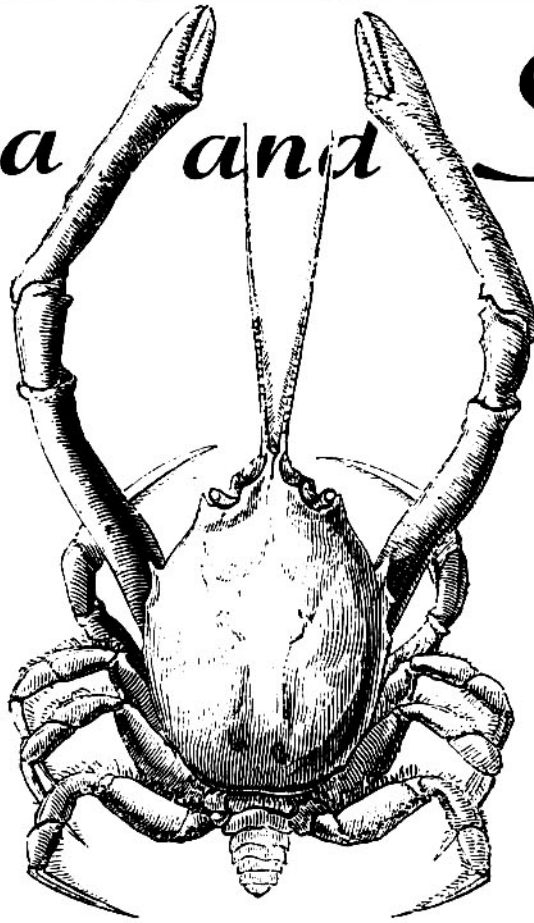


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Volume 18, No. 4

Winter 1996

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ISSN 0085-607X

Editor TOM RICE

## In Memoriam

R. TUCKER ABBOTT - page 199

HAROLD W. HARRY - page 201

BYRON W. TRAVIS

JAMES G. WESTBROOK - page 219

NOTICE: the *Of Sea and Shore Publications* office **WILL BE CLOSED FROM January 15 to February 20, 1996.**  
We're going shelling!

See From the Editor's Desk, page 224

See article on page 185



Figure 2

Left: *Taia polyzonata* Frauenfeld; Center: *Filopadulina javanica* Busch;  
Right: *F. sumatrensis peninsularis* Brandt

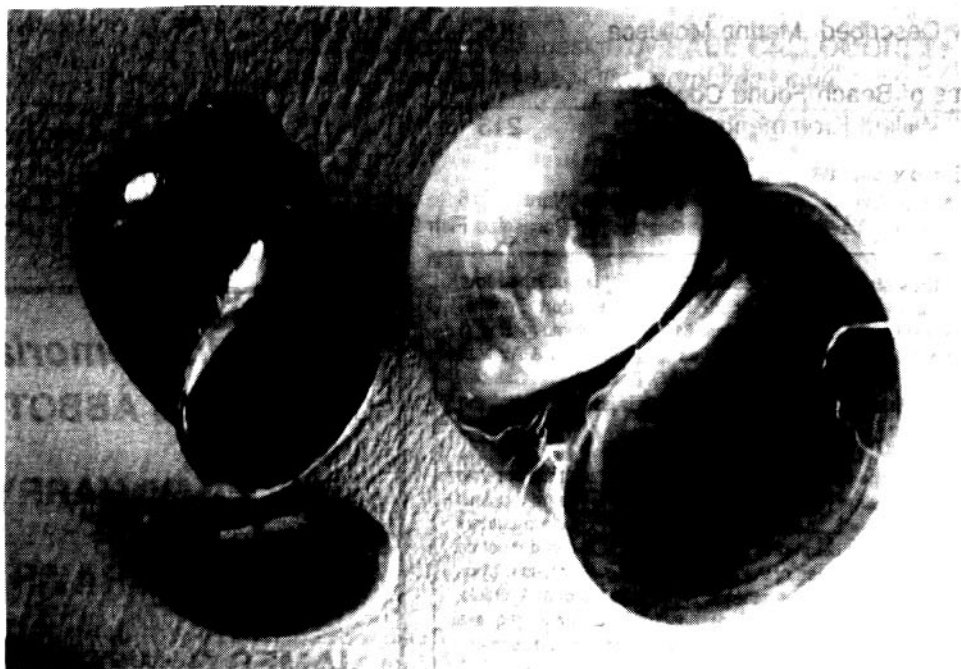


Figure 3

Left: *Pila scutata* Mousson; Right: *Pomacea Canaliculata* Lamarck



# Some Freshwater Gastropods of Singapore

Sow-Yan Chan\*

I have attempted to identify freshwater gastropods from Singapore for quite some time, but still am not certain of my identifications. I would love to hear from anyone who has comments about or interest in these shells.

## Bithynidae

Figure 1, top. *Bithynia pulchella* Benson, 1836. I found this species only in one location, at Jurong Lake, competing with *Melanoides granifera*, which is a very recent introduction. Both were found among sandy mud and other algaed habitats, and then apart as all are brownish in colour, including another *Melanoides* - *tuberculata*. Out of numerous samples taken only one piece was found among thousands of *M. granifera*. The closest area in which *B. pulchella* is found in this region of the world is West Malaysia. It is very likely a native species, but had not been found or collected previously.

Figure 1, bottom. *Bithynia* species. This species was first collected in an ornamental fish shop among waterweeds in 1993. Next I discovered that they can also be found in the Botanical Gardens and at a waterweed farm. Unfortunately, I am unable to identify the species or its origin. But, very likely this is an introduced species which may come in with the many exotic ornamental water plants cultivated here. The species of waterweed may give some idea about the source of introduction.

## Viviparidae

Figure 2, left. *Taia polyzonata* Frauenfeld, 1862. This species has its origin in East Asia and was one of the earlier introduced species that can be found and recorded in Singapore. It can be collected in many freshwater habitats, although these ponds and ditches are fast disappearing, sad to say.

Figure 2, center. *Filopadulina javanica* (V.D. Busch, 1844). Only one specimen was found, at the outlet of a canal. Although it was dead when collected, the keeled umbilicus separates it from *F. sumatrensis peninsularis*.

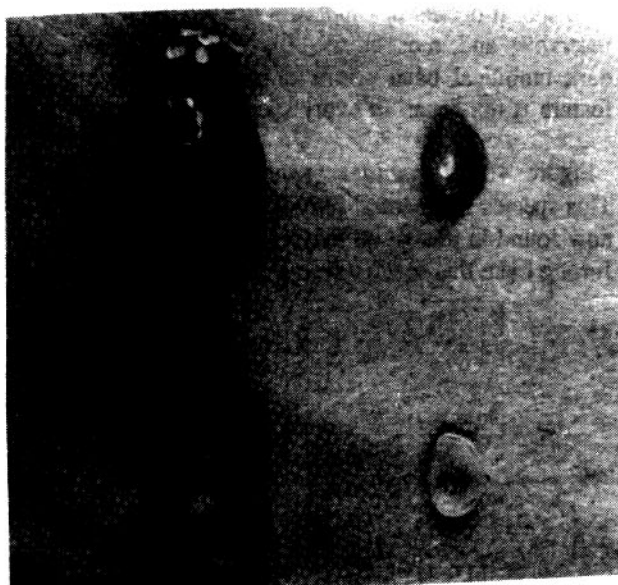


Figure 1

Upper: *Bithynia pulchella* Benson; Lower: *B. sp.*

Of course more effort is needed to find live ones - as usual. Again this species had not previously been reported or collected.

Figure 2, right. *Filopadulina sumatrensis peninsularis* Brandt, 1974. Singapore's specimens have fainter color bands than the type race. It is the most abundant among the three Viviparidae and nearly perfect specimens can be found at Kranji Reservoir.

## Ampulariidae

Figure 3, left, *Pila scutata* (Mousson, 1848). The only native apple snail, which is now very difficult to find. The likely reason for this is the filling up of ponds and ditches for development, although the removal of waterweeds in reservoirs (to prevent clogging the waterways) may have also contributed to its scarcity too. The introduced *Pomacea canaliculata* Lamarck, 1801 has added a competition for available food, as both species share the same habitat.

Figure 3, right. *Pomacea canaliculata* Lamarck, 1801. This "golden" snail is probably the most notorious

amongst freshwater snails for destruction of agriculture produce in East Asia. Although Singapore does not have a significant agricultural industry, this species is most likely to compete for space with the native snails like *Pila scutata* (Mousson, 1848) and others.

### Thiaridae

Figure 4A, *Melanoides tuberculata* (Müller, 1774). This species is, so far, the most wide spread among the four Thiarids in Singapore. It is also the most variable in shape. It occurs in small rain ditches, open ponds or reservoirs and, most of the time, in polluted areas. A dark umbilical band seems quite distinctive, but this feature is not found in every specimen.

Figure 4B *Melanoides granifera* (Lamarck, 1822). This species is the latest introduction to Singapore. It is now found in almost all major bodies of freshwater. In Jurong Lake this species seems to be heavily competing

with *Melanoides tuberculata* (Müller, 1774) and *Bithynia pulchella* Benson, 1836. It is a new record.

Figure 4C. *Thiara scabra* (Müller, 1774). Another new record of a Thiarid found at Lim Chu Kang mangrove swamp in August 1994. It was collected at a small stream from the outlet of a commercial ornamental fish pond and was in soft mud influenced by sea water only at high tide.

Fig. 4D. *Thiara (Sermyla) riqueti* (Grateloup, 1840). Normally found in higher intertidal monsoon canals, this species is the least encountered, except on beaches near outlets and then as dead specimens.

Fig. 5. Live *Melanoides granifera* (Lamarck, 1822). At Punggol Park - a newly constructed public park.

Figure 5 is on page 187

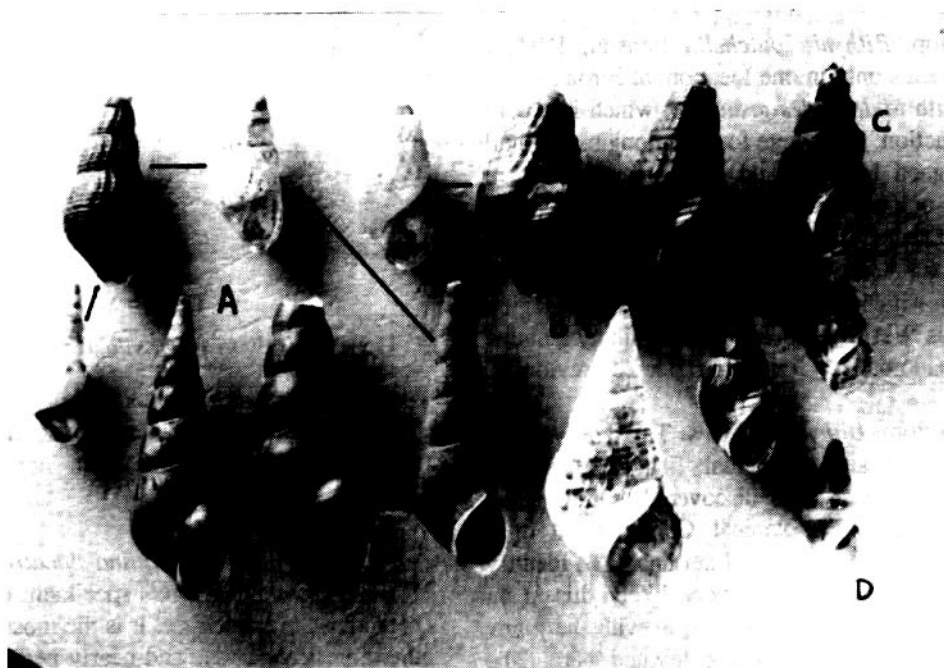


Figure 4

A: *Melanoides tuberculata* Müller; B: *M. granifera* Lamarck  
C: *Thiara scabra* Müller; D: *T. (Sermyla) riqueti* Grateloup

\* 79 Jalan Girang; Singapore 359248, Singapore

### TANGLE NETS & SHELL TRAPS

Does anyone have information - photographs, diagrams, etc. on how to make and/or use either shell traps or tangle nets. Or where to buy same? A reader (and your Editor) is very interested in learning more about these items and the techniques used. Write Helmut Bayer, Asau Post Office; Vaisala - Savaii; Western Samoa.

### HELP!

Please let us know of your club or society's activities and we'll give you some publicity here. Just send the information as far ahead of the activity as possible since we are a quarterly and need as much advance time as we can get! Thanks!



Figure 5

Live *Melanoides granifera* Lamarck

## Collecting ..... Containers ?

Steven M. Rosenthal

That's right. With shelling coming under attack along with other related "collecting" of natural history objects, it seems only appropriate to write about one aspect of our hobby which undeniably has no (direct) impact on our natural world. If, like me, you send a lot of shells through the mail, or have to store your shells somewhere, the question naturally arises as to what kinds of containers to put them in. Most shellers know about the obvious things, like clear plastic hinged boxes, and polyurethane "zip-lock" bags, including what dimensions are best for a given kind of shell, where to buy them through the mail, etc. Here is some homespun advice about certain kinds of containers that may not always come to mind; you can get them without going out of your way much, and at little or no expense (sort of); and, best of all, they are very good protection for small and fragile shells, especially in the mails.

1. Fast-food condiment containers. Certain franchises such as Roy Rogers, Hardens, and others have little plastic tubs (with lids) that you can use for your mustard, ketchup, etc., if you eat-in or take-out. As a

junk food junkie I regularly patronize these establishments and help myself to a few extra containers even if my needs for ketchup can be satisfied with just one or two. These are sturdy and the lids never fall off accidentally.

