14.336'W, Colón, drift, 26.1mm (EFG 25565). 5-6. *Barleeia creutzbergi* (Jong & Coomans, 1988), 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 2.3mm (EFG 29346). 7. *Caelatura gerhardtae* (Jong & Coomans, 1988), 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 2.4mm (EFG 29345). 8. *Schwartziella bryerea* of Redfern? not Montagu, 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 4.3mm (EFG 29494). 9. *Epitonium phymanthi* Robertson, 1994, 9°22.027'N, 82°14.336'W, Colón, drift, 10mm (EFG 25629). 10. *Epitonium tiburonense* Clench & Turner, 1952, 9°22.027'N, 82°14.336'W, Colón, drift, 5mm (EFG 25603). 11. *Cerithiopsis albiovittata* (C.B. Adams, 1850), 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 2mm (EFG 29317). 12. *Cerithiopsis prieguei* Rolán & Espinosa, 1996, 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 1.75mm (EFG 29316). 13. *Monophorus olivaceus* (C.B. Adams, 1850), 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 4.9mm (EFG 29470). 14. *Similiphora intermedia* (C.B. Adams, 1850), 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 3.6mm (EFG 29471). 15. *Aesopus stearnsii* (Tryon, 1833), 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 3.8mm (EFG 29509). 16-17. *Costoanachis sertularium* (d'Orbigny, 1841), 9°21'47.62"N, 82°14'22.8"W, Colón, drift, 9.3mm (EFG 25575).

Plate 2, Figures 18-31

18-19. *Costoanachis catenata* (Sowerby I, 1844), 9°22.027'N, 82°14.336'W, Colón, drift, 7.9mm (EFG 25549). 20-21. *Costoanachis sparsa* (Reeve, 1859), 9°22.027'N, 82°14.336'W, Colón, drift, 7.8 mm (EFG 25574). 22. *Decipifus kristenseni* Jong & Coomans, 1988, 9°22.027'N, 82°14.336'W, Colón, drift, 3.9mm (EFG 29461). 23. *Decipifus sixaolus* Olsson & McGinty, 1958, 9°22.027'N, 82°14.336'W, Colón, drift, 3.6mm (EFG 29459). 24-25. *Decipifus sixaolus* Olsson & McGinty, 1958, 9°22.027'N, 82°14.336'W, Colón, drift, 4.3mm (EFG 29459). 26-27. *Parvanachis obesa* (C.B. Adams, 1845), 9°22.027'N, 82°14.336'W, Colón, drift, 4.8mm (EFG 25547). 28-29. *Parvanachis* sp. aff. *nisitella* (Duclos, 1840), 9°22.027'N, 82°14.336'W, Colón, drift, 4.2mm, (EFG 25550). 30-31. *Steironepion maculatum* (C.B. Adams, 1850), 9°22.027'N, 82°14.336'W, Colón, drift, 4.5mm, (EFG 29463).

Plate 3, Figures 32-47

32. *Steironepion minus* (C.B. Adams, 1845), 9°22.027'N, 82°14.336'W, Colón, drift, 4.7mm (EFG 29458). 33-34. *Volvarina heterozona* (Jousseume, 1857), 9°22.027'N, 82°14.336'W, Colón, drift, 5.3mm (EFG 29500). 35-36. *Volvarina rubella* (C.B. Adams, 1845), 9°22.027'N, 82°14.336'W, Colón, drift, 3.9mm (29499). 37-38. *Volvarina* sp., Pondsuck Reef, Almirante Is., 7mm (EFG 25711). 39-40. *Glyphoturris rugirima* (Dall, 1889), 9°22.027'N, 82°14.336'W, Colón, drift, 4.5mm (EFG 29452). 41-42. *Strictispira solida* (C.B. Adams, 1850), 9°22.027'N, 82°14.336'W, Colón, drift, 10.2mm, (EFG 25573). 43-44. *Psilaxis krebsii* (Mörch, 1875), 9°22.027'N, 82°14.336'W, Colón, drift, 3mm (EFG 25627). 45. *Turbonilla levis* (C.B. Adams, 1850), 9°22.027'N, 82°14.336'W, Colón, drift, 4.1mm (EFG 29328). 46. *Turbonilla* (*Strioturbonilla*) sp. B of Lee (2009), 9°22.027'N, 82°14.336'W, Colón, drift 4.6mm (EFG 29478). 47. *Teinostoma* sp. A., 9°22.027'N, 82°14.336'W, Colón, drift, 2.2mm (EFG 29326).

Plate 4, Figures 48-63

48. *Caecum insularum* Moore, 1970, 9°22.027'N, 82°14.336'W, Colón, drift, 4mm (EFG 29511). 49. *Caecum cycloferum* Folin, 1867, 9°22.027'N, 82°14.336'W, Colón, drift, 3mm (EFG 29510). 50. *Caecum jucundum* Folin, 1867, 9°22.027'N, 82°14.336'W, Colón, drift, 2mm (EFG 29312). 51. *Meioceras ryssotitum* Folin, 1867, 9°22.027'N, 82°14.336'W, Colón, drift, 1.7mm (EFG 29349). 52-53. *Eulimostraca* sp., 9°22.027'N, 82°14.336'W, Colón, drift, 2.3mm (EFG 29335). 54. *Botula fusca* (Gmelin, 1791), Hospital Pt., Colón, 9°20'01.9"N, 82°13'07.7"W, 24.7mm (EFG 25682). 55. *Lithophaga bisulcata* (d'Orbigny, 1853), Hospital Pt., Colón, 9°20'01.9"N, 82°13'07.7"W, 31mm (EFG 25684). 56. *Caribachlamys ornata* (Lamarck, 1819), off resort area, Bocas del Drago, NW Colón, in 3-10m, 17.5mm (EFG 25721). 57. *Leptopecten bavayi* (Dautzenberg 1900), Almirante pilings, Almirante, 12.7mm (EFG 25731). 58-59. *Macoma pseudomera* Dall & Simpson, 1901, Almirante pilings, off Almirante, 23.6mm (EFG 25685). 60. *Semele purpurascens* (Gmelin, 1791), Cayo Adriana, 9°14.456'N, 82°10.413'W, in 3-10m, 25.7mm (EFG 25640). 61-62. *Cyclinella tenuis* (Récluz, 1852), Almirante pilings, Almirante, 27.4mm (EFG 25686). 63. *Gastrochaena ovata* Sowerby I, 1834, off resort area, Bocas del Drago, NW Colón, in 3-10m, 12.6mm (EFG 25724). 64. *Spengleria rostrata* (Spengler, 1783), off resort area, Bocas del Drago, NW Colón, in 3-10m, 33.7mm (EFG 25729).

LIST OF SPECIES COLLECTED IN BOCAS DEL TORO ARCHIPELAGO, PANAMA

Boldface taxa are pictured in this article.

Taxa with one asterisk (*) were not reported by Olsson & McGinty.

Taxa with two asterisks (**) have not been previously reported from Panama.

- Lottia jamaicensis* (Gmelin, 1791)
Patelloida pustulata (Helbling, 1779)
Diodora arcuata Sowerby II, 1862
Diodora cayenensis (Lamarck, 1822)
Diodora dysoni (Reeve, 1850)
Diodora fargoi (Olsson & McGinty, 1958)
Diodora listeri (d'Orbigny, 1847)
Diodora minuta (Lamarck, 1822)
Diodora sayi Dall, 1899
Diodora variegata (Sowerby II, 1862)
Emarginula phrixodes Dall, 1927
Emarginula pumila (A. Adams, 1851)
Fissurella fascicularis Lamarck, 1822
Fissurella angusta (Gmelin, 1791)
Fissurella rosea (Gmelin, 1791)
****Hemitoma emarginata (Blainville, 1825) (fig. 1)**
Hemitoma octoradiata (Gmelin, 1791)
Lucapina suffusa (Reeve, 1850)
Calliostoma javanicum (Gmelin, 1791)
Arene riisei Rehder, 1843
****Arene tamsiana (Philippi, 1852) (figs. 2-3)**
Eulithidium affine (C.B. Adams, 1850)
Eulithidium tessellatum (Potiez & Michaud, 1838)
Lithopoma caelata (Gmelin, 1791)
Parviturbo rehderi Pilsbry & McGinty, 1945
Nerita versicolor Gmelin, 1791
Smaragdia viridis (Linnaeus, 1758)
Bittium varium (Pfeiffer, 1840)
Cerithium eburneum Bruguière, 1792
Cerithium lutosum Menke, 1828
Alaba incerta (d'Orbigny, 1841)
Angiola lineata (da Costa, 1778)
***Turritella marianopsis Petuch, 1990 (fig. 4)**
Echinolittorina meleagris (Potiez & Michaud, 1838)
Echinolittorina ziczac (Gmelin, 1791)
Littoraria nebulosa (Lamarck, 1822)
Littoraria tessellata (Philippi, 1847)
****Barleia creutzbergi (Jong & Coomans, 1988) (figs. 5-6)**
****Caelatura gerhardtae (Jong & Coomans, 1996) (fig. 7)**
Lirobarleia chiriquiensis (Olsson & McGinty, 1958)
***Caecum cycloferum Folin, 1867 (fig. 49)**
****Caecum insularum Moore, 1970 (fig. 48)**
***Caecum jucundum Folin, 1867 (fig. 50)**
Caecum pulchellum Stimpson, 1851
***Meioceras ryssotitum Folin, 1867 (fig. 51)**
Meioceras nitidum (Stimpson, 1851)
Rissoina cancellata Philippi, 1847
Rissoina decussata (Montagu, 1903)
Schwartziella bryerea (Montagu, 1893)
Schwartziella cf. bryerea (Montagu, 1893)
Schwartziella fischeri (Desjardin, 1949)
****Schwartziella bryerea** of Redfern (2001)?, not Montagu (fig. 8)
- Stosicia aberrans* (C.B. Adams, 1850)
Zebina browniana (d'Orbigny, 1842)
Alvania auberiana (d'Orbigny, 1847)
Parviturboides interruptus (C. B. Adams, 1850)
Hydrobiid sp.
***Teinostoma species A (fig. 47)**
Teinostoma species B
Vitrinella elegans Olsson & McGinty, 1958
Vitrinella helicoidea C.B. Adams, 1850
Hipponix antiquatum (Linnaeus, 1767)
Hipponix subrufus (Lamarck, 1819)
Niveria quadripunctata (Gray, 1827)
Pusula pediculus (Linnaeus, 1758)
Natica canrena (Linnaeus, 1758)
Polinices lacteus (Guilding, 1834)
Bursa granularis (Röding, 1798)
Cymatium martinianum (d'Orbigny, 1847)
Epitonium albidum (d'Orbigny, 1842)
Epitonium foliaceicosta (d'Orbigny, 1842)
Epitonium lamellosum (Lamarck, 1822)
****Epitonium phyanthi Robertson, 1994 (fig. 9)**
****Epitonium tiburonense Clench & Turner, 1952 (fig. 10)**
Epitonium unifasciatum (Sowerby II, 1844)
Opalia hotessieriana (d'Orbigny, 1842)
Eulima bifasciata d'Orbigny, 1841
Eulima cf. fuscostrigata (Carpenter, 1864)
Eulima species A
Eulima species C
****Eulimotraca sp. (figs. 52-53)**
Melanella eulimoides (C.B. Adams, 1850)
Melanella hypsela (Verrill & Bush, 1900)
Melanella cf. jamaicensis (C.B. Adams, 1845)
Melanella jamaicensis (C.B. Adams, 1845)
Melanella species 5 Jong & Coomans, 1988
Vitreolina arcuata (C.B. Adams, 1850)
****Cerithiopsis albovittata (C.B. Adams, 1850) (fig. 11)**
Cerithiopsis greenii (C.B. Adams, 1839)
Cerithiopsis vicola Dall & Bartsch, 1911
****Cerithiopsis prieguei Rolán & Espinosa, 1996 (fig. 12)**
Retilaskeya bicolor (C.B. Adams, 1845)
Seila adamsi (H.C. Lea, 1845)
Metaxia abrupta (Watson, 1880)
****Monophorus olivaceus (C.B. Adams, 1850) (fig. 13)**
Marshallora nigrocincta (C.B. Adams, 1839)
Nototriphora decorata (C.B. Adams, 1850)
****Similiphora intermedia (C.B. Adams, 1850) (Fig. 14)**
“Triphora” species A
Dermomurex pauperculus (C.B. Adams, 1850)
Favartia alveata (Kiener, 1842)
Plicopurpura patula (Linnaeus, 1758)
Risomurex caribbaeus (Bartsch & Rehder, 1939)
- Risomurex deformis* (Reeve, 1846)
Coralliophila caribbaea Abbott, 1958
****Aesopus stearnsii (Tryon, 1833) (fig. 15)**
Astyris lunata (Say, 1826)
Conella ovulata (Lamarck, 1822)
Costoanachis catenata (Sowerby I, 1844) (figs. 18-19)
****Costoanachis sertularium (d'Orbigny, 1841) (figs. 16-17)**
****Costoanachis sparsa (Reeve, 1859) (figs. 20-21)**
****Decipifus kristenseni Jong & Coomans, 1988 (fig. 22)**
Decipifus sixaolus Olsson & McGinty, 1958 (figs 23-25)
Mazatlanica cosentini (Philippi, 1836)
Mitrella dichroa (Sowerby I, 1844)
Mitrella ocellata (Gmelin, 1791)
Parvanachis obesa (C.B. Adams, 1845) (figs. 26-27)
****Parvanachis sp. aff. nisitella (Duclos, 1840) (figs. 28-29)**
Rhombinella laevigata (Linnaeus, 1758)
Steironepion maculatum (C.B. Adams, 1850) (figs. 30-31)
****Steironepion minus (C.B. Adams, 1845) (fig. 32)**
Steironepion moniliferum (Sowerby I, 1844)
Bailya parva (C.B. Adams, 1850)
Engina turbinella (Kiener, 1835)
Polygona brevicaudata (Reeve, 1847)
Leucozonia nassa (Gmelin, 1791)
Mitra barbadensis (Gmelin, 1791)
Mitra nodulosa (Gmelin, 1791)
Vexillum gemmatum (Sowerby II, 1874)
Vexillum puella (Reeve, 1845)
Jaspidella blainesi (Ford, 1898)
Oliva reticularis Lamarck, 1810
Olivella marmorata (Olsson & McGinty, 1958)
Vasum muricatum (Born, 1778)
Persicula catenata (Montagu, 1803)
Persicula weberi Olsson & McGinty, 1958
Plesiocysticus larva (Bavay, 1922)
Prunum guttatum (Dillwyn, 1817)
Prunum leonardhilli Petuch, 1990
Volvarina avena (Kiener, 1834)
****Volvarina heterozona (Jousseume, 1857) (figs. 33-34)**
****Volvarina rubella (C.B. Adams, 1845) (figs. 35-36)**
***Volvarina species (figs. 37-38)**
Hastula hastata (Gmelin, 1791)
Hastula salleana (Deshayes, 1859)
****Conus archetypus Crosse, 1865**
Conus cardinalis Hwass, 1792
Conus jaspideus Gmelin, 1791
Conus mus Hwass, 1792
***Strictispira solida (C.B. Adams, 1850) (figs. 41-42)**

