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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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## COA Nominating

### Committee Report 2012

COA 2012 Nominating Committee is composed of the following members:

Amy Dick, Alan Gettleman, and F. Matthew Blaine (Chairman)

Each of the following COA members were contacted by a member or members of the nominating committee and each has agreed to serve in the respective posts if elected. As required by the COA Bylaws we are herein publishing the list prior to the election. We are pleased to announce the slate of officers for 2012:

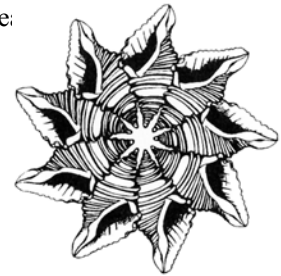
José Leal, President

Harry Lee, Vice President

Phyllis Gray, Secretary

Steven Coker, Treasurer

Bill Lyons, Trustee



I would like to thank the members of the Nominating Committee who worked eagerly, cooperatively, quickly, and efficiently to produce this fine slate of officers. It was a pleasure to be a part of this important activity.

Respectfully submitted,

F. Matthew Blaine

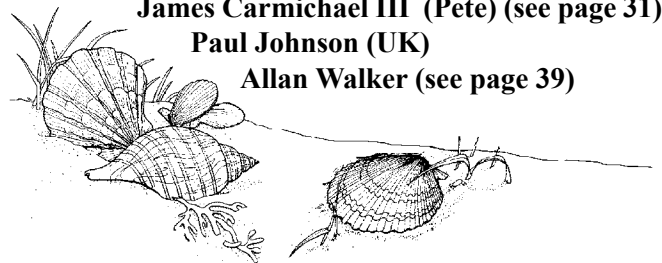
#### In Memoriam:

**Dr. Donald Bosch (see page 31)**

**James Carmichael III (Pete) (see page 31)**

**Paul Johnson (UK)**

**Allan Walker (see page 39)**



### American Malacological Society Annual Meeting

June 16-21, 2012

### Conchologists of America Convention

June 19-24, 2012

Information and registration at:  
[conchologistsofamerica.org](http://conchologistsofamerica.org)



**Front Cover:** *Strombus pugilis* Linnaeus, 1758, from Trujillo Bay, Honduras. This common species as well as several rare species were collected during night dives from a shrimp boat. See the article by Karen VanderVen on page 20. Photograph by Marc Nathanson.

**Back Cover:** A colorful collection of Indonesian landsnails of the genus *Asperitas*. Species in this genus have shell colors and patterns rivaling any in the world. Photograph by Nimal Bahar of Coventry, United Kingdom.



# Claud-Mantle, Harvard, and two sinistral sacred chank shells: A THRILLING DISCOVERY

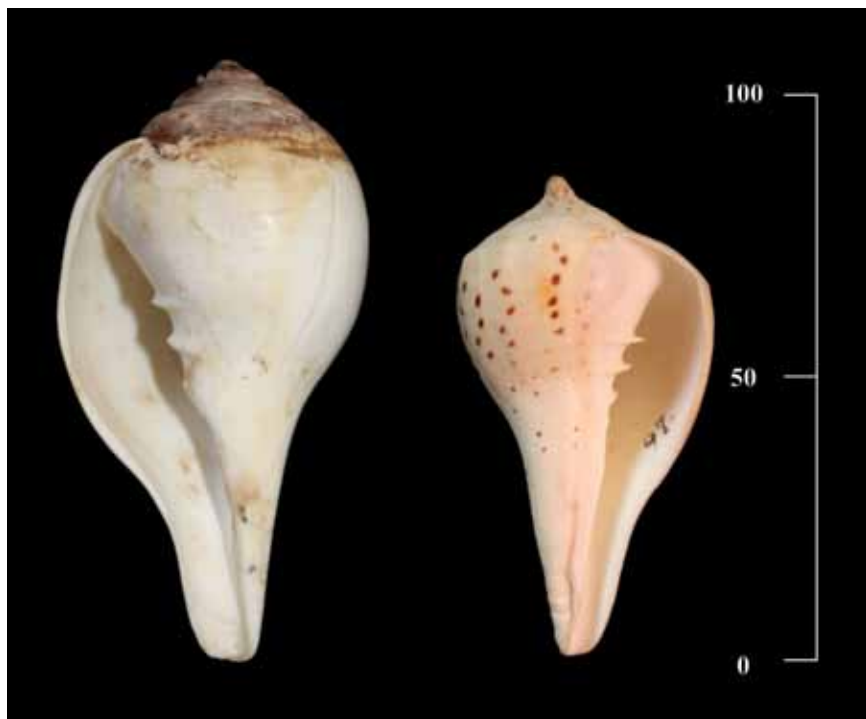
Edward Nieburger<sup>1</sup> and Adam J. Baldinger<sup>2</sup>

*Thrilling can be defined as producing a sudden, strong, deep emotion or excitement, often producing trembling or quivering. Discovery is quite simply finding something.* These were definitely some of the feelings I, Ed Nieburger, experienced on the night of January 3, 2012, when I was attending the meeting of the Boston Malacological Club, which has met for over a half-century on the first Tuesday of the month in the Museum Lecture Room at the Museum of Comparative Zoology (MCZ) at Harvard University in Cambridge, Massachusetts. The program for this particular night included a presentation titled, “The Mollusk Department: Past and Future” and a guided tour of the Mollusk Department by Curatorial Associate, Adam Baldinger.

Following Adam’s talk, club members were allowed to look through some of the thousands of drawers of shells. As the bewitching hour of ten o’clock neared, Adam said: “Time to close the cabinets and head back to the elevator.” I had spent my time looking through some of the drawers containing shells from a collection I recently appraised online. I was just picking up one last shell. It was about the third or fourth shell that I touched, in a collection of thousands. I was feeling quite light-headed as I asked my friend Dan Teven, standing to my right, to verify if one particular shell opened on the left or on the right. Dan said: “left.” So, we both knew the significance of the find, the ultimate rare and valuable seashell, a sinistral sacred chank shell [*Turbinella pyrum* (Linnaeus, 1758)] (Fig. 1). I never thought I would see one in person. I certainly never thought I would hold one in my hand. And to be the first in eighty years to hold such a treasure, and then to realize that it was a treasure, made me delirious.

Shock, excitement, and embarrassment overwhelmed me as the Club members headed for the elevator. Embarrassment because I had just evaluated this huge collection for the family and heirs of the collector and had completely missed seeing the left-handed specimen of what is “always” right handed. How could I have missed it? This will certainly go down as the classic “missed identification” of conchological history. My name, Edward Nieburger, will remain forever as the person who missed such an identification!

This shell was part of the Joseph George Claud-Mantle collection that was donated to the MCZ on June 24, 2011. With 5,200 shells, and with almost 4,000 species, the collection does contain rarities, including this most valuable of all shells, a



**Fig. 1. A sinistral sacred chank shell, *Turbinella pyrum* (left) and the more common dextral form (right), both from the Joseph George Claud-Mantle collection donated to the Museum of Comparative Zoology, Harvard University, June 24, 2011. Scale in mm.**

sinistral sacred chank shell of India. Born in Calcutta, India, in 1858, Joseph George Claud-Mantle located to London as a young boy. His education is unknown. He went to sea as a young man and made Chief Engineer at the age of twenty-six. He arrived in America in 1882, married in 1887, and was widowed in 1907. They had three sons (one died in infancy), three daughters (one died at age eight), seven grandchildren, and fifteen great-grandchildren. Joseph George Claud-Mantle (Fig. 2) lived in New York City and assembled this large shell collection between 1880 and 1930. The shell cabinet (Fig. 3) was a remarkable built-in arrangement, with what appears to contain an equally valuable shell-book library that was located at 111 Ames Avenue in Leonia, New Jersey. Joseph George Claud-Mantle died in 1934 in Trumbull, Connecticut. He also collected rocks and minerals. Most of his shells were purchased from Hugh C. Fulton, the famous shell-dealer of London, England. Few, if any specimens, appear to be self-collected, with the possible exception of some from Long Island Sound, New York.

Claud-Mantle’s grandson, George Ferrera (Fig. 4) of Trumbull, Connecticut, remembers his grandfather Joseph as a



**Fig. 2. Joseph George Claud-Mantle, circa 1888 (photo courtesy of Cindy Arendt).**

“genteel man.” Ferrera said in *The Hartford Courant* newspaper interview (Adinolfi, 2011), “An accomplished engineer, esteemed by his neighbors, he always carried an umbrella and looked dandy in a black jacket and tie. ‘All my neighbors would remark about how he was a great man, a real gentleman,’ He was also an enigma who, according to family legend, was the son of a British officer and an Indian woman who died of cholera while aboard a ship bound for England. He worked as an engineer, manufacturer, and inventor. He registered at least one engineering device with the United States Patent Office. He eventually founded a successful engineering firm, Mantle and Company, Park Avenue, New York City, before retiring in 1916 and moving to Leonia, a wealthy hamlet in Bergen County...” northern New Jersey. He was a member of numerous scientific organizations and museums. “After retiring, Claud-Mantle immersed himself in hobbies, particularly in his collection of shells.” He enjoyed eighteen years of retirement with his growing collections.

Over the years, Ferrera offered the collection to several museums, including The Academy of Natural Sciences in Philadelphia, “but none would accept it without an accompanying donation to catalog and maintain it.” In early 2008, his daughter Laura Ferrera of Norwalk, Connecticut, and her two cousins, Deborah Lasnier of Canton, Connecticut, and Cindy Arendt of Oxford, Connecticut, resolved to accomplish George’s dream. They documented the collection, taking inventory using their great-grandfather’s original logbooks, and then created an electronic database and online photo gallery of the shells (Figs. 5, 6, & 7).

Also from *The Hartford Courant* newspaper article



**Fig. 3. (Above) Joseph George Claud-Mantle shell cabinet and library (photo courtesy of Cindy Arendt).**

**Fig. 4. (Below) George Ferrera and Deborah Lasnier holding a drawer of Claud-Mantle specimens on June 24, 2011 – transfer day of the collection to the Museum of Comparative Zoology.**



(Adinolfi, 2011), Adam Baldinger said “It isn’t unusual to receive collections from private collectors, but I have rarely seen a collection that was so diligently catalogued. The collection’s true value is scientific, and lies in the precise way Claud-Mantle recorded data about each of his shells. The technique that he used is a technique that was commonly used by early natural-history museums. They kept a ledger and recorded the appropriate data for the specific specimens. Small strips of paper are affixed to each of Claud-Mantle’s shells, listing its name and a number that corresponds with the logbook entry where he recorded information such as the shell’s origin and when it was purchased. I’m very interested in this collection because of the data and the careful work of the family, and particularly the great-grandfather, that was put into the collection. Claud-Mantle probably corresponded with professional scientists and collectors from around the world, who taught him how to preserve and record his shells. It will take several months to catalogue and study the collection. Until then, we cannot determine which shells have the most scientific value.” In the meantime, family members can view their ancestor’s full collection, online in images posted on their private website.





**Fig. 5. (left) Fig. 6. (right) The drawer (left) in its original condition as Ed first saw it with the sacred chank shell, aperture down, and (right) after the cousins cleaned the drawer and shells (photos courtesy of Cindy Arendt).**

Joseph George Claud-Mantle was connected to the American Museum of Natural History in New York City while he lived there. After he died in 1934, the 120 cabinet drawers of shells were carefully removed by family members and stored, without the cabinets, then moved about the Northeast five more times, in New Jersey, to Vermont, then Connecticut. Then in early 2008, Deborah, Cindy, and Laura took on the project of cleaning and photographing the collection (Figs. 5, 6, & 7). This project took almost four years. Eighty years had taken only a small toll on the arrangement of shells, and the shells cleaned up well for the transfer to the MCZ (Figs. 4 & 8). My appraisal was based on viewing the photographed shells online. These cousins spent infinite hours photographing the drawers and most of the shells, individually, but not the chank shell. Their extensive and exhaustive time involved has to be considered a labor of love.

For eighty years this sacred chank shell avoided re-discovery, sitting in a drawer with many much more attractive shell specimens. The cousins were right when they speculated that there was a really rare “sleeper” shell in the collection, and it would be a “plain Jane.” The shells were now sitting in MCZ drawers (Fig. 9) during that first week of January 2012, eighty-five years after Joseph George Claud-Mantle had bought the sacred chank from Hugh C. Fulton, in 1927, for five pounds sterling, just waiting to be re-discovered.

It took just overnight for Adam and me to start checking. Adam double-checked that the specimen was indeed part of the Claud-Mantle collection, and it did appear in one of the thousands of photographs of the collection that I had used during the online valuation of the collection for the family. It was “hiding,” aperture down in a drawer (Figs. 5 & 6) with other stellar shells, including two *Austrotrophon catalinensis* (Oldroyd, 1927), shells that had distracted me from recognizing this “ultimate” valuable shell.

A similar sinistral sacred chank shell is wonderfully documented in *American Conchologist* (June, 2011), in Harry Lee’s detailed article about his own specimen, which is destined for the Florida Museum of Natural History at the University of Florida, Gainesville. Dr. Lee estimated that there are several

hundred such specimens in Asia today. The sinistral, or left-handed, chank is revered as a religious object in Hindu temples, as the place where Vishnu, the god of the sea, had hidden sacred scrolls (Rose, 1974, 2011). Dr. Lee estimated that there are probably just three specimens of the sinistral sacred chank shell in North America.

Rice (2011) then wrote an article that appeared in the same June 2011 issue of *American Conchologist* answering the question: “What shell is the most valuable?” Coincidentally, his conclusion was that the sacred chank shell was the most valuable, not just for its rarity in nature, but also because of its value as a religious object. The sacred chank shell comes from shallow water, off India. The shell coils dextrally, or is “right-handed,” almost always. A great rarity is one that coils sinistrally, or is “left-handed,” opening on the left with the spire pointed up. Only one in six hundred-thousand coils sinistrally (Lee, 2011)! It was in Rice’s (2011) article that the sinistral specimen was valued at \$45,000. The normally right-handed specimens sell for under \$10.

The five pounds sterling that Claud-Mantle paid for his sinistral specimen was a lot of money in the 1920s, but what Joseph George Claud-Mantle paid for the chank can be compared to what he paid for a glory of the seas cone, *Conus gloriamaris* Chemnitz, 1777, also in that same time period: eighty pounds sterling, also bought from Hugh C. Fulton, of London.

The family and heirs of Joseph George Claud-Mantle are very excited with this newest discovery. They are thrilled that their great-grandfather’s shells are safe and being appreciated by others. As fate would have it, this newly re-discovered specimen stimulated Adam to review the literature and the department’s database and he notified me of yet another sacred chank shell in the collections (Fig. 10). This one came from the Duchess of Portland collection from the 1700s. This older specimen is a bit smaller than the Claud-Mantle specimen, but how remarkable is it to have two such specimens in the same place? Harry Lee was very insightful in stating that there are “three specimens in North America” (Lee, 2011). It appears that there are no others known either in private collections or in museums in North America.





Fig. 7. Some of the original drawers containing Claud-Mantle specimens that total over 5,200 shells and almost 4,000 species (photos courtesy of Cindy Arendt).





**Fig. 8. Specimen drawers neatly wrapped and stored in preparation for transferring the Claud-Mantle collection to the Museum of Comparative Zoology.**

The Duchess of Portland collection provided the first sinistral sacred chank shell specimen that came to the MCZ (Johnson, 1999). The Duchess Dowager of Portland, Margaret Cavendish Bentinck (1714 - 1785), was a member of the British elite. She made friends with “Dr. David Solander and Sir Joseph Banks, who would soon accompany Captain James Cook on his first voyage of discovery to the South Seas (1768 - 1771)” (Johnson, 1999). Many rare shells found their way from that voyage into the Duchess’s cabinet. “A year after the Duchess’s death, in 1786, a sale catalog of her shells was made up by her chaplain and librarian, Rev. John Lightfoot. Lightfoot, a botanist and conchologist himself, printed over twelve hundred copies of *The Portland Catalogue*, which would eventually be recognized as a legitimate descriptor of new species, with Lightfoot as their author. *The Portland Catalogue* claimed that the Duchess of Portland collection was the finest in Europe.” (Johnson, 1999) It probably was. The sale took thirty-eight days to complete. On its final day, Lot 4023, the Duchess’s sacred chank shell “a very fine reversed *Voluta ponderosa*, S. (Solander ms – as in label only) or Heavy Volute, *extremely scarce*, from the East-Indies. A direct (dextral) one is figured in Favanne, pl. 35, fig. 1” (Johnson, 1999) was sold. Lot 4023 eventually came to Boston, but not before being in multiple important European collections between 1786 and 1938. It is most interesting that this “Portland chank” came from England to America through the hands of the same London shell dealer, Hugh C. Fulton, who had handled the Claud-Mantle chank shell. They came eleven years apart. The Duchess’s shell came in about, or soon after, 1938. “The Duchess’s Portland chank arrived to the collection of Gretchen Osgood Warren, a wealthy Brahmin, at 8 Mount Vernon Place, Beacon Hill, Boston,” (Johnson, 1999) a very aristocratic address. From her daughter, Rachel, the shell was given to the Boston Museum of Science, and then in 1962 most of the museum’s collection was transferred to the MCZ (Johnson, 2004). The Duchess’s shell came to America at almost the same time that Harry Lee’s specimen arrived.