2. Vending machines. If you have kids you know how hard it is to get out of the grocery store, toy store, etc. without having to give the kids a quarter or two to put in one of those vending machines where you turn the handle and out comes some cheap plastic toy, sticker, etc. Most people keep the toys and throw away the little 2-piece plastic "bubbles" or "eggs" they come in. (I keep the plastic, the kids get the toy.) In fact, at my local grocery store the machines are right behind the checkout counters and there are usually plenty of discarded empty "eggs" to be had for the taking as you head out with your groceries.

3. Panty-hose containers. Occasionally the Mrs. may buy some of those brands that come in their own plastic egg. She keeps the hose, I take the egg. (These "eggs"

Continued from previous page.

are virtually the same as those you sometimes find in #2 above.)

4. Food packaging. In New York take-out food often comes in tough plastic containers that are great for shells. Examples include the thick plastic containers Chinese restaurants use for soup; similar plastic containers are in my grocery store for products such as deli salads, pickles, sherbet and ice cream,, and many more. Plastic tubs for margarine are very good, especially for low, flat bivalves, especially pectens.

5. Pill bottles and containers. Those plastic vials/containers pharmacies use for prescription drugs are great for shells, the long narrow ones are especially good for shells like *Conus* and *Terebra*. Smaller, stouter bottles, used for some prescription drugs and for over-the-counter products, like aspirin/analgesics may be ok, but the openings are often very narrow which makes it tough to get shells in and out. (Incidentally, have you ever seen all the cotton they put in those things? Save it for use as "bedding" for the shells.)

6. Pill organizers. Unlike the containers in #5, pill organizers are seven little hinged boxes connected in a row. People taking more than one kind of medicine daily use them to organize their medicines for the week. (Each box contains the pills for each day of the week and is labelled with the different days of the week). These are great for storing small shells in the field as you collect them; the multiple boxes allow you to separate shells collected from different localities; since they are all attached to each other, there is only one "unit" in your pocket in lieu of seven separate ones.

7. Film canisters. The virtues of these are obvious. Next time you go to pick up film from one of those film-developing centers don't be afraid to ask if they have any extras of these lying around.

Seven being a lucky number, I think I'll stop here. No doubt some of you have other interesting examples of your own ....

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## Coastal Zone Canada '96

We invite you to participate in Coastal Zone Canada '96 (CZC'96) to be held in Rimouski, Québec, Canada, on 12-17 August 1996. The theme of the conference is "Integrated Management and Sustainable Development in Coastal Zones". The conference has the following objectives: to review current knowledge; to provide a forum; to frame recommendations. Papers and case study presentations are invited from national and international coastal zone stakeholders, community-based organizations, scientists and engineers, governments and primary resource users, industry and business. This international conference will feature oral and poster presentations, plenary panel sessions and round-table discussions in a wide variety of areas.

A major trade show and exhibition is planned to allow private companies and public organizations involved in coastal/marine activities to meet with attendees and discuss innovative technologies, approaches and business opportunities.

For more information or in order to receive the second announcement, please write to Professor Mohammed El-Sabh, Coordinator Coastal Zone Canada '96 International Conference Groupe de recherche en environnement côtier, (GREC), Université du Québec, 310, allée des Ursulines, Rimouski, Québec, Canada G5L 3A1.

## Abalone Symposium

The 3rd International Abalone Symposium is scheduled for 5-11 October 1997 in Monterey, California, USA. Suggested symposium topics are: Aquaculture, Biotechnology, Ecology, Fishery Management, Larval Biology, Marketing & Economics, Morphometrics, Nutrition, Pathology, Phylogeny, Life History, Taxonomy, Evolution, and Population Biology. If you would like to receive further announcements, registration and other information e-mail Catherine Ashley (California Sea Grant College) at [cashley@usc.edu](mailto:cashley@usc.edu).

Please indicate level of interest: Attend - Oral presentation - poster presentation - video presentation - contribute ms to proceedings - chair session - student travel scholarship - shell trading - shell display - trade show.

Received from D.R. Lindberg; Department of Integrative Biology & Museum of Paleontology; University of California, Berkeley.



# PALAWAN

## Beautiful to Experience - Difficult to Travel

E. Shary Almasi



A Palawan taxi! (just kidding)

This seems to be the year of the Palawan shelling trip. I know of three shelling groups travelling these lovely islands and was lucky enough to be in one of those groups. Trevor Roberts and I spent three weeks travelling in the Philippines in January of 1995 with Peter Bright and Glenn Duffy of Living World Tours, out of Ft. Lauderdale. We had been to the Philippines before, but never to Palawan.

Palawan is an island approximately 425 kilometers long and 40 km wide. The island was inhabited about 40,000 years ago by Malays traveling via Borneo. Chinese and Arab merchants began trading there in the 9th century. In fact, Palawan most likely comes from the Chinese *Pa lao ya* - "Land of the Beautiful Safe Harbor". In the 14th century, the Muslim Malays settled there in earnest and the island was brought under the control of the Sultan of Borneo. In 1521 the survivors of the Magellan expedition replenished supplies on Palawan and shortly after, Spanish priests arrived. In 1750 the island was ceded to Spain by the Sultan of Brunei. So, the island has a long and varied

history. Palawan is situated between the South China Sea and the Sulu Sea. This was our first destination on a "three pronged" trip.

We left Seattle, traveling with Janet Armbrust and Jane Paton, also from the great State of Washington. In Los Angeles we checked in at Philippine Airlines and met bits and pieces of the group, most of whom we had travelled with in the past. Alice Forkner was a new acquaintance to me, as were Al and Marilyn Duncan. Trevor, of course, knows everyone. All the rest were familiar faces. Eighteen plus the two "great white fathers", Glenn and Peter.

We refueled in Honolulu and arrived in Manila bright and early in the morning. Got to the Philippine Village Airport Hotel at about 8:30 a.m. about 2 hours after landing. At 9:30 we gathered in the lobby and caught cabs to the crafts market. Then a few of us took a short walk to a money exchange, a must before going on to the Carfel Shell Museum. Met Carlos Leobrera, then caught taxis back to the hotel for lunch. At lunch we



were introduced to a new fruit - "chico", which is very grainy, but with a persimmon flavor. And ... they still make great flans in the Philippines.

Up at 2:50 a.m. and on the plane at 5:15 a.m. for a one hour flight to Puerto Princessa ... the largest city in Palawan, with a population of approximately 100,000. Checked in to the Emerald Hotel and after a 1½ hour rest we boarded our bus and took off on a wash-boardy dusty ride to St. Paul Subterranean River National Park. After 2½ to 3 hours we arrived at the Park. We took an outrigger ride to the section of the park that has the caves and underground river. The boatman had two young boys helping him; they were about 8 and eleven years old and they were full of fun. At one point the younger boy threw a small pail of water at the older boy. Trevor asked the boatman if they were brothers and the boatman replied, "Yes, one is my brother and the other is my wife." "Your wife?", said Trevor. "Yes, my wife," he replied. It's no wonder there is so much turmoil in the world when you realize how difficult it is to communicate on a daily level with two peoples who do not speak the same language ... at least, who do not speak it at the same level ... The caves turned out to be quite spectacular. There were three species of bats in the caves and many were very active! The "ceiling" of one section of the caves is 65 meters high. One or two people in each boat carried flashlights so that the botmen could navigate the river while the passengers provided the light, such as it was. After a barbecue picnic lunch we fed the monkeys our extra bananas and "stalked" monitor lizards. The lizards were between 2½ and 6 feet long and were extremely shy. Later our boats raced back to the village where we had left the bus. One wonders if the boatmen like to race each other or they just want to get finished with us a.s.a.p.

On the way home we had to make an extra stop when the bus couldn't make it to the top of the hill. We all got out and started walking. It was a good excuse for some of us to stretch our legs so Betty Covey, Janet Armbrust and I did a long hike up the hill. The bus finally caught up with us and away we went. Arrived back at the hotel at 7. After a quick shower we headed for the dining room. We were part of the third table of the group to be seated. I tried to order a Philippine dish of noodles and fresh vegetables. No comprehende. I cleaved to my San Miguel beer. Along came Peter, who is a seasoned Philippine traveler. He ordered for me and after about 45 minutes I got a bowl of hot steaming noodle soup and nary a vegetable to be seen. The other tables had not been served. Tibby Haslam (at our table) ordered fruit (1 slice papaya, 1 banana). Trevor offered to share his large bowl of soup with her and she accepted. Then she decided on dessert. Ice cream. It came in a dixie cup-like container only about 4 times the size. Frozen solid. I helped cut it up with a sharp

knife and she shared it with Trevor. Still the other tables had not been served. Tibby finally caught our server's eye and asked for her check. The girl asked, "What did you have?" "Fruit and ice cream", replied Tibby. She went over it three times, the girl nodded and went away. Five minutes later the girl returned with, guess what? Papaya and banana! When Tibby finally did get the bill she had not only been charged for her ice cream and fruit, but also for the soup that Trevor had shared with her. That'll teach them to share! Two hours later the others were just being served. And I went to bed, hoping for a long sleep. 12:05 a.m. and a knock at the door. Room service with fresh towels and soap! Lucky me. 5:15 a.m. the telephone rang. A wake up call. Lucky, lucky me. I wonder who is NOT getting a wake up call, as I sure as heck didn't want it! Fresh towels at midnight and a 5:15 a.m. wake up call. The group swore innocence.

Off at 9:20 a.m. for a very long 4½ hour ride to Port Barton. Though most of us rode on the bus, one or two people rode ahead of us in a jeepney that carried nearly all our luggage - which was considerable. One particular couple doesn't travel light! I figure 25% of the luggage belonged to Al and Marilyn! However, I must admit that they were travelling on to the Far East after leaving us. Still ...

We travelled through mountainous areas and rich looking farm land. We saw caribou (cattle) soaking in mudholes up to their haunches, their tails swishing in and out of the mud. Emerald green rice paddies. Golden rice grains drying near the homes. At one point we came down a long hill and ahead we spotted a very modern, wide concrete bridge across a small river. In the middle of the bridge was our jeepney. Flat tire. We all got out and wandered about stretching our legs. At one end of the bridge the whole oncoming lane was taken up with coffee beans laid in the sun to dry. T'was convenient and no one seemed to mind. Anyone who came by detoured nicely around the vans. Life in the slow lane. When the jeepney was ready several of us loaded into it, as we were about to climb a very steep hill and the bus wouldn't have made it with all passengers. Yes, we did have an air conditioned bus, but the trouble was that when the air conditioning was on the bus had less power for the hills. I have a Subaru wagon that runs on the same principle. When I want to go up an extremely steep Seattle hill I have to turn off the air conditioning. And eventually that is what we had to do with the bus. Soooo, then the windows opened and with open windows we had dust. Dust like I'd never seen before. Dust that cannot be described. It permeated everything. Every few kilometers we would catch a glimpse of the Sulu Sea, then we finally turned west and reached Port Barton. This is a clean little village, very picturesque. A Swiss gentleman owns



Pete and Glenn point out collecting sites on map of Palawan.

cottages (for rent) on the beach and runs a lovely open air dining room. This establishment is known as "Swissipini". I wonder who dreamed up that clever name? After a great buffet lunch in this establishment we boarded our banca boats for an hour's ride to San Vicente and Caparii Dive Resort on the South China Sea. Our congenial group was \*%&#@ glad to be rid of our wonderful air conditioned bus! And the best part was that we had 6 wonderful days ahead in which to forget the whole ride.

Our first day at Caparii was one of total relaxation. We shelled in front of the resort and found the usual *Strombus ursellus*, various *Trochus*, *Cinera lunella*, *Cypraea arabica*, *C. annulus*, etc. I did find three new shells for my collection: *Hastula mera*, *H. anomala* and *Oliva tigridella*. A new shell a day keeps one happy! Three new shells makes for a banner day. At dinner, Shirlee Marko bought a very dubious looking bottle of wine and we all had the pleasure (?) of tasting it. I've tasted better vinegar and the consensus was that it should never have been decanted! That bottle lasted for more than one dinner, after Shirlee and Sybil Burger tried to resell it and failed. They shouldn't have let us taste it first!

The next day we snorkeled and turned rocks on Boyan Island ... about a 30-40 minute banca ride from Caparii. The shelling was profitable. *Ovula ovum*, *C. arabica* (will not mention this species again in this article ... they were everywhere), *C. asselus*, *C. quadrimaculata*, *Mitra mitra*, *Conus marmoreus*, *C. striata*, *Chicoreus brunneus* to mention a few.

Trevor seemed happy as a clam as he was finding bivalves and they are all dear to his heart. That evening we were entertained by a young dance group. They did various folk dances with rice (the harvest and all that), balance boards, bamboo castinets, etc. It made for a pleasant evening with a nice fire on the beach, starry skies and mandolins.

For the next two days we shelled Boyan Island, but made a detour to Albaguen Island for a half day. One area we worked had mangroves and we found *Thais buccinea* on the mangrove roots. *Conus spectrum* form *pica* was collected along with *C. magus*, *Oliva elegans*, *O. panniculata*, *Haliotis planata*, *H. glabra*, *Modulus tectum*, *Strombus canarium*, *Chicoreus trigonulus*, *Vexillum mirabile*, a Turrid species, *Hastula albula* plus many "old friends" that I gave away.

After dinner entertainment one night, was a man who did that ol' "walk on coals" thing. Perhaps I should look into this with my perpetually cold feet? It may be mind over matter, but there has to be more to it than that!