Crassispira elatior (C. B. Adams, 1845)
Cymakra dubia (Olsson & McGinty, 1958)
Nannodiella vespuciana (d'Orbigny, 1842)
Pilsbryspira leucocyma Dall, 1883
Cryoturris quadrilineata (C.B. Adams, 1850)
*****Glyphoturris rugirima* (Dall, 1889) (figs. 39-40)**
Pyrgocythara albovittata (C.B. Adams, 1945)
Pyrgocythara plicosa (C.B. Adams, 1850)
Heliacus bisulcatus (d'Orbigny, 1842)
Heliacus cylindricus (Gmelin, 1791)
Heliacus perrieri (Rochebrunne, 1881)
*****Psilaxis krebsii* (Mörch, 1875) (figs. 43-44)**
Boonea jadisi (Olsson & McGinty, 1958)
Chrysallida gemmulosa (C.B. Adams, 1850)
Odostomia? species
Triptychus niveus (Mörch, 1875)
*****Turbonilla levis* (C.B. Adams, 1850) (fig. 45)**
Turbonilla pupoides (d'Orbigny, 1842)
*****Turbonilla (Strioturbonilla) sp. B* of Lee (2009)(fig. 46)**
Haminoea glabra (A. Adams, 1850)
Atys sandersoni Dall, 1881
Pedipes mirabilis (Mühlfeld, 1816)
Williamia krebsii (Mörch, 1877)

BIVALVES

*****Botula fusca* (Gmelin, 1791) (fig. 54)**
*****Lithophaga bisulcata* (d'Orbigny, 1853) (fig. 55)**
Barbatia cancellaria (Lamarck, 1819)
Cucullarca candida (Helbling, 1779)
Scapharca chemnitzii (Philippi, 1851)
Lima caribaea (d'Orbigny, 1853)
Bractechlamys antillarum (Récluz, 1853)
Caribachlamys imbricata (Gmelin, 1791)
*****Caribachlamys ornata* (Lamarck, 1819) (fig. 56)**
Euvola zizac (Linnaeus, 1758)
****Leptopecten bavayi* (Dautzenberg 1900)(fig. 57)**
Codakia orbicularis (Linnaeus, 1758)
Divalinga quadrisulcata (d'Orbigny, 1842)
Lucina pensylvanica (Linnaeus, 1758)
Ctena orbiculata (Montagu, 1808)
Phlyctiderma semiasperum (Philippi, 1836)
Chama florida Lamarck, 1819
Crassinella lunulata (Conrad, 1834)
Laevicardium laevigatum (Linnaeus, 1758)
Papyridea soleniformis (Bruguiere, 1789)
Trachycardium muricatum (Linnaeus, 1758)
Trigoniocardia media (Linnaeus, 1758)
*****Cyclinella tenuis* (Récluz, 1852) (fig. 61)**
*****Macoma pseudomera* Dall & Simpson, 1901 (figs. 58-59)**
Tellinella listeri Röding, 1798
Donax striatus Linnaeus, 1767
Semele proficua Pulteney, 1799
****Semele purpurascens* (Gmelin, 1791)(fig.60)**
Petricola lapicida (Gmelin, 1791)
Juliacorbula aequivalvis (Philippi, 1836)
*****Gastrochaena ovata* Sowerby I, 1834 (fig. 62)**
*****Spengleria rostrata* (Spengler, 1783) (fig. 63)**
Thracia species

FRESH WATER

Thiara species

A New Shell Display

Bobbi Cordy



The new “Johnson/Cordy Hall of Mollusks” will open at the Brevard Museum of Natural History, 2201 Michigan Avenue, Cocoa, Florida, within the next 6-9 months. Johnnie Johnson (a former member of the Astronaut Trail Shell Club and now deceased), retired US Navy, has most of his collection located at the museum. The collection is housed in shell cabinets, disorganized, and very dimly lit. The shells are numbered and binders on top of each cabinet list the corresponding names for the shells. These binders are seldom used. Most visitors just casually go through the drawers.

In October 2009, Jim’s 97 year old Mom passed away and left us a goodly sum of money and we had to decide just what we wanted to do with it. Jim’s first response was, “I want a shell museum.” My mouth was agape! I figured he would say new house, new car, etc. Well we sat down with paper and pencil and looked at the associated costs: property, a building (owned or rented), maintenance, utilities, security, salary for curator and assistant, insurance, etc. etc. etc. The sum was not trivial.

We had recently been invited by the Administrator at the Brevard Museum to view Johnnie Johnson’s collection. We were quite disappointed at the way this collection looked and found it was mostly a funding (or lack thereof) issue. So the “wheels





The front entrance to the Brevard Museum of History and Natural Science. Hopefully within this next year the shell display will be completely redone and upgraded into "The Johnson/Cordy Hall of Mollusks."

started turning." We offered to completely remodel the room, add some really nice glass cases, add many of our own shells, and name it "The Johnson/Cordy Hall of Mollusks".

The name had a double meaning for us as Jim's mom enjoyed shells and traveled with us to Mexico several times when we lived in California. Her maiden name was Johnson, so we know this will be a great memorial to her.

There happens to be a large case in the center of the room full of sand. I am going to add sea grass and rocks and display my models of living mollusks to make it look like "under the sea."

Another dream we have always had is to share some of the great shell show exhibits with more of the public than is able to view them with a short weekend presentation. We hope to do that by rotating exhibits by some of the winners from our Space Coast Seashell Festival. We already have several shellers who agree this is a good idea and are willing to help in any way. For Jim and I this is also a way of regaining some space in our shell room at home.

Jim and I plan to give monthly shell talks or craft demonstrations and we will try to generate more publicity for the museum. Hopefully, this will benefit both the museum and our shell club. The "Hall of Mollusks" will be open in time to be offered as one of the field trips for the 2011 COA convention.

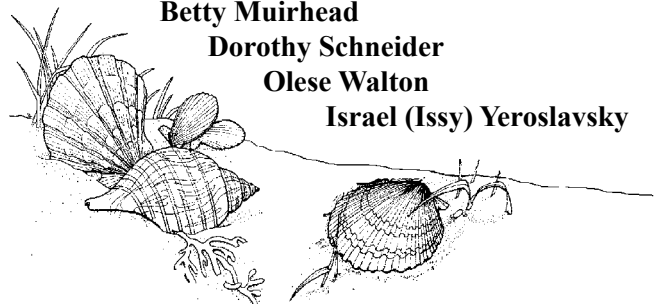
James and Bobbi Cordy
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In memoriam:

- June Huie (page 23)**
- Betty Muirhead**
- Dorothy Schneider**
- Olese Walton**
- Israel (Issy) Yeroslavsky**



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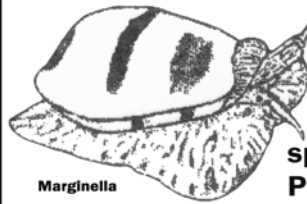
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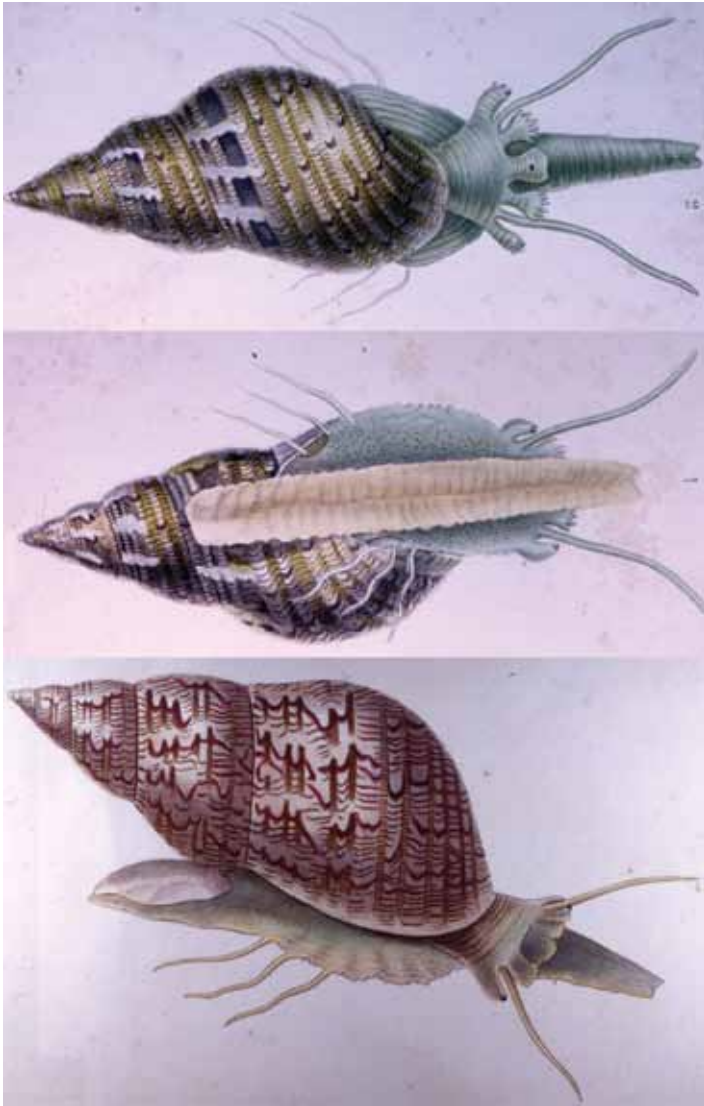


Plate A. Living *Phasianella australis*: dorsal, ventral, and right lateral views. Top and middle images from Quoy & Gaimard (1833), bottom image from Kiener (1847).