Presently the Claud-Mantle sacred chank shell has less provenance. Claud-Mantle was living in Leonia, New Jersey, in 1927 and must have been putting the finishing touches on his collection. The three cousins still have a file of correspondences



**Fig. 9. The Claud-Mantle collection safely housed within specimen cabinetry within the Department of Malacology at the Museum of Comparative Zoology.**

between Joseph George Claud-Mantle and Hugh C. Fulton. Perhaps the details and history of the sacred chank shell in Claud-Mantle’s collection will emerge, maybe even its locality data and earlier chain of ownership. Could it be that this sacred chank came from a famous European collection?

The Claud-Mantle collection (Fig. 11) also contained two golden cowries, *Lyncina aurantium* (Gmelin, 1791); one *Barycypraea fultoni* (Sowerby III, 1903), for which he paid twenty pounds sterling; *Bernaya teulerei* (Cazenavette, 1846) from Aden, Arabian Sea, for which he paid eighty pounds; two *Erronea nymphae* (Jay, 1850) from Mauritius; a rhododendron cone, *Conus adamsonii* Broderip, 1836; a *Conus timorensis* Hwass in Bruguiere, 1792; a noble cone, *Conus nobilis nobilis* Linnaeus, 1758; a *Cymbiola (Cymbiolacca) thatcheri* (McCoy, 1868); two *Austrotrophon catalinensis* (Oldroyd, 1927) from California; a *Lyria (Harpeola) anna* (Lesson, 1835) from Mauritius; a *Carinaria cristata* (Linnaeus, 1767) from the Moluccas, a tiny shell that looks like a glass ice-cream cone; a violet spider conch, *Lambis violacea* (Swainson, 1821); *Cymbiola (Cymbiola) cymbiola* (Gmelin, 1791); a ribbed harp, *Harpa costata* (Linnaeus, 1758); and freshwater snails such as *Io fluvialis* (Say, 1825) from Tennessee and an elaborately ornamented snail *Tiphobia horei* E.A. Smith, 1880, from Lake Tanganyika. Claud-Mantle even had a drawer of pteropods, pelagic or free-swimming mollusks from mid-ocean.

The Joseph George Claud-Mantle collection is a wonderful historical record of what an outstanding collection of its time looked like. The species selection is remarkable, even though (and perhaps because) there are almost no self-collected shells! Each genus has complete runs of the available species of the time. It must have been one of just a handful of such collections





**Fig. 10.** Another sinistral sacred chank shell, *Turbinella pyrum* (MCZ 249020) within the Department of Malacology at the Museum of Comparative Zoology. It was once part of the Duchess of Portland collection. Scale in mm.

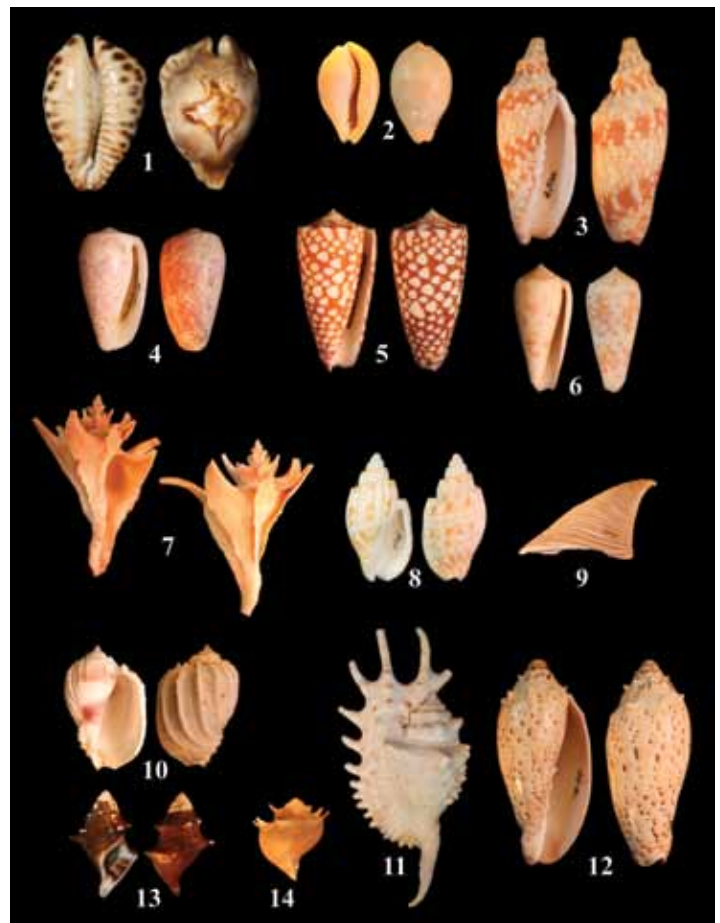
world-wide a century ago. Since Hugh C. Fulton was the premier dealer of the day, and we believe that Claud-Mantle was probably his prime customer at the time, this collection is likely the star collection of its era. It is remarkable that his heirs preserved this collection. I am certain that Joseph George Claud-Mantle would be very proud to have his collection appreciated by descendants he never got to know. I am grateful that I had the opportunity to experience such a thrilling discovery.

#### Acknowledgments

The authors thank Cindy Arendt, Laura Ferrera, Deborah Lasnier, and “Uncle” George Ferrera for the opportunity to share their story of, and to carefully study the collection of, Joseph George Claud-Mantle. We thank Cindy Arendt for the use of many of her images. We also thank Gayle Nieburger for proofreading and adding valuable comments to this manuscript and Harry G. Lee for his thorough review and editorial comments.

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**Fig. 11.** Selected specimens within the Joseph George Claud-Mantle collection: 1. *Barycypraea fultoni*, 2. *Erronea nymphae*, 3. *Cymbiola (Cymbiolacca) thatcheri*, 4. *Conus adamsonii*, 5. *Conus nobilis nobilis*, 6. *Conus timorensis*, 7. *Austrotrophon catalinensis*, 8. *Lyria anna*, 9. *Carinaria cristata*, 10. *Harpa costata*, 11. *Lambis violacea*, 12. *Cymbiola (Cymbiola) cymbiola*, 13. *Io fluvialis* and 14. *Tiphobia horei*.

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The Sacred Chank Shell and other shells within the Claud-Mantle collection are now on public display within the Harvard Museum of Natural History as part of an exhibition titled “Mollusks: Shelled Masters of the Marine Realm.” This exhibition will be in place through February 2014.

# Partulid snails, their collectors, and a prodigious dynasty of French naturalists

Harry G. Lee

## The Acquisition Phase; the “Adanson Family Collection”

The peripatetic Alain Allary, noted French shell-dealer and frequent participant in COA Convention bourses, and I go back quite some time. I recall getting some very interesting, both biologically and historically, shells from him as far back as the Panama City (1993) event, but our conversations and transactions have unfortunately been relatively few and far-between. Consequently I was pleasantly surprised at the recent Port Canaveral bourse when he showed me a sizable sample of curatorially time-worn tropical land snails. Alain informed me that they were from a collection belonging to the extended family of pioneer malacologist Michel Adanson. He went on to say the shells began to accumulate in the Eighteenth Century and increased in number through the efforts of certain members of later generations. Fascinated as much by the fame and antiquity of the material as my need to know more about *Partula* snails, obviously the dominant group in the assortment, I happily purchased the entirety of his offering.

The state of conservation of this little collection certainly warrants more than passing comment. Firstly, Alain found this material in a somewhat less well-curated condition than I did. He had labored to place what seemed to be all the constituents of each lot in a Ziploc®-style plastic bag. I found one to eight specimens constituting each lot. The shells were, or had been, glued to the outside of the bottom of mostly uniform cardboard trays (75X60X10 mm); a neatly handwritten, uniformly-formatted, label with the scientific name, author, and a brief indication of the locality was glued next to them. On the inside of the tray were glued one to three labels with less disciplined handwriting - often clearly that of more than a singular scribe, and usually containing more information as to provenance [Fig. 1]. The vagaries of time and neglect were quite apparent, and no shell or label escaped them. Dust, detachment of shells and labels from the glue, insect and rodent depredations on the labels, foxing of all the trays and labels, and (rarely) a missing label or shell had to be dealt with. Then there came the task of freeing the majority of labels and specimens from their holdfasts. Actually the process of rehabilitation went well, but it was quite tedious and time-consuming, lasting several days. An added dimension of complexity in the (re)curation effort was the inaccuracy of some labels (over 20% misidentifications, sometimes wanton, as well as incorrect locality, e.g., the extensive use of the designation “Îles Sandwich,” then exclusively applied to the Hawaiian Islands, an ipso facto inaccuracy. All this notwithstanding, the results were gratifying. The shells for the most part had escaped permanent damage from Byne’s Disease and other threats, loose specimens



**Fig. 1** The original display with the shells glued to the top of the box and the labels attached inside. The label under the shell provides the name and locality while the additional label(s) inside the box expand the information.

and labels matched up eventually, and ultimately the labels were almost all decipherable [Figs. 2, 3]. I had before me a total of 183 specimens in 58 lots, all seeming of a single vintage, the mid-Nineteenth Century. Of the total, 175 specimens in 54 lots are partulids. Of these partulids, 166 specimens in 52 lots were collected in French Polynesia and are comprised of 31 species [Plate 2]. Most of the remaining 21 lots are taxa subordinate to the 31 species, and a few are duplicate lots. The other partulid material, two lots, two species, originated in Micronesia (Guam and Ponape). The remainder, eight non-partulid specimens comprising four lots, are phylogenetically and zoogeographically diverse land snails (*Macroceramus*, *Cerastoides*, *Orobaphana*, *Tropidophora*). This acquisition and the process of its (re)curation taught me more than I ever expected to learn about *Partula* and Partulidae.

## Taxonomy and other aspects of the natural history of the Partulidae

The family Partulidae Pilsbry, 1900, is deployed throughout the high islands of south and western Oceania as well as New Guinea. Its metropolis is in French Polynesia, particularly the Society Islands. Here the nominotypical subgenus of *Partula* Férussac, 1819, is limited to the Society and Hervey Is. (Pilsbry, 1909). It has more than 76 species, with several subspecies in addition (Brewer, Czekanski-Moir, and Rundell, 2007). Most *P.*





Fig. 2 (above) and Fig. 3 (below) show details of the original display and labels as well as the authors new labels. The shells are obviously in excellent condition.



Fig. 4 William Harper Pease (1824-1871) who, along with Andrew Garrett (1823-1887), spent numerous years exploring and collecting in the tropical Pacific. In all, Pease named 31 partulids while Garret named 11.

(*Partula*) species are limited to a single island even though several inter-island distances are rather small (Pilsbry, 1909). Although predominantly arboreal, there are several terrestrial species (Pilsbry, 1909). Among the four genera (eleven subgenera) in the family (Schileyko, 1999), many taxa in this subgenus distinguish themselves with a variety of color patterns, more conspicuous in the tree-dwelling species. Most islands have more than a single species and ecological as well as geographical forces seem to have driven their evolution. The steep terrain isolates many deep valleys, in which the snails prosper. Besides allowing divergence of species, such topographic barriers have allowed infraspecific variation (forms and subspecies) to evolve within taxa distributed over relatively wide areas with varying landscape. Examples of this include *P. (P.) otaheitana* (Bruguière, 1792) [Plate 2, figs. 22-27] on Tahiti and *P. (P.) rosea* [Plate 2, figs. 31-32] on Huahine.

The type, and first-named, species of *Partula* is [*Limax faba* Martyn, 1784 (2: pl. 67), described from shells brought home to England under the command of Captain James Cook (1728-1779), who visited Raiatea, Society Is., aboard HMS *Endeavour* in July 1769 on the first of his three voyages. Because the *Universal Conchologist* of Thomas Martyn (1735-1825) (see Dall, 1906, 1908) was not a consistently binominal work, the International Commission for Zoological Nomenclature exercised its plenary powers (ICZN, 1957) to declare most of its names unavailable for the purposes of taxonomic nomenclature.\* Fortunately Gmelin (1791: 3623) had already validated the name, as *Helix faba* [Plate 1; Plate 2, fig. 10], which, albeit mislocalized in Tahiti, nonetheless limited nomenclatorial confusion. By the next year, Cook material somehow reached the French malacologist Jean Guillaume Bruguière (1749-1798), who named *Bulinus otaheitanus*, which he believed to be an inhabitant of fresh waters.

\* Nine well-known New Zealand marine gastropod species, also the product of Cook's explorations, were spared suppression by the ICZN: (1) [*Patella*] *denticulata*, now *Cellana denticulata* (Martyn, 1784) [Patellidae]; (2) [*Trochus*] *granosus*, now *Turbo (Modelia) granosus* (Martyn, 1784) [Turbinidae]; (3) *Trochus heliotropium*, now *Astraea heliotropium* (Martyn, 1784) (Turbinidae); (3) *Buccin[um] linea*, now *Buccinulum linea linea* (Martyn, 1784) [Buccinidae]; (5) *Buccin[um] maculosum*, now *Cominella maculosa* (Martyn, 1784) [Buccinidae]; (6) [*Limax*] *opalus*, now *Cantharidus opalus opalus* (Martyn, 1784) [Trochidae]; (7) *Buccin[um] papulosum*, now *Struthiolaria (Struthiolaria) papulosa* (Martyn, 1784) [Struthiolariidae]; (8) [*Trochus*] *punctulatus*, now *Maurea punctulata* (Martyn, 1784) [Calliostomatidae]; and (9) *Buccin[um] vermis*; now *Struthiolaria (Pelicularia) vermis* (Martyn, 1784) [Struthiolariidae].



**Fig. 5** (left to right) compares (1) *Samoana attenuata*; (2) a mirror-image of the no. 3 shell, a possible hybrid; (3) the shell found with a group of *Partula otaheitana* that is obviously not that species; and a typical *P. otaheitana* lot-mate of the no. 3 shell. I'll let the reader decide if this constitutes a reasonable case for hybridization.

The next century saw more intensive exploration of Oceania by the leading seafaring nations. Dr. René Primevère Lesson (1794-1849), having served as naturalist aboard the French Corvette *La Coquille*,\*\* returned in March 1825 from its three-year-long circumnavigation. He accumulated a rich booty of novel natural history objects including Birds-of-Paradise and an ample helping of *Partula* species collected in Tahiti, Bora Bora, the Carolines, and New Guinea. He described a handful of the latter years later (Lesson, 1831). *Partula* were also among the myriad treasures brought home by pioneering conchologist Hugh Cuming (1791-1865). Known to many as “The Prince of Shell Collectors” (Dance, 1986), he, in the tradition of countryman Cook, visited French Polynesia in 1827-1828 on the first of his three voyages of exploration in the Pacific. Cuming’s *Partula* species were named by Englishmen William John Broderip and Lovell Reeve as well as Ludwig (Louis) Pfeiffer in Germany. **Plate 1** features figures of *Partula* appearing in three of the six aforementioned authors’ works.