Our last day at Caparii was a relaxing one. Trevor, Jane Paton, Shirlee and I snorkeled near the dive resort. Found a beautiful *Fasciolaria filamentosa* and beautiful corals. Caparii Dive Resort is in quite a beautiful spot. It has a small cove or harbor in front with a rocky area, a coral area and a great sandy beach. The beach alone gave me three new *Terebra* and two new olives. The rides in the bancas were, and are, a wonderful mode of transportation. There always seems to be a good wind blowing in that area, but it didn't always keep the



Heading into the St. Paul Subterranean River caves.

mosquitoes away. Most of us did well just by keeping ourselves covered with repellent, but Shirlee claimed one night that the bugs and mosquitoes lick her repellent off and then bit her. And she did look a bit spotty. Or was it that bottle of wine? The meals were quite good, especially when one thinks about how far everything has to be transported. The service was the usual Philippine style ... slow, but friendly. After dinner on that last evening our two waiters serenaded us with Kenny Rogers's songs. A limited and unusual repertoire, but happily their enthusiasm made it all seem almost wonderful.

One afternoon we had a shell I.D. clinic. I always like these get togethers. A dozen heads are always better than one when it comes to identification. Betty Bashinsky of Birmingham, Alabama was on her first shelling trip ever, and really took advantage of these gatherings. Of course experienced shellers like Marie Weir, Barbara Hudson, Beverly O'Leary and Ann Bedford all added to our "pool of shell knowledge". Alice just showed up to model a new hat now and then! She was our "stylish" sheller and dressed with a flair! We had four Betty's on this trip - Betty B, Betty C, Betty Dostal (whom we had met on our first Philippine trip in 1991) and we had the expertise of Betty Jean Piech on this trip. And did I mention how delightful Betty Jean looks in her black tights and bathing suit? At a resort, later in the trip, some nice waiter found her a "youth" chair and it was a pleasure to have Betty Jean looking down on us for a change!

On the last morning we were up at 3:40 a.m., ate at 4 and cooled our heels waiting for the bancas for over an hour. As our schedule was tight we were extremely relieved to see the boats finally arrive. The ride into Port Barton was worth the wait. Dark at first, with the stars out, then a pinkish golden haze to the east. As we passed houses on the beach we could see the wood smoke rising from their early morning fires and it all smelled and looked so peaceful ... if that makes any sense to anyone. When we arrived at Port Barton, our Swiss restaurateur was quite disappointed that we had already eaten. He had had his kitchen staff bake fresh bread and it smelled as wonderful as the ride over! Happily Pete bought the bread and some cheese and we had a wonderful second breakfast on the bus. I must admit that the ride back to Puerto Princesa seemed a bit shorter than the ride out. I'd love to go back when they have a paved four lane highway to Barton!

Later that day, at the airport, we met three Americans who came to Palawan with Earth Watch. They spent three weeks in two villages studying nutrition with the local people. Because the fishing is bad in the Philippines (as it is in many parts of the world) a family usually has only one small fish for 6 to 7 people. There just isn't enough protein. We count our blessings. The struggle to survive continues.

Our group moved on to Cebu and Bohol and our wonderful experiences continued. Though the travel on Palawan is difficult, the discomfort is fast forgotten when one thinks of all those mental pictures stored in one's memory bank. And we were there before (long before) super highways ruin everything!

# Pronouncing That Latin

H. E. Scheidt

Have you been pronouncing the names of your shells correctly? Since these names are based on classic Latin, we consulted one of the standard authorities, Cassell's Latin and English Dictionary (Macmillan, 1987). The result was enlightening.

Words contain vowels (a, e, i, o, u, y), consonants (all the other letters), and the occasional diphthong (two vowels used together as one sound). Vowels may be pronounced two ways, either "short" or "long", depending on use. Diphthongs carry only the long sound. These sounds are:

## Short Sound

- ă - as in "again"
- ĕ - as in "met"
- ĭ - as in "hint"
- ŏ - as in "offer"
- ŭ - as in "foot"

## Long Sound

- ā - as in "father"
- ē - as in "gate"
- ī - as in "eat"
- ō - as in "open"
- ū - as in "food"

## Diphthongs

- ae - as in "kite"
- au - as in "out"
- ei - as in "stray"
- oe - as in "coil"

Consonants were pronounced as in English, with some exceptions:

- c always hard as in "car"
- g always hard as in "gate"
- i ("consonantal i," later written j) pronounced like y in yet
- r trilled
- s always as in "sign", never as in "ease"
- t pronounced without aspiration (modestly)
- v always like w as in "win"
- bs always like ps as in "apse"
- bt always like pt as in "apt"
- ch always like ch as in "chaotic"
- ph always like ph as in "top heavy"
- th always like t as in "take"

Words are divided into syllables, and every Latin word has as many syllables as it has vowels or diphthongs.

When a word is divided into syllables, a single consonant that lies between two vowels is pronounced with the second vowel. If two or more consonants come between two vowels, the last consonant is pronounced with the second vowel. The consonant groups **ch**, **ph**, **th**, and **qu** each count as a single consonant, as do "blends" -- groups consisting of a stop (**p**, **b**, **t**, **d**, **c**, **g**) plus **l** or **r**.

The prefix in a compound word, however, is pronounced as a separate syllable; e.g. *abest* is pronounced *ab-est*.

A vowel or syllable may be either long or short according to the time required to pronounce it.

A vowel is short,

- if it is followed by another vowel or **h**
- if it is followed by **nd** or **nt**

A vowel is long,

- if it is derived from a diphthong
- if it is followed by **ns**, **nf**, or sometimes **gn**
- if it is followed by contraction (e.g. *nil*, "nothing", from *nihil*)

A diphthong is always long.

A syllable is long

- if it contains a long vowel or diphthong
- if it contains a short vowel followed by two or more consonants (not a blend) or by **x**, which is regarded as a double consonant (**ks**)

A syllable is short

- if it contains a short vowel followed by another vowel or a single consonant
- if it contains a short vowel followed by a consonant blend

In words of two syllables the 1st syllable is accented. In words of three or more syllables the accent falls on the penult (next-to-last syllable) if it is long. The accent falls on the antepenult (syllable before the penult) if the penult is short.

Continued column one, next page.



Continued from previous page.

Now you know how classic Latin is pronounced. And if you understand all the rules thoroughly and have already put them into practice, you are one up on most shell collector/pronouncers. Let's examine some of the common pitfalls:

1. you can't get an English long *a* sound from an *a* in Latin. It has to come from the Latin long *ā* or from the diphthong *ei*.
2. you can't get an English long *e* sound from an *e* in Latin. It has to come from the Latin long *ē*.
3. you can't get an English long *i* sound from an *i* in Latin. It has to come from the Latin diphthong *ae*.
4. there is no Latin equivalent to the English long *u* (pronounced "you").
5. both the *c* and *ch* should sound like a *k* (as in kite)
6. *th* should sound like an aspirated *t* (as in "town", not as in "with").
7. the *v* should (like it or not) sound like *w* (as in win).

There are admittedly some fuzzy areas in pronouncing the Latin names of shells. This stems from the descriptors naming of shells species after *important* people. The term "knighting" comes to mind. If the person's real life name is pronounced one way and the rules of Latin pronunciation provide an alternative, which should be used? The name of our illustrious *OS&S* editor comes to mind Rice. Should he some day be so honored, how would such a species name as "ricei" be pronounced, "ri-kay", or "rae-sac"?

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Wilson, was actually a hoax involving a toy submarine fitted with a plastic wood neck and photographed in a small bay. The problem with the toy sub "revelation" is that the original Wilson photo is an uncropped wide-angle view which clearly shows that the object (whatever it is) is not in a bay but midwater of this immense lake with the opposite shoreline visible. And a second, little-known photo taken moments later shows the object submerging with its head/neck angle changed from about 90 degrees to nearly straight.

Giant octopuses and so-call Loch Ness monsters may not exist; skull-losing whale carcasses and shape-changing plastic wood certainly do not. It is high time that common sense and high standards of scientific evidence be demanded not only of the proponents of mystery animals, but the skeptics as well.

Sincerely,  
Richard D. Smith; Rocky Hill, New Jersey

## Melanistic & Rostrate Cowries

### A Possible Cause for Cypræid Melanism in New Caledonia

Christopher Meyer\*

Unusual rostrate and melanistic cowries from New Caledonia have been recognized since the mid 1800's. These strange, irregular forms have attracted the attention of numerous conchologists, both professional and amateur. A close examination of this phenomenon reveals that the irregular growth and pigmentation patterns are not expressed during the juvenile marginal progradation, but only during adult surficial aggradation. Thus, the irregularities must be unique to this different biomineralization mode. Also, because many species independently express this phenotype, it is assumed to be caused by an external factor unique to that locale.

The rostration and melanistic phenomena are restricted to the southwestern coast of New Caledonia. Comparison of the distribution of geologic formation reveals that there is a remarkable concordance between the presence of an eluvial ferruginous deposit and the occurrence of melanism. This geologic formation is a weathered incoherent ore deposit rich in nickel, iron, cobalt, chromium, and copper. Certain spin-stabilizing metal ions including copper, cobalt, nickel, zinc and iron are known to be involved in the formation of melanin pigments. These metal ions act as catalysts and affect the kinetics of biochemical reactions in the metabolic pathway for the synthesis of melanins. Furthermore, it has been shown that added amounts of copper not only increase the activity of the tyrosinase enzyme, but also increase the amount of enzyme transcription. The correlation of this metal rich substrate with the irregular cypræid forms and the role that metal ions play in the melanin biochemical pathway strongly suggest a causal link between the two and certainly warrants further investigation.

\*Department of Integrative Biology, University of California, Berkeley, California. Abstract in *Annual Report*, Vol. 27, The Western Society of Malacologists.

### HELP

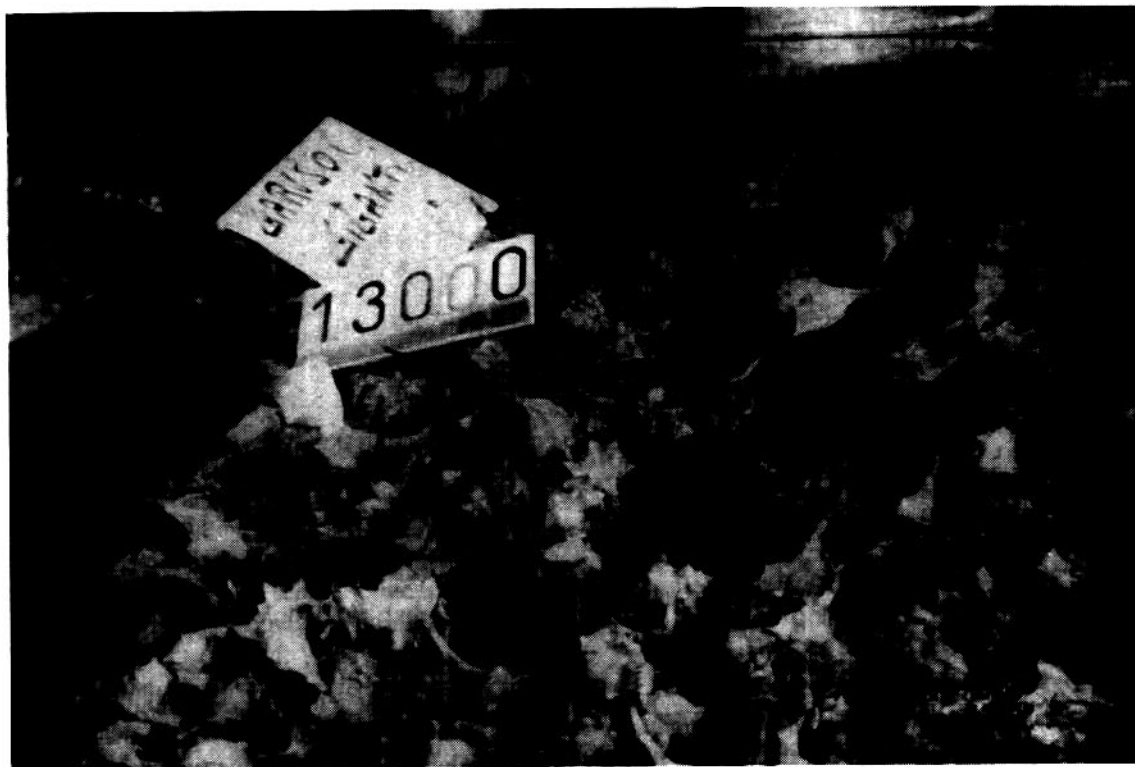
We need photographs of your favorite shell or from your last shelling trip. Or tell us the story of how you started collecting.

The only way we can fill these pages is with your help!



## Incidental Collecting on a European Tour

Jean Roe \*



The Dye Murex - *Bolinus brandaris* Linné - in the market at Venice, Italy.

When Charlie first suggested celebrating our anniversary on a trip to France and Italy with college friends from Tulsa, I didn't see the shelling possibilities of the trip. Instead, I thought of the history, scenery, statues and art we would see. But you know how shellers are. As the time for departure approached, I began to think of the beaches of the Atlantic and Mediterranean, so I managed to include two squarish peanut jars with good tight lids in our meager luggage. (It was necessary to travel light with only a roll-aboard case and small tote each, as we planned to take a night train from Paris to Rome - and, believe me, it's true that there are no porters in the train stations!)

I didn't think much about shells in Paris - it's too beautiful and there's too much to see. But the shell motif is everywhere: giant shells included in statues, shells on picture frames in the Louvre, shells on carousel horses. However, thoughts of shelling came back into our lives one night as we were eating

dinner. The entree was sole with mushrooms and, as the mushrooms were served in a side dish, we were curious about the black chunks in the sauce for the fish. "Snails," replied our waiter. Seeing my expression, he quickly added, "Is okay. Sea snails!" So we had our first taste of periwinkles.