I have not published much on *Phasianella* before now because I thought my results too inconclusive. The purpose of this paper is to summarize what I learned, particularly as regards nomenclature, and to suggest future avenues of research.

Pheasant snails (Phasianellidae) have been placed in three subfamilies (Phasianellinae, Tricoliinae, and Gabrieloninae), based on the genera *Phasianella* Lamarck, 1804, *Tricolia* Risso, 1826, and *Gabrielona* Iredale, 1917. Most of their shells and external body surfaces are extremely variable as to colors and patterns. They are spotted, striped or lined spirally or diagonally, often with subsutural “flames.” Only on small or young *Phasianella* are there “spiral capillary lines.” These are features of the color pattern and not sculptural. *Phasianella* shells do not fluoresce in short- and



Plate B. *P. australis*: extremes in observed adult shell shapes, mm scale.

mixed-wave length ultraviolet; *Tricolia* does so from both, with red coloration fluorescing red (personal observations). *Phasianella* attains the largest sizes, and *Gabrielona* species are smaller than most *Tricolia* species. Length - width variation is greatest in *Tricolia*. *Gabrielona* is invariably low-spined. Shell whorls are mostly smoothly rounded, but in two probably independently evolved *Tricolia* species, spiral cording and whorl shouldering are variably developed. Mature males are probably always smaller than females, but pronounced sexual shell dimorphism has evolved at least once, possibly twice, in Indo-West Pacific *Tricolia*. *Phasianella* differs from *Tricolia* in lacking an umbilical chink. Unlike their supposed relatives *Turbo* and *Trochus*, phasianellid shells all lack mother-of-pearl (nacre) internally. Only *Gabrielona* has a faint, incised spiral line (“palatal sulcus”) in the middle or high in the aperture, and two or three apertural denticles. Like *Turbo*, though, phasianellids have calcareous opercula; *Trochus* have corneous opercula. The opercula are few-whorled: those of both *Phasianella* and *Tricolia* have convex and mostly smooth

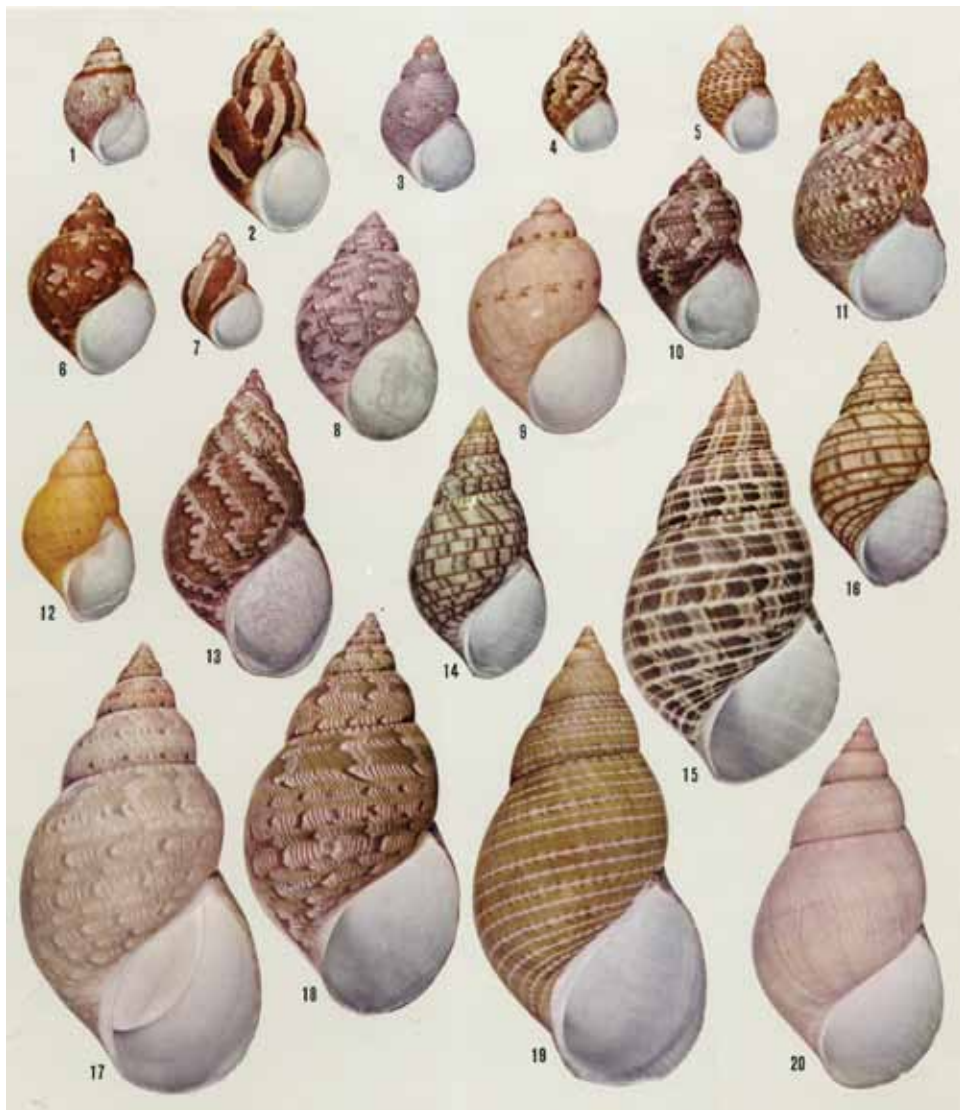


Plate C. Adult shells of *P. ventricosa* (figs. 1-11) and *P. australis* (figs. 12-20). All temperate southern Australia. All to same scale.

outer surfaces (pl. E); those of *Gabrielona* are spirally ribbed externally and are thickest marginally. Cladograms in a recent molecular study (Williams *et al.*, 2008) show that *Phasianella*, *Tricolia*, and *Gabrielona* cluster near the Colloniidae (a surprise) and separate from all the remaining Trochoidea (Turbinidae and Trochidae, etc.). The superfamily Phasianelloidea was newly so-ranked.

Long ago, I published on the systematics of *Tricolia* in the tropical western Atlantic and the tropical and temperate Indo-West Pacific, on *Gabrielona* in the Indo-West Pacific, and on *Eugabrielona* Hickman & McLean, 1990 fossil and living in the West Indies. The last differs from *Gabrielona* primarily by radular characters; the shells are closely similar but are spirally sulcate. Radula morphology varies little in *Phasianella*, but is diverse particularly in Indo-West Pacific *Tricolia*, calling in question the generic distinctness of *Eugabrielona*. *T. "variabilis"* (Pease, 1861) has sexually dimorphic radulae that also vary geographically in correlation with shell size. This and some other species of *Tricolia* undergo striking radular ontogeny. Warén (1990) wisely opposed recognizing genera based solely on radular characters. Middle

American *Tricolia* species belong in *Eulithidium* Pilsbry, 1898, which deserves no higher rank than subgenus if it is to be coordinate with taxa in the Indo-West Pacific. Adults are distinct mainly in having four pairs of radular lateral teeth; elsewhere, adult *Tricolia* have either five or three pairs. I based some western Atlantic subspecies mainly on shell color patterns. They greatly need restudy, using other shell and animal characters.

With the possible exception of *Tricolia indica* Winckworth, 1940, which lives in an anomalous habitat and has a tiny aberrant radula showing some juvenile traits (Robertson, 1985), all phasianellids are probably unselective herbivores or detritivores restricted to shallow waters. Their shell pigments are largely retained or derived from algal pigments. *Phasianella australis* reproduction was studied by Murray (1967). Spermatozoa and 0.14mm eggs were shed freely in an aquarium. The eggs, fertilized in small dishes, became brilliant-green, free-swimming trochophore larvae. The length of the planktonic stage remains unknown.

Although it occurred in the Middle Miocene of eastern Europe (Romania), true *Phasianella* is now restricted to the tropical Indo-West Pacific and temperate southern Australia. It is present at the northern ends of the Red Sea and Persian Gulf, south to Mozambique, east to southeastern Honshu (Chiba Prefecture), Japan, south to northern and southern Australia (not New Zealand), and east to southern Polynesia (at least to Samoa); it is absent from Hawaii.

Far the largest two species of *Phasianella* occur in non-tropical southern Australia (pl. C): *P. australis* (Gmelin, 1791), the type species, and *P. ventricosa* Swainson, 1822. The former attains a length of about 10cm, and the latter is smaller and has a lower spire. Both have been named excessively. A synonymy of *P. australis* was given in Robertson (1958: 255-256) and is repeated here in table 1 with the addition of *P. marcheii* Mabilie, 1888 (wrongly "Philippines"). A list of synonyms of *P. ventricosa* is presented in Table 2. These two have brittle shells, unlike the still smaller species, and repaired breaks change shell shapes (pl. B) and disrupt color patterns (pl. C, fig. 2). *P. australis* and *P. ventricosa* live from southern Western Australia east to Victoria and Tasmania. Subfossils from New South Wales are smaller and appear intermediate.

P. angasi Crosse, 1864, type locality: Port Elliot, South Australia, co-occurs with *P. australis* and *P. ventricosa*, and is much smaller than either of these (pl. D, figs. 3-6, pl. F). It closely resembles some forms of *P. "solida"* (Born, 1778) but has less inflated spire whorls. Curiously, I have yet to see a live-collected specimen, but it has been recorded to a depth of 22 fathoms.

P. solida is here called a “complex” because, as will be shown later, it comprises perhaps as many as 20 or 30 closely similar subspecies or species occurring singly at each of its localities throughout most of the tropical Indo-West Pacific (pl. D, figs. 7-42). Both sexes show extreme geographic variation in maximum attained shell size throughout the area (pl. I). This is like *Tricolia variabilis* in the broad sense (Robertson, 1985: pl. 86), another complex; but the largest and smallest shells in each of these complexes occur in different places, and there is no pronounced sexual shell dimorphism in *Phasianella* as there is in the *Tricolia*. The largest *P. “solida”* shells occur at Mozambique and the smallest adult sizes are attained at Samoa (pl. H). The difference in shell volume is 20- to 30-fold.

Shell and operculum colors, shell shape, shell microsculpture, and a radular character all show geographic variation in the *P. solida* complex. Examples: in Japan and the Bonins, shells tend to be more red or pink than elsewhere, often with orange around the aperture. In Queensland and nearby New Caledonia, operculum exteriors are usually tinged with yellow; elsewhere, they are always white. Spire height varies, as does also the degree to which whorls are swollen. Shells are spirally corded in the entire Indian Ocean east to northern Australia and New Caledonia. The cords are finest and faintest in Sri Lanka and Western Australia; elsewhere in the western Pacific cords are rare or absent. Then in the southwestern Indian Ocean the unworn tips of the inner marginal radular teeth are asymmetrically truncated; elsewhere, they are asymmetrically pointed. Using this mosaic of characters, the geographic provenance of shells without locality data can sometimes be ascertained.