Three decades would pass before the Society Islands became the scene of the great epiphany in *Partula* discovery and understanding. This enlightenment wasn’t wrought by the French or English but through the labors of Andrew Garrett (1823-1887) and William Harper Pease (1824-1871) [Fig. 4; note the “cadaverous” countenance (Thomas, 1954)], expatriate Americans who spent most of their lives on tropical Pacific Islands. These halcyon years of discovery, and dissemination of knowledge of *Partula*, seem to have been coeval with the collection Alain provided. Pease and Garrett were friends and worked closely together from 1857 until 1863, when Garrett left Hawaii for the final time. From then until Pease’s death in 1871, they maintained an extensive correspondence. Although of two different dispositions and backgrounds, their collaboration was quite fruitful. Garrett was the intrepid traveler, collector, and (well) self-taught field naturalist; Pease, although not neglectful of fieldwork, was more

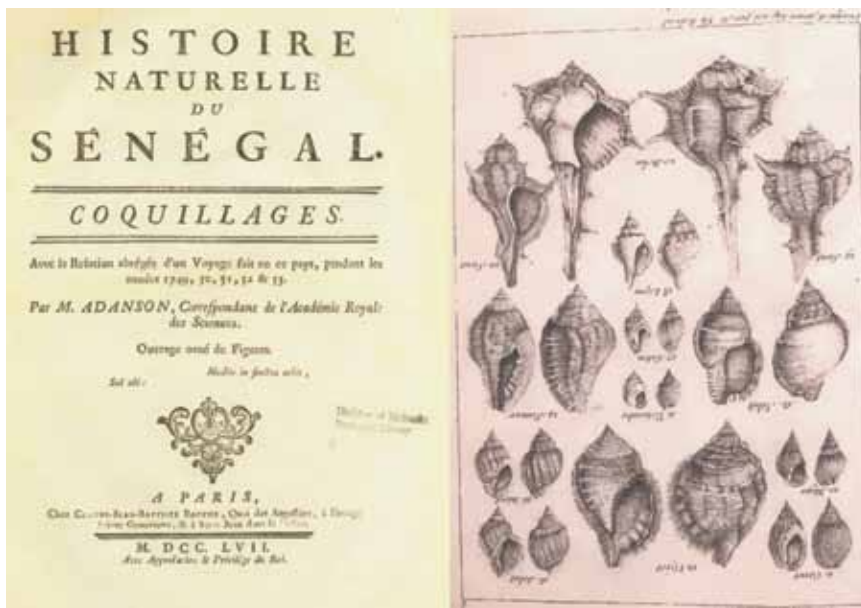


**Fig. 6** Michel Adanson (1727-1806) produced the *Histoire naturelle du Sénégal* in 1757 (see Fig 7). Published a year before the Tenth Edition of the *Systema Naturae* (Linnaeus, 1758), it is not considered available for nomenclatorial purposes (excluded by Article 3.1 of the Code (ICZN, 1999), but is still of import for its contribution to malacology. Adanson is the beginning of the paper trail of these shells.

the armchair collector, articulate writer, tutor, and sometimes sponsor (Thomas, 1979; Kay, 1975; Johnson, 2002). Garrett visited the Society Islands briefly in 1856-1857, and he returned there in 1860 for a more extensive stay. Commenting on the work of his scientific predecessors (notably Cook and crew, Lesson, and Cuming), he wrote: “During the years 1860-1863 I made a much more thorough exploration than any of my predecessors, and, by searching in nearly every valley of the group, discovered 50 new species...” (Thomas, 1979). In 1863 Garrett returned to Hawaii and shortly quit those islands for the Central Pacific, where he spent the next seven years traveling to the islands of Tuamotus, Marquesas, Samoa, and Fiji groups. All the while he sent shells to Pease, who named them promptly. Although usually published, many such nomina, noticeably among the *Partula*, existed in manuscript only (Clench, 1975; Crosse and Fischer, 1873). Shells bearing such names, e.g., *Partula radiata* “Pse.” [Fig. 3], were

\*\* Within a year of her return to France, *La Coquille* was refit, re-christened *l’Astrolabe*, and launched on another three-year circumnavigation of geographic and scientific exploration (1826-1829). Jean René Constant Quoy (1790 - 1869) and Joseph Paul Gaimard (1796-1858) succeeded Dr. Lesson in the role of expedition naturalists. Their report on the Mollusca (Quoy and Gaimard, 1832-1835) contained a great many new species, including two Melanesian partulids, and some of the finest illustrations ever drawn (Dance, 1986).





**Fig. 7** Michel Adanson's *Histoire naturelle du Sénégal* (1757) was richly illustrated and dealt exclusively with the mollusks of Senegal.

widely but illicitly in use on labels in contemporary collections such as the one on which this report is based. During his final 17 years, which he spent on Huahine, and only after Pease's demise, did Garrett produce significant scientific papers. Although mostly short communications describing new marine shells, one was a sentinel work indeed, the pages of which often contain extensive descriptions of the ecology, habits, and zoogeography of virtually all the *Partula* known from the Society Islands (Garrett, 1884). Alongside the over 10,000 specimens, not among the great many lost in two devastating shipwrecks, successfully reaching his many correspondents, e.g., Pease and Newcomb in HI, Hartman in NH (Smith, 1901), Anthony in Cincinnati, L. Agassiz at Harvard, and Godeffroy in Hamburg, and his extensive collection of 8,000 species and 30,000 specimens (Spoehr, 1963), now at the Bishop Museum, Honolulu (Clench, 1979; Johnson, 1994), this contribution stands as his most treasured legacy to malacology, evolutionary genetics, and terrestrial ecology. Fortunately for taxonomists, he also synonymized or validated [as demonstrated in **Fig. 3**] all of his mentor's extensively-circulated manuscript *Partula* nomina. In all, Pease named 31 valid partulid species-level taxa, the lion's share from the Society Islands, and virtually all supplied by Garrett, who added eleven of his own, nine of which were based on Pease manuscript names. That his contributions were not limited to malacology is perhaps most notably exemplified by a work based on some 470 of his high quality paintings of the fishes of Oceania (Günther, 1873, 1873-5, 1909 *vide* Spoehr, 1963: 101).

#### Variability and genetics in *Partula*

Reference to **Plate 2: figs. 31, 32** and to **Figs. 2 and 3** will give the reader a hint of the variation in color and pattern expressed in about half the species of *Partula* (*Partula*). These characters vary within as well as between colonies. Other plastic characters include shell-size and direction of coil (mutation to sinistrality). I make no secret of being fascinated by the latter phenomenon and admit the passion fed my impulse to get involved with the

"Adanson Family Collection" in the first place. All told, there are about a half dozen exclusively sinistral and about that number of enantiomorphic (relatively frequent occurrences of both left- and right-coiling shells) species in *Partula* (Crampton, 1916, 1932). In the Partulidae, reversal of coil is seen in only two other instances: within certain colonies of *Marianella gibba* (Férussac, 1821) in the Marianas (dextral specimens were in the purchased assortment), and characteristically in the small, obscure genus *Draparnaudia* Montrouzier, 1859, centered in New Caledonia. With easy access to large numbers of the protean snails, it's not surprising that geneticists enthusiastically (and successfully) adapted *Partula* snails to their labs.

Indeed, in the tradition of Gregor Mendel's iconic pea plant, a century of research on the inheritance of these traits has earned *Partula* poster-child status of "model organism." All the aforementioned characters are for the most part genetically determined and generations of laboratory and field workers (not to mention dozens of generations of snails) have devoted valuable time and energy to the elucidation of these processes (e.g., Crampton, 1916, 1924, 1932; Murray and Clarke, 1968, 1976a, 1976b).

#### Hybridization in *Partula*

With relatively penetrable ecological and geographic boundaries between species of *Partula* cohabiting an island in the Society group, it comes as no surprise that inter-species hybrids occasionally crop up under certain conditions. Garrett (1884) recorded such cross-breeding not uncommonly between *Partula elongata* and *P. taeniata*, *P. garretti* and *P. thalia*, *P. faba* and *P. virginea*, *P. faba* and *P. radiata* (arboreal and terrestrial respectively), *P. faba* and *P. fusca*, *P. fusca* and *P. navigatoria*, as well as the latter and *P. faba* [the parent species are figured on **Plate 2**]. All these hybrids were observed on Moorea or Raiatea; Garrett made a point of reporting that none was seen on Tahiti or Huahine.

Among the shells obtained, one specimen in a suite of seven sinistral *Partula otaheitana*, a Tahiti endemic, has a very different look to it - more elongate and gracile, with a narrower aperture, more flared labrum, straighter columella with a longer fold at its apical aspect, and a more extensive parietal reflection than its lot-mates. These characters all tend toward *Samoana attenuata*, with which it occurs on Tahiti. **Fig. 5** shows a comparison of four shells, L to R: *S. attenuata*; an artificial mirror-image of the shell under discussion; the shell under discussion; and a typical *P. otaheitana* lot-mate of it. I'll let the reader decide if this constitutes a reasonable case for hybridization. *S. attenuata* lives high in the canopy, and *P. otaheitana*, while arboreal, is found much closer to the ground (Garrett, 1884). It appears that their isolation is more ecological than geographic, but what of the remote taxonomic relationship between the two putative parents? Based on the "genetic distance" between the two taxa, partulid expert Dr. Diarmaid Ó Foighil (personal communication 13 December 2011; Lee et al., 2009) is skeptical of my hypothesis. Such discord typifies the chinks in our knowledge of this wondrous group of snails.



**Fig. 8** *Le Château de Balaine* (sometimes rendered *Baleine*), home to the Adanson family, was completed in 1850 and now serves as an upscale country inn within a 20-hectare botanical garden in France.

#### Man meddles with nature; Paradise Lost?

Readers are likely familiar with the far-flung introductions of the giant African snail, *Lissachatina fulica* (Bowditch, 1822), and the fragile nature of oceanic island ecosystems. The Society Islands fell prey to the invasion in the Twentieth Century and the adverse impact, most noticeably to agriculture, led to the deliberate introduction of the carnivorous rosy wolfsnail, *Euglandina rosea* (Férussac, 1821), on Tahiti in 1974, Moorea in 1977, and on other Society Islands in the 1980s and 1990s (Coote, 2007). While having little impact on the target giant African snail, this nonselective predator produced mass extirpations of partulids and the rapid extinction (in the wild) of the large majority of the 61 described endemic Society Islands partulid tree snails (4 *Samoana* and 57 *Partula* species). The impact is best documented on the island of Moorea (Clarke et al., 1984; Murray et al., 1988), where, within a decade of the arrival of *Euglandina*, all the once abundant partulids, 7 *Partula* and 2 *Samoana* species, were deemed extirpated (Murray et al., 1988; Lee et al., 2009).

There is some room for optimism, however: (1) Intensive on-going field surveys have detected scattered relict populations, seven (of the original nine) on Moorea, and several on a number of other islands (Lee et al., 2009; J. Slapcinsky, personal communication September 2011). (2) Perhaps in anticipation of the calamity, and certainly abetted by of the interest of laboratory geneticists as noted above, a number of Society Island partulids have been captive bred for decades (Coote and Loève, 2003). Attempts at reintroduction have thus far been unsuccessful, but the possibility looms on the horizon (Ó Foighil, 2009). Despite the carelessness of humanity, perhaps partulids will someday reach the level of prosperity to which Andrew Garrett and others bore historic witness.

#### The Adanson Dynasty; their scientific activities and the “Adanson Family Collection”

The primogenitor and most famous member of a noble succession of naturalists, collectors, and horticulturalists was



**Fig. 9** *Partula* data labels showing that Major Emile Doumet received these shells from J. Rothschild, Éditeur du Libraire de la Société Botanique de France, Paris, in 1862. The Rothschild source was indicated on most of the labels.

**Michel Adanson** (1727-1806) [Fig. 6]. From 1749 to 1753 “Le Savant,” as he came to be known, endured the rigors of life in Senegal, then a French colony. His charge was to observe, and gather specimens of, the biota of this wild tropical west African region. Adanson’s intention was to publish several accounts of all elements of the flora and fauna that came under his notice (Dance, 1986), but only one major iconography [Fig. 7] was produced. Fortunately for malacology, it dealt exclusively with the mollusks (Adanson, 1757). Besides being a lavishly illustrated and logically-organized iconography greatly superior to anything of its ilk that appeared earlier, it contained a novel system of classification based on the animals’ soft anatomy. Adanson also employed a system of nearly consistent binominal nomenclature using Latin and Senegalese epithets. Readers may note that the date of publication (1757) anticipated that of the Tenth Edition of the *Systema Naturae* (Linnaeus, 1758) by one year. Apparently there was considerable debate about the acceptance of Adanson’s names, the French School retaining them for some decades. Nonetheless, this work precedes the (admittedly arbitrary) beginning of zoological nomenclature (ICZN Art. 3.1), so Adanson’s names are not available, except as validated by later authors. The mild controversy notwithstanding, Adanson’s taxonomic system was a sentinel contribution to malacology, and posterity has exalted him into the pantheon of malacological Masters.

In ca. 1760 Adanson gave what was thought to be his most important shells to King Louis XV along with plants and other natural history objects collected in Senegal in return for a life annuity. It appears that the politics of the First Republic interfered with delivery of this largesse inasmuch as Michel Adanson spent





Plate 1. Classical original figures of French Polynesian *Partula* species.

L to R: [*Limax*] *faba* from Thomas Martyn (1784: pl. 67, middle two figures, of four, edited just for juxtaposition); *Partula inflata* and *P. rubescens* from Lovell Augustus Reeve (1850: pl. 1, fig. 3a; pl. 3, fig. 12 respectively); *P. stenostoma* and *P. suturalis* from Ludwig (Louis) Pfeiffer (1856: pl. 17, figs. 17, 18 respectively).

much of his later life in abject penury (M. Adanson website, 2011). It also appears this royal shell collection has been lost (Lamy, 1929). Once again fortunately for malacology, Adanson (and his heirs) actually retained the most important of the Senegal shells, including virtually all those figured in his magnum opus. These specimens were discovered in 1939 and given by Adanson's great-great-great grandson, Hugues Marie Auguste Michel de Rocquigny-Adanson (see below), to the Muséum National d'Histoire Naturelle (MNHN), Paris (Fischer-Piette et al., 1942). Also included in the donation was material gathered by Michel in various parts of France and from the West Indies, likely brought to him in Senegal by slavers. Likely his brother, **Jean-Baptiste Adanson** (1732-1804), a professional interpreter to royalty and amateur archaeologist living for a half century in Syria, Egypt, and Tunisia, accounted for the portion of material collected on those shores (Lamy, 1929; Fischer-Piette, 1942). Here follows a climb down the Adanson family tree with attention to family members sharing their antecedents' taste and talent for natural science, especially malacology.

#### Michel Adanson was:

Father of **Aglaré-Catherine Adanson Doûmet** (1775-1852), his only daughter, who in 1804 began creation of an arboretum in an area with optimal climate, soil, and terrain in the countryside 18 km from Moulins, in the Département of Allier. In 1812, at age 30, and in the wake of a divorce, she retired to the premises and began construction of a grand residence, Le Château de Balaine (sometimes rendered Baleine), completed in 1850, but with some elements said to date to the Fourteenth Century. The edifice is now an elegant country inn [Fig. 8]. The arboretum, perhaps better termed a botanical park, presently covers 20 hectares and is the largest privately-owned botanical garden in France. Continuously maintained for over 200 years, it contains 2,500 varieties of plants, including many installed by Aglaé herself. Glowing testimonials to its excellence (e.g., Anon., 1902) are many and continue to the present.

Uncle to an as yet anonymous man whom J.C.H. Crosse (1826-1898) credited with sparking his interest in shells when the latter was fifteen years of age (Poyard, 1899). All efforts by me and my

referee, Dr. D. Callen, failed to clarify this genealogical connection.

Grandfather of **Paul-Anacharsis Doûmet** (1801-1880), brother of Emile, horticulturist and botanist who directed the Arboretum at Balaine created by his mother, Aglaé.

Grandfather of **Major Emile Doûmet** (1796-1869), son of Aglaé and an accomplished conchologist and prodigious general collector, he lived and collected in Cette (rendered "Sete" after 1827), in the south of France, for much of his life and eventually accumulated collections of "all sorts" over a span of "sixty years" (Crosse and Fischer, 1870; Lamy, 1929: 316). After his death, his son, Paul-Napoléon Doûmet-Adanson, created "Le Musée" on the grounds of the Château de Balaine in 1879-1880 (Lamy, 1929: 316; Fischer-Piette et al., 1942: 109-113; Anon., 1902). The Musée was an extensive and eclectic museum containing fine and spectacular paintings, statuary, porcelains, archaeological and ethnological artifacts, Napoleon Bonaparte memorabilia, and other compelling pieces among some 200,000 objects in all, mostly accumulated by the Major (Anon., 1902).

This *Partula* assortment I received from Alain was certainly assembled by Major Emile Doûmet. It was part of a shell collection once containing over 100,000 specimens of 10,000 species already suffering from curatorial neglect a century ago (Anon., 1902). The Major almost certainly assembled this *Partula* collection in great part through purchase from, and/or exchange with, contemporaries A.C. Bernardi (d. 1863; Crosse and Fischer, 1864) and J. Rothschild, Éditeur du Libraire de la Société Botanique de France, Paris [see Fig. 9], the latter source being indicated on most of the labels [see Figs. 1, 2, 3]. These collectors apparently provided material to Emile in July 1856, Sept. 1862, and August 1864. During those times, opportunities for travel to *Partula* country were limited for a variety of reasons, there were very few field collectors, and none is thus identified on Emile's labels. Some of the Cook, Cuming, and Lesson material was probably still circulating, but clearly much newer material was flowing into the collection. Andrew Garrett hadn't seen Tahiti until several months after the first date, but he was well-traveled in the Society Islands and certainly sent much material to Pease by the two later dates. Since Pease had extensive correspondence with European

collectors (Clench, 1979), it seems the two Americans were the first links in the chain of ownership and that the bulk of material Emile was receiving had been “freshly-picked.” In further support of this scenario are the several attributions of unpublished names to Pease years before validation (Garrett, 1884) [see Fig. 3]. As for the two lots accompanying the July 1856/Bernardi provenance, if Pease wasn’t involved, perhaps they had a much earlier origin.

Great grandfather of **Paul-Napoléon Doûmet-Adanson** (1834-1897), who added to, and cared for, the collections of his father, Emile. Apparently unsuccessful at convincing the municipalities of Sete and Moulins to adopt these extensive holdings, he moved them from Sete and installed them at Balaine. At his death he left (to his family, it seems) a fine shell collection and library (Crosse, 1898). I found no evidence of any later member of the Adanson dynasty showing a particular interest in shells. Father of Marie.

Great-great grandfather of **Marie Cécile Louise Doûmet-Adanson** (1863-1892). Proprietor of the Château, Musée, and Arboretum de Balaine. Her husband, Guillaume Charles de Rocquigny (1852-1905) later added Adanson to his name. He was a well-respected botanist, horticulturist, lepidopterist, and mathematician. Father of Hugues. Host to annual meetings of the Société Scientifique de Bourbonnais.