I collected a couple of these the next day in the local market in Rouen, where Joan of Arc was martyred. The girl at the fish market kindly gave me some when I explained in limited French that I was a "collectionneur". She also gave me a couple of scallop halves (*Pecten jacobaeus* Linné) from under the counter. The periwinkles (*Littorina littorea* Linné) were salted down in a film canister and went into one of the peanut jars.

This was the start of our collecting. The next day at Mont-St.-Michel, where the tide swing is 45 feet around the beautiful eleventh century abbey on the rock, I was given one of the edible whelks (*Buccinum*



Jacob's Scallop - *Pecten jacobaeus* Linné - in fish market, Venice, Italy.

*undatum* Linné). Fortunately for us, the tide was in, so we were not tempted to check out the beach - it's full of dangerous bogs of quicksand!

A stop at the D-Day beaches on the Normandy coast gave us our first chance to actually collect on the beach. At Utah Beach I spotted two men in boots carrying a bucket and clam diggers, so we followed them to the sand (but not into the water). They were collecting the edible razor clam (*Ensis arcuata* Linné). Several of these were lying up on the beach, along with mussels (*Mytilus galloprovincialis* Lamarck) and cockles (*Cerastoderma edule* Linné). It was a beautiful sunny day, so it was difficult to imagine what a different scene took place here and at nearby Omaha Beach when the Allies came ashore in 1944. Up the hill, monuments and crosses commemorate the occasion and a large statue of General Eisenhower stands in the center of the highway.

In a small supermarket connected with the autoway (French highways are great.) I bought my first shells, a half-kilo of "amandes". This means "almonds" in French, but is actually the golden clam *Glycymeris glycymeris* Linné. These I was able to clean with Charlie's Swiss army knife, so they went into the jar - filling the first jar.

\*Portland, Texas

The second jar remained empty through Rome and Florence, as it wasn't until Venice that we found a real Italian fish market. This one was located under the Rialto Bridge just off the Grand Canal and it was part of a huge market selling produce, crafts, clothing, flowers and just about anything you might want. The fish stalls were wonderful: huge swordfish, salmon steaks, all sizes and kinds of fish, crabs, squid and shells. We found large sacks of scallops (*Pecten jacobaeus*) and were able to purchase a few. (Remember the size of the jar!) We also bought a few murex (*Bolinus brandaris* Linné), which were the source of the Tyrian purple dye that was such a status symbol in the Early Roman Empire. I encountered a little dye myself when I spotted a small *Aequipecten opercularis* Linné in amongst the squid. Holding it up, I asked in the combination Spanish-Italian we were using, if he had anymore. He said, "No", it was the end of the season. Then he called me back, hunted through the trash, and handed me two more.

The maitre d' at the hotel arranged to get the scallops and murex cooked for us. He seemed intrigued with the idea of collecting shells and asked me if I would write down the names we use for them. I asked him to do the same for me. Scallops are "Cape Sante" and the murex are called "Garusoli". When he brought them out, they were on a plate with a slice of lemon! Molte grazie! Many thanks! Such nice people!

## Common Sense and the Naming of Shells: One Collector's Viewpoint

David DeLucia \*

I have been collecting shells for the past 25 years, and during that time any things have changed. Formerly "rare" species have come on the market at reasonable prices, remote collecting localities such as Somalia have yielded hundreds of new species, and political/environmental pressures have closed off a surprisingly large area of the world to mollusk collecting.

In addition, several large shell families have been recently revised, leading to an amazing number of name changes. It seems that most of my spare time lately has been spent typing (or in some cases, retyping) labels for my shell collection. I cannot remember any time in the past where so many commonly used names have been replaced, even after being mentioned in the scientific literature for over 200 years! Clearly, the naming issue has gotten completely out of hand. What should be governed by common sense has given way to an often haphazard, illogical "splitting" system. "New" species and genera are erected daily, only to fall in a month or so to "definitive" anatomical studies. Widely disparate families are combined on one characteristic out of 100 they all have in common. Names which are featured in 99 out of 100 shell books are changed due to other, slightly "older" species uncovered through a literature search. Instead of simplifying and clarifying the overall nomenclature of seashells, many of these changes have resulted in fractured families, vaguely defined genera, and an abundance of "new" species which may or may not stand the test of time. The notion of using "common sense" in the naming of shells have been abandoned in favor of "rigorous" scientific studies which are often seriously flawed in methodology and sampling procedures.

Linnaeus inadvertently started the naming mania by setting up a nomenclatural system whereby the oldest given name for a particular shell is the correct one. So simple ... and so incredibly complicated. Without the communication systems that are taken for granted today, shells were often described by two or more scientists across several publications. Type specimens were misplaced, burned, or stolen, adding to the confusion. Many scientists named shells on the basis of juvenile or extremely worn specimens. Jousseaume, for

example, named more than 30 Red Sea *Epitonium*, which have, apparently "disappeared" today. Where did they go? Some workers believe that Jousseaume was working with mislabeled specimens with incorrect locality data. Moreover, many Malacologists were incredible "splitters", utilizing "form" names which have little nomenclatural significance. The net result is confusion compounded. Even a relatively small group such as the *Latiaxis* has undergone extraordinary revision over the last 10 years. Fifty of the approximately 150 species names have been changed in an attempt to follow the Linnaeus system. As if this wasn't bad enough, there is no end in sight ... Kosuge's recent text, *Latiaxis and its Related Groups* is already out of date and cannot be relied upon to provide current names for this family.

Along with the current plethora of new/improved species names, there have been several attempts to describe new genera across many of the popular families. Unfortunately, most of these have limited practical use and very few collectors use them. For example, some scientists have attempted to divide the cone family into 20 or more genera, many based on exceedingly minor differences in overall shell shape. This system falls apart with species that are naturally variable in shape across populations (such as *Conus magus*). Moreover, general tend to be defined using shell characters only. As even protoconchs and opercula can vary over a large series of shells, this is obviously a flawed methodology. When I first started to collect shells, at the age of 12, I tried to develop a system for naming *Murex* genera based on geographical locations. Thus, the Western Atlantic murex were assigned to "Caribbeanomurex", Red Sea shells were "Israeliomurex", and Mediterranean species were "Europeomurex". Ridiculously simple? - Yes. "Hopelessly naive?" - Probably. But that system certainly would be no worse than the mess the Muricidae is in now, where many genera have been defined on naturally variable shell characters such as the number of varices, length of spines, and overall shell shape. The list of parameters one could use for shell genera not based on shell characters is virtually endless - shallow/deep water, coral reef/sand bottom, feeding habits, rarity, predators, etc. The advantage of using non-shell characters is

that the genera themselves would then be easier to remember. Your reef-dwelling Muricid fits nicely into "Reefiomurex", while its friend from Japan has neatly been placed in "Japaneomurex." Which is easier to remember, "Japaneomurex" or "Ceratostoma"? The way genera have been named over the years amply illustrates that "common sense isn't that common"!

The International Commission on Zoological Nomenclature (I.C.Z.N.) rules mention "stability of nomenclature" as an attempt to control the amount of unnecessary name changes. Unfortunately, most scientists ignore this caveat in an attempt to get "new" species into circulation. Clearly, it is time to reconsider consider some basic issues in the naming of shells. I propose the following ideas as "food for thought" for both the beginning collector and advanced scientist:

1. If a particular shell name is changed, it cannot be altered again for 50 years, despite what contradictory information is found later.

One of the unfortunate side-effects of the naming/renaming explosion is that major shell texts go "out of date" almost immediately after publication. Even such relatively "new" publications as Shells of the Philippines and Latiaxis and its related groups contain many "errors" due to the renaming phenomenon. Older texts, such as Seashells of the World with Values emerge as quaint approximations of the current nomenclature. The "fifty year rule" would at least stabilize new names and give them a chance to "prove themselves".

2. Names which are "entrenched" in the shell literature (e.g., are mentioned in 9 out of 10 major publications on mollusks) and that have been used for at least 100 years cannot be changed, for any reason.

It makes little sense to change such well established shell names as *Panopea generosa* and *Pecten nobilis*. They are mentioned as such in virtually all shell publications, are labeled as such in the major museums, and are familiar as such to beginning collectors and professional researchers alike. What is gained by forcing a name change to fit an arcane classification system? It's easy to forget that all naming systems are completely arbitrary. Linnaeus could just have well said "the most recently assigned name for a particular species is the correct one." I hardly think he anticipated the current clamor to find the oldest given name for a particular shell. In an effort to be "correct" most

workers have forgotten the negative "ripple" effect nomenclature changes have. Collectors start losing faith in the accuracy of molluscan literature; labels are left "as is," after three previous names have been crossed out; and, most important, potential conchologists/malacologists are discouraged by an increasingly complicated and contradictory nomenclature. The message is clear; leave the established "war horses" alone!

3. After a given date, (to be decided by the I.C.Z.N.) all renaming stops.

This is my favorite suggestion, as it has a wonderful surrealistic quality. "The Day the Naming Stopped" would probably not be a sci-fi box office hit, but would be interesting viewing nonetheless. Obviously, a complete shutdown of nomenclature "progress" is as undesirable as the current naming blitz. However, an imposed period of "frozen" names might give some workers a chance to thoroughly examine literature and come up with alternate ways of handling the inevitable contradictions that occur.

One of the handicapped preschool children I work with calls all items from the sea "shells". Thus, a smooth sand dollar is named a "pretty shell," whereas a prickly sea urchin becomes a "hurt-hand shell". Perhaps our leading taxonomists can learn from this precious attempt to make sense out of an increasingly complex world.

\*Middle Town, New York

## HIGH HOPES

The creatures of the sea abound  
In shapes and sizes quite bizarre  
Unfortunately I have found  
I cannot tell just who they are.

The names I know now lie neglected  
And it's often bothered me  
That a new name be selected  
By authorial decree.

In the Great Beyond I'm expectantious  
That the collecting will be fabled  
And the specimen so gracious  
As to be found correctly labeled!

HAL SCHEIDT



## R. Tucker Abbott 1919-1995

Dr. R. Tucker Abbott, Director of Sanibel's Bailey-Matthews Shell Museum, died November 3, 1995 following a long illness.

The author of more than 30 books on malacology, Dr. Abbott was one of the world's best known and respected experts on Mollusca. Born in 1919 in Watertown, Massachusetts, he was a 1942 graduate of Harvard University. Following his World War II service as a Navy dive bomber pilot, Abbott earned his Master's Degree at George Washington University in 1953 and his Ph.D. in malacology in 1955. After eight years as curator of Mollusks in the Division of Mollusks of the National Museum of Natural History, Smithsonian Institution, he was curator and chairman of the Department of Malacology at the Academy of Natural Sciences of Philadelphia from 1955 to 1969. In 1970 he was appointed Assistant Director of the Delaware Museum of Natural History in Wilmington. He left that position in 1977 to establish his own publishing company, American Malacologists, Inc. in Melbourne, Florida.

Dr. Abbott became associated with the Bailey-Matthews Shell Museum in 1989, when he was retained as a scientific consultant. That same year, he was named Founding Director. In 1992 he was appointed Museum Director, a post he held until his death.

Dr. Abbott is survived by his wife, the former Cecilia White, his son, Robert T. Abbott, Jr.; daughters Carolyn Tucker Palmer, Cynthia Douglas Sullivan, Cheryl Robin Nelson, Jonna Leigh Robson, Erika Vonder Heyden, and five grandchildren.

The family requests that in lieu of flowers, contributions be made to the R. Tucker Abbott Memorial fund at the Bailey-Matthews Shell Museum, P.O. Box 1580, Sanibel, FL 33957 USA.

Tucker will be buried at Arlington National Cemetery. A Memorial Service is being planned during the Sanibel/Captiva Shell Show.

### E-MAIL

You can now contact us through email. Our email address is [ofseashr@pacific.telebyte.com](mailto:ofseashr@pacific.telebyte.com).

If you can access the internet there is a home page called "Spence's Shellware Page" at:  
<http://www.slip.net/~spence/>

## Through the Years With Dr. Abbott

Eric Jay Dolin

There are moments in life when things come full circle, and the past and present are connected in a very special way. One of those moments occurred in my life on a hot, overcast day on Sanibel Island, Florida, this past August. At the end of a day spent shelling, I spoke with Dr. R. Tucker Abbott for over an hour, drawing out memories that spanned nearly 25 years, and which made clear, once more, how important shell collecting is to me.

It was the summer of 1972, when I was ten years old, that my dad took me to a Coney Island, Marine Life fair to hear Dr. Abbott speak. Under a big-top tent I listened to the man whose Golden Guide, *Seashells of the World*, had been my shell collecting bible for two years. I was not there as a novice, but as a "seasoned" collector, a member in good standing with the Hawaiian Malacological Society and the New York Shell Club, who had scoured the beaches of Long Island Sound, and saved up his lawn-mowing money to buy exotic seashells at the Collector's Cabinet and Mal-de-Mer in New York City, and from dealers in other parts of the world. I even catalogued my specimens, numbering them with ink, covered in clear nail polish, and writing down all the relevant information on 3x5 index cards.

After the talk, I dragged my dad to the front of the tent where I introduced myself, asked a few questions, and got Dr. Abbott to sign my program. While other kids had baseball players and rock stars as idols, I had this shell collector, the "Dean of Malacology," with the unusual, and unforgettable name.

In the following years my collection and devotion to shell collecting grew, as did my malacological library. *Kingdom of the Seashell*, *The Shell*, *500 Million Years of Inspired Design*, *The Collector's Encyclopedia of Shells*, etc., joined the *Seashells of the World*, adding to my knowledge of, and excitement about shells. I was not happy, however, just collecting pretty specimens; I wanted to learn about the Gastropods and the Cephalopods, the mantle and the adductor muscle, the pearly nacreous layer and the periostracum.

By the time I reached high school, I was giving slide lectures to local libraries and school groups. During my senior year, I transformed my love of shells into a 147-page senior paper, titled "The Molluscs of Long Island Sound." I was lucky enough to have two chapters of this



tome published in *Of Sea and Shore*. More importantly, this report created a bridge between high school and college. While writing the report, I was accepted to Brown University. In my application, I professed my desire to study marine biology and to, one day, become a professional malacologist. "The Molluscs of Long Island Sound" was partial proof that this was a well thought out decision. If the admission's office needed more proof, they could look at the pictures of my shell collection I had presented at my interview, and the recommendation that Dr. William K. Emerson, then Curator of Invertebrates at the American Museum of Natural History, had written on my behalf.

Brown lived up to my hopes. I pursued a course in biology and continued giving lectures on shells to local schools and garden clubs. At the end of my freshman year, my interest in shells became the talk of the campus when the Brown Alumni Monthly wrote an article that feature me and was titled, "The Admission's Office Called Him 'Shell Man'." And that summer I worked under Professors Ruth Turner and Kenneth Boss in the Mollusk Department of Harvard's Museum of Comparative Zoology.

As my college years passed, I became increasingly interested in environmental policy and ended up majoring in that field, and then going on to other schools to get a masters and Ph.D. in environmental management and policy. Throughout this time, I drifted away from my earlier passion for shells and shell collecting, yet I never lost my love for them. Trips to the shore still found me scouring the surf, and telling my companions about the lives of Mollusks. That is why, when I found I was traveling to Tampa for business, I knew I had to visit Sanibel island as well -- the seashell capital of the United States.

Coincidentally, just before my trip, the *Smithsonian* magazine published an article on shelling on Sanibel island (August 1995 -- "Seeking gifts from the sea, Sanibel-style"). It focused on Dr. Abbott and his successful efforts to site the Bailey-Matthews Shell Museum on this sheller's paradise. Reading the article got me very excited, but my spirits sagged a bit when it said that the museum was not scheduled to open until November. My trip was at the end of August, meaning I would miss the museum by a few months. And who knew when I was going to be back.

Nevertheless, on August 30, at 2:30 in the morning I dragged myself out of bed, walked outside of my hotel in downtown Tampa, and started the rental car on its way to Sanibel. Three hours, and two cups of coffee later, I pulled into the parking lot at Bowman's Beach, on Sanibel, and walked, expectantly, along the deserted path to the shore.

And there it was. Beach as far as the eye could see, and shells everywhere. I had hoped to find specimens of *Scaphella junonia*, *Cryptopleura costata*, and *Ficus communis*, but I knew that it was rare to find such beauties washed ashore, and rarer still to find them whole after being pounded by the waves. What I did find, while assuming the position of the famed "Sanibel-stoop," were excellent specimens of *Atrina serrata*, *Atrina rigida*, *Argopecten gibbus*, *Plicatula gibbosa*, *Arcinella cornuta*, *Dinocardium robustum*, *Macrocallista maculata*, *Terebra dislocata*, *Noeta ponderosa*, and *Lucina pectinata*.

Next, I was off to Turner's beach, where, a local resident told me, the best shells were to be found. He was right. In the surf, and among the flotsam and jetsam were *Phyllonotus pomum*, *Sinum perspectivum*, *Arca zebra*, *Busyon contrarium*, *Crepidula fornicata*, *Neverita duplicata*, *Vermicularia spirata*, *Oliva sayana*, and a juvenile *Pleuroploca gigantea*. Most exciting to me were the many *Strombus alatus* I found in the shallow pools that marked the transition between ocean and land. These thick-lipped fighters, after being rolled in by the waves, came to rest inches beneath the sand, with only their knobby spires hinting that they were there.

Shells were not my only companions on the beach. Egrets, cormorants, sandpipers, gulls, and a small group of Roseate Spoonbills all joined me at various times. The upper reaches of each beach were littered with the casualties of the red tide that was growing offshore. Snook, Puffer Fish, Cowfish, and a lone, juvenile Hammerhead Shark added to the sights and smells of the day.

Late in the afternoon, I wiped the sand from my feet, placed the shells in the trunk and began driving off the island. At 4:05 I passed a sign for the Bailey-Matthews Museum. Looking beyond the sign, I saw the Museum itself and there were people coming out of its front door.

How can this be, I thought? The museum is not supposed to be open until November. I pulled into the parking lot, and, although the sign said the museum closes at 4:00, I ran in the front door and came face-to-face with a somewhat startled looking woman at the front desk. I was so excited, I'm not sure what I said to her. Nevertheless, after a few minutes I learned that the museum, though not officially open, did allow visitors, and, yes, I could take a quick look at the exhibits which were in various stages of completion.

When I mentioned that I had met Dr. Abbot years ago, the woman asked if I would like to go upstairs and say hello to him. So it was, that after a quick spin through

the museum, and the gift shop, where I purchased Dr. Abbott's new book, *Compendium of Seashells* (co-authored with Peter Dance), I took the elevator to the second floor and sat down, face-to-face with Dr. Abbott to talk about old times and that which had transpired since.

Dr. Abbott was just as I had remembered. Despite his deteriorating health, he was inviting, engaging, and excited to talk about shell collecting -- the ultimate ambassador for Malacology. He was proud of the museum, as he should be, and deeply immersed in the search for a curator who could help make it the premier showcase for the science, history, function, form, and art of shells.

Strewn about his office was everything from recent issues of the scholarly journal, *The Nautilus*, which he edited for 28 years, specimens from various locales, drawings of shells, and paper, paper, paper. One wall even sported an extremely tacky clock, that had shells glued to its face, which Dr. Abbott liked precisely because it was so "bizarre".

As with any reunion of old acquaintances, you not only tell your life's story, albeit in abbreviated form, but you also relive it yourself. I was a little kid again, spending hours on the beach, arranging my collection, and telling others about the wonders of shells. I also heard Dr. Abbott tell stories about shelling on Sanibel, the creation of the museum, and malacologists I had known or read about. I was greatly amused when Dr. Abbott told me about how the incidence of finding *Junonia* on the beach rose sharply right around the holidays when tourism is at its peak. Local hotel and resort owners purchase the shells and "seed" the beach so that their patrons can experience the joy of finding a beautiful shell that they can take home.

Our discussion of shells on postage stamps made me most excited, for in the year before my trip to Sanibel, I seriously began collecting such stamps. Talking to Dr. Abbott about shell stamp collecting was especially fitting because he, too, is a molluscan philatelist and is very knowledgeable on the subject. But more importantly, there was a certain element of historical symmetry to our conversation. Our meeting on Coney Island took place near the beginning of my shell collecting period, and this meeting was taking place near the start of my involvement in stamps. And both meetings inspired my efforts.

Unfortunately, after more than an hour of talking about the past, present, and future. I had to get back to Tampa. Dr. Abbott and I walked out of the museum and parted company. As I walked to my car, and took a last

glance at Dr. Abbott and at the museum, I broke into a grin. What had been a great day had, because of this chance meeting, become a truly memorable one.

On the drive back I thought about what shell collecting has given me over the years. An abiding appreciation and respect for nature, a love of the ocean, curiosity about science, an understanding of form and function, and the drive to learn about the world and to never stop asking questions. I also thought about Dr. Abbott and the positive impact he has had on my life. It has been a great gift to have known him and to have learned from his work.

## Harold W. Harry

Dr. Harold W. Harry died on June 30, 1995, at his home in Bellaire, Texas after many months of care resulting from removal of cancerous brain tumors. We give our love and support to his wife, Mildred.

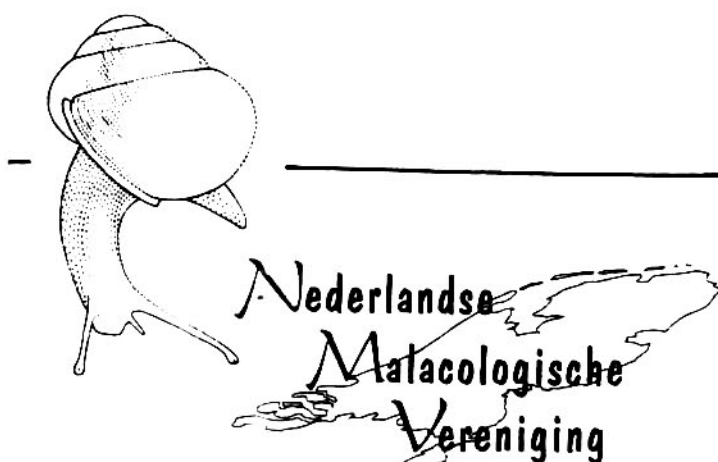
A celebration of his life was held in a service on July 23rd in Rice Chapel at Rice University. A number of his students offered special tributes for his guidance as they pursued their studies to obtain Ph.D's.

Dr. Harry earned his Ph.D. at the University of Michigan and served in the following capacities: Research Assistant in Limnology at the Academy of Natural Sciences of Philadelphia, supervisory zoologist in Civil Service at Walter Reed Institute of Research which led him to study the epidemiology of Schistosomiasis for three years in Puerto Rico, Chief Pharmacist Mate in the U.S. Navy, 1942-46, and Professor of Marine Biology, Texas A&M University. Post-retirement research led to important publications on worldwide oysters. He travelled to major museums for this study, helping to update collections and seeking information.

Active as a research associate at the Houston Museum of Natural Science, he was especially aware of the fine Malacological library in the Department of Malacology and the material in the Northwest Gulf Mollusk Population Study. From time to time, he donated some of his own library and some of his own mollusk collection to the museum. Now, he has left his valuable library of books, research materials and microscopes to the museum. He was especially interested in having the Houston museum's malacological collection become of worldwide importance.

CONNIE BOONE in *Texas Conchologist*, XXXII, No. 1, October, 1995.

## With the Societies



The Netherlands Malacological Society (Nederlandse Malacologische Vereniging, NMV) was founded in 1934, to coordinate and to promote the study of molluscs in The Netherlands. At present the NMV has about 500 members, in The Netherlands as well as abroad. The members take an interest in a wide range of topics within malacology: marine and non-marine molluscs, tropical shells, fossils, books on malacology/conchology, systematics, anatomy, molluscs on stamps, etc. Among its members are professional Malacologists as well as amateurs.

The NMV organises a number of activities for its members. Each year two general meetings are held during which members or invited speakers give lectures or demonstrations. Once a year a one-day symposium is organised around a central theme, or a field trip is arranged to some part of The Netherlands or its neighboring countries.

The NMV publishes two periodicals. Basteria (about 200 pages yearly) includes scientific papers in the English, Dutch, German or French language. It is issued twice yearly. The NMV newsletter (Correspondentieblad, about 160 pages yearly) contains reports on NMV-activities, notes and short papers reflecting the interests of the members. It is written in Dutch (with English summaries). The newsletter appears six times a year.

At present, full membership including both Basteria and the Correspondentieblad costs 62.50 Dutch Guilders (NLG 62.50, about 41 U.S. Dollars) yearly. As a rule the Correspondentieblad is sent to members living outside The Netherlands and Belgium at special request only.

Those wishing to have more information, or wishing to join the Netherlands Malacological Society, may write to the Hon. Secretary: Dr. A.S.H. Breure; Van Schagenplantsoen 8; NL-2741 EN Waddinxveen, The Netherlands.

### WESTERN SOCIETY MALACOLOGISTS

The Western Society of Malacologists will hold its 1996 meeting from 23-27 June at the Handlery Hotel and Country Club, San Diego, California. Symposia on the Biology and Evolution of Cypraeoidea, Functional Morphology & Natural History of Molluscan Feeding and Invertebrate DNA: Prospects and Problems are included in the schedule. Field trips to Seaworld, fossil sites, the Stephen Birch Aquarium at Scripps, and several scuba diving possibilities are mentioned. For further information and details contact: H. Bradner, President WSM; 0225 University of California San Diego; 9500 Gilman Dr.; La Jolla, CA 92093-0225. Phone (619) 459-7681; Fax: (619) 459-0657; email: hbrander@ucsd.edu.

### C.O.A. 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.

The above was adopted at the Conchologists of America convention in San Diego, California following a panel discussion on June 25, 1995. There is growing concern with the multiplying governmental efforts to restrict or completely ban shell collecting in various places around the world.

If you're serious in your concern about preserving your rights to continue collecting shells, please consider joining a national organization, such as the Conchologists of America. Dues are \$12.50 for U.S., \$15 for Canada. Send to Bobbie Houchin, 2644 Kings Highway, Louisville, KY 40205-2649.



## OCTOPUS ENCOUNTER AT SLANT ROCK

Roland C. Anderson



Photograph by Leo Shaw

Along the shores of the North Pacific grow the world's largest octopuses, *Octopus dofleini*. Octopuses (the preferred plural nowadays) in general have been maligned in fiction, folk lore and cinema. A classic example of the exaggeration of octopuses' size and strength occurs in Victor Hugo's novel *Toilers of the Sea*, first published in 1866. Among many other mis-statements, Hugo called the octopus "a glutinous mass, endowed with a malignant will... a monstrous embodiment of disease."

In the 170 years since Hugo published his book we have learned that octopuses are not monsters but are intelligent creatures who *as a whole* are shy and retiring beasts who *generally* would rather live in a cave than have contact with humans. I put "as a whole" and "generally" in italics because recent evidence shows differences in behavior of individual octopuses (see Mather and Anderson, 1993, "Personalities of Octopus," *J. Comp. Psych.*, 107(3):336-340). We learned in a recent issue of *Of Sea and Shore* that the existence of *Octopus giganteus* is a myth. Certain other characteristics of octopuses may also be myths. Here is a report on the activities of a giant Pacific octopus that was bold and aggressive instead of shy and retiring.

A crew from the Seattle Aquarium was collecting animals for the Aquarium at Slant Rock on Cape Flattery on the northwestern-most corner of Washington State. This area is one of the most scenic seascapes in the state. Rocky cliffs plunge dramatically into the cold Pacific Ocean. Upwelling at the entrance to the Strait of Juan de Fuca keeps the water usually cold and clear. This upwelling provides nutrients to the filter feeders and hence to other organisms. The vigorous wave action on the rocks (20-foot swells are common) provide oxygenation. Octopuses in the area are usually small (10-20 pounds), possibly because of the high energy environment - sixty pound octopuses are common in nearby protected Puget Sound.

Slant Rock is a tilted flat slab of rock projecting up out of the water a hundred yards from the shore just inside the Strait. Behind it is the scenic Titicoclos waterfall. Last summer the Aquarium collecting team was attacked here by a giant Pacific octopus.

The collecting crew, composed of three scuba divers, was gathering adult rockfish (*Sebastes* spp) using a barrier net, a net made of transparent monofilament mesh that the fish are trapped in. The

net is set upright from the bottom and a school of rockfish are herded into it by divers. The fish get caught in the net by the spines on their cheeks. The divers then un-snap the fish and place them in plastic bags. Two Aquarium divers were herding fish into the net while a volunteer who was observing the technique waited at the net. While waiting, the volunteer scared a rockfish into the net and decided to bag it before the other divers got back. While doing this the diver noticed a small giant Pacific octopus had crawled up to the net and was "flared" across it. The octopus was about fifteen pounds and six to seven feet across. The diver thought the octopus was trying to get the snagged rockfish. While this was happening, the other two divers returned and helped the volunteer finish bagging the fish.

Meanwhile, the octopus moved to the divers, reached out arms to each diver and grabbed onto them. It actually pulled a dry glove off one diver, causing him great aggravation and a leak of cold water up his arm. The divers pushed the octopus away gently, thinking that would be enough to scare it away. The divers then picked up their gear and moved to another area of the reef to continue collecting on top of a ridge. While hanging in the water five to six feet off the bottom they were surprised to see the octopus crawling toward them. It jetted up off the bottom and "attacked" again, doing a web-over pounce onto a diver. The diver wrestled the octopus off whereupon it went to another diver. The divers could not get rid of the animal. They tried "shooing" it away, they tried gently hitting it, they tried swimming away from it; it continued to follow them. It "attacked" two divers twice each and the third diver once. This so broke up the concentration of the divers that they gave up the fish chase and surfaced to their support boat overhead. The octopus didn't follow them to the surface. I was driving the boat for their pick-up and can attest that they all surfaced laughing about the "horrible octopus attack."

Now a fifteen pound octopus with arm span of five to six feet is by no means a monster. Its "attack" on the experienced divers was comparable to a puppy worrying a shoe lace. But as a puppy might chew through an electric cord, so too might a small octopus do damage in an encounter with a diver. A giant Pacific octopus has a formidable beak that could tear a diver's suit or flesh. The octopus can inject a venomous saliva into a bite. It could easily pull off a diver's mask or regulator, exposing the diver to panic or lack of air. I think it was obvious the octopus was originally after the struggling fish in the net and perhaps associated the divers with that potential food rather than having any idea of attacking the divers.

However, if an 80-100 pound octopus were to attack a diver, the outcome could be very different. Instead of laughing as they surfaced, some divers

might not have surfaced at all. Fortunately, most large giant octopuses are "pussycats" and it's been my experience that the larger they are, the more sedate they are. Maybe less aggressive octopuses live longer and get bigger than aggressive ones. The aggressive behavior of the octopus at Slant Rock certainly made it more susceptible to predation or taking by an Aquarium collecting crew, and it provided an entertaining interlude for three working scuba divers.

My thanks to Jeff Christiansen, Bill Robertson and Steve Blazina for sharing their octopus encounter with me.

Are linguists people who eat tree snails?

## Adopt-A-Drawer

Have you ever wanted to help curate a major museum's fossil collection? Now you can! The installation, in early 1995, of nearly 2000 new compactorized drawers in the Paleontological Research Institution collections offers PRI members and friends a special opportunity to become personally involved with the ground-up renovation of one of the nation's largest collections of invertebrate fossils and shells. PRI collections staff are now engaged in the process of rehousing much of the Institution's collections in the new drawers, and they need your help, and involvement.

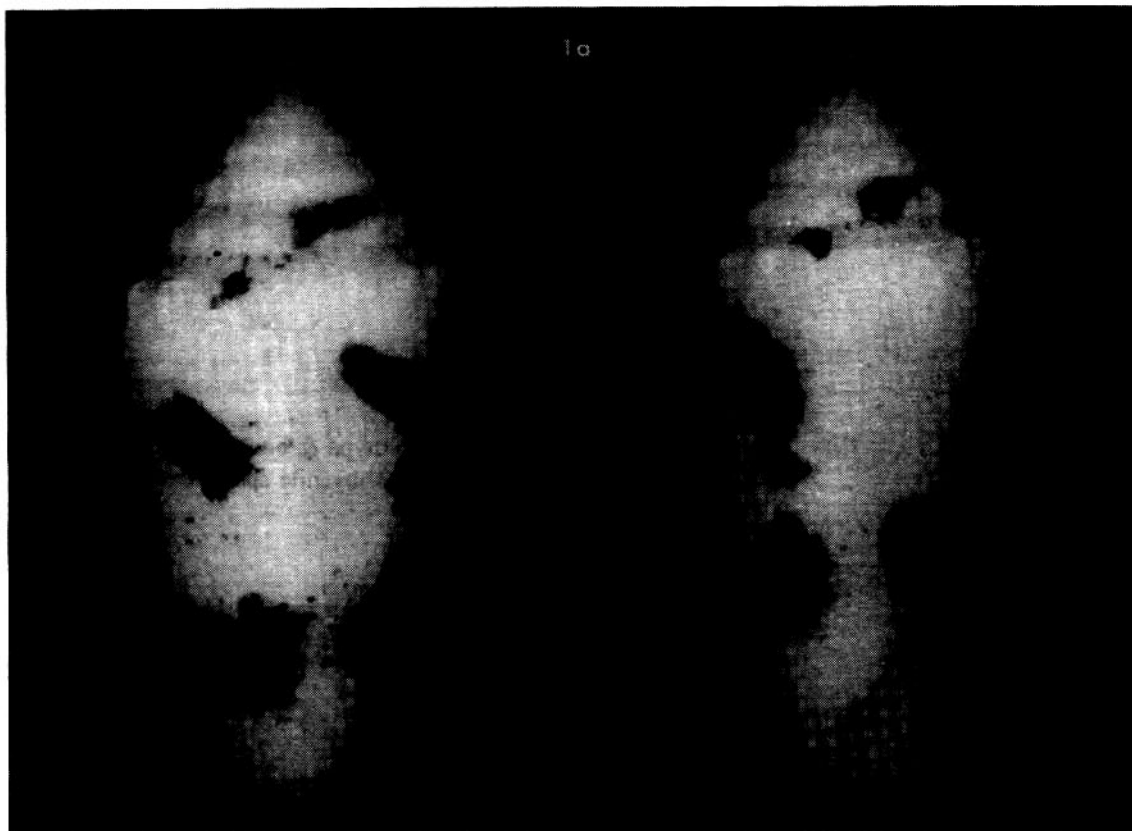
The Adopt-a-Drawer program allows you to sponsor one new drawer of fossils or Recent shells. For a contribution of \$100 a year, you will receive a photograph and full description of the drawer and its contents and annual bulletins as about the state of curation of your drawer and the entire collection. You can correspond with collections staff and learn as much as you want about your adopted specimens. It's a great educational gift for an aspiring biology or geology student. Your contribution will support the costs of staff and supplies as we continue to reorganize, conserve, and curate the PRI collections of more than 1.6 million specimens.

For more information write: Adopt-a-Drawer; Paleontological Research Institution; 1259 Trumansburg Road; Ithaca, New York 14850.

Information contributed by Brian D. Gregory



## Recently Described Shelled Marine Mollusks



Holotype of *Conus julienanreae* Cargile, 1995

***Conus julienanreae* Cargile, 1995**

From: offshore eastern Honduras

Described in *La Conchiglia* #275, April-June 1995.

A member of the *Conus cedonulli* Linné, 1767 complex and the original specimens were collected at a depth of 3 to 10 meters in sand pockets among rocks and coral, Cayos Caratasca, Honduras. The holotype measures 23mm in length. The author compares the new species to *Conus aurantius* Hwass in Bruguière, 1792; *C. harlandi* Petuch, 1987; *C. granarius panamicus* Petuch, 1990; *C. curassaviensis* Hwass in Bruguière, 1792; and *C. consobrinus* Sowerby, 1850. It is most similar to *C. aurantius*, but is radically smaller and has a greater relative spire height, and more numerous shoulder nodules.

***Conus barbieri* G.R. Massilia, 1995**

From: shallow water, South Samar Island, Philippines

Described in *La Conchiglia* #274, Jan.-March, 1995

Another member of the *Conus textile* group, this is closest to *C. aureus* Hwass, 1792. It was collected

intertidal under rock, in a muddy and rocky bottom inside the reef. The habitat is harsh with strong currents and waves and thus most specimens are badly scared, broken and the lip and most of the large specimens were dead collected. The holotype is 27.6mm, with paratypes ranging from 20 to 40mm in length. The most obvious distinguishing characteristic of the new species is the dull white, well calcified protoconch.

***Conus evorai* Monteiro, Fernandes & Rolán, 1995**

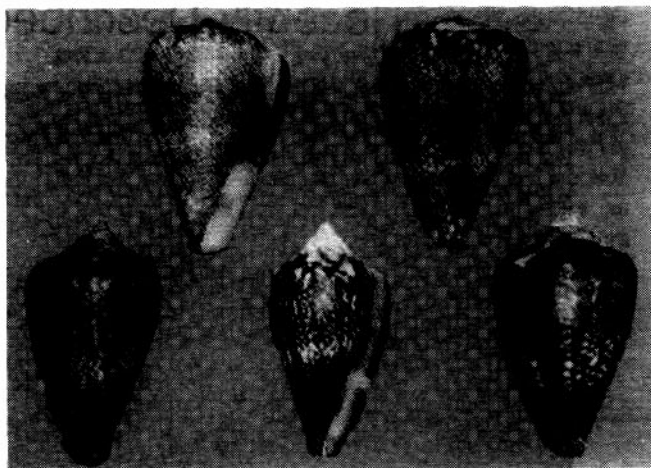
From: Cape Verde Islands, West Africa in shallow water.

Described in *World Shells* #12, March 1995

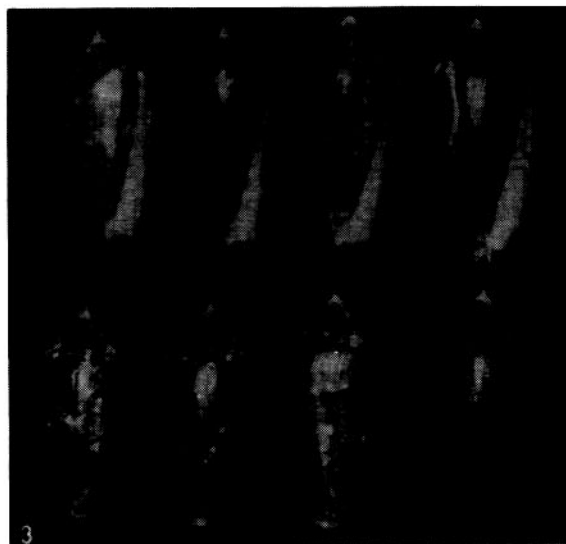
The new species most closely resembles *C. delanoyi* Trovao, 1979. But the authors separate the new species saying that *C. delanoyi* (referring to it as *C. delanoyae* as it was named after a lady) is generally larger (reaching about 35mm, versus approximately 15-19mm for the new species) and its spire is somewhat concave versus moderately convex in *C. evorai*. The shoulder in *C. delanoyi* has dark and white spots more clearly marked. Radular differences are also noted.



Holotype of *Conus evorai* Monteiro, Fernandes & Rolán, 1995



Top row: holotype & one paratype of *C. evorai*;  
bottom row: 3 juvenile specimens of *C. delanoyae*



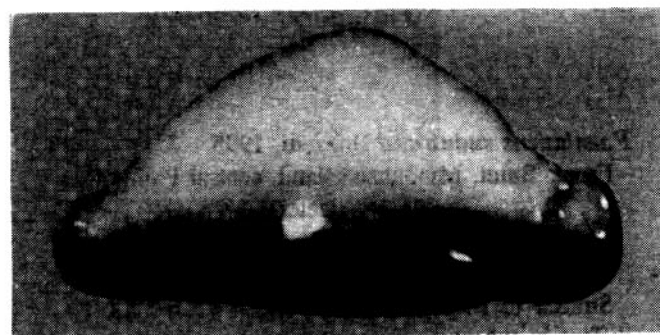
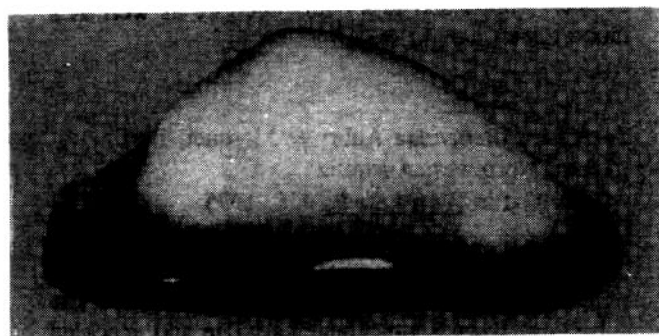
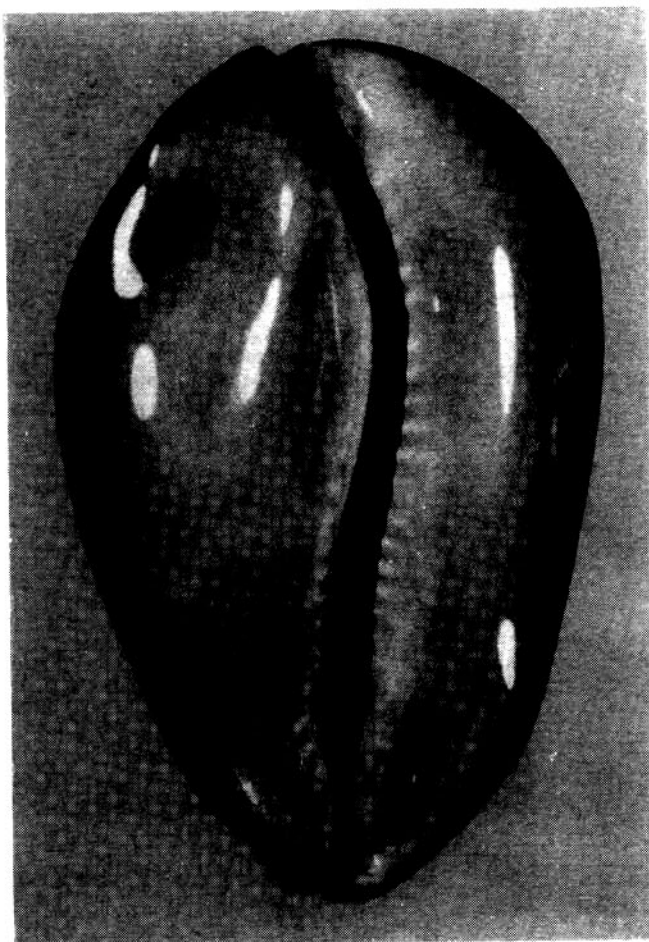
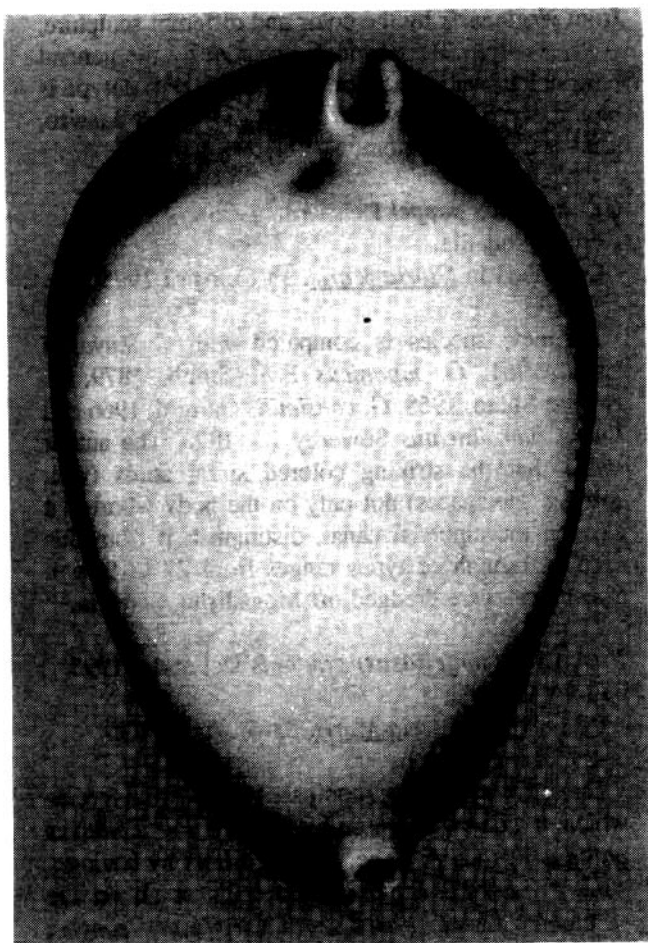
Holotype and paratypes of *Conus barbieri* G.R. Massilia, 1995



Holotype of *Conus barbieri*

*Cypraea (Zoila) lobettiana* L.R. Massilia, 1995  
From: Great Australian Bight, 200 meters  
Described in *World Shells* #13

Originally thought possibly a form of *C. rosselli* it has now been newly named. Most striking, initially, is the color: inside an off-white, dorsum snow-white, base and margins a bright orange-yellow! Shape and teeth are other characteristics distinguishing the two species.



*Cypraea (Zoila) lobettiana* L.R. Massilia, 1995      Holotype

Deep water shell traps and tangle nets in the Philippines have yielded, over recent years, many interesting and new species of shells. In 1988 Emerson and Moffitt erected a new genus *Falsilatirus* with the original type species, *Falsilatirus pacificus* Emerson & Moffitt, 1988 from traps in deep water off the Mariana Islands. Now a second species of the

genus has been described, this one from the traps in the Philippines. The genus has tentatively been placed in the family Fasciolaridae, based mainly on the prominent spiral columella, but other shell characteristics make this assignment questionable; soft parts, when available, may help solve the situation.



*Falsilaticus suduirauti*

***Falsilaticus suduirauti* Bozzetti, 1995**

From: Balut, Mindanao Island, central Philippines,  
140-180 meters

Described in *Apex* Vol. 10(1), April 1995

Similar to *F. pacificus* in general characters, this differs in the uniform staining (pale yellow), in the more numerous axial nodules (7 versus 5), spiral primary cords (6-8 versus 3-4 on spire whorls, 18 versus 12 on body whorl) and labrum denticles (8 versus 6) and in the more developed siphonal canal. The holotype measures 32mm as does the paratype.

***Latirus (Polygona) devyanae* Rios, Costa & Calvo,**

From: off Rio de Janeiro, Brasil 1994

Described in *La Conchiglia* #273, Oct/Dec. 1994

The authors state that the species is quite distinct from all others found in Brazilian waters, having an arched siphonal canal. It also differs from *L. ogum* by the absence of large nodules; from *angulatus* in being more elongate and in having a finer sculpture. *L.*

*devyanae* does not reach the size of *L. infundibulum*; from *virginensis* by the color and different sculpture. And, finally, differs from *L. lacteum* by the general morphology and the color. Length of the holotype is 35mm. Type locality is off Cabo Frio, Rio de Janeiro, sand and gravel bottom, 140 meters depth.

***Granulifusus poppei* Delsaerd, 1995**

From: Somalia

Described in *Gloria Maris*, 33(6), April 1995

The new species is compared with *G. hayashii* Habe, 1961, *G. niponicus* E.A. Smith, 1879, *G. kiranus* Shuto, 1958, *G. consimilis* Garrard, 1966 and *Fusus rubrolineatus* Sowerby III, 1870. The author states that the striking colored spiral cords (with shining interspaces) not only on the body whorl, but also on the siphonal canal, distinguish it from this species. Length of types ranges from 27 to 51mm. Specimens were dredged off Mogadishu, Somalia.

***Fusinus (Simplicifusus) guidonis* Delsaerd, 1995**

From: Somalia

Described in *Gloria Maris*, 33(6), April 1995

The new species is compared with two species which it somewhat resembles. From *Pseudolaticus pallidus* Kuroda & Habe, 1961 it differs by having a straight siphonal canal and no folds at all on the columella. From *Fusinus (Simplicifusus) simplex* (Smith, 1879) it differs in a shorter siphonal canal, swollen whorls and less ovate aperture as well as a much lighter weight shell.

***Terebra whiteheadae* Aubry & Marquet, 1995**

From: Northwest Australia

Described in *World Shells* #13, 1995

Measuring 34mm (holotype), the ground color is very glossy and varies from light to dark brown. The subsutural band is porcelainous white and speckled with dark brown randomly distributed spots. Before the sutural groove, many of these spots are underlined by a small dash of the same color. The columella is white and straight; the aperture is square. In the article the authors make extensive comparisons with nine other Indo-Pacific species.

***Terebra fernandae* Aubrey, 1995**

From: Somalia

Described in *World Shells* #13, 1995

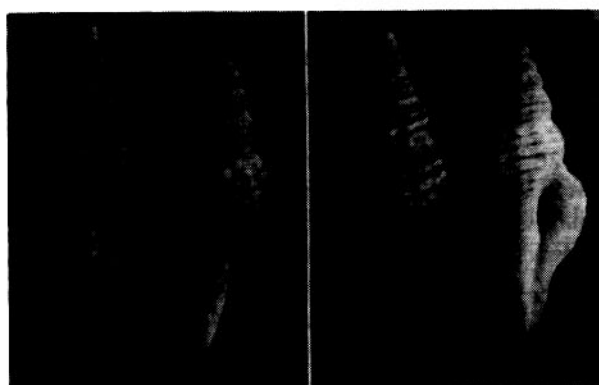
Specimens have not measured more than 34mm in length. The color is white with very evident fine, irregularly distributed, brown speckling on the subsutural band. This band is formed of small nodules

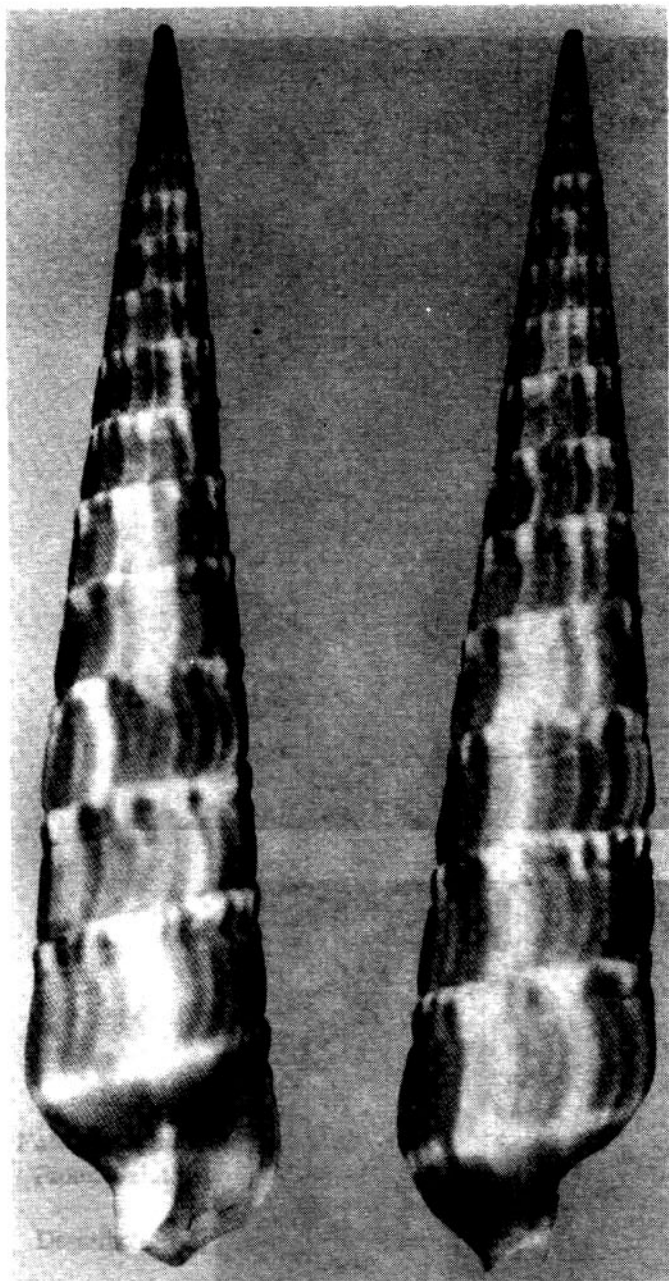




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Top: *Latirus (Polygona) devyanae* Rios, Costa & Calvo, 1995. Center: *Fusinus (Simplicifusus) guidonis* Delsaerd, 1995. To right: *Granulifusus poppei* Delsaerd, 1995.





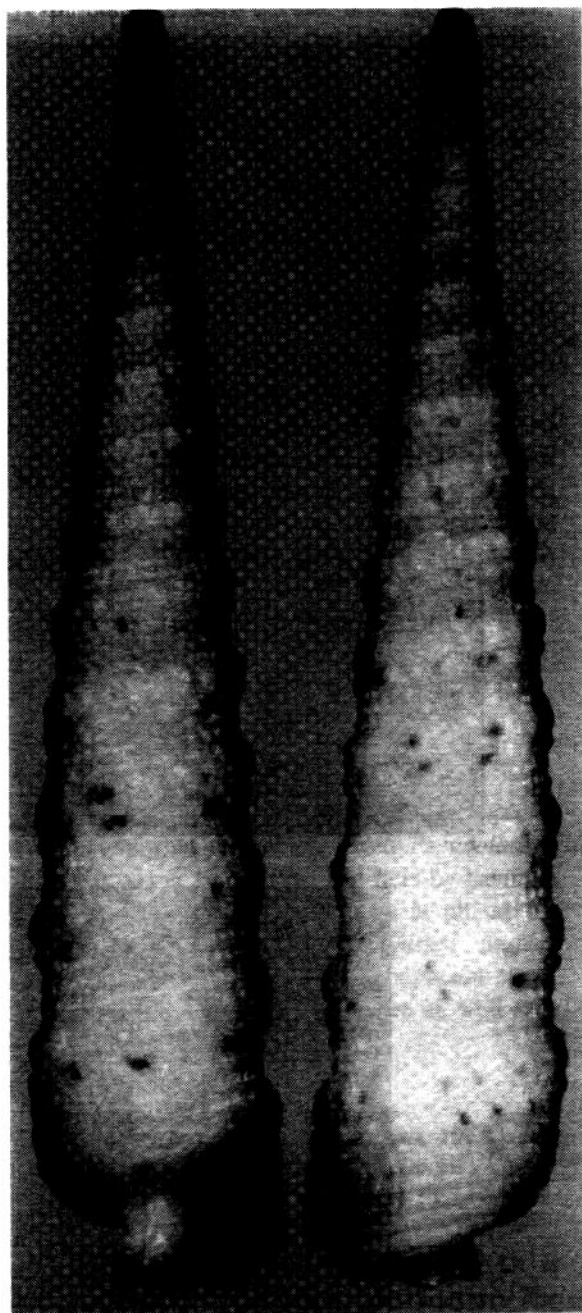
*Terebra whiteheadae*

arranged in two rows, separated by a deep groove, of which the posterior one is most prominent. There is spiral sculpturing and axial ribbing - creating a honeycomb pattern. The columella is very curved, almost hooked. The aperture is square. With comment and illustrations the author compares the new species to six others.

*Terebra moolenbeeki* Aubry, 1995

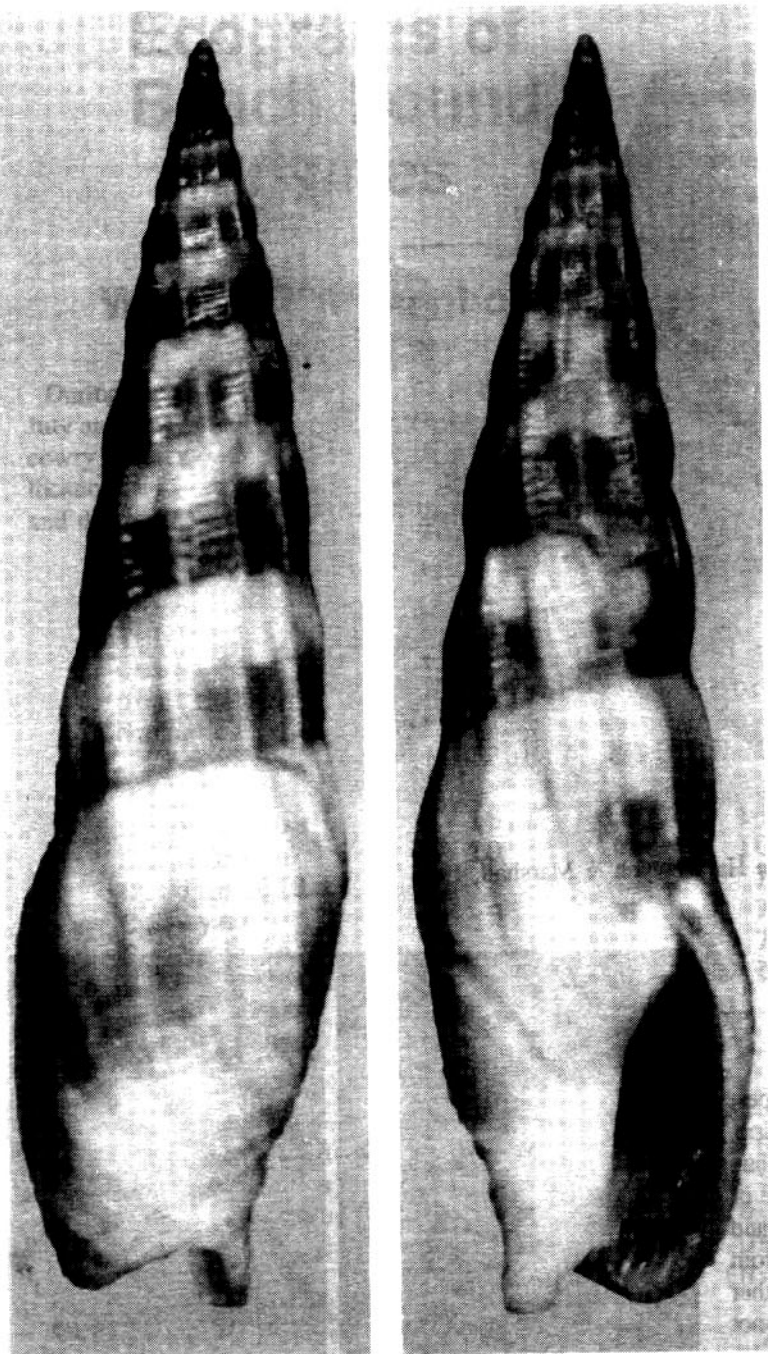
From: Costa Rica

Described in *World Shells* #14, Sept. 1995

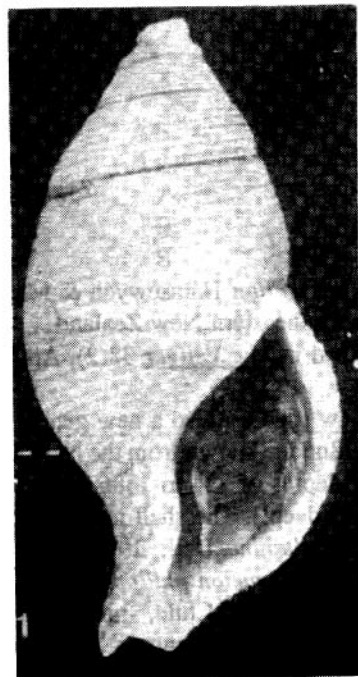


*Terebra fernandae*

This 23mm shell with a wide apical angle, the absence of a sutural groove, the prominent axial sculpturing, with wide interspaces, the numerous fine spiral grooves intersecting the ribs, and the extremely long body whorl is, according to the author, completely different from any other species. In fact, he states that no other species can be even remotely compared to it. The species is based upon a single specimen.



*Terebra moolenbeeki* Aubry, 1995



*Aulacofusus insulapratasensis* Okutani & Lan, 1994

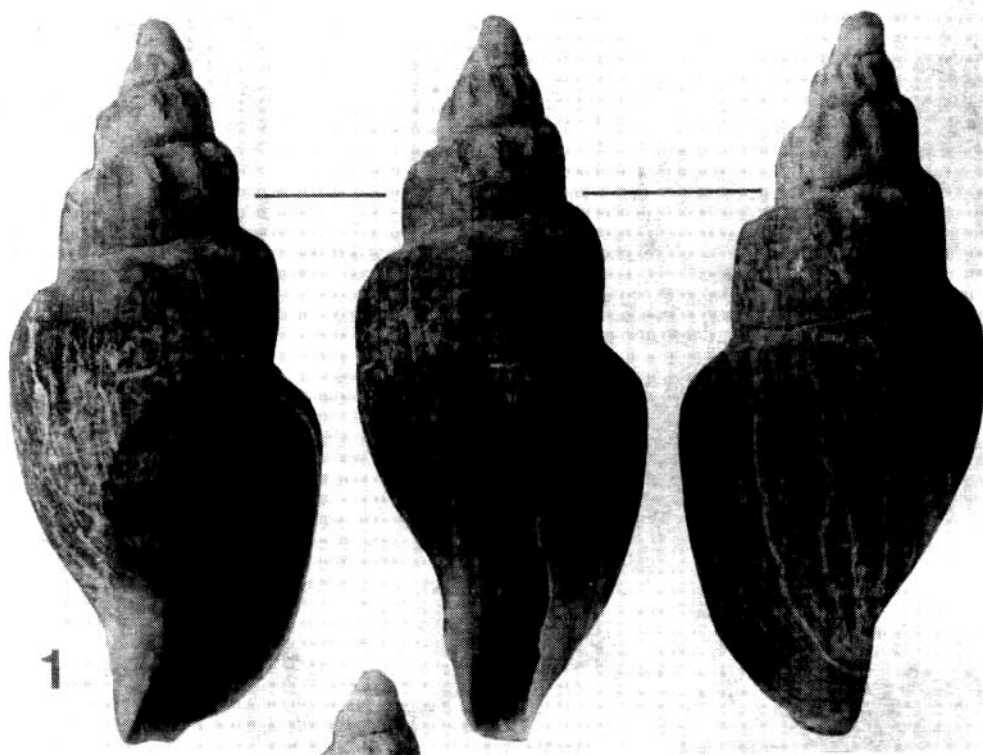
*Aulacofusus insulapratasensis* Okutani & Lan, 1994

From: Pratas Islets, South China Sea

Described in *Bulletin of Malacology* 18:1-4  
(Malacological Society of China)

This new buccinid gastropod was collected at a depth of about 300 meters near the Pratas Islets (Reef), South China Sea and measure just over 40mm in length. The authors state that the new taxon superficially resembles *Eosipho smithi* (Schepman, 1911), which is characterized by sulcated shell sculpture. But

the new species differs from *E. smithi* in having a much obeser shell ornamented with sharp spiral cords that are never wider than interspaces whereas spiral rings of *E. smithi* are always flat and wider than the interspaces. The deeply sinuous posterior canal, varix-carrying outer lip and more strongly recurved siphonal canal may be other taxonomic characters of this new taxon.



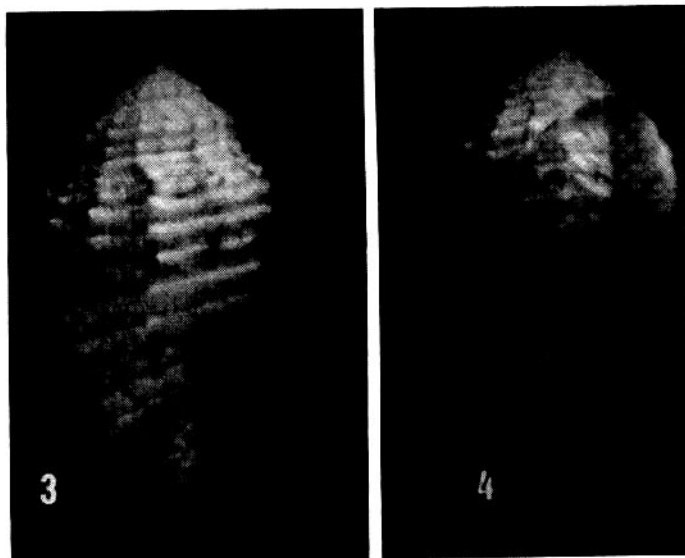
*Zygomelon zodion* Harasewych & Marshall, 1995

*Zygomelon zodion* Harasewych & Marshall, 1995

From: southeastern New Zealand

Described in *The Veliger* 38(2), April 1995

This new species (also a new genus) is the deepest living Volutidae known from the New Zealand region, taken in depths of 734 to 1386 meters (to more than 4,000 feet deep!). The shell most resembles those of *Miomelon eltanini* Dell, 1990 from the Falkland Islands and *Miomelon philippiana* (Dall, 1890) from off the coast of Chile, but radular and other anatomical features common in *Miomelon* are not present in the new species. It is also superficially similar to species of the genus *Alcithoe*, especially small *A. wilsonae* (Powell, 1933), but it lacks the four strong, oblique columellar folds characteristic of that genus. The shells of the new species measure up to just over 50mm.



*Morum (Oniscidia) vicdani* Emerson, 1995

From: Saya de Malha Bank, Indian Ocean

Described in *Apex* 10(2-3) Sept., 1995

Similar to *M. (O.) grande* (A. Adams, 1855), but the new species differs in having a more fusiform outline and a much less dense shell, with fewer axial ribs (10 to 12 vs. 17 to 19) and a thinner, less pustulated

parietal shield, and with the exterior edge of the outer lip non-crenulate at maturity. The type specimens measure between 47 and 60mm.

In our next issue we'll feature newly described species of the families Trochidae and Marginellidae, plus other mollusks from various families described from various localities around the world.



# Ecograms of Beach Found Cowries

**Willem Krommenhoek**

During the period 1989-95, mainly in the months of July and August, I have been able to make ecograms of cowry species washed up on beaches at uninhabited locations with a steady wave action, both in Indonesia and the Seychelles.

At some localities I had the opportunity to return a number of successive days and/or years. This gave me the chance to investigate to what extent an ecogram is a reliable and constant source of information about the frequency of the different species of cowries found washed up on the beach at a certain location.

Although it is known that such beach-found death-assemblages or thanatocoenoses differ considerably from the living cowry population due to transport and sedimentation, ecograms of washed up cowries nevertheless provide useful information especially about the condition of the reef from which the beach-found specimens are derived. (Krommenhoek, 1994) The results are listed below.

**Table 1.** Grajagan Bay, east Java. Ecograms for six successive days in the last week of 1991. Numbers indicate percentages in the beach-found population.

Name of species:	Day 1 (N=1258)	Day 2 (N=713)	Day 3 (N=1029)	Day 4 (N=824)	Day 5 (N=534)	Day 6 (N=474)
<i>C. annulus</i>	16	16	18	18	16	15
<i>C. moneta</i>	10	9	10	13	12	12
<i>C. isabella</i>	9	5	7	7	7	5
<i>C. lynx</i>	9	6	7	7	9	7
<i>C. boivini</i>	9	7	7	7	6	6
<i>C. staphylea</i>	6	7	6	6	8	6

**Table 2.** Nyang-nyang