These cases of geographic variation in the *P. solida* complex are probably indicative of “archipelagic differentiation.” This was first reported in the eastern Indian Ocean and western- and mid-Pacific Ocean turbinid *Astrarium “rhodostomum* (Lamarck, 1822)” by Meyer *et al.* (2005). What had been considered a somewhat variable, widespread species was shown by molecular genetics, external body color patterns, and cladistics to be developing localized populations, subspecies, or even

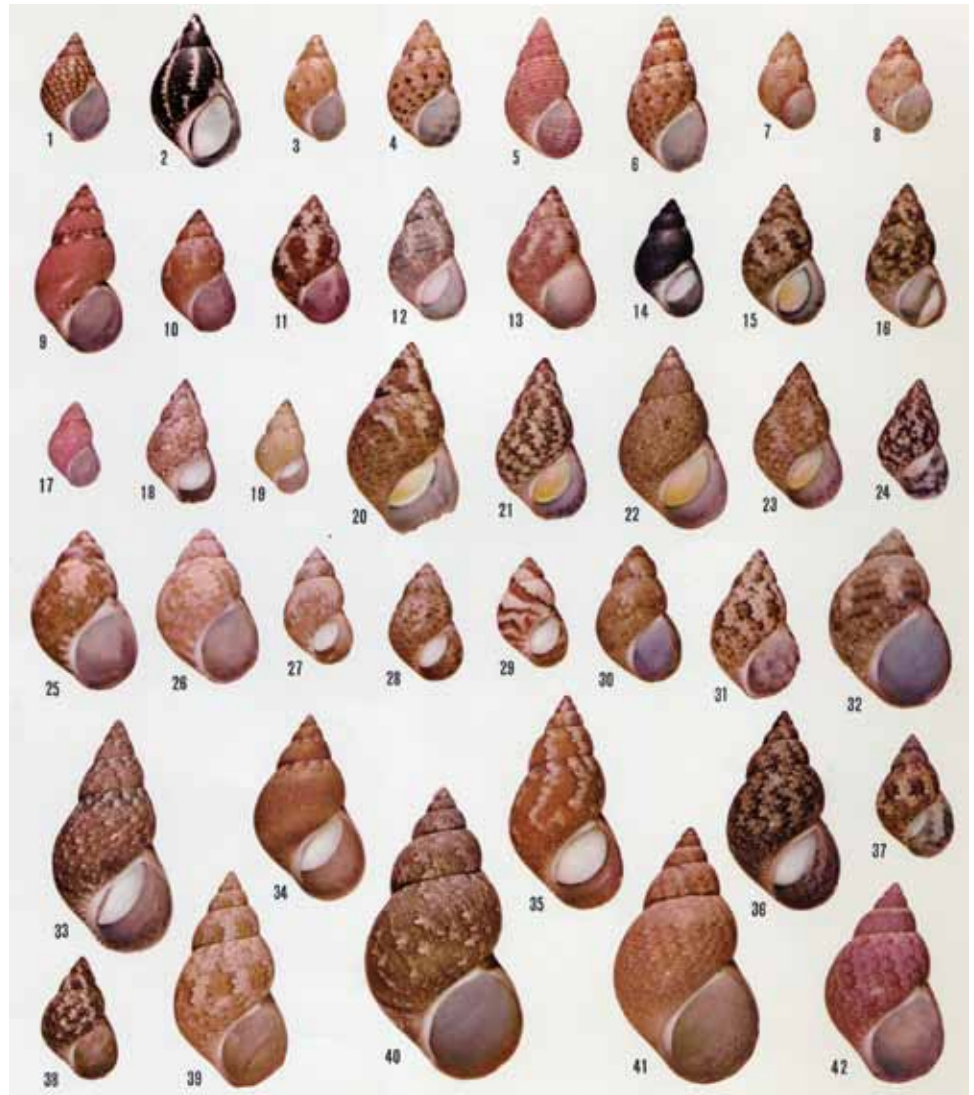


Plate D. Juvenile *P. australis* (figs. 1-2) and adult *P. angasi* (figs. 3-6); all temperate southern Australia. *P. solida* complex (figs. 7-42); adults from numerous tropical Indo-West Pacific localities. All to same scale.



Plate E. Calcareous opercula (yellow concave interiors with an organic periostacum-like covering on the left and white convex exteriors on the right) of *P. ventricosa* (figs. 1-2), *P. solida* (figs. 3-4), and *P. australis* (figs. 5-6).



Plate F. *P. angasi*. Holotype from South Australia. Length: 22.5mm.

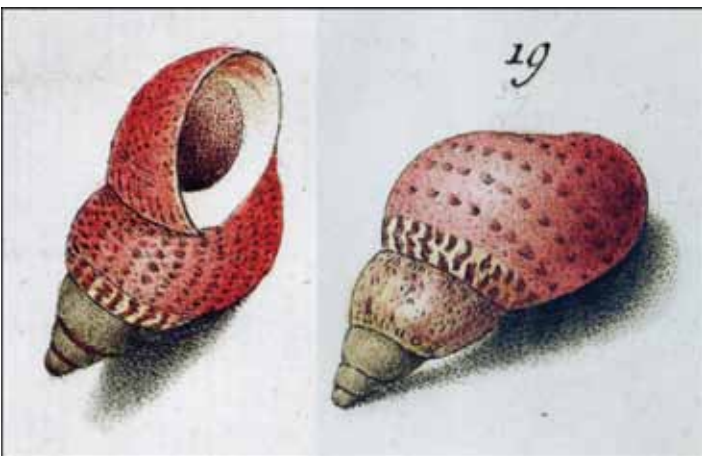


Plate G. *P. solida*. Original illustrations of “*Helix*” *solida* Born, 1778. From Born (1780, pl. 13, figs. 18-19). Locality unknown. Length about 20-25mm.

species - numerous isolated endemic clades, some separated by as little as 180km.

Names considered here to belong in the *P. solida* complex in chronological order (with localities) are given in Table 3. Many of these names and perhaps others will probably be needed ultimately for each localized form, subspecies, or species.

Phasianella and *Tricolia* nomenclature have frequently been intertwined. For example, Poppe (2008: 264, pl. 77) illustrated in color six “*Tricolia*” shells and two living animals from the Philippines. All but one show spiral capillary lines and hence belong in *Phasianella*. His *Tricolia fordiana* (Pilsbry, 1888) (fig. 2, not 3) is correctly identified and is a first record in the Philippines. “*T.*” *modesta* belongs in the *P. solida* complex. He



Plate H. Largest observed *P. solida* shells are from Mozambique (lower right) and the smallest from Samoa, mm scale.

stated that “the Pacific *Tricolia* are in need of revision,” evidently being unaware of Robertson (1985). The *T. variabilis* complex also occurs in the Philippines.

The genus *Phasianella* has been a dumping ground for quite different fossil and some living species. Research already begun on *Tricolia* and trochoideans could and should be extended to *Phasianella*: 1. scanning electron microscope (SEM) studies of protoconchs and adult shell microsculptures, 2. life histories: eggs, larval development, settlement and metamorphosis, 3. sperm ultrastructure (transmission electron microscopy), 4. adult animals (living and preserved): external morphology (cirri, etc.) [pl. A], comparative internal microanatomy and functional morphology, 5. radulae: ontogeny and functional morphology studied and illustrated using various techniques, 6. adult ecology, foods and feeding, 7. effects of different foods on shell colors and sculptures, and 8. molecular and cladistic studies of species and populations.

Ideally, a molecular geneticist cum microanatomist should be supported with millions of dollars to stay in one idyllic place after another throughout the Indian Ocean and South Seas to seek The Truth about *Phasianella* and *Tricolia*.

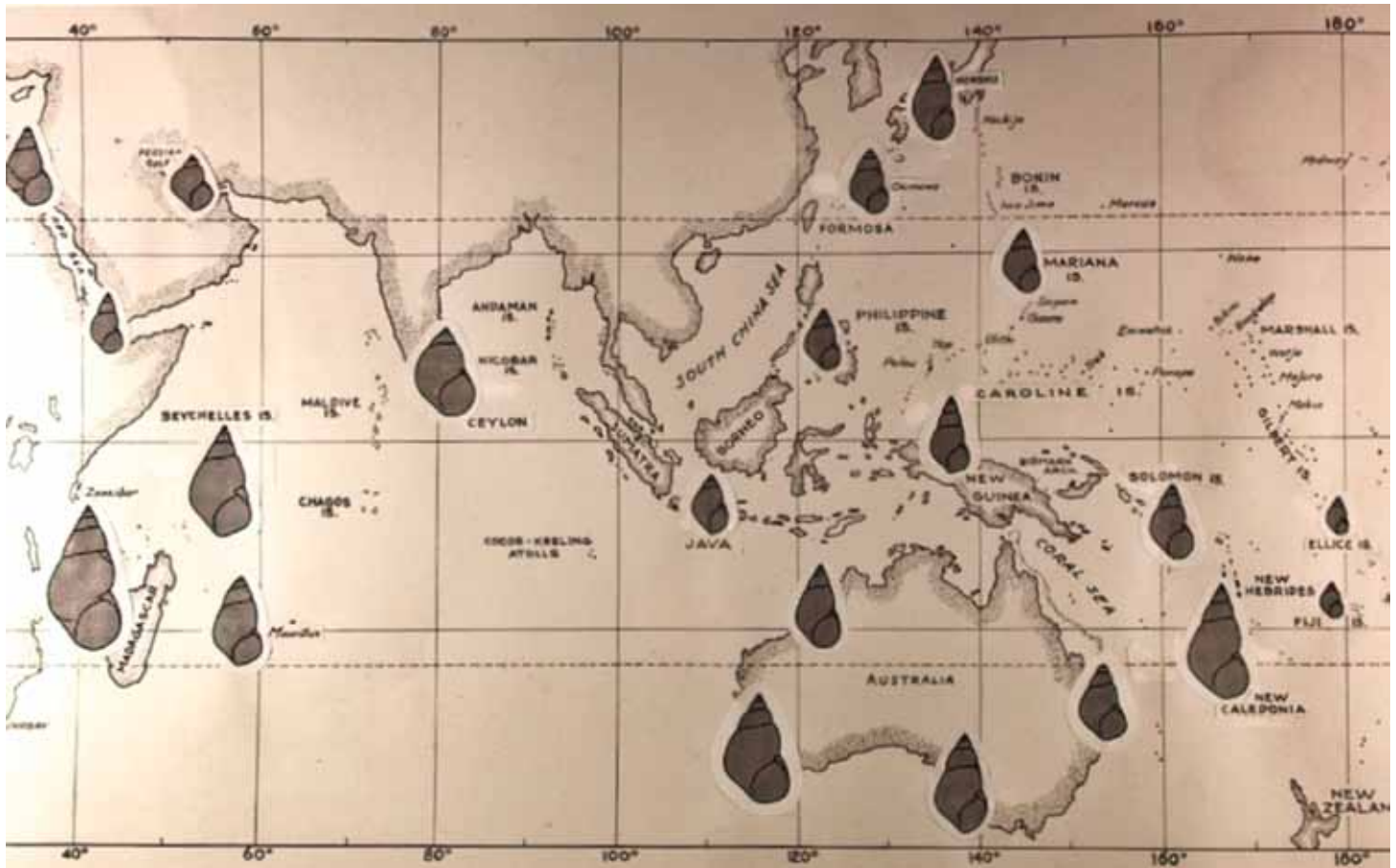


Plate I. Map of Indo-West Pacific showing geographic variation in maximum observed shell sizes in the *P. solida* complex (including *P. angasi* in South Australia). They are all outlined at the same scale and are definitely adults (thousands of shells were studied).

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Table 1. Synonyms of *Phasianella australis* (Gmelin, 1791). From Western Australia east along the southern coast to Victoria and Tasmania. Gmelin's type locality of New Zealand rivers is in error.

1. *Helix phasianus* Röding, 1798
2. *P. variegata* de Roissy, 1810
3. *Bulimus phasianus* Perry, 1810
4. *Trochus phasianella* ? Brookes, 1815
5. *P. varia* Lamarck, 1816
6. *P. bulimoides* Lamarck, 1822
7. *P. picta* de Blainville, 1825
8. *P. tritonis* Anton, 1838 ["1839"]
9. *P. lehmanni* Menke, 1843
10. *P. preissii* Menke, 1843
11. *P. venusta* Reeve, 1848
12. *P. decorata* Chenu, 1859
13. *P. pulchella* Tenison-Woods, 1878 (not Récluz, 1843)
14. *P. delicatula* Tenison-Woods, 1878
15. *P. australis* Gmelin var. *subsanguinea* Pilsbry, 1888
16. *P. marcheii* Mabile, 1888 (wrongly Philippines)

Table 2. Synonyms of *Phasianella ventricosa* Swainson, 1822. All southern Australia.

1. *P. inflata* Swainson, 1822
2. *Turbo (Phasianella) perdix* Wood, 1828
3. *P. articulata* Anton, 1838 ["1839"] (type wrongly labeled "Oceania")
4. *P. brevis* Menke, 1843 (not d'Orbigny, 1842)
5. *P. turgida* Philippi, 1853
6. *P. delessertii* Chenu, 1859
7. *P. sanguinea* Reeve, 1862
8. *P. zebra* Reeve, 1862
9. *P. venosa* Reeve, 1862
10. *P. reticulata* Reeve, 1862
11. *P. peroni* Mabile, 1888

Table 3. Names for forms, subspecies or species in the *Phasianella solida* complex from numerous tropical Indo-West Pacific localities.

1. *Helix solida* Born, 1778 (locality?) [Pl. G]
2. *P. variegata* Lamarck, 1822 (not de Roissy, 1805 [not in Sherborn]) (Australia [tropical])
3. *P. rubens* Lamarck, 1822 (Australia [tropical])
4. *Tricolia brongniartii* ["brongniartii"] Audouin, 1826 (Egypt)
5. *Turbo varius* Wood, 1828 (not *P. varia* Lamarck, 1816) (Sri Lanka?)
6. *Turbo (Phasianella) lineolatus* Wood, 1828 (Mauritius)
7. *P. viridis* Anton, 1838 ["1839"] (locality?)
8. *P. unifascialis* Kiener, 1847 (Australia [tropical])
9. *P. flammulata* Philippi, 1848 (Pacific Ocean or Red Sea?)
10. *P. splendida* Philippi, 1849 (Red Sea)
11. *P. grata* Philippi, 1853 (Madagascar)
12. *P. aethiopica* Philippi, 1853 (East Africa, Zanzibar, etc.)
13. *Eutropia modesta* Gould, 1861 (Ryukyu Is.)
14. *P. nivosa* Reeve, 1862 (Sri Lanka and Philippines)
15. *P. fulgurata* Reeve, 1862 (Australia [tropical])
16. *P. jaspidea* Reeve, 1862 (Zanzibar)
17. *P. histrio* Reeve, 1862 (Philippines)
18. *P. lentiginosa* Reeve, 1862 (W. Australia)
19. *P. graeffei* Dunker, 1871 (Samoa Is.)
20. *P. wisemanni* Baird, 1873 (Vanuatu)
21. *P. (Orthomesus) modesta* (Gould) var. *gouldii* Pilsbry, 1895 (Japan)
22. *P. montebelloensis* Preston, 1914 (N.W. Australia)
23. *P. zigzag* Odhner, 1919 (Madagascar)
24. *P. caloundra* Iredale, 1927 (Queensland, Australia)



June Huie, a member of the North Texas Conchological Society for 35 years, and a charter member, died March 25, 2010 after a short illness. She was 86 and serving as newsletter editor and program chairman for the club. June began collecting shells in the 1940's. She knew each shell she had by scientific name and shared her knowledge with others by always holding a club office, giving programs, and helping us with species identification. June was a long time member of the Conchologists of America and loved going to conventions, jamborees, and shelling trips. She will be missed as a friend and fellow shell collector.

Ardeth Hardin

What goes around comes around; Jacksonville Shell Club to fund annual COA Academic Grant

Harry G. Lee

On June 22, 1959, the first meeting of what was to become the Jacksonville Shell Club was held in the home of Mr. and Mrs. Larry Hedgecoth. The event resulted from an article by staff writer Nancy Campbell appearing in the Florida *Times Union* on April 26 of that year. Nancy reported on the shelling exploits of Jacksonville resident Gertrude Moller while she and her family lived on Eleuthera, in the Bahamas. As a result of the publicity, nine individuals contacted Gertrude inquiring about shells. One of the callers was Harriet Hedgecoth, who volunteered to host a get-together of all the interested parties, and who also provided refreshments and a slide show on that sentinel occasion. The rest is history, repeated on fourth Thursdays and extending beyond a golden anniversary last year. The meetings were held in member's homes initially but were soon moved to various locations in the Jacksonville area as membership grew from the original 10 to 20. In January 1960, the group officially became the Jacksonville Shell Club with 20 Charter Members, and Larry Hedgecoth was elected its first President. In October 1959, volume 1 no. 1 of the club's official organ, the *Shell-O-Gram*, came off the (mimeographic) press, and this journal has continued, moving from a monthly to a bimonthly publication in 1983 to the present day essentially without interruption.

The club presented its first shell show at the Lion's Club building at 20th and Main Street in downtown Jacksonville in July, 1962. With the effort of the membership and Dr. William Clench, Curator of Mollusks at the Museum of Comparative Zoology, Harvard University, the show was deemed a success. The Jacksonville Shell Club was incorporated under Florida statute in 1964 and in May 2009 was recognized as tax-exempt educational organization under the provisions of Section 501(c)(3) of the Internal Revenue Code.

From its inception the club has held education as principal in its mission. Aside from the nearly annual shell shows, the 44th being held on May 28-30, 2010, members have participated in various other public exhibitions, spoken to civic organizations and schools, operated booths at various festivals and local events, sponsored field trips, participated in curatorial and

field work with scientists, and donated material and volunteer services with scientific and educational institutions including the Florida Museum of Natural History and the Bailey-Matthews Shell Museum. In the 1980's the club began to provide grant support for students showing an aptitude for and an interest in malacology. Past scholarship winners include Dr. Paula Mikkelsen of the Paleontological Research Institution (then at Florida Institute of Technology) and, while at Jacksonville University, Debi Ingrao, recently retired from Mote Marine Lab, Sarasota, Florida. Most years, however, we were unable to grant an award because the coffers just weren't ample enough.

An abiding goal for the club was the creation of a thorough inventory of the marine mollusks of the Jacksonville region based on our own primary research. This special collaboration involving several dozen club members and a few others began in 1975 and culminated last year with the publication of *Marine shells of northeast Florida* (Lee, 2009a, b). To forward this campaign, we received an Academic Grant from the COA in 1990. In large part due to the proceeds from the sale of this book, the Jacksonville Shell Club is now in a financial position to embellish and formalize its commitment to the support of education and research in malacology. Considering COA's past assistance to our club and the current arrangement for joint philanthropy as expressed by Chairman Donald Dan, the club has decided to endow a COA annual Academic Grant (\$10,000). This stipend is expected to be a perennial award in support of graduate or postgraduate studies in malacology, particularly work focusing on taxonomy and organismic studies of the fauna of our region. Our only charter member, Gertrude Moller, was among those casting votes in the unanimous support of this initiative. She can tell you better than anyone that we've come a long way in this half century.

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Jacksonville Shell Club



Jacksonville, Florida

2010 SHELL SHOWS & RELATED EVENTS (August – December)

Following information is subject to change. Please verify with individual organization

- | | | | |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Aug. 20-22
2010</p> | <p>JERSEY CAPE SHELL SHOW, Stone Harbor, New Jersey
The Wetlands Institute, Stone Harbor
Karen Lelli e-mail: kjlelli@comcast.net
(856) 691-5831</p> | <p><i>Date to be confirmed</i></p> | <p>SEA SHELL SEARCHERS SHELL SHOW, Lake Jackson, TX
Brazosport Museum of Natural Science
400 College Blvd., Clute, Texas 77531
Patty Humbird, Tel. (979) 265-1320
Wanda Coker, Tel. (979) 297-0852
Email: shellclub@earthlink.net</p> |
| <p>Aug. 27-31
2010</p> | <p>CONCHOLOGISTS OF AMERICA ANNUAL CONVENTION, Boston, MA
The Boston Park Plaza Hotel, 50 Park Plaza & Arlington Street
Don Robak (617) 889-1841 E-mail: shellsnail@comcast.net
Warren Graff (978) 749-3351 E-mail: wgraff@vicr.com
Web site: www.conchologistsofamerica.org</p> | <p>Oct. 30
2010</p> | <p>BRITISH SHELL COLLECTOR'S CLUB CONVENTION, Essex, England
Theydon Boys Community Centre, Theydon Boys, Epping, Essex
Tom Walker, 38 Redlands Road
Reading, Berkshire RG1 5HD, England 44 (118) 987-4294
E-mail: tom@tmwalker.co.uk</p> |
| <p>Sept. 18-19
2010</p> | <p>31st INTERNATIONAL SHELLS & FOSSIL BOURSE, Ottmarsheim, France
Salle Polyvalente, Rue de la Priscine
Michel Rioual, 2 Rue des Vergers
68490 Ottmarsheim, France (3) 89-26-16-43</p> | <p>Oct. 30
2010</p> | <p>SYDNEY SHELL SHOW, Sydney, Australia
Show contact:
Steve Dean, 166 Narabeen Pk Pde
Mona Vale, NSW 2103 61 (2) 9979-9536
E-mail: steve@easy.com.au</p> |
| <p>Sept. 24-26
2010</p> | <p>NORTH CAROLINA SHELL SHOW, Wilmington, NC
Cape Fear Museum of History & Science
814 market Street
Ann Buddenhagen, 618 Crabber Lane
Raleigh, NC 27609 (919) 787-7103
E-mail: abuddenhagen@nc.rr.com</p> | <p>Nov. 13-14
2010</p> | <p>XV PRAGUE INTERNATIONAL SHELL SHOW, Prague, Czech Rep.
KULTURNIDUM LADVI Buresova 1661, Prague 8
Jaroslav Derka, Holeckova 51/370
15000 Praha 5, Czech Republic
42 (2) 5731-6246
Email: jderka@volny.cz http://cksl.webpark.cz http://shells.webz.cz</p> |
| <p>Sept. 25-26
2010</p> | <p>ANNUAL GERMAN SHELL FAIR, Oehringen, Germany
KULTURA Hall, Herrenwiesenstr. 12
Kurt Kreipl, Hoehenweg
D-74613 Oehringen-Cappel, Germany
E-mail: meeresmuseum@t-online.de
Tel. (7941) 62-826</p> | | |
| <p>Oct. 9 -10
2010</p> | <p>PHILADELPHIA SHELL SHOW, Philadelphia, PA
Academy of Natural Sciences, Parkway & 19th St.
Paul Callomon, Academy of Natural Sciences
Parkway & 19th St., Philadelphia, PA 19103
(215) 299-1159
E-mail: callomon@ansp.org</p> | | <p>DONALD DAN, COA Awards Chairman
6704 Overlook Drive
Ft. Myers, FL 33919 U.S.A.
Tel. Voice & Fax (941) 481-6704
E-mail: donaldan@aol.com SH-DATE2.2010 April 13, 2010</p> |



The World's Smallest (and Probably Ugliest) Shell Collector

Tom Eichhorst



Dorsal view of the 7mm green lacewing larva found by David Kirsh in Mayo River State Park. In this view you can barely see the insect for the shells. All of which appeared empty.



Ventral view of the green lacewing larva. In this view you can see the business-like jaws that make this insect such an effective predator. Both images by David Kirsh.

In April 2010, COA member David Kirsh collected a small insect larva that had a number of even smaller land snails attached to its body. The 7mm larva was found under dead leaves and ground debris near a stream in Mayo River State Park, Mayodan, Rockingham County, North Carolina. The attached snail shells were approximately 3mm or smaller. This was certainly something David had not previously seen and he was quick to get photographic evidence of this 7mm shell collector.

The larva was subsequently identified by Dr. Raymond J. Pupedis of the Peabody Museum of Natural History at Yale University, New Haven, Connecticut, as a green lacewing larva - family Chrysopidae (order Neuroptera). This is a large insect family with up to 2,000 species in 85 or more genera (a number that varies with author, as does the assignment of genera). They are especially prevalent in Europe and North America. Most specimens encountered in the temperate region are relatively small with a wing span of about 10-20mm, but tropical green lacewings can have a wing span of 65mm. In the larval form they are voracious predators and are sold commercially in the US for aphid (and other small garden pests) control. A quick check online showed a price of \$15 for 1,000 green lacewing eggs.

So what was it doing with land snails attached to its back? Apparently the family Chrysopidae is known for the larval stage attaching small items, such as pieces of leaves and ground debris, lichens, and insect parts to their body. This habit has earned it the nickname, "junkyard bug." Whether this is done for camouflage, protection, or some other reason is unknown.

David's encounter was not the first recorded instance of a snail-collecting green lacewing. In the first issue of the *Appalachian Highlands Science Journal* is a article describing a similar finding in the Great Smokey Mountains National Park,

North Carolina. While studying land snail diversity, Dan Dourson found green lacewing larva with six different land snail species attached, including: *Punctum vitreum* H.B. Baker, 1930 (a new record for the area); *P. minutissimum* (Lea, 1841); *P. blandianum* Pilsbry, 1900; *Gastropocta pentadon* (Say, 1821), *G. contracta* (Say, 1822), and *Carychium clappi* Hubricht, 1959. The *G. pentadon* was still alive, maybe answering a question about snail predation by the green lacewing larva.

Now back to the specimen found and photographed by David Kirsh. He showed his images to our own Dr. Harry G. Lee, who promptly identified the shells as juvenile *Glyphyalinia wheatleyi* (Bland, 1883). Much of this story can be found on line at the Jacksonville Web Site at: <http://www.jaxshells.org/mare20.htm>. There are also a number of references provided by Dr. Harry Lee about predation of various mollusk species by insects (including one that lists a predatory butterfly caterpillar!).

To have an interest in conchology is to appreciate the shiny perfection of a golden cowrie (*Cypraea aurantium* Gmelin, 1791), or even the ever-changing taxonomy that lists the same species as *Lyncina aurantium* (Gmelin, 1791). Similarly, the spiny perfection of a Venus comb murex (*Murex pecten* Lightfoot, 1786) or the bright colors and intricate sculpture of a specious scallop (*Gloriopallium speciosum* (Reeve, 1853)) are indeed wonders to behold. David Kirsh found the wonder of conchology (as well as natural history in general) on a small insect under a leaf in North Carolina.

"It is perhaps a more fortunate destiny to have a taste for collecting shells than to be born a millionaire."

Robert Louis Stevenson (1850-1894)

Jim & Bobbi Cordy Take the COA Award at the Marco Island Shell Club Shell Show (Plus a Few Others)



Jim and Bobbi Cordy have collected shells at least twice a year on Eleuthera Island for the past 16 years. With other members of the Astronaut Trail Shell Club, they travel hidden beaches and seldom visited areas. The result of this is a truly superb Caribbean shell collection seen recently in their 40-foot exhibit of "Self Collected Shells of Eleuthera," which took the COA and other awards at 2010 shell shows.



Above: Jim (looking very happy) and Bobbi Cordy with two of many awards they won in 2010.

Below: The football-sized West Indian chank shell (*Turbinella angulata*) that took best of show.

At the **Space Coast Seashell Festival** they won the R. Tucker Abbott Award for Best Florida/Caribbean Exhibit. At the **Broward Shell Show** they won the DuPont Trophy and the Van Kunnon Memorial Award for best Caribbean exhibit. At the **St. Petersburg Shell Show** they won the Florida Museum of Natural History Platinum Award and the Dorothy Hansler Award for best Caribbean exhibit and they took Shell of the Show with a very large and seemingly perfect chank shell (*Turbinella angulata* (Lightfoot, 1876) - see the image at right). At the **Marco Island Shell Show** they won the COA Trophy and the Dr. William Reid Trophy for best Florida/Caribbean exhibit.



It looks like they are on a roll. Contact for the Marco Island Shell Club is Margaret Cook at 394-7022. The club meets the 1st Tuesday of the month at 8:00 p.m. (November thru May) at First Methodist Church, 350 S.Barfield Avenue, Marco Island, FL.

St. Petersburg Shell Club 63rd Annual Shell Show 27-28 Feb 2010



After 74 years of existence and 63 annual shell shows, it appears the folks in St. Petersburg, Florida, really know how to put on a shell show (the club was founded in 1936 and incorporated in 1968). They had lots of exhibitors and crowds of interested spectators at "one of the best shows ever." This year's

show had four judges. Scientific judges were: Dr. Gary Schmelz and Marcus Coltro. Artistic judges were: Debbie Freeman and Lynn Gaulin. After careful scrutiny of the numerous displays, they decided on the following awards:

MAJOR:

CONCHOLOGISTS OF AMERICA AWARD -- Martin Tremor, Jr (The Helmets and the Bonnets of It All)

DUPONT AWARD -- Dale Stream (Fossil Shell of the Okeechobean Sea)

NATIONAL MUSEUM OF NATURAL HISTORY AWARD -- Martin Tremor, Jr. (The Helmets and the Bonnets of It All)

FLORIDA MUSEUM OF NATURAL HISTORY PLATINUM -- James & Bobbi Cordy (Self Collected Eleuthera Island)

MINOR:

FLORIDA/CARIBBEAN DOROTHY HANSSLER AWARD -- James & Bobbi Cordy (Self Collected Eleuthera Island)

SELMA LAWSON MOST BEAUTIFUL AWARD -- Martin Tremor, Jr. (The Helmets and the Bonnets of It All)

BEST SMALL SCIENTIFIC -- Wayne & Patti Humbird (Dye Murex)

EARL CLARK BEST ARTISTIC AWARD -- Cheryl Whitten (Victorian Pearl)
 SHELL OF THE SHOW SELF COLLECTED -- James & Bobbi Cordy (*Turbinella angulata*)
 SHELL OF THE SHOW COLLECTED ANY MANNER -- Dale Stream (*Cymatium floridana*)

Judges Special Awards:

Scientific:

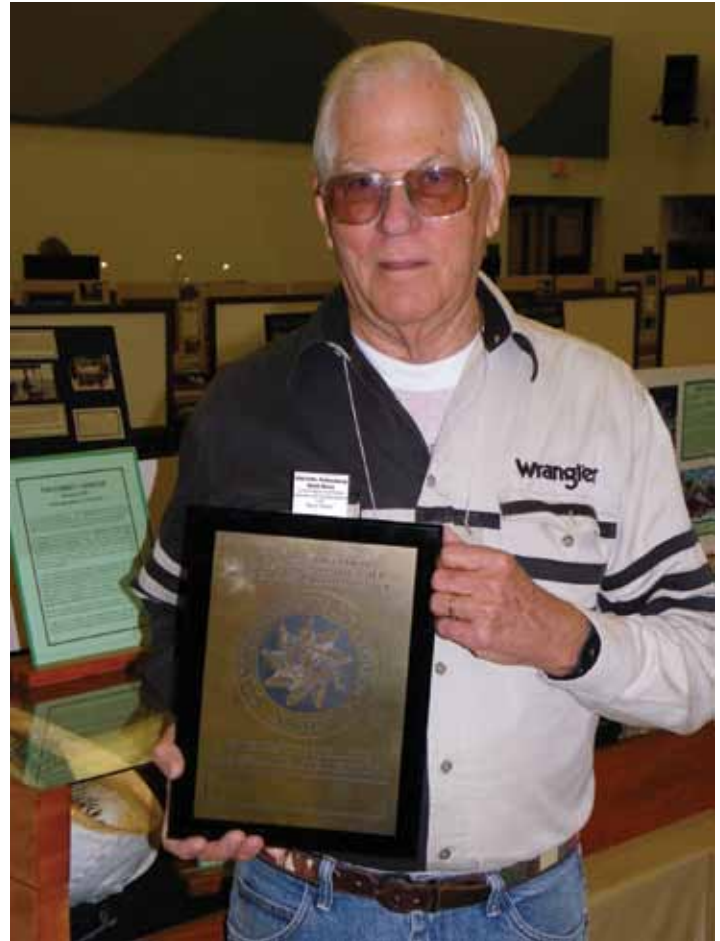
Carolyn Petrikin -- World Record *Mercenaria mercenaria*
 Martin Tremor, Jr. -- Hawaiian *Cassis cornuta*

Artistic:

Brandy Llewellyn -- Yesteryears
 Wendy Marshall -- Song of the Sea

Shell show president Martin E. Tremor Jr. wishes to thank all judges, participants, and exhibitors. Meetings are held on the second Friday of the month (except in March when it is on the third Friday) from September to May at the Seminole Recreation Center located at 9100 113th Street North Seminole, Fl 3772. The meeting starts at 7:00 P.M. and the public is invited.

Right: Martin E. Tremor Jr., winner of the COA Award for "The Helmets and the Bonnets of It All."



Oregon Society of Conchologists Shell Show 23-25 April 2010



The Oregon Society of Conchologists held their shell show at the Oregon Museum of Science & Industry. A superb facility and a perfect venue for the shell show, which could hardly

have gone better, lots of great shells on display and lots of people interested in them. This year's COA Award went to Valerie K. Moore from Vancouver, Washington. Her exhibit was titled "What is a Bivalve," and proved both educational and artistic.

The Oregon Society of Conchologists, a non-profit organization, has about 70 members and was founded in 1965. Monthly meetings are held at various locations in northwestern Oregon and are open to anyone interested in studying and collecting seashells. Contacts for the club are: Donna Saffir, President, dragonzs@comcast.net (503) 297-3009 or Joyce Matthys, joycematthys@aol.com



Sarasota Shell Club Shell Show

12-14 February 2010



The Sarasota Shell Club was started to bring together people interested in shells from Sarasota, Manatee, and Charlotte Counties. This year's shell show was the club's 47 annual show. As

usual there was great participation, lots of really beautiful shells and friendly folks, and shell displays that were both educational and nice to look at. This year's event was held at the Sarasota Municipal Auditorium, located at 801 N. Tamiami Trail, Sarasota, FL. The shell show chairperson was Peggy Williams and the scientific judges were Dr. Ed Petuch and Robert Lipe.

The COA Award was won by Martin E. Tremer Jr. of St. Petersburg, Florida. His 14 case, 32 foot display was titled, "A Display of Trumpets and Tritons of the World." Martin also took the DuPont Trophy for his display titled "Helmets & Bonnets." Jeanette Tysor won the Mote Gold Award for her display, "Staying Alive." The "Shell of the Show" was a perfect specimen of *Chicoreus hilli* Petuch, 1990, displayed by Lynn Gaulin. The fossil "Shell of the Show" was *Strombus mayacensis* Tucker & Wilson, 1933. There were almost 1,300 paid attendees at this year's show.

The Sarasota Shell Club meets on the second Thursday of each month from **September** through **April**. The agenda includes a program of interest to shell collectors and a short business meeting. Meetings start at 7:00 p.m. and are held at the Mote Marine Laboratory, 1600 Ken Thompson Parkway, 3rd floor - Buchanan Room, Sarasota, Florida. Contact is info@sarasotashellclub.com

Right: Because Martin is pictured for his win at the St. Petersburg Shell Show (and because I only received the single image), images of the Mote Marine Laboratory will have to suffice.



Sanibel-Captiva Shell Club Shell Show

4-6 March 2010

The 73rd annual Sanibel-Captiva Shell Club Shell Show was held at the Sanibel Community Center in Sanibel, Florida. This is one of the nation's larger shell shows and exhibits and the admission fees are used to fund research scholarships. This is the only shell club to fully fund a student through graduate school into a PhD program at the University of South Florida, St. Petersburg. Founded in 1963, the club presently has 100 members. Contact for the Sanibel-Captiva Club is sanibelchiton@aol.com

This year's show met the high standards of this club, with superb exhibits and lots of attendees. Winner of the COA

Award was Patricia Linn with her three case exhibit titled "Shells of Caladesi and Honeymoon Islands, FL." Her purpose was to educate the public about shelling on the island beaches in this state park. It obviously garnered some attention as judges Dr. Henry Chaney and Paul Callomon presented Patricia the COA Award.



Broward Shell Club Shell Show

23-24 January 2010



Left: Alan Gettleman with his richly deserved COA Award. Maybe only Alan could design a display of U.S. freshwater mussels that would take not only the COA Award, based on the judges evaluation, but also garner the People's Choice Award. Congratulations Alan.



The Broward Shell Club, Broward County, Florida, was established in 1962 and has pretty much been a mainstay of US shell clubs ever since. Meetings are held the 2nd Wednesday of every month at the Emma Lou Olson Civic Center, 1801 N.E. 6th Street, Pompano Beach, Florida (call 954-786-4111).

The 45th annual Broward Shell Club Shell Show was a tremendous success with some truly spectacular exhibits. The COA Award went to Alan Gettleman for his display titled "Freshwater U.S. Pearly Mussels." He also won the People's Choice Award (as voted by attendees). That ought to quiet the crowd who think our native mussels are just "brown and boring" shells. There were any number of worthy exhibits and those that received awards are listed here. Of special note were two exhibits. One was by Linda Sunderland, titled "Earthenware Molasses Can." Linda's exhibit won the first ever Fay Mucha Memorial - Best Collectibles Trophy. As covered in the December 2009 issue, Fay (who contributed uncounted photos to this publication) passed away in October 2009. The other exhibit of note was of "Cuban *Polymita*" by Archie Jones. He won the Len Hill Memorial Trophy with his colorful display, but sadly passed away not a month later (reported in the March 2010 issue). Below are listed the various awards and award winners.

Major Trophies

AMERICAN MUSEUM OF NATURAL HISTORY AWARD - Lillian Shin "Historical Review of the South Florida Tree Snail *Liguus fasciatus*"

CONCHOLOGISTS OF AMERICA TROPHY - Alan Gettleman "Freshwater U.S. Pearly Mussels"

The DuPONT AWARD - James and Bobbi Cordy "Shells of Eleuthra. Self Collected"

The "BEST OF THE BEST" Trophy - Gene Everson "Shells of Masirah Island, Oman"

Other Trophies & Sponsors

LEN HILL MEMORIAL TROPHY – Archie Jones "Cuban *Polymita*"

JIM VUNKANNON MEMORIAL BEST FLORIDA / CARIBBEAN TROPHY - James and Bobbi Cordy "Shells of Eleuthra. Self Collected"

NEIL HEPLER MEMORIAL TROPHY FOR EDUCATIONAL EXCELLENCE – Lillian Shin "Historical Review of the South Florida Tree Snail *Liguus fasciatus*"

SHELL OF SHOW - Self Collected – Bobbi Cordy "Left Handed *Morum oniscus*"

SHELL OF SHOW - Any Manner – Alan Gettleman "Extinct Mussel"

BEST SEA LIFE EXHIBIT TROPHY – Jonathan Galka – Panamanian Seabeans"

BEST STUDENT EXHIBITOR TROPHY – SCIENTIFIC – Valentino Leidi "Self Collected South Florida Shells"

BEST BEGINNING EXHIBITOR – SCIENTIFIC – Tom Ball "Buying Shells On Ebay"

PEOPLE'S CHOICE AWARD – SCIENTIFIC - (As voted by the attendees) Alan Gettleman

Artistic Division

BEST IN SHOW TROPHY – PROFESSIONAL - Luis Miguel Rodriguez – Painting

BEST IN SHOW TROPHY – SAILOR'S VALENTINE (any manner) - Brandy Llewellyn "Yesteryears"

FAY MUCHA MEMORIAL - BEST COLLECTIBLES TROPHY – (any manner) - Linda Sunderland "Earthenware Molasses Can"

BEST BEGINNING EXHIBITOR ARTISTIC – Bob Pace – Caricatures "Animals of the Everglades"

PEOPLE'S CHOICE AWARD - ARTISTIC DIVISION - (As voted by the attendance) Heather Strawbridge

Last Call for Shell- ebration Boston!



Join in the celebration of the Conchologists of America 2010 Convention in Historic Boston, Massachusetts, and help observe the 100th year of the Boston Malacological Club. Convention dates are August 27th through August 31st, with pre-convention tours August 26th and 27th.

The host hotel is the Boston Park Plaza, located in the heart of downtown Boston. Minutes from Logan International Airport, the hotel is also close to many of Boston's finest attractions. The Boston Park Plaza has 941 recently renovated rooms, five in-house restaurants and many other amenities, and is the most affordable venue for downtown Boston. Reservations can be made by calling (617) 426-2000 or (800) 225-2008 and you must mention 'COA' to receive the convention rate (which will be honored 3 days prior and 3 days after the convention dates), or use the website <http://www.starwoodmeeting.com/Bookcac0826>. The special website address is to reserve the regular state rooms. If a suite or some other type room is desired, use the hotel's regular website address, <http://www.bostonparkplaza.com>.

NOTE: The Boston Park Plaza has reduced the convention rate of the hotel staterooms to \$169 plus 14% tax, a savings of \$30 from the original rate of \$199 per night. In addition, the entire room block has been upgraded to deluxe guestrooms with complimentary internet access. Also, COA officers and your Boston-based club request that you make reservations by using the Boston Park Plaza hotel contact information (phone number or special link) and NOT travel sites such as Expedia or Travelocity. In order to be financially feasible, as in all COA conventions, COA must meet certain contract-related goals with the hotel, and booking through outside sources does not give credit to COA toward meeting these goals.

Logan Airport is about six miles from the hotel and costs approximately \$25-\$35 by taxi. There is no hotel shuttle, but independent shuttles cost \$14 per person and are available by calling the Park Plaza concierge service. Note: as in other cities in the northeast corridor, **parking is expensive in Boston and is typically at least \$20 or more for 24 hours.** The Park Plaza does not have its own lot, but there are several private lots nearby; see the registration insert for details on parking options. **Special**

temporary parking arrangements will be made for bourse dealers for loading/unloading at the setup and take down times. For those of you planning to drive, directions to Boston and the hotel will be provided in the registration insert.

The convention schedule will start with pre-convention tours on Thursday, August 26th and continue with a.m. tours Friday, August 27th; see details on these tours below. Registration will begin Friday morning, and the convention opening will be at 1 p.m., with the welcoming party Friday evening. Registration will continue Saturday, August 28th and the COA annual meeting will be held in the afternoon with the oral auction that evening. Sunday, August 29th and Monday, August 30th will consist primarily of programs; dealers' bourse setup will be Monday in the morning, with the bourse opening at 1 p.m. that afternoon. The bourse will conclude Tuesday morning August 31st and the farewell banquet will be held that evening. Silent auctions, raffles, and door prizes will be conducted daily as in the past and the detailed schedules for these will be available in your registration packets.

Come early and you will be able to enjoy three field trips on Thursday and two on Friday morning before the official convention opening ceremony. Here are the field trips planned for Thursday August 26th; see the insert for details on departure times, duration, and cost.



Historic Concord, Mass. Tour the location of the start of the American Revolution. Located 16 miles west of Boston, Concord was home to Ralph Waldo Emerson, Henry David Thoreau, and Louisa May Alcott. The tour will comprise visits to the Old North Bridge, the Alcott House, the Concord Museum, and the Concord Library, which houses an exhibit of the Shells of Concord, collected by Boston Malacological Club member Kristina Joyce. Through careful planning and preservation efforts, much of Concord still looks as it did in revolutionary times.

Harvard Museum of Natural History, Cambridge, Mass. Tour the fabulous collections, including the Mollusk Department, Mineral Exhibit (deemed one of the best in America), the Great Hall of Mammals, and the famous Exhibit of Glass Flowers.



Public Garden, Massachusetts State House and Beacon Hill, the Old State House, Faneuil Hall and Quincy Market, Bunker Hill Memorial, and the USS Constitution, to name a few. Take a virtual tour from this link below and crank up the volume! http://www.bostonducktours.com/tour_video.html



U.S.S. Constitution and Museum. You will go aboard the oldest commissioned warship in the world. A veteran of the War of 1812, this maritime treasure has been restored to its original splendor. The 2-hour tour also includes a visit to the USS Constitution Museum; the ship and the museum are located in the Charlestown Naval Yard.



Shelling Trip. Although not as bountiful as a Florida mud flat, shelling can be productive on the beautiful east coast beaches of the Massachusetts, particularly north of Boston. The trip is planned for either or both of two such locations, Nahant Beach in Lynn, and Revere Beach. Several of our New England shell experts from the Boston club will host this trip. A stop at the famous Kelly's Restaurant, a Revere Beach staple since 1951, is planned for lunch.

Other things to take in. There are many other worthwhile places and things to see in Boston. There was not enough time to schedule all of these as field trips, so for those coming early or staying late, here is a list we recommend for you to do on your own.

Field Trips scheduled for Friday morning August 27th include the Boston Duck Tour and the U.S.S. Constitution and museum. See the convention insert for details on departure times, duration, and cost. Both tours will return in time to get lunch and make the convention opening ceremony.



Boston Duck Tour. A great way to see many of Boston's famous sites and places, the Boston Duck Tour is in W.W.II style amphibious landing vehicles. The tour takes about 90 minutes and includes a tour guide and a short water excursion providing a wonderful skyline view of the city. You will see the Boston

Faneuil Hall/Quincy Market complex. A short taxi ride from the hotel and close to the waterfront, this is the most visited tourist site in Boston. Originally a marketplace, these historic buildings were beautifully restored in the 1970's and house a myriad of restaurants, stores, and tourist item vendors. The Faneuil Hall auditorium was used in the first protests against taxation and is still in use today.



JFK Library and Museum. Located in Dorchester, a Boston neighborhood, the JFK Library houses the papers and memorabilia of our 35th president.



Boston Public Garden. Only two blocks from the hotel, this beautiful and serene area is an oasis within the city. Don't forget to take a ride on the famous Swan Boats.



Top of the Pru and the Hancock Towers. Spectacular views of Boston and Cambridge can be seen from the top of both of these famous landmarks located just a few blocks from the hotel in Back Bay. The Prudential has an excellent restaurant, 'Top of the Hub.'



Other interesting places include a tour of **Fenway Park**, home of the Boston Red Sox, the **Paul Revere House** in Boston's North End, and the **New England Aquarium** on Boston's waterfront. The Park Plaza concierge can help arrange transportation to these venues.

Donations

Please donate shells and shell-related items that can be used for raffle items, silent auctions, or door prizes, as well as specimen-grade shells for the oral auction. Shell donations should include pertinent data (name and locality). Donations are tax deductible and help support COA grants and research. Financial donations are accepted as well and help offset the expense of awards and other convention necessities. Categories for Financial donations are:



- Argentum** \$10-\$99
- Aurantium** \$100-\$199
- Diamantine** \$200+

In order to be listed in the 2010 COA program booklet, donations must be postmarked no later than July 10th, 2010. All shell-related donations should be sent to Don Robak, 6 John St., Chelsea, MA 02150. Financial donations should be sent to Warren Graff, 18 Noyes Lane, Merrimac, MA 01860. **COA APPRECIATES YOUR SUPPORT!**



Living Fossils

Zvi Orlin



Above: A preserved coelacanth, *Latimeria chalumnae* Smith, 1939, caught off Grand Comoro in the Comoros Islands in 1974. In life this 'living fossil' (first discovered live by science in 1938) is blue with irregular light blue blotches. This specimen weighed 60kg and is 170cm long. It is on display in the Natural History Museum of Vienna, Austria. A second species, *L. menadoensis* Pouyaud, Wirjoatmodjo, Rachmatika, Tjakrawidjaja, Hadiaty, & Hadie, 1999 was discovered a decade ago in Indonesia. It is brown in color.

Right: The tuatara, on the right, is in the class Reptilia, but despite its appearance, it is not a lizard (order Squamata), but rather the sole surviving genus in the order Sphenodontia (two living species: *Sphenodon guntheri* (Buller, 1877) and *S. punctatus* (Gray, 1842)). The tuatara has been considered as en-



dangered since 1895. This intriguing reptile is endemic to New Zealand where it is confined to 32 offshore islands that were free of introduced predators like the Polynesian rat and habitat loss caused by human development. It has recently been reintroduced to the mainland in a specially prepared sanctuary. Tuataras can live to be well over 100 years of age. Photo by Flicker user, Philippi C., on Wikipedia.com

When one sees the phrase 'living fossils' the first images that come to mind are probably the lizard-like tuatara (Sphenodontidae) of New Zealand or the fish *Latimeria* or coelacanth (Latimeriidae) of East African waters. Both can trace an evolutionary lineage to ancestors living some 200 million years ago (mya). As our dealings here are with mollusks, I would like to mention three families that are perhaps among the more interesting of the phylum, have an ancient lineage, and fit the 'living fossil' description. First it is important to clarify what we mean by the term 'living fossil.' Darwin was probably first to coin this phrase and it has been used and abused ever since. One of the more interesting definitions I have run across is, "the recent members of an extinct group of organisms." Despite the internal contradiction in that definition, it does portray the meaning. You can find dozens of definitions on line and in print. Wikipedia has maybe a half dozen definitions, of which it highlights:

Living fossil is an informal term for any living species (or clade) of organism which appears to be the same as a species otherwise only known from fossils and which has no close living relatives. These species have all survived major extinction events, and generally retain low taxonomic diversities. A species which successfully radiates (forming many new species after a possible genetic bottleneck) has become too successful to be considered a "living fossil."

Some authors (Stanley, 1978) believe this term should be dropped altogether. Despite the difficulties of definition, I have chosen here to use the phrase 'living fossil,' as it is popularly accepted.

The first 'living fossil' molluscan family I think worthy of mention is the bivalve family Trigoniidae, whose ancestors evolved during the Ordovician (about 450mya). Only two genera of this family survived the Cretaceous Mass Extinction (65mya). In the following Cenozoic Era the genus *Eotrigonia* became extinct, leaving *Neotrigonia* as the sole genus in this family to survive to modern times. *Neotrigonia* is found in the waters off Australia and there are only 5 (or 6, or 11, depending upon the author) Recent species. The species most generally agreed upon are: (*N. margaritacea* (Lamarck, 1804), *N. bednalli* (Verco, 1907), *N. lamarcki* (Gray, 1838), *N. gemma* Iredale, 1924, *N. uniophora* (Gray, 1847) and *N. kaiyomarumae* Habe and Nomoto, 1976 - this last is known only from a single specimen from off Western Australia. Each occupies a segment of the ring of shallow seas that encircle the continent. They have highly sculpted shells with prominent ridges or rows of knobs on the outer surface and unusual profiles of large (in relation to shell size) interlocking hinge teeth. They also have a highly muscular foot that enables them to burrow in sand more rapidly than other clams that inhabit the same sandy areas. In addition, these bivalves have a distinctive heel that facilitates leaping (like some cockles). These characteristics of fast burrowing and the ability to leap have probably kept them one step ahead of their predators. These species are popular with collectors because of their distinctive outer sculpturing and bright



One of the more commonly available broach shells, *Neotrignonia bednalli* Verco, 1907, 27mm, from 50 feet deep in sand in the Gulf of St. Vincent, South Australia. Broach shells have an ancient lineage and should not be dismissed as "just another small brown bivalve." In fact, a *N. bednalli* displayed by Sophie Ward at the 2009 British Shell Club Annual Shell Show won the Walter Karo Award for "Shell of the Show."

nacre interior. I am proud to mention that I had two specimens of *Neotrignonia bednalli* in my shell collection, both from friends in Australia.

Next is a 'living fossil' that is also called a 'Lazarus taxon,' a clade that disappears in the fossil record for a period of time and then reappears as either a fossil or a Recent taxon (the coelacanth mentioned in the first paragraph also fits this definition). The fossil record of the order Monoplacophora showed they existed from the early Cambrian to approximately the mid-Devonian (550 - 380 mya), when they were thought to become extinct. Then in 1952, a Danish Biologist, Henning M. Lemche (1904 - 1977) discovered 10 living specimens of what he would eventually name *Neopilina galathea* Lemche, 1957, trawled while he was a member of the Galathea Expedition off the coast of Costa Rica at a depth of 3,590 meters. He described the specimens in the order Tryblidiacea - a monoplacophoran, thought extinct for 380 million years. Later more specimens were found at depths of up to 6000 meters, which certainly would account for them remaining undetected for so long. Once scientists knew what to look for they were able to identify other monoplacophorans that had been collected earlier but misidentified, usually as limpets. The earliest of these was perhaps *VeleroPilina zografi* (Dautzenberg & Fischer, 1896), finally properly identified nearly 100 years later in 1983.

Monoplacophorans are found worldwide in the major oceans (including off Antarctica and in the Red Sea) and resemble limpets in outer appearance and chitons in several soft-body part characteristics, but are different from both, having a nacreous shell structure, a cap shaped protoconch, and serial multiplications of several organ systems. Extant species (of which over 20 have been named) feed on detritus in the cold waters in which they are found and some have been discovered to have symbiotic bacteria in the epidermis of their mantle. They have been termed a missing link between annelids and mollusks, but their anatomy suggests



A small (under 1mm) monoplacophoran, *VeleroPilina zografi* (Dautzenberg & Fischer, 1896) trawled at 500 meters, Fiumicino, Italy. It is easy to see why this shell, without the living animal, would be mistaken for a gastropod. Image courtesy of © Guido & Philippe Poppe - www.poppe-images.com The inset shows the living animal, including the pairs of ctenidia (gills), a structure more similar to chitons than to gastropods. Original image source unknown.

a strong relationship to modern chitons, despite the difference in shell morphology. Authorities differ on the exact placement and status of this group, but whatever the final outcome, they have certainly provided decades of excitement for some researchers.

Now we come to the third and what I believe are the most fascinating of our 'living fossils:' the family Nautilidae. The earliest nautiloids (class Cephalopoda) evolved in the Cambrian, the first period of the Paleozoic Era. They have thick shells for protection and the interior is sectioned off with calcareous partitioned chambers of liquid- and gas-filled space. In the partition between the chambers is a perforation permitting the passage of a porous tube called the siphuncle that includes blood vessels, nerves and other tissues. It joins the liquid filled chambers with the anterior living chamber. The amount of liquid is regulated by osmosis. If the salt content of the liquid is lower than that of the animal's blood, the osmotic gradient causes the liquid to flow through the blood into the body, leaving behind a gas-filled space. The role of the siphuncle is to control the gas and liquid content of the chambers. This creates a buoyancy organ, enabling them to hover weightlessly above the sea bottom and swoop down on their prey, or ascend from the ocean depths at night to feed near the surface. They are jet propelled predators, catching prey with their tentacles and biting off chunks of flesh with a parrot-like beak. The gas contained in the inner chambers is at a very low pressure and thus has an implosion depth limit at which the pressure of the sea could crush the shell. This means nautiloids could only submerge down to about 600 meters, but most probably lived up to about 300 meters in comparatively shallower depths. The shell system has a very slow growth rate and it can take up to 20 years for the animal to reach full adult size.

Fishes evolved in the Early Paleozoic, but were mainly found in freshwater lakes, ponds, and streams. By the Devonian, they had invaded the sea and evolved true jaws. They attacked



Nautilus belauensis Saunders, 1981, photographed off Palau by Lee R. Berger, courtesy of Wikipedia.

young nautiloids and the characteristic slow nautiloid growth became a major liability. The nautiloids dwindled as fish proliferated. Closely related cephalopods, the ammonites, seemed to partially solve the predation problem by producing vast numbers of tiny eggs (nautiloids produced only few eggs at a time with slow rates of development). Thus ammonites, with numerous young floating in the plankton, could be carried by currents to widely separated parts of the globe. By the end of the Devonian they radiated explosively into many hundreds of new species. Over 80 genera existed at that time, but they were later annihilated by successive mass extinctions. They became common in the Mesozoic Era (the Age of Dinosaurs) with over 400 genera in the Triassic circ. 220 mya. Despite a mass extinction at the end of the Triassic, when only two genera survived, they radiated again in the Jurassic. By the early Cretaceous they were amongst the most common creatures of the sea. The subsequent mass extinction at the end of the Cretaceous (referred to as the KT extinction circ. 65 mya) annihilated them, after a 300 million year reign.

The cardinal question is why did the nautiloids survive the KT extinction? According to P.T. Ward (1991), one of the reasons is that *Nautilus* eggs seem to be laid and kept at great depths (100-300 meters) during the year it takes them to develop. The KT catastrophe may have killed off all juvenile and adult ammonites as well as nautiloids, but it is possible that the slow developing nautiloid eggs were preserved in the depths. In any case, only two nautiloid genera survived to the present, *Nautilus* and *Allonautilus* (though there is still some dispute about the status of this second genus). They are represented by only five species (or six, or seven, again depending upon author). Generally accepted species of Nautilidae are: *Allonautilus perforatus* (Conrad, 1849) (Indonesia); *Allonautilus scrobiculatus* (Lightfoot, 1786) (Papua New Guinea and the Solomon Islands); *Nautilus belauensis* Saunders, 1981 (Palau); *Nautilus macromphalus* Sowerby, 1848 (New Caledonia to NE Australia); *Nautilus pompilius* Linnaeus, 1758 (type) (southern Japan to Australia and Indonesia to Fiji); *Nautilus stenomphalus* Sowerby, 1848 (Queensland, Australia).

There are, of course, other cephalopods that demonstrate an ancient lineage. Perhaps of most interest here would be *Spirula*

(Linnaeus, 1758). This deep-sea dweller looks like a squid, but is actually the last surviving member of the fossil family Belemnoidea (belemnites), a group of squid-like creatures that are related to ammonites and may have giving rise to modern squids and cuttlefish. Today, *Spirula spirula* is mostly known from the small white spiral shell that is completely enclosed inside the animal in life, but often washes ashore on tropical and temperate beaches after the animal dies.

Are these the only living fossils of mollusks? Certainly not, but how many mollusks can be traced back in the fossil record for at least 150 mya? I have searched my available literature and would like to present a list of the extant common families whose ancestors I was able to trace back further than 150 mya. I have not added the Cretaceous Period as it borders on the Cenozoic Era, when most of the present extant species of mollusks evolved and can be traced by more recent fossils. My list is limited to families well known to most shell collectors.

Mesozoic Era:

Jurassic - Aporrhaidae, Epitoniidae, Ringiculidae, Cylichnidae, Physidae, Retusidae, Ellobiidae, Siphonariidae, Arcidae, Anomiidae, Tellinidae, Arctidae, Thraciidae, Teuthidae, Sepiidae

Triassic - Scissurellidae, Fissurellidae, Neritidae, Strombidae, Naticidae, Architectonicidae, Mytilidae, Pteriidae, Limidae, Ostreidae, Gryphaeidae, Spondylidae

Paleozoic Era:

Carboniferous - Acteonidae, Pinnidae

Devonian - Solemyidae, Nuculanidae, Pectinidae, Cardiidae

Ordovician - Trochidae, Buccinidae, Scaphapoda

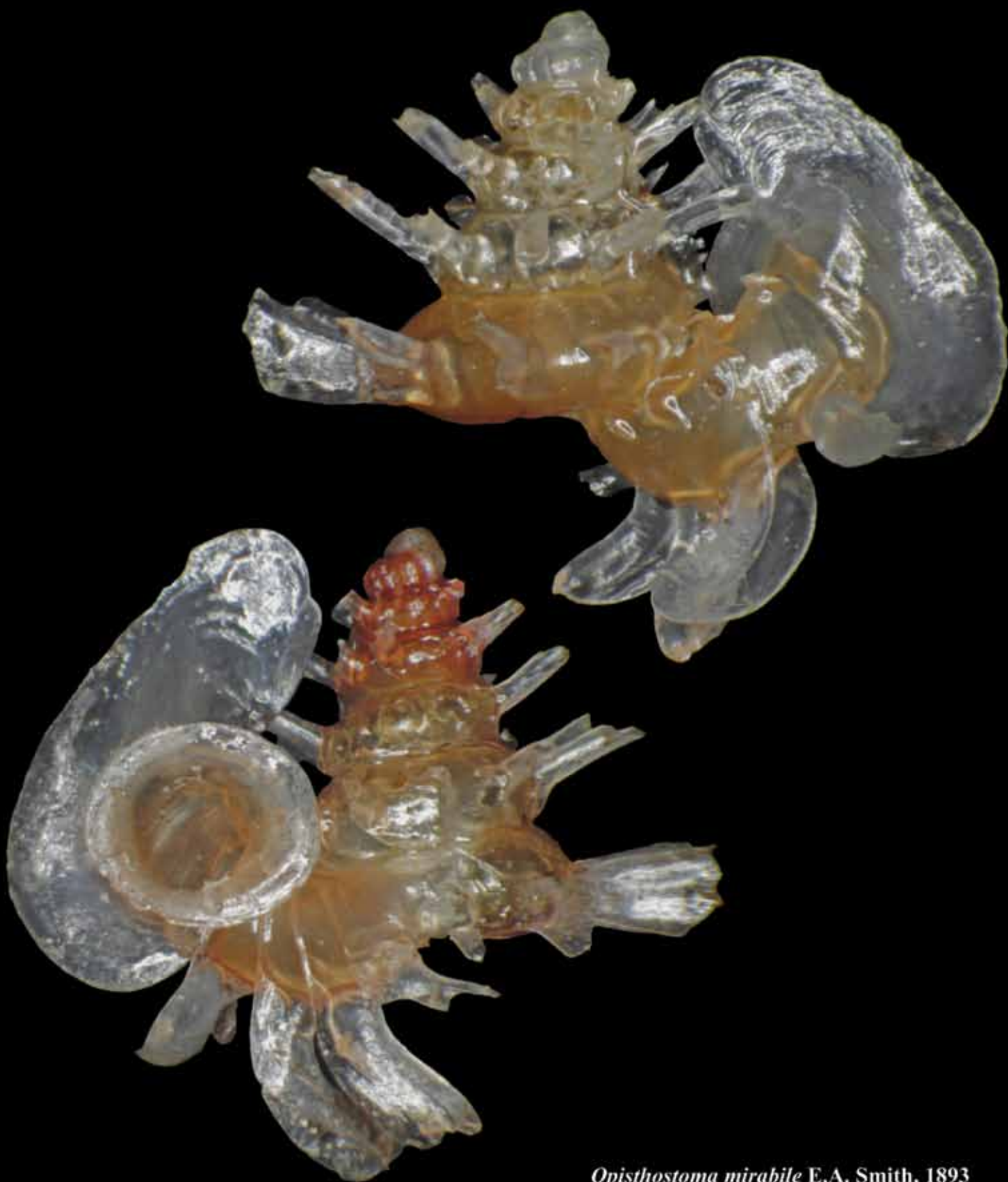
Cambrian - Pleurotomariidae, Chitons

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Opisthostoma mirabile E.A. Smith, 1893
4.5mm, on limestone rock, Borneo