Great-great-great grandfather of **Hugues Marie Auguste Michel de Rocquigny-Adanson** (1888-1959), son of Marie and Guillaume. In 1939, he played host to MNHN malacologist Edouard Fischer-Piette at Château de Balaine. At that time Fischer-Piette discovered Michel Adanson’s Senegal collection. Hugues released this valuable material to the Paris Museum shortly afterward (see above). At the time Hugues was placed among the accomplished naturalists descendant from Michel (Fischer-Piette *et al.*, 1942: 110). *Natica rocquignyi* Fischer-Piette, 1942, was named in his honor, probably in consideration of unselfish service to the MNHN and posterity. Hugues had four children, the two youngest of whom, François (b. 1921) and Catherine, are still living. All were at the Château when the Michel Adanson Senegal Collection was released (Fischer-Piette *et al.*, 1942).

Great-great-great-great grandfather of **Guillaume de Rocquigny** (1919-1973), second son of Hugues. Guillaume served as Proprietor of the Château, Musée, and Arboretum de Balaine and restored part of the château, and arboretum during his tenure.

Great-great-great-great-great grandfather of **Louise Courteix-Adanson**, who is serving her 39<sup>th</sup> year as Proprietor of l’Arboretum de Balaine, having assumed that position at the time of her father’s death.

Thus, although there appears to be a prodigious shell collection at Château de Balaine, it is unlikely that any specimens that were in the hands of “Le Savant” remain. This material derives from the labors of his grandson, Major Emile Doûmet and great grandson Paul-Napoléon Doûmet-Adanson. These remnants, although vastly larger than Michel Adanson’s material in terms of diversity and any other numerical metric, are of a lesser scientific value than that which was surgically excised and placed in Paris by Fischer-Piette seventy years ago. Nonetheless, this resource at Balaine may legitimately be characterized as the “Adanson Family Collection,” a vibrant cultural asset that has survived successive monarchies, empires, and republics, and a measure of neglect hopefully to illuminate and entertain future generations.

**Plate 2 (facing page).** French Polynesian Partulidae, principally of the Society Islands. Two genera, 31 species, plus forms and subspecies arranged alphabetically: locality by island. Note \* and † below.

**Row one:** 1. *Samoana attenuata* (Pease, 1864): \*Raiatea; 2. †*Partula auriculata* Broderip, 1832: Raiatea; 3. †*P. bilineata* Pease, 1866: Tahaa; 4. †*P. callifera* L. Pfeiffer, 1856: Raiatea; 5. †*P. citrina* Pease 1866: Raiatea; 6. †*P. crassilabris* Pease, 1866: Raiatea.

**Row two:** 7. †*P. dentifera* L. Pfeiffer, 1852: Raiatea; 8. *P. dubia* Garrett, 1884: Tahiti; 9. *P. elongata* Pease, 1864: Moorea; 10. †*P. faba* (Gmelin, 1791): Raiatea; 11. †*P. fusca* Pease, 1866: Raiatea; 12. †*P. garretti* Pease, 1871: Raiatea.

**Row three:** 13. †*P. hebe* (L. Pfeiffer, 1846): Raiatea; 14. *P. hyalina* Broderip, 1832: \*Tahiti; 15. †*P. imperforata* Broderip, 1832: Raiatea; 16. *Samoana (Marquesana) inflata* (Reeve, 1842): Nuka Hiva, Marquesas; 17. †*P. lugubris* Pease, 1864: Raiatea; 18. †*P. lutea* Lesson, 1831: Bora Bora.

**Row four:** 19. †*P. navigatoria* (L. Pfeiffer, 1846): Raiatea; 20. †*P. nodosa* L. Pfeiffer, 1851: Tahiti; 21. *P. nucleola* Garrett, 1884: Moorea; 22. *P. otaheitana otaheitana* (Bruguière, 1892): Tahiti; 23. *P. o. affinis* Pease, 1867: Tahiti; 24. *P. o. lignaria* Pease, 1864, solid brown: Tahiti; 25. *P. o. lignaria* Pease, 1864, banded: Tahiti.

**Row five:** 26. *P. o. rubescens* Reeve, 1850: Tahiti; 27. *P. o. sinistrorsa* Garrett, 1884: Tahiti; 28. †*P. planilabrum* Pease, 1864: Tahaa; 29. †*P. radiata* Garrett, 1884: Raiatea; 30. †*P. rosea* Broderip, 1832, f. *zonata* Pilsbry, 1909: Huahine; 31. †*P. rosea* Broderip, 1832, f. *cognata* Garrett, 1884: Huahine.

**Row six:** 32. *P. simplaria* Morelet, 1853: Huahine; 33. †*P. suturalis* L. Pfeiffer, 1855: Moorea; 34. *P. taeniata* Mørch, 1850: Moorea; 35. †*P. thalia* Garrett, 1884: Raiatea; 36. †*P. umbilicata* Pease, 1866: Tahaa; 37. †*P. varia* Broderip, 1832: Huahine.

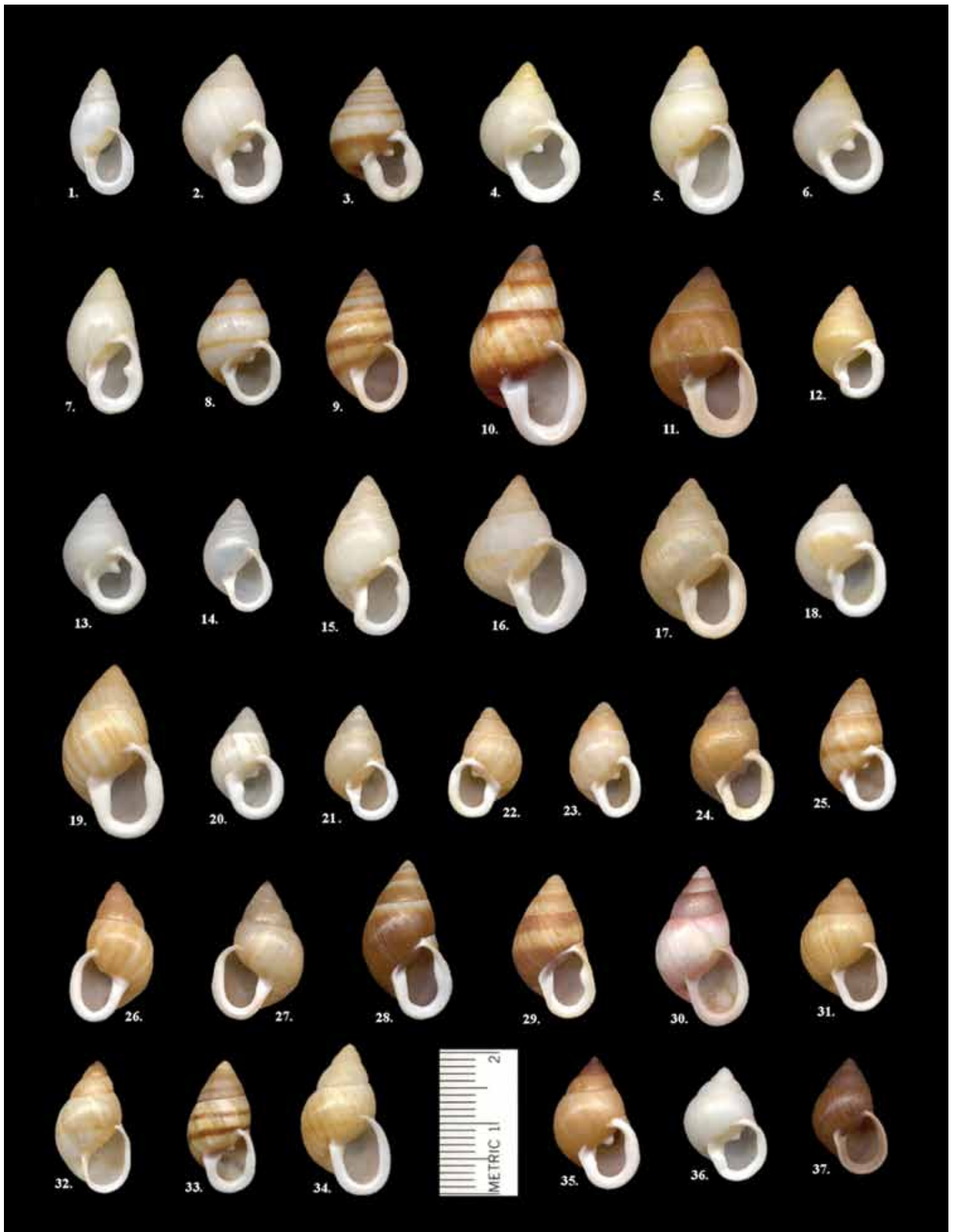
\* indicates occurrence on at least one other island.

† indicates extinct in nature. Of the 22 species-level taxa thus indicated, four (nos. 10, 13, 30-31, and 33) survive in zoos or labs (IUCN, 2011).

### Summary and Conclusions

The acquisition of a small collection of pretty shells from far-away and long ago has compelled me to place these objects in an historical and biological context to better understand the manifold levels in which people and mollusks interact. Conchology may be a “light form of study” (Eliot, 1872: 113) to some, yet a contemporary of equal literary renown and, like Garrett before him, interred in *Partula* country, held that this form of study reaps greater rewards than those conferred by vast pecuniary riches (Stevenson, 1911: 45). The players and their works revealed in this *Partula* chronicle certainly conform far better to the latter perception.





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## SHELLS IN THE NEWS

From Josy Wiener of Boynton Beach, Florida, comes news of a display at the Ft. Lauderdale Museum of Art, titled "Journey Through Faith and Art." One of the displays is a model of a church in Amman, Jordan that is made of white marble with inlaid polished sea shells around the windows and doors. The model is made of inlaid shell pieces. The shells are *Haliotis iris* Gmelin, 1791, also called the paua or blackfoot paua, a New Zealand endemic renowned for its blue and silver nacre and often used for jewelry. (Photo credit unknown.)



From Ed Sossen of Hollywood, Florida, as printed in the Broward Shell Club newsletter, *The Busycon*, comes this, "Ed was recently at an antique show in Miami where he noticed a tiger cowrie - a common \$1.00 "bin shell" on a dealer's table with a price tag of \$200! When Ed asked

why the high price the dealer replied... 'Well, just look at the quality, they don't make them like that anymore.' Buyer beware." (Photo from Wikipedia.com.)

The July 2011 issue of *Scientific American* reported snails being sold in Paris, in which a land snail shell is purchased from "dustmen and ragpickers" and then stuffed with "lights



or cats' meat," cut into a corkscrew form to fit the shell. The fake escargot is sealed with fat and sold to unsuspecting consumers. On Conch-L, David Campbell pointed out that "cats' meat" is actually meat intended for cats, rather than the meat of cats. Dick Petit then added that "lights" are lungs. As a closing comment, David Campbell stated the basic principle that, "...anything with enough garlic butter will taste like garlic butter sauce." (Photo from Wikipedia.com.)

# Shrimp boats are a-comin' - there's shelling tonight: A high seas adventure to Trujillo Bay, Honduras

Karen VanderVen

Shell collectors have pursued the hunt for molluscan specimens from every type of floating object ranging from World War II landing craft to tiny inflatables. A lucky few recently had the opportunity to live aboard and shell from a 100-foot fully-fitted shrimp boat. The shells retrieved from this vessel were not the by-catch cast aside by shrimpers, but rather those found by an intrepid group of divers who, every night as the sun slipped below the horizon, stepped backwards into the black wavy Caribbean waters below.

The destination for this adventure was Trujillo Bay, a five mile semi-protected body of water surrounded on the coastal side by high mountains and the small town of Trujillo at the base of the mountainous Honduras coastline. Several rivers flow down from the mountains carrying rich nutrients that have produced a rich and varied ecosystem, including many forms of shell life that live and flourish on the Bay's sand and grass bottom.

Robert Masino was organizer and trip leader. Charles Rawlings, Steve Zinn, Marc Nathanson, and I were the divers who got to go along last April (2011). We were lured by the promise of such rare shells as *Conus harlandi* Petuch, 1987, *Conus sunderlandi* Petuch, 1987, *Vokesimurex cabritii* (Bernardi, 1858) (f. *donmoorei* Bullis, 1964), *Voluta polypleura hennequini* Petuch, 1995, as well as the potential for top adventure.

We spent the night before our embarkation for Trujillo at the Turquoise Bay resort on Roatan. There was time for an afternoon snorkel to a special spot where in the past there had been a colony of *Strombus pugilis* Linnaeus, 1758. They seemed to be more scarce this time, but I was quite happy with several beautiful black and cream striped bivalves, *Chione cancellata* (Linnaeus, 1767) and a small *Fasciolaria tulipa* (Linnaeus, 1758). Next morning we boarded the shrimp boat *Captain Ron* and embarked on the five hour cruise to Trujillo Bay. With Robert's leadership



**Above: Our leader Robert Masino checks our gear for a final time before heading to Trujillo Bay. (Photo by M. Nathanson)**

**Below: A view of the mountainous terrain around Trujillo Bay and our gear laid out in preparation for the night's dive. (Photo by M. Nathanson)**



and expertise on all aspects of the trip, and a large, helpful, and pleasant crew, we knew we'd be in good hands all the way.

## Scuppers and Suppers

Prior to the trip there was a bit of buzz. How would the divers enter the water when a shrimp boat rides high and there is no obvious opening or platform from which to step off? Even more challenging ... how would they get back on after each dive? These questions were answered for good that first night. Here's how we did it. The divers, carefully steadied by the attentive and muscular crew, would step over the railing, one leg after another and put



**Boarding the *Captain Ron*. (Photo by M. Nathanson)**





***Conus harlandi* crawling on a broken piece of coral. Although photographed during the day, like the other specimens, it was collected during a night dive. (Photo by author)**

their fins through the scupper, the square opening in the metal wall going around the boat. They would be held while holding on to the railing, and putting one hand tightly over their mask then take a reverse 'giant stride.' I added an additional step of breathing.

"Bombs away" I mumbled into my regulator as I stepped off and in a nanosecond - the time it took to fall about 6 or 7 feet - hit the water, soon to continue my journey downward.

Getting back on? The crew would place a wooden ladder over the side and cluster at the top holding it down tight. I made a point of being sure to surface right under the ladder, coming up after the preceding diver had climbed up. Off with the BC and tank in the water where strong hands would hand it up to a crew member on deck. Then scamper up the ladder and over the railing where more helpful hands provided a steadying effect. Once on deck we could not wait to open our collecting bags and review the bounty we had brought up from the bottom.

#### **Nights, Lights, and Delights**

Most of the dives were between 30 and 40 feet deep, allowing us lots of time on the sandy and grassy bottom. We scanned this terrain with our bright dive lights and began to come up with the anticipated finds. There is no bigger thrill than when, in the beam of your light, there is a perturbation in the sand that you know will be something 'interesting.' For the cone aficionados (that is, everybody) there were the hoped-for fine specimens of the endemic rare cones, *Conus harlandi* and *Conus sunderlandi*. The *Conus harlandi* were particularly large, with distinctive brown markings. The *Conus sunderlandi*, with yellow orange dorsums and a band of white around the middle and at the base, brought joy to us all when we spotted them. There were also *Conus spurius* Gmelin, 1791, handsome shells that were more abundant. These would be out on top of the sand and each was a thrill to find. Collectively we all ended up with a beautiful size and pattern series to bring home. We found beautiful *Conus mindanus* Hwass,



**Above: A juvenile *Voluta polypleura hennequini*, a stunning subspecies in the *Voluta musica* complex that is sure to be a favorite in any collection. (Photo by author)**

**Below: The delicately sculptured and handsomely colored *Euvola ziczac*. (Photo by author)**







Above: *Oliva reticularis* showing a nice reddish coloration.

Below: *Conus spurius* is a commonly found shell in the area, but always nice to collect. (Both photos by author)



1792 as well. Of course we ended up with some ‘mystery cones’ that nobody could quite place.

On one lucky night dive, I no sooner reached the bottom than I spotted two of the lovely *Vokesimurex cabritii* f. *donmoorei* out for a little walk (crawl?) in the grass. All of us found several specimens of this stunning shell with its perfect spines and rich orange brown, spiny dorsum. Adding to our murex finds were smaller *Haustellum rubidus panamicus* Petuch, 1990. Each night we found several darkly marked olives, *Oliva reticularis* Lamarck, 1811, in an endemic form.

The *Strombus* species found were: *Strombus pugilis*, *Lobatus costatus* Gmelin, 1791, and *Lobatus raninus* (Gmelin, 1791). The latter were exceptional in that they were dwarfs and more colorful than their more northerly counterparts. The *Strombus pugilis* were hardly ho-hum with incredibly rich dark orange apertures and large spines.

One night we wanted to try deeper water and headed down to 60 feet. Here, even a finger probe in the sand raised a cloud of visibility-killing silt. We started up at once. In spite of this, Robert not only miraculously retrieved several really lovely *Polystira albida* (G. Perry, 1811), but also generously shared them with us once we were on top.

Members of the ‘*Voluta musica* complex’ are always a treasure and, as with many of the other local forms, were richly colored. We all brought up the rich brown and purple *Voluta polypleura hennequini* Petuch, 1995. Other notable gastropod finds included *Xenophora conchyliophora* (Born, 1780), *Prunum oblongum* (Swainson, 1830), *Phalium granulatum* (Born, 1778), *Cymatium nicobaricum* (Röding, 1798), *Natica canrena* (Linnaeus, 1758), *Turritella exoleta* (Linnaeus, 1758), and an unidentified *Terebra* species.

Not to be ignored were the bivalves. Robert told us that the egg cockles found here were vibrant orange and yellow. I picked up a few small pairs, but Marc saved the day by sharing with me a large specimen as brilliant as the sunrise. Also dark and colorful were the brown mottled *Argopecten nucleus* (Born, 1778), that I found and added to my pecten collection. As a bonus, Robert handed me a colorful *Euvola ziczac* (Linnaeus, 1758). Even the arcas (*Anadara transversa* (Say, 1822) and turkey wings (*Arca zebra* (Swainson, 1853)) were attractive. Pairs of checkerboard clams (*Macrocallista maculata* (Linnaeus, 1758)), and king’s Venus (*Lirophora paphia* (Linnaeus, 1767)) further enriched the bivalve take.

Between the first and second night dives our chef served up a hearty dinner that we hungrily scarfed down while standing up on the deck, using it to warm us as we looked forward to our next jump into the shell-filled waters. When we came up again, we’d have a snack and head for bed. Nothing felt better than climbing into my dry bunk and sipping a few drops of the firewater rum I bought in Roatan.

### Sun and a Gun

Preceding the night dives were day-time photographing activities. Each night, selected live shells were placed in an aquarium to ‘pose’ for photographs in the morning. Charles rose at the crack of dawn - the sun came up early here - and took the shells and his underwater camera down to the bottom to photograph them *in situ*. Often I’d go down with him, circling the photography site like a shark, but without getting so close I spooked the operation.



(This was learned from a previous trip when I, with tunnel vision, made a beeline for a large cone I had spotted. My hand was just about to snatch it up when I saw Charles with his large underwater camera poised to photograph it and I backed off... just in time). These morning excursions were extra exercise for me and an opportunity to work off the bountiful meals I had been eating. There were few if any shells out, justifying our emphasis on the very productive night diving. We'd be out of the water before 7:00 AM.

Otherwise we didn't dive until the sun slipped below the horizon, and one might wonder how we whiled away the daytime hours. We would keep ourselves busy on the boat all day and the time flew by. A canopy was put up on the deck during the day to shelter us from the sun's bright rays. We could be found each day on deck treating our shells, showing them to the admiring eyes of the others, organizing our dive equipment, and reading (I was thankful for my Kindle). With time out for an ample lunch followed by an hour or so of spirited conversation, I would also retreat to my topside bunk where I could watch the lines on the masts as the wind came up in the afternoon. The more they shook and vibrated back and forth, as a wind indicator, the higher the waves we might expect to encounter for the night's dives. Mercifully there was no current and conditions permitted diving every night. The weather was nearly impeccable and I don't believe there was a drop of rain the entire time. We all marveled at the stunning sunsets each night as we anticipated it becoming just dark enough for us to take our first dive.

Of course it is not a live-a-board adventure trip in the tropics without being boarded by the local militia. Sure enough, one afternoon a skiff came alongside and on climbed a group of mostly young Honduran men, clad in camouflage and armed with large rifles. "All but the lady" were 'asked' to assemble out on deck while they searched the boat. I went out to stand on the deck with the men and it was not long until, having found everything in order, they were chatting pleasantly with all of us before they disappeared as fast as they had come, climbing down into their vessel and chugging off.

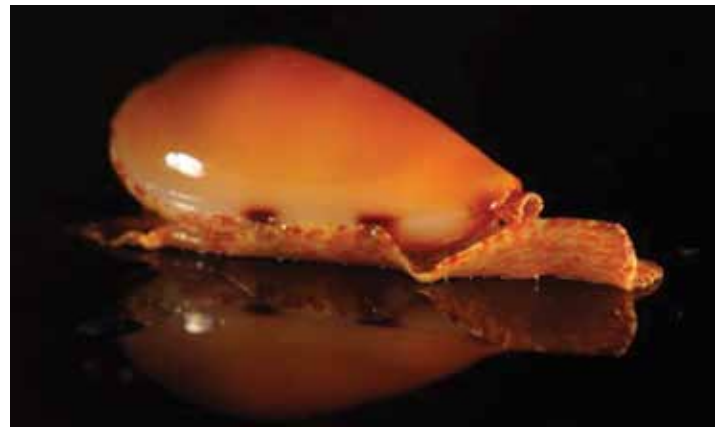
#### To Shore and More

Adding to the excitement of the trip were occasional trips away from the 'mother boat,' taking the dinghy to the shore, where Charles, Steve, and the crew explored both mangroves and shoreline. I was the lucky one since they slipped me some of the shells they brought back, which were different from those found diving. Charles handed me a clump of mossy oysters that I happily accepted. Cleaned up and displayed, they turn out to be *Isognomon bicolor* (C.B. Adams, 1845) and are beautiful with their unusual shape and nacreous interiors. Steve added a set of bubble shells (*Bulla striata* Brugiere, 1792) and a *Melongena bicolor* (Say, 1826). Even the crew got in the picture, bringing us a little bag of coquinas and periwinkles. All of these extended the scope and variety of my collection from this trip.

All too soon the eight days of diving were over and we



Display specimens of *Conus harlandi* (left) and *Conus sunderlandi* (right). These beautiful shells are seemingly endemic to this area and both were greatly anticipated prizes we looked forward to collecting. (Photo by M. Nathanson)



Above: A *Prunum oblongum* photographed alive by R. Masino.

Below: *Vokesmurex cabritii* f. *donmoorei* is an elegantly shaped murex. (Photo by M. Nathanson)



prepared for the return to Roatan. Flying from Roatan to San Salvador, to Washington DC, and on to Pittsburgh, was enervating, but the opportunity for such a unique experience, with both the variety and rarity of specimens collected and the camaraderie with fellow shellers and crew, made the trip memorable and worthwhile.

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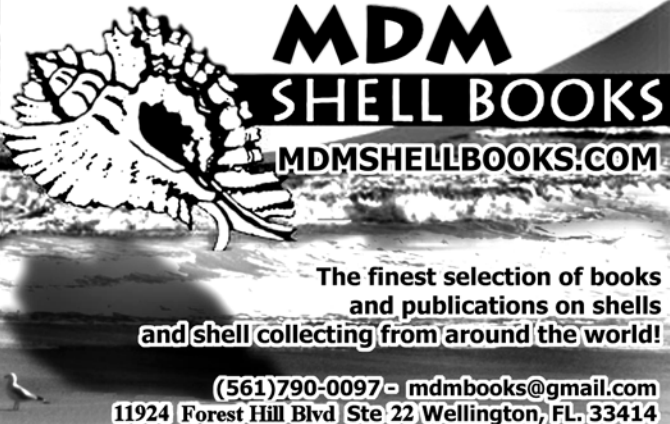


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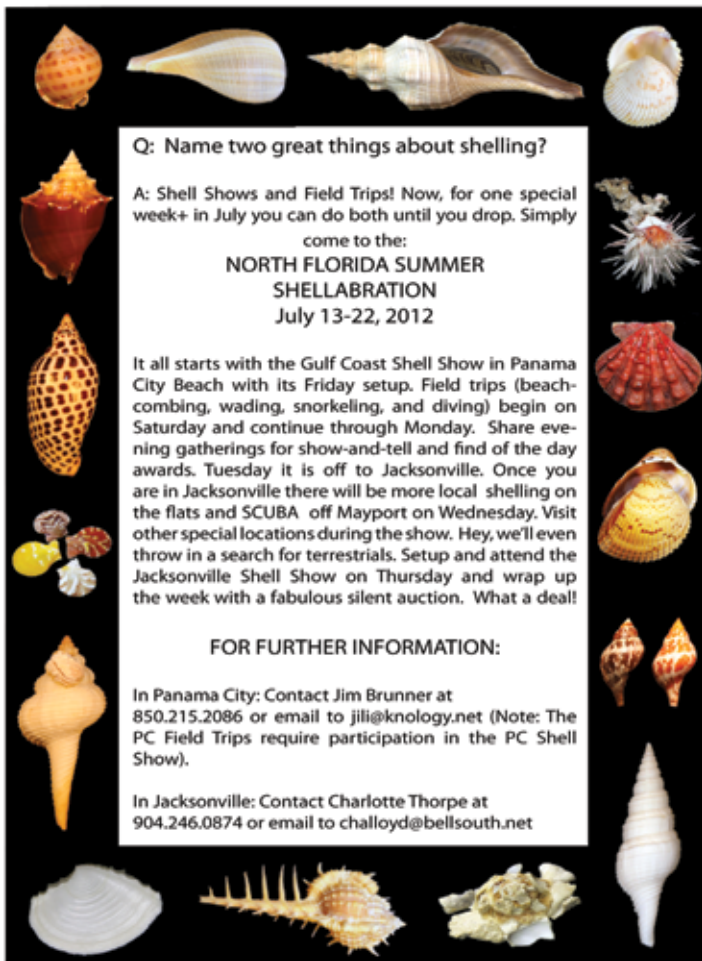
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# Studying local adaptation in *Crepidula* spp.

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1. *Crepidula convexa* Say, 1822, 2. *Crepidula fornicata* (Linnaeus, 1758), and 3. *Crepidula plana* Say, 1822, are all shells commonly collected along the east coast of the US, and yet there is still much unknown about these common species.

I am interested in how organisms can adapt to ongoing climate change and how patterns of adaptive evolution are influenced by dispersal. In marine invertebrates this means comparing species with dispersing planktotrophic larvae that can live in the water for weeks with direct-developing species whose young crawl away from their mother (or egg sac) as juveniles. In my dissertation research, I am hoping to answer questions relating to how different dispersal types in the gastropod genus *Crepidula* can influence extant and potential adaptation to warming temperatures.

During the summer and fall of 2011, I conducted research funded in part by a fellowship from Conchologists of America to investigate local adaptation to temperature in larvae and juveniles of *Crepidula fornicata*, *C. plana*, and *C. convexa*, three species native to the east coast of North America. *C. fornicata* and *C. plana* have planktotrophic larvae that live in the water for 2-4 weeks and *C. convexa* has direct-developing larvae. In previous dissertation work, I found that *C. convexa* has much lower gene exchange among populations than *C. fornicata* (see also Collin 2001), but I wanted to know if that translated to ecologically relevant differences in temperature tolerance. I chose to manipulate temperature in my experiments because the thermal regime along the east coast varies from generally cool north of Cape Cod to generally warm south of Cape Hatteras, with more seasonal temperatures in between these two biogeographic barriers.

I collected adult females of all three species from different populations along the coast (from Nova Scotia to Virginia) and reared their larvae in a common garden experiment at one of three temperatures: 12°C, 20°C, or 28°C. These temperatures were chosen to represent maximum summer temperatures north of Cape Cod, from Cape Cod to Cape Hatteras, and south of Cape Hatteras, respectively. I measured larval growth, survival, and metamorphosis rates for four weeks. *C. fornicata* was represented at seven populations, while the other two species were only represented at three populations each.

As I expected, *C. fornicata* did not show a pattern of local adaptation. All populations grew, survived, and metamorphosed

equally well at any given temperature. Metamorphosis was strongly temperature-dependent, regardless of population (no metamorphosis was observed at 12°C). *C. convexa* and *C. plana*, however, show signs of local adaptation in survivorship, where northern populations survived better at 12°C and more southern populations survived better at warmer temperatures. As I only had three populations each for these species, I am planning to investigate this problem further to see if the pattern of local adaptation holds with a larger sample size. I am particularly interested in why *C. plana*, a species with planktotrophic larvae, shows more similarities with *C. convexa* than with *C. fornicata*, another planktotroph. We know very little about the ecology of *C. plana*, so it is unclear why local adaptation might be occurring in this species. I also am hoping to get individuals from south of Cape Hatteras, where animals may already be warm-adapted, to add to my dataset.

Since *C. fornicata* appears to do equally well at all sites, the consequences of changing climate may be more uniform across the range of the species than in *C. plana* or *C. convexa*, where extant local adaptation may impede the ability of the species to shift with its moving bioclimatic envelope.

#### Acknowledgements

Funding for this project was provided in part by a Conchologists of America Grant to Malacology, a Melbourne R. Carriker award from the American Malacological Society, and a Grant in Aid of Research from the Society for Integrative and Comparative Biology. Thanks to J. Levinton, D. Padilla, and D. Futuyma for help with project development. K. Alam, P. Jeyasri, A. Viazzo, and A. Woytash provided lab help. T. Essock-Burns, R. Etter, M. Luckenbach, P. Petraitis, T. Rawlings, and D. Ritschhoff helped with sample collection.

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## SCUM XVI: Southern California Unified Malacologists

Lindsey T. Groves  
 Natural History Museum of Los Angeles County  
 Malacology Section, 900 Exposition Blvd.  
 Los Angeles, CA 90007  
 lgroves@nhm.org

**Standing (l to r):** Jennifer Alexander, Jazmín Ortigosa, Zafia Ksiazkiewicz, Mary Stecheson, Jennifer Berdan, Jermaine Mahguib, Jessica Goodheart, Daniel Geiger, Shawn Wiedrick, Dieta Hanson, John Ljubenkov, Julianne Passarelli, Pat LaFollette, Jim McLean, Hans Bertsch, Alan Miller, Calvin Won, Lindsey Groves, George Kennedy, Keri Eckdahl, Emile Fiesler, Chrystal Johnson, Kelvin Barwick. **Kneeling:** Ángel Valdés.

**Present at SCUM XVI but not in photo:** James Preston Allen, Zoe Allen, Melissa Betruce, Martin Carreon, Jairo Correra, Yajaira Correa, Geraldine Kratz, Ed Maestro, Ulises Maciel, Alan Nunez, Mike Schaad.

(Image taken by Zoe Allen with the authors camera)

The 16<sup>th</sup> annual gathering of Southern California Unified Malacologists (SCUM) was held in the John M. Olguin Auditorium, Cabrillo Marine Aquarium, San Pedro, CA. Despite the inclement weather the meeting was attended by thirty-five professional, amateur, and student malacologists and paleontologists on Saturday, January 21<sup>st</sup>, 2012. This informal group has continued to meet on an annual basis to facilitate contact and keep members informed of research activities and opportunities. In keeping these gatherings informal, there are no dues, officers, or publications. Other regional informal groups such as: Bay Area Malacologists (BAM), Mid-Atlantic Malacologists (MAM), Ohio Valley Unified Malacologists (OVUM), and FUM (Florida Unified Malacologists) have enjoyed continued success and hopefully additional groups of malacologists and paleontologists will meet in a likewise manner.

Host John Ljubenkov welcomed the group to SCUM XVI and in SCUM tradition all members present introduced themselves and give a short update about current mollusk related activities. Most presentations were informal but several were more detailed. Aquarium director Mike Schaad welcomed everyone to the

aquarium and highlighted many of its accomplishments over the past 70 years. It was particularly refreshing to hear presentations by four graduate students of Ángel Valdés (California Polytechnic State University, Pomona). Students Jennifer Alexander, Jessica Goodheart, Dieta Hanson, and Jermaine Mahguib each presented their current thesis research on various aspects of opisthobranch phylogeny. Five students from nearby San Pedro High School also attended the gathering. More detailed presentations included those by Geraldine Kratz on the Port of Los Angeles and the development of an abandoned dock area for research facilities; Julianne Passarelli on the history of collections at the Cabrillo Marine Aquarium; Emile Fiesler on the historical vs. actual range of the Trask shoulderband snail *Helminthoglypta traskii traskii*; and Zofia Ksiazkiewicz on her research of land snail diversity vs. habitat preference in western Poland.

SCUM XVII will be co-hosted by Lindsey T. Groves (NHMLAC Malacology) and Mary Stecheson (NHMLAC IP) at the Natural History Museum of Los Angeles County on January 19<sup>th</sup>, 2013 as part of the museum centennial year.



**SCUM XVI participants and their respective interests and/or activities:**

**Jennifer Alexander** (Calif. Poly. Univ., Pomona): Researching the molecular phylogeny of *Aplysiomorpha* (sea hares).

**Zoe Allen** (San Pedro High School): Volunteers at the Cabrillo Marine Aquarium.

**Jennifer Berdan** (Calif. Poly. Univ., Pomona): Will begin graduate research on the possibility of *Haminoea japonica* invading southern California.

**Kelvin Barwick** (Orange Co. Sanitation District): Continues research on mollusk and polychaete faunas of the Southern California Bight. Kelvin is the current Western Society of Malacologists Treasurer and encouraged SCUM members to attend the next meeting in Santa Cruz, CA.

**Hans Bertsch** (San Diego, CA): Currently researching population densities of nudibranchs. Included in this study are factors such as endemism, vertical and horizontal distributions, and barriers. Study areas included localities in Hawai'i, Mexico, and Oregon and compared taxa vs. their preferred prey, including bryozoans, cnidarians, and sponges.

**Kari Eckdahl** (Calif. St. Univ., Fullerton): A grad student under Doug Eernisse and researching southern California limpets.

**Emile Fiesler** (BioVeyda): Emile reported on a current project comparing the historical range vs. the current range of the Trask shoulderband snail *Helminthoglypta traskii traskii*. Historical collection records indicate that it is known from San Luis Obispo County to Kern County and Mexico. He recently observed 30+ living individuals in the Puente Hills of eastern Los Angeles County. This indicates a relict population left behind as urbanization separated this group from the actual species range of southeastern Los Angeles County to southern Ventura County.

**Daniel Geiger** (Santa Barbara Museum of Natural History): Will soon begin editing and producing Jim McLean's long awaited volumes on North Pacific shelled gastropods, which could be completed by mid 2014. Has nearly completed a major monograph on the Scissurellidae, which will be published by the Santa Barbara Museum of Natural History. He completely revised the Conchological Iconography on the family Haliotidae, co-authored with Buzz Owen, which should be available in March of 2012.

**Jessica Goodheart** (Calif. Poly. Univ., Pomona): Current graduate student researching the biogeography and molecular phylogeny of pleurobranch sea slugs (Opisthobranchia: Notaspidea).

**Lindsey Groves** (Nat. Hist. Mus., L.A. Co.): Continues research on fossil cowries and recently published papers on new species from California, Washington State, and Baja California Sur, Mexico. He also published a list of the fossil mollusks of Hawai'i in the new books of Hawaiian marine and terrestrial shells by Mike Severns. Currently investigating introduced species of terrestrial and freshwater mollusks in California.

**Dieta Hanson** (Calif. Poly. Univ., Pomona): Dieta presented "Invasion of the sea slugs," her graduate research that focuses on *Haminoea japonica*, an invasive marine species in California and how it ended up in northern California, Italy, Spain, and France, and why it has not invaded southern California.

**Chrystal Johnson** (Calif. St. Univ., Fullerton): Currently a graduate student at Calif. St. Univ. Fullerton.

**Zofia Ksiazkiewicz** (Polish Academy of Science): Currently researching land snail diversity vs. habitat preference in wetlands of western Poland.

**George Kennedy** (Brian F. Smith & Assoc., Poway, CA): A SCUM co-founder, He continues work as paleontological monitor in San Diego County particularly in Pleistocene and Eocene formations. Continues his research of Pleistocene marine terraces of California and molluscan faunas of the Pliocene San Diego Formation.

**Geraldine Kratz** (Port of Los Angeles): First woman director of the Port of Los Angeles. Currently helping to develop 30+ acres of City Dock #1 for use by local universities and agencies including Univ. Calif., Los Angeles, Univ. So. Calif., Occidental Coll., the Calif. St. universities, for research facilities and docking space for research vessels.

**Pat LaFollette** (Nat. Hist. Mus., L.A. Co.): Research associate at NHMLAC, reviewing and rearranging the Pyramidellidae in the malacology collection. He collects micro mollusks from outcrops of the "Imperial Formation" near Palm Springs, California.

**John Ljubenkov** (Pauma Valley, CA): Invertebrate taxonomist and continues his research on mollusks and associated hydroids.

**Ed Maestro** (Cabrillo Marine Aquarium): Exhibits Director at the Aquarium and interested in red and white abalone aquaculture.

**Jermaine Mahguib** (Calif. Poly. Univ., Pomona): Jermaine presented his research on "ugly dorid" nudibranch phylogeny, one of the largest nudibranch groups. Preliminary results from phylogenetic trees revealed that better genetic support is needed.

**Jim McLean** (Nat. Hist. Mus., L.A. Co.): Jim continues work on his eagerly anticipated volumes on North Pacific shelled gastropods. He recently added collaborator Daniel Geiger (Santa Barbara Mus. Nat. Hist.) to the project to edit and produce the volumes, which could be published by mid 2014. His monograph of worldwide Liotiidae is nearly complete.

**Alan Miller** (Calif. St. Univ., Long Beach): Alan reported on an on-going research project on the longevity of the cowry *Mauritia mauritiana* on Coconut Island, Kaneohe Bay, Oahu, Hawai'i. Over 22 years he marked 101 individuals with large numbers to determine their longevity and movement habits around the research area. Of those 101 animals, 2 lived 20+ years, 6 lived 16 + years, but most lived between 4 and 14 years.

**Jazmin Ortigosa** (UNAM): Currently conducting a survey with a team of biologists and students of the fish and invertebrates in Alacranes Marine National Park, Yucatan Peninsula, Mexico. Has documented 400+ species through collecting and photography.

**Julianne Passarelli** (Cabrillo Marine Aquarium): Julianne is the Collections Curator and reported on the history of the Cabrillo Marine Aquarium shell collection and other marine invertebrate collections. Their goal is to database the collections and make it available for research purposes.

**Mike Schaad** (Cabrillo Marine Aquarium): Aquarium director. Has helped establish protection of the ecosystem network with southern California aquaria and works to educate the public about the marine environment.

**Mary Stecheson** (Nat. Hist. Mus., L.A. Co., Invert. Paleo): Recently promoted to Collection Manager and currently databasing and rearranging gastropod type collection.

**Ángel Valdés** (Calif. Poly. Univ., Pomona): Teaches Evolutionary Biology and continues phylogenetic research on opisthobranch gastropods of the Caribbean and Panamic provinces. Four of five of his students in attendance gave presentations.

**Shawn Wiedrick** (Pacific Conchological Club): President of the PCC and interested in all areas of shell collecting. Volunteers at the Nat. Hist. Mus. of L.A. Co., identifying micro-turrids of the Indo-Pacific. He gave a narrative of his various malacological projects including Panamic muricid research, travel to Aruba, and construction of 24 cabinets to house his growing shell collection.

**Calvin Won** (Cabrillo Marine Aquarium): Calvin is Collection Assistant for the Cabrillo Marine Aquarium and works closely with Julianne Passarelli.



# FUM 2012

## Florida United Malacologists

José H. Leal, Ph.D.

On February 11, 2012, The Bailey-Matthews Shell Museum (BMSM) hosted the third meeting of Florida United Malacologists (FUM). The one-day gathering was designed to facilitate and enhance communications among professional, amateur, and student malacologists, with topics including but not limited to biology, ecology, paleontology, archaeology, and conservation.

The State of Florida is endowed with a large surface area, a wealth of drainage systems, a diversity of ecosystems, a long coastline (spanning more than one bio-geographical region), and a relatively abundant number of researchers working on different aspects of malacology, including a large and productive group of collectors, non-professional researchers, and citizen scientists.

This year, presentations spanned marine, freshwater, and terrestrial mollusks, with subjects ranging from micro landsnails, clam aquaculture, and drilling by marine gastropods, to Florida's marine molluscan food webs and everything in-between. (Make sure you check more about FUM 2012 and its Abstracts & Programs on the Museum web site at <http://shellmuseum.org/newsdetail.cfm?articleID=447>.)

FUM follows the pattern established by similar informal gatherings such as the Bay Area Malacologists (BAM), the Southern California United Malacologists (SCUM), the Mid-Atlantic Malacologists (MAM), and the Ohio River Valley United Malacologists (OVUM). There is no need for formal membership and there are no dues, officers, or publications, however, presenters are required to submit a brief abstract limited to 150 words or less.

The first installment of FUM took place at The Bailey-Matthews Shell Museum in 2010. In 2011 the gathering was hosted by Dr. Gustav Paulay and his staff at the Florida Museum of Natural History in Gainesville. Next year's gathering will be hosted by Dr. Greg Herbert at the University of South Florida's Department of Geology in Tampa. Please include FUM 2013 in your plans if you are going to be in the neighborhood next year!

### PROGRAM:

**Chelsey Campbell & John Slapcinsky:** New insights into diversity in Madagascar's acavid land snails.

**John Slapcinsky & Harry G. Lee:** Cryptic diversity in the land snail genus *Daedalochila* Beck, 1837 sensu stricto (Stylommatophora: Polygyridae) is revealed by DNA barcoding efforts and supported by new anatomical and conchological data.



**Donald Swenson:** Coral Cove update: a review of this year's specimen collecting and changing beach conditions along with a display of sample specimens.

**Dennis Sargent:** The naming of a new strombid species from northern New Zealand and the Kermadec Islands.

**Melissa Broderick, Shirley Baker, John Scarpa, & Leslie N. Sturmer:** Clam aquaculture in Florida: an overview of methods and challenges.

**Aswani K. Volety, Katie McFarland, Molly Rybovich, Shirley Baker, & Patrick Baker:** Temperature, salinity, and desiccation tolerance of the Green Mussel, *Perna viridis*, in Southwest Florida.

**Shubhabrata Paul & Gregory S. Herbert:** Prey-size selectivity in *Chione* species (Bivalvia) in the late Neogene of Florida: a reevaluation.

**David J. Karlen, Thomas L. Dix, Barbara K. Goetting, & Sara E. Markham:** Trends in the benthic community structure of McKay Bay.

**José H. Leal:** The bivalve genus *Dilemma* (Bivalvia: Anomalodesmata: Poromyidae): bizarre clams hint at hidden deep-sea diversity.

**Julie Zill:** Host specificity and density of eulimid parasites (Gastropoda: Caenogastropoda: Hypsogastropoda) of holothurian hosts in Moorea, French Polynesia.

**Subhronil Mondal, J. Hutchings, & Gregory S. Herbert:** Obligatory edge drilling by the naticid gastropod *Polinices lacteus* from Florida.

**Gregory S. Herbert & Allyson Imperio:** Molluscan food web structure in Florida's marine ecosystems.





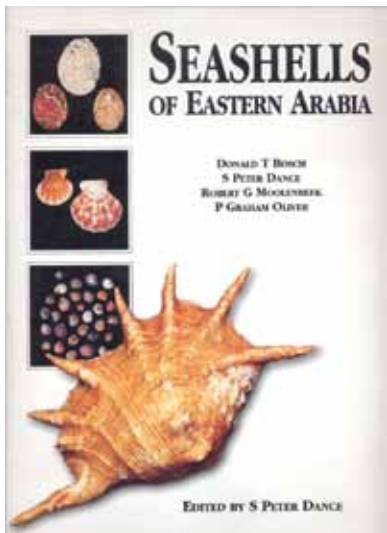
**Dr. Donald Taeke Bosch (1917-2012)** was born in Amoy (now Xiamen), China, to missionary parents. He married Hannah Eloise Boynton in 1942 and served as a medical officer in WWII. After the war, Don and Eloise decided their skills would be of best use as missionaries. In September 1951 they sailed from New York to England, flew on to Beirut, then finally arrived in Basra, Iraq. They spent a few days in Basra with friends before leaving for Amarah, Iraq, where they stayed until the end of 1954, training in language and other skills they would need in their posting in Oman.

In 1955, Donald started service in Oman as a surgeon in the Mission Hospital in Mutrah. He visited his patients all over the country, not just in the hospital. He often traveled on the back of a donkey or camel rather than by car. Many of his patients had never seen a doctor. The year 1970 proved to be a major transitional phase for Oman. His Majesty Sultan Qaboos bin Said al Said came to power and Oman moved steadily forward on the road of progress. In 1973 the Sultan bestowed the Order of Oman on Dr Bosch, the first American citizen to receive this honor.

One of the favorite family activities was going to the beach or camping on the weekends. They visited remote places, like the now famous Masirah Island. Collecting shells in their spare time started as a family hobby, then became serious study, resulting in their first book, "Seashells of Oman."

In 1984, both Donald and Eloise retired from active mission work, dividing their time between residences in America and Oman. During periods in Oman after retirement, collecting shells became a passion and the number of new finds they made for the region grew steadily.

During 1989 they published their second book, "Seashells of Southern Arabia," a more popular and relatively inexpensive reference manual, written in English and Arabic. Then in 1995, with help from his Omani friends, and with S. Peter Dance as editor, Robert G. Moolenbeek for the gastropod section, and P. Graham Oliver (National Museum of Wales) for the bivalve section, he published his "dream volume," "Seashells of Eastern Arabia." [Much of the above is from an article on Donald Bosch by Robert G. Moolenbeek, published in the *American Conchologist*, March 2008.]



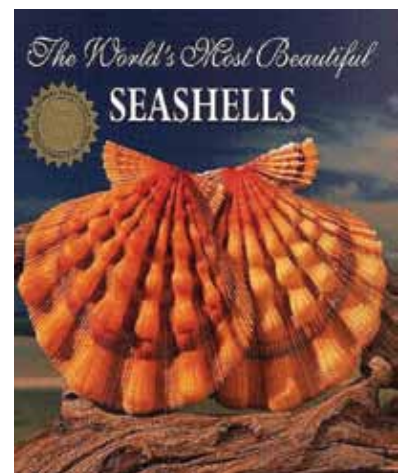
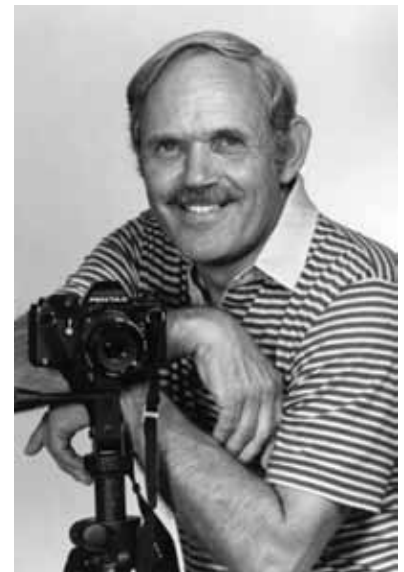
**James Hammond Carmichael III (Pete) (1930-2011)** was born in Augusta, Georgia, to Anne Moran and J. Hammond Carmichael. Pete attended grammar to high school in Augusta and graduated from The Citadel in Charleston, SC, in 1952. He went on to study the Russian language at Syracuse University, NY.

Pete joined the military and after completing his tour of duty attended Mexico City College to earn a Master's Degree in Anthropology. Pete taught both anthropology and geology at universities in North Carolina, but his real interest was a growing fascination with photography, especially wildlife photography. He eventually retired from teaching to pursue wildlife photography full time. He and his family moved to Sarasota and Pete began his photographic journey.

He was the photographer for "Shells" by Dr. R. Tucker Abbott, "Seashells" and "The Audubon Field Guide to North American Shells" both by Dr. Harald A. Rehder, and his photos are in many of the "Florida's Most Fabulous Series" of nature books. Pete has been called "the world's foremost shell photographer" and proof of this status is a book he published with the late Leonard Hill, "The World's Most Beautiful Seashells" (above). His work also appeared in a number of magazines, including: *Audubon*, *National Wildlife*, *Nature*, *Ranger Rick*, etc.

Of course, he photographed much more than shells and had an uncanny knack in finding hidden treasures in many of the rain forests of Central and South America. In his own words, "I've done nature photography for many years, shifting whimsically from one obsession to another. Spiders, though, became a long-lasting fascination when I met with so many unfamiliar beauties while living in Mexico in the 1960s." Examples of Pete's close-up photographs of spiders can be seen at: [www.awesomespiders.com](http://www.awesomespiders.com).

Pete was a multilingual artist, musician, photographer, teacher, and athlete. He approached life with an exuberance that showed through in his superb photographs.



# Preliminary report on the possible effect of the Deepwater Horizon oil spill in the Gulf of Mexico on the molluscan fauna of the surrounding area

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**Lafayette, LA 70503**

In August 2011 I joined a group of biologists from the University of Louisiana, Lafayette, on board the R/V *Pelican* for a third trip to inspect the area surrounding the Deepwater Horizon oil spill in the Gulf of Mexico. The spill occurred on April 20, 2010, at 28°44'12"N, 88°23'13.8"W (see map) and lasted for about three months. On two previous campaigns we sampled the area: in December 2010, and in April 2011. Some of the more important molluscan findings of the first two cruises have been reported already in *American Conchologist* [39(3) 4-9]. The area covered by the three cruises was roughly from 27°58'N to 29°26'N and from 87°34'W to 91°01'W (see map), at depths from approximately 16 m to 1760 m. The three campaigns were purposely spread throughout a year's time, to be sure that seasonal changes were not the cause of the results obtained. All three cruises brought similar but mixed results.

Oil was not found visually in any of the hauls, and only one haul, this on top of one of the banks or "pinnacles," had a weak odor of petroleum. Dredging done on a mud bottom at 80 m and deeper produced a rich live molluscan fauna; on a mud bottom between 16 and 50 m we netted only two species: *Oliva sayana* Ravenel, 1834, and *Solenostira cancellaria* (Conrad, 1846).

The dredging done on the shallower calcareous-rubble tops of the banks off the Mississippi Delta had different results. Sampling on Sackett Bank (approximately 28°38'N, 89°33'W and 55 to 70 m in depth; see map and Table 1), which had formerly netted rich results, was very disappointing, and the bank seemed to be biologically stressed. Sampling on Ewing Bank, situated west of Sackett (approximately 28°06'N, 91°02'W and 50 to 60 m in depth; see map), produced somewhat better results. I should add that a colleague who has worked with algae on these pinnacles for a number of years and who participated in all three campaigns, also found both banks very disappointing. The good news, at least for her, is that upon bringing some rock samples to her lab and placing them in aquaria, she managed to grow a number of species otherwise unnoticeable in the field.

What was the cause of the biological stress in these banks? The expected oil was nowhere to be found, so was it then the large amount of oil dispersants used? Oil has always been part of the Gulf of Mexico ecosystem, particularly concerning deep-water ecology. The obvious health of mollusks in deeper-water benthos encountered in all three campaigns seems to attest to the fact that if oil had reached that area, the mollusks (and crustaceans) were not affected. Man-made chemicals that could alter the ecosystem may not have reached those deeper zones, or if they did, they may have been much more diluted in the deeper water column.

I have a friend who worked with the clean-up crew for the *Exxon Valdes* spill in March, 1989, using solvents to clean the shore rocks that were covered with oil. When she went back five

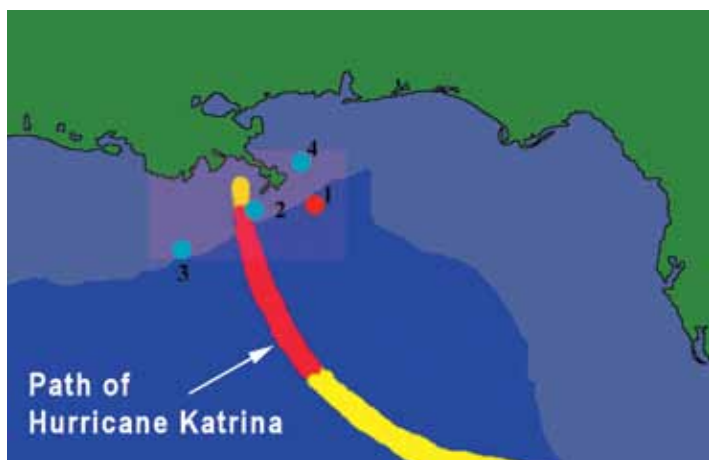
years later, the rocks that were cleaned with solvents were still clean, but those that were left alone had a variety of marine life growing on them. From what I have read about oil dispersants, there seems to be a general consensus on the beneficial results concerning seabirds, marine mammals, and coastal marshes, but the jury is still out with regard to its toxicity to different species of marine life; the possible harm dependent on many variables, such as the type of solvent, molecular structure, concentration, water temperature, type of species, etc. The greatest harm, it seems, may not come from the dispersant itself but from the creation of smaller oil droplets, now more toxic than before the oil was "dispersed."

There are two other suspects in the list of possible culprits for the biological stress of, at least, Sackett Bank. One is the ever-increasing amount of nitrogen and phosphorous that comes down the Mississippi from farming, animal waste, and other pollutants. These products have created a "dead zone" in the Gulf of Mexico due to hypoxia, which usually occurs when too much decomposing organic matter prevents the production of enough oxygen in the water, either through photosynthesis or by atmospheric absorption, to maintain a healthy biota. The area of the "dead zone" in the Gulf is constantly changing, but it usually covers only coastal areas from Alabama to Louisiana. At this point there is no basis to believe that hypoxia is affecting the offshore banks in question.

The other possible suspect, and the data seems to show that this is most probably the original culprit, is hurricane Katrina, which on August 28, 2005, became a category 5 hurricane in the north-central Gulf of Mexico. According to the National Oceanic and Atmospheric Administration (NOAA), Katrina had maximum sustained winds of 170 miles per hour prior to landfall (<http://www.ncdc.noaa.gov/special-reports/katrina.html>). Katrina maintained Category 5 status (shown in red on the map) until it passed over the top of Sackett Bank (see map) and hurricane-strength winds extended 120 miles from the center. Was this force enough to disturb the surface of a bank 60 to 80 m deep? I believe that the answer is "yes."

I visited Sackett Bank for the first time in 1996, and the single dredge haul produced 16 lots of mollusks. We went back in 2004, and this time 5 hauls produced 88 lots, many of the species having been collected from the "grunge" brought home to sort. We did not go to Sackett in 2005, when Katrina passed through the area, but campaigns done in 2006, 2008, 2010, and April and August 2011 (see chart below) netted a total of only 31 lots in 22 hauls, that is 1.4 lots per haul vs. 104 lots in 6 hauls, or 17.3 lots per haul before Katrina. After Katrina, dredging done on top of Sackett produced rubble, but no "grunge," the finer sediment that netted so many species in 2004. Where was it? It was when I asked myself this question that I decided to take a closer look at that titanic hurricane. If Katrina was strong enough to affect





Map showing path of hurricane Katrina. Area in red shows Katrina at Category 5. Area in pink shows the general area covered by the three campaigns of the R/V Pelican in December 2010, April 2011 and August 2011. 1) Deepwater Horizon oil spill; 2) Sackett Bank; 3) Ewing Bank; 4) Alabama Bank.

the top of Sackett, the “grunge” removed fell into a soft, muddy bottom, and any possible living specimens carried with it (adult and juvenile alike) would have died. One must remember that, for all practical purposes, these pinnacles are submerged islands and I believe that the species dislodged from the upper calcareous surface into the surrounding soft mud would have “drowned,” just as if it had been from land to water.

Ewing Bank, farther to the west, seems to have fared slightly better (see map and TABLE 2 ). The cruises of 2000 and 2004 to that bank produced 30 lots in 2 hauls, or 15 lots per haul. Sampling in 2006, 2008, 2010, and 2011 produced a total of 85 lots in 29 hauls, or 2.93 lots per haul. While Sackett’s post-Katrina sampling produced only 8% of pre-Katrina lots, Ewing’s post-Katrina production was 19.5%.

Although pre-Katrina data are limited, the tables below do show a drastic reduction of molluscan diversity after the 2005 hurricane; however, 6 years after Katrina one would think that Sackett and Ewing Banks should have begun to show some sign of recuperation, but the data does not support that conclusion.

There are no obvious differences in collections made post-Katrina and post-oil spill in either bank; however, closer scrutiny of the species collected at Sackett Bank in 2006 shows a larger percentage of living specimens [including the uncommon *Chicoreus (Siratus) consuela* (Verrill, 1950) and the rare *Conus* sp. aff. *riosi* Petuch, 1986] than was found in later dredgings, and the data suggest that perhaps these two banks may have deteriorated further after the oil spill.

I have records for a third bank located in the area of this study. The data here are more sparse because there are no pre-Katrina records and only one pre-oil spill record. The bank is located off the Alabama coast (approximately 29.15°N, 88°20.5’W, 75-90 m in depth; see map and Table 3). Although the data, such as they are, shows a reduction in the number of species from the single pre-oil spill haul, the samplings done in April and August of 2011 netted a number of species rarely collected in the northern Gulf of Mexico, such as a freshly-dead *Pseudosimnia vahniningi* (M. Smith, 1940) and a live *Pazinotus bowdenensis* (Vokes, 1970),

as well as a live specimen of *Anna florida* Garcia, 2008, the first record for the species in this area of the Gulf, dead or alive. The results for this bank do not seem to be the same as those of the Louisiana banks. The effects of the oil spill should have been the same, but Katrina was farther to the west.

Did the oil, or oil dispersants, hinder a possible comeback for the banks off Louisiana or were the banks so affected by Katrina that to-date they have not had a chance to recuperate? The data for the Louisiana banks seem to suggest so, but not that of the Alabama bank, which is more to the east, and deeper, and therefore not as affected by the hurricane. Is perhaps the “dead zone” expanding offshore enough to affect the banks off the Mississippi delta, particularly after the effects of Katrina? Other than the fact that Katrina must have given the first preliminary blow to these areas, one can only speculate at this point.

The three cruises made after the Deepwater Horizon oil spill were supported by the National Science Foundation and the Gulf Research Initiative grant. Dr. Emily Vokes, Professor Emerita, Tulane University, reviewed this paper and made some important editorial suggestions.

TABLES

TABLE 1. SACKETT BANK: approximately 28°38’N, 89°33’W; 55 to 70 m in depth.

YEAR	# OF HAULS	# OF LOTS	LOTS/ HAUL
1996	1	16	16
2004	5	88	17.6
<b>Total</b>	<b>6</b>	<b>104</b>	<b>17.3</b>
2005	KATRINA		
2006	5	8	1.6
2008	4	7	1.75
2010 (Apr.)	OIL SPILL		
2010 (Dec)	3	3	1
2011 (Apr)	4	3	0.75
2011 (Aug)	6	10	1.66
<b>Total</b>	<b>22</b>	<b>31</b>	<b>1.4</b>

TABLE 2. EWING BANK: approximately 28°06’N, 91°02’W; 50 to 60 m in depth.

YEAR	# OF HAULS	# OF LOTS	LOTS/ HAUL
2000	1	21	21
2004	1	9	9
<b>Total</b>	<b>2</b>	<b>30</b>	<b>15</b>
2005	KATRINA		
2006	3	14	4.7
2008	9	20	2.2
2010 (Apr.)	OIL SPILL		
2010 (Dec)	5	21	4.2
2011 (Apr)	3	16	5.3
2011 (Aug)	9	14	1.5
<b>Total</b>	<b>29</b>	<b>85</b>	<b>2.93</b>

TABLE 3. ALABAMA BANK: approximately 29.15°N, 88°20.5’W; 75- 90 m in depth.

YEAR	# OF HAULS	# OF LOTS	LOTS/ HAUL
2006	1	7	7
2010 (Apr.)	OIL SPILL		
2010 (Dec)	1	3	3
2011 (Apr)	3	7	2.3
2011 (Aug)	3	6	2
<b>Total</b>	<b>8</b>	<b>23</b>	<b>2.87</b>



# Noteworthy offshore mollusks from the north-central Gulf of Mexico, including geographical extensions and a generic reassignment

Emilio F. García

The Gulf of Mexico is our North American Mediterranean, being shared only by the United States and Mexico. It is a relatively enclosed body of water, with outlets only through the Yucatán Strait and the Strait of Florida. This makes it a very interesting body of water concerning its biota, not only for the possibilities of endemism but also for the unexpected occurrence of certain species. Having been given the great opportunity of participating in many campaigns in the Gulf on board the R/V *Pelican*, and having had access to unique collecting areas, I have been sharing my findings with the malacological community.

This is a continuation of reports of noteworthy molluscan species from the Gulf of Mexico, the last having been published in the September issue of this magazine (García, 2011). The taxa treated below, except for *Cuspidaria microrrhina* Dall, 1886, *Conus ermineus* Born, 1778, and *Benthomangelia bandella* (Dall, 1881), were dredged in August 2011 during a campaign covering the offshore waters of eastern Louisiana, Mississippi, and western Alabama. Please, refer to the "Preliminary report" included in this issue (page 32) for further information.

***Hyotissa mcgintyi* (Harry, 1985) (Fig. 1)** - Although it has been reported from jetties in South Padre Island, Texas (Tunnell *et al.*, 2010:323), this species inhabits deep water (see Mikkelsen & Bieler, 2008: 114). The specimen illustrated, our first, was dredged off the Alabama coast at 28°32.088'N; 89°22.396'W to 28°20.128'N; 89°23.410'W, in 688-776 m. Like *Neopygnodonte cochlear* (Poli, 1795), another deep-water bivalve reported in *American Conchologist* [39(3): 4-5, fig 3], it is a "foam oyster," and belongs to the family Gryphaeidae. It measures 44.4 mm.

***Cuspidaria microrrhina* Dall, 1886 (Fig. 2)** - I have two records, a single valve each, of this interesting species. The first was dredged in 2006 in hard mud at 27°35.22'N to 27°33.13'N; 91°52.31'W to 91°47.55'W, in 600-960 m; the second, illustrated here, was dredged in 2008 at 28°05.009'N to 28°05.348'N, 91°11.365'W to 91°09.093'W, in 110-109 m. *Cuspidaria microrrhina* was not reported as inhabiting the northwestern Gulf of Mexico in Turgeon *et al.* (2009), but it may have been recorded by Odé (1964- 2001) as *Cuspidaria cf. microrrhina*. The specimen illustrated measures 38.6 mm.

***Cuspidaria rostrata* (Spengler, 1793) (Fig. 3)** - Another interesting deep-water, mud-dwelling species recorded here for the first time as inhabiting the western Gulf of Mexico. It was reported erroneously for this area by Turgeon *et al.*, (2009:738), most probably a *lapsus mentis* for *Poromya rostrata* (Rehder, 1943), which did appear in García & Lee (2005), the reference given by the former publication. The single specimen was dredged at 27°59.070'N, 91°04.279'W to 27° 58.821'N, 91° 05.651'W, in 148-157 m. It measures 17.8 mm.

***Fedikovella beanii* (Dall, 1882) (Fig. 4)** - Formerly placed in the genus *Cocculina*, this species was first recorded from the Gulf of Mexico by Vokes & Vokes (1983:12; pl.23, fig.2); however, this record was questioned by Rosenberg (2009), presumably because of the poor condition of the specimen illustrated. Otherwise, the species has not been reported from the Gulf until now, in spite of the fact that several live specimens were collected in a single dredge haul attached to small pieces of old sunken branches. The specimens were collected at 28°32.088'N; 89°22.396'W to 28°20.128'N; 89°23.410'W, in 688-776 m. The specimen illustrated measures 6 mm.

***Hyalorisia galea* (Dall, 1889) (Fig. 5)** - Although this species has been reported from the western Gulf (Rosenberg *et al.*, 2009), this is the first time we have dredged it. Like *Fedikovella beanii*, described above, it needs a hard surface to survive, something very difficult to find in the muddy bathyal region that these species inhabit. The single live specimen collected,

illustrated here, was dredged at 28°29.155'N; 89°32.159'W to 28° 31.870'N; 89°32.687'W, in 595-387 m, and was attached to a living *Propeamussium* sp.; this would have made it very difficult for the latter to "swim" given its relatively small, fragile shell. Presumably, it was the proportionally large "extension" of its valves that gave the animal enough propulsion to save the day. The *Hyalorisia* specimen measures 8 mm.

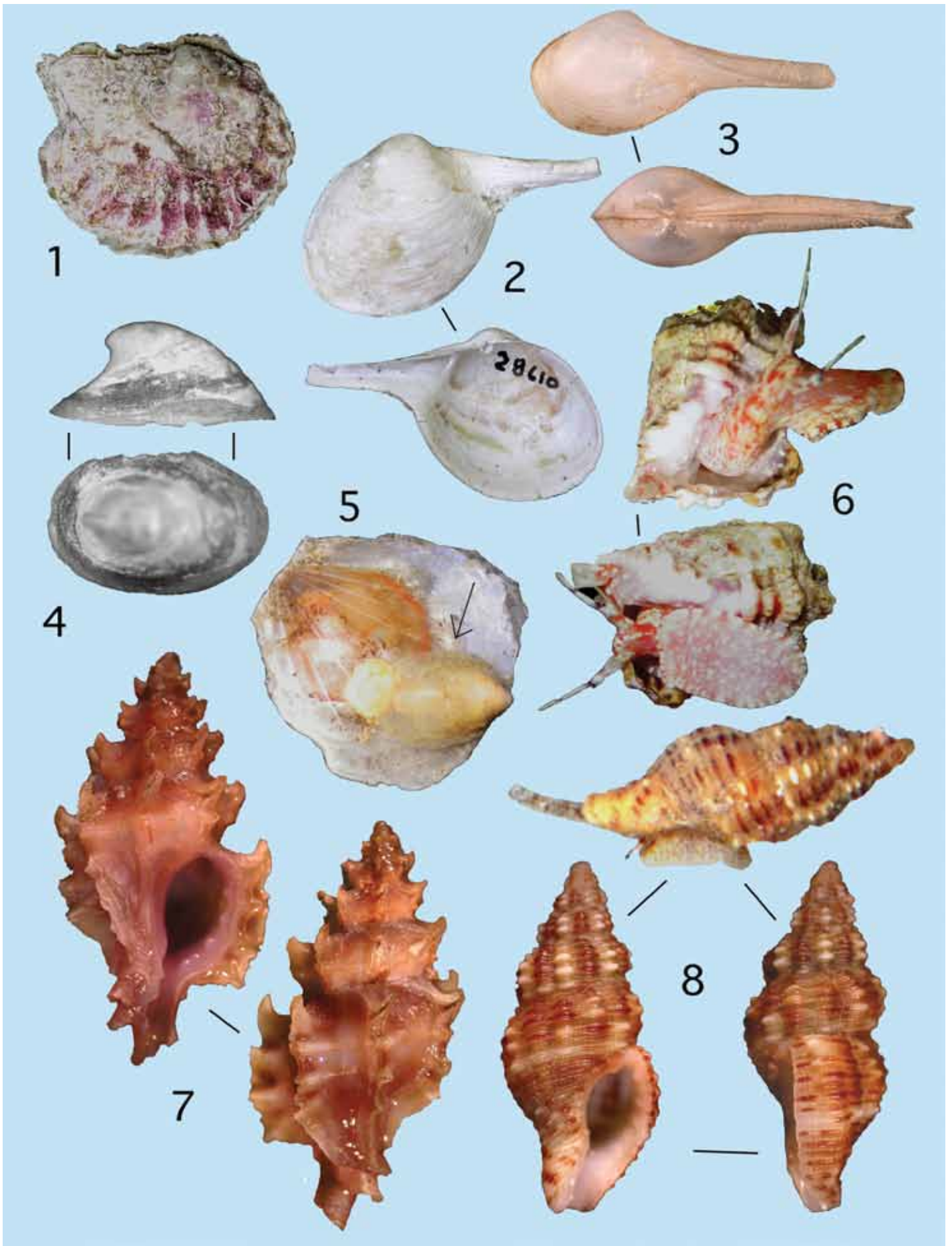
***Bursa rhodostoma thomae* (d'Orbigny, 1847) (Fig. 6)** - This western Atlantic subspecies and the Indo-Pacific *B. rhodostoma rhodostoma* (Sowerby, 1835) are, according to Beu (1998), very similar, differing only in apertural coloration. The western Atlantic subspecies is widely distributed, from North Carolina to the island of St. Helena in the southeastern Atlantic (Rosenberg, 2009); however, it does not seem to be common at any locality. The immature live specimen illustrated was dredged at Ewing Bank, 28°05.689'N; 91°01.915'W to 28°05.928 'N; 91°02.142'W, in 55-56 m. It measures 22 mm. As it often happens with juveniles, I could not photograph the animal in its crawling position because every time it turned itself so, it would crawl with the animal unexposed. I don't blame it.

***Pazinotus bowdenensis* (E. H. Vokes, 1970) (Fig. 7)** - It has been very exciting the few times that this beautiful little muricid has come up in the dredge. The species was originally described as a Miocene fossil from Bowden, Jamaica (Vokes, 1970: 27-28; pl. 5, figs. 5a-5b); however, its Recent distribution seems to be confined to the northeastern quadrant of the Gulf of Mexico, with limits in the south at latitude 27.5°N (Rosenberg, 2009) and in the west at longitude 89° 33' (EFG 16938). The specimen pictured was dredged at 29°15.848'N; 88°20.146'W to 29°15.552'N; 88°20.319'W, in 87.3-88.3 m. It measures 10.2 mm.

***Anna florida* García, 2008 (Fig. 8)** - Specimens of this species initially came from both Florida coasts and Bermuda; however, just before publication of its description several specimens of *Anna florida* collected in Texas, and brought to my attention by Dr. Fabio Moretzshon, were discovered at Texas A & M University, Corpus Christi (see Tunnell *et al.*, 2010: 214). The species had not been recorded from the central Gulf until the August 2011 campaign, nor had a live specimen been previously photographed. Two specimens were extracted from a hole in a rock dredged at 29°15.681'N; 88°20.237'W to 29°15.713'N; 88°20.219'W, in 78-86 m. The specimen illustrated measures 11.7 mm.

**Conoidean taxa.** The following conoidean taxa have been bounced around from family to family for many years. Fortunately, two papers recently published in the same journal, and meant to be read together, will render more stability to the "cones," "terebras,"





and “turrids.” Puillandre et al. (2011) present in their paper a molecular phylogeny of the Conoidea where, “for consistency of usage,” and to the collector’s relief, the families Conidae and Terebridae are kept as families. The “turrids,” however, are split into 12 families of “comparable rank.” Bouchet et al. (2011) follow up with a paper laying out a new operational classification of the Conoidea based on Puillandre et al. Accordingly, and following the discoveries in these two papers, the conoidean genera listed below are assigned as follows: *Conus*: Conidae; *Benthomangelia*: Mangeliidae; *Corinnaeturris*, *Glyphostoma*: Clathrellidae; *Leucosyrinx*: Pseudomelatomidae. The last assignation is “tentative” and hypothetical as, “anatomically, this is the most variable family of Conoidea.” The authors state that “most genera were formerly included in the subfamily Crassispirinae, but the nomenclaturally valid name for this clade is Pseudomelatomidae.” (Bouchet et al. (2011: 292).

***Conus ermineus* Born, 1778 (Fig. 9)** - This relatively common species arguably achieves its most dramatic color patterns in the pinnacles of the north-central Gulf of Mexico. The 14.4 mm specimen illustrated here (EFG 22158) has a verrucose surface with unusually stepped whorls. As is the case with other juvenile cones (e. g., *Conus regius* Gmelin, 1791), it seems that some young *C. ermineus* also develop pustules on the surface of their shell. We have dredged two other specimens (EFG 22158, 23226) with such a characteristic. The illustrated specimen was collected in the 2000 campaign at 28° 0.561’N, 91° 02.205’W to 28° 05.524’N 91° 02.036’W in 58 m.

***Benthomangelia antonia* (Dall, 1881) (Fig. 10)** - This taxon has been reported from the northwestern Gulf of Mexico before (García & Lee, 2004). It is illustrated here because it is the best specimen of this rare species collected by us. It was dredged at 28°54.535’N; 88°12.078’W to 28°56.811’N; 88°14.140’W, in 1136-1124 m and measures 15.5 mm. The specimen illustrated by Bouchet & Warén (1980: 47, fig. 106) is not that of *B. antonia* but of *B. bandella* (Dall, 1881). Although the epithet “*antonia*” is used both in the image and in their discussion of the species, this may have been a mix up in redaction, as the epithet “*bandella*” is listed in the introduction to the genus while “*antonia*” is not (p. 45). The photo shown in Williams as *B. antonia* (2005, species 5530, photo at left) is not that species.

***Benthomangelia bandella* (Dall, 1881) (Fig. 13)** - The type locality for this species is Blake station 47, which is off the mouth of the Mississippi River. Although it has not been reported from elsewhere in the Gulf of Mexico, I have two lots from western Florida, as far south as 24°35.29’N (EFG 25313). The specimen illustrated was dredged off Alabama at 28°31.26’N, 87°40.64’W, in 2432- 2468 m. Although the maximum reported size is 9.4 mm (Rosenberg, 2009), the illustrated specimen measures 15 mm.

***Corinnaeturris leucomata* (Dall, 1881) (Figs. 11- 12)** - Formerly placed in the genus *Pleurotomella*, presumably because the known specimens lacked a protoconch. Bouchet & Warén (1980: 77), with better specimens at hand, pointed out that this species has the unique character of a smooth, multispiral protoconch with a single keel, and erected the taxon *Corinnaeturris* to accommodate the species. The illustrated adult (Fig. 11) was dredged at 28°48.057’N; 88°05.040’W to 28°50.092’N; 88°02.178, in 1758-1726 m, and measures 17.6 mm. The juvenile (Fig. 12) specimen shows the distinguishing protoconch.

***Glyphostoma golfoyaquense* Maury, 1917 (Fig. 14)** - This is the first time that this elegant *Glyphostoma* has been reported from the northern Gulf of Mexico. Two live specimens were dredged at 28°29.155’N; 89°32.159’W to 28°31.870’N; 89°32.687’W, in 595-387 m. The specimen illustrated measures 20 mm. The animal is white with unexpected orange mottling on top of the siphon and at

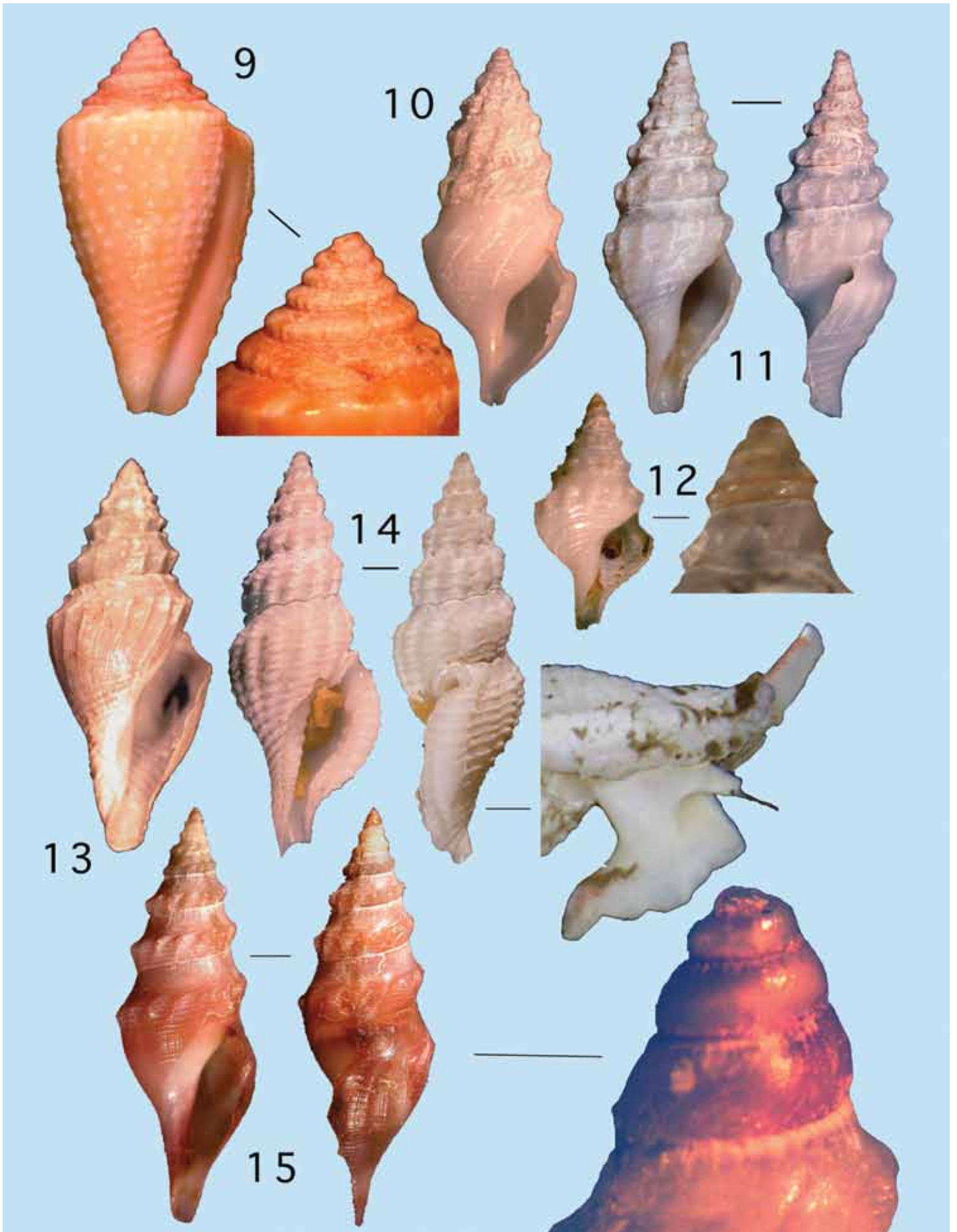
the posterior end of the foot.

***Leucosyrinx filifera* (Dall, 1881) (Fig. 15)** - When Dall first described this species he placed it in the genus *Pleurotoma* (1881: 56), stating that the nuclear whorls were “generally decorticated, but when perfect **probably** (my bold letters) as in the preceding species,” which was described as having the sculptured protoconch of Daphnellinae (now Raphitomidae). Eventually, the taxon *filifera* was placed in *Gymnobela*, still in Raphitomidae, presuming, as had been the case with *Corinnaeturris leucomata* (above), that it had the characteristic protoconch of that family. The specimen of “*Pleurotoma filifera*” illustrated here has an almost intact smooth protoconch, with no trace of the sculptural ornamentation of raphitomids. The protoconch and other shell characters place this taxon in the genus *Leucosyrinx*. It was dredged at 28° 32.088’N; 89°22.396’W to 28° 20.128’N; 89°23.410’W, in 688-776 m and measures 20.5 mm.

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# Broward Shell Show 2012

Nancy Galdo



This year's Broward Shell Show was the best ever, a record breaking show. As before, the 47th annual Broward Shell

Show was held at the Emma Lou Olsen Civic Center, in Pompano Beach, Florida. Attendance was up, with plenty of returning regulars and lots of newcomers. We increased our club membership by 31 new members! Of note were the many youngsters in the crowd - getting their introduction to the wonders and mysteries of conchology at a young age. We had a full slate of quality exhibits, and sincere thanks and appreciation go to the judges, exhibitors, dealers, and club members who participated in and ensured the success of the 2012 Broward Shell Show. Of special note was the display by Amy Tripp, that took three awards, including the COA Award. The Emma Lou Olsen Civic Center, in Pompano Beach is also where the club holds its monthly meetings on the second Wednesday of each month at 6:45 p.m. Annual dues are \$18 for an individual or family, \$5 for a student (thru high school), and \$20 international. This year's show co-chairs were Nancy Galdo and Alice Pace.



**Amy Tripp with well-deserved ribbons and awards for her three-case winning display of "Uncommon Beach Shells Collected From the Marco Island Area." She won the Conchologists of America Award, Jim Vunkannon Memorial Florida/Caribbean, and Shell of Show - Self-collected. This last was a near perfect specimen of *Conus spurius aureofasciatus* Rehder & Abbott, 1851.**

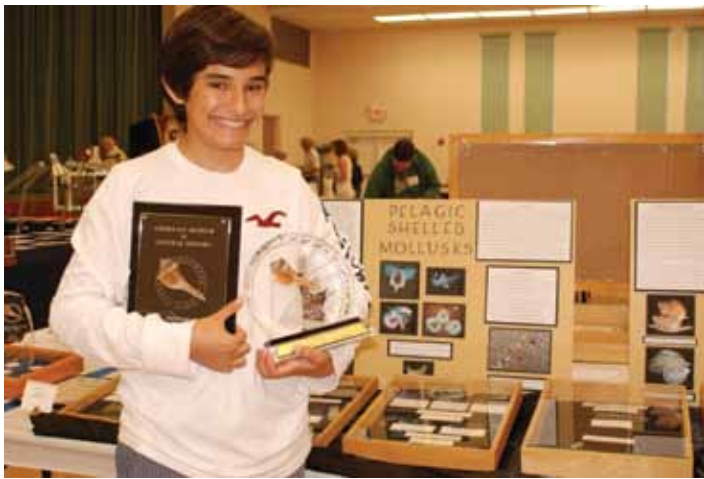


The Emma Lou Olsen Civic Center, in Pompano Beach, Florida, has served as an excellent facility for club meetings and special events like the annual shell show.



**Bob Pace was winner of the DuPont Award, the Gerrit deGraff Memorial, and Shell of Show - Any Manner, with a nicely-sized and near perfect muricid, *Poirieria oregonia* (Bullis, 1964).**





**Jonathan Galka won the American Museum of Natural History Award and the Len Hill Memorial Award for his display of “Pelagic Shelled Mollusks.”**



**Valentino Leidi won Best Student Exhibitor with his scientifically accurate and educational display titled “Diversity in the World of Seashells.”**



**Gene Everson is certainly no stranger to the award page of this magazine. Here he is with his display titled “Pecten Shells Worldwide,” winner of Best of the Best.**

**Allan Walker (1921-2012)** was an Honorary Life Member of the Jacksonville Shell Club (JSC) and for 37 years a major influence and guiding presence for the club.



Allan was born in Providence, Rhode Island, and served in the USAF in WW II as well as ten years in the Rhode Island Air National Guard. He married Hazel Barrs during wartime and their union lasted 67 years until his passing. The couple settled in Jacksonville in 1959 and Allan went to work for The Florida Times-Union/Journal. He retired from his position of press photographer in 1983. During his 24 years of service to journalism he was recognized with several national awards for his photography.

Allan and Hazel attended their first JSC meeting at the Citizens Federal Savings and Loan Association on University Blvd. in March, 1975. Their immersion was immediate and earnest as each won a blue ribbon in the Eleventh JSC Shell Show less than four months later. One, the other, or both the Walkers won ribbons and major awards, including Most Beautiful, Most Educational, The People’s Choice, and the Maggi Wheldon Trophy at essentially every event for the next 20 years.

At the time of his retirement from the newspaper and following a short apprenticeship with the late Don Campbell, Allan went to work for the JSC. He served as Chairman of the Shell Show for five of the next six years, one of them, 1988, when he was club President. These were the halcyon Years of the Beaches’ Flag Pavilion JSC shows, with exhibits stretching over 800 feet on some occasions. Allan’s spectacular photographs of the events from the balcony of the vast auditorium were well-received and widely circulated, appearing in numerous publications.

Allan and Hazel’s passion was education. In the mid-1980’s they initiated the JSC Education Committee and began a series of talks to elementary school children. The emphasis of their curriculum was the living mollusk, and their teaching materials included a great number of animals preserved in their shells. Audience interaction was encouraged and the response was overwhelmingly positive. Overwhelming is a particularly apt descriptor; the Walkers, along with a retinue of JSC recruits, gave over 200 such presentations to thousands of children during those busy years and earned Allan the moniker “Shell Man.” The Walkers and team also presented their programs to the JSC, at Jacksonville University, FCCJ (now FSCJ: Florida State College at Jacksonville), and Marineland.

As is evident from the preceding account, Allan Walker was pretty much inseparable from Hazel. While this abiding partnership produced a laudable volume of good works, those of us who knew these special individuals will probably remember the sense of fellowship that the Walkers brought to the JSC.

When Allan became stricken with a stroke in late 1994, the Walkers’ JSC participation was curtailed, but they maintained contact. They donated their shell collection to the Mary Brogan Museum of Art and Science in Tallahassee, where, according to Aimee Hills-Hayes, Director of Education and Public Programs, it has illuminated audiences of tens of thousands. During his infirmity Hazel gave Allan the highest caliber of nursing care to which I have ever borne witness. As in health, clearly this nurse and patient were a perfect fit. [Text from Harry G. Lee, photo by Dale Bulock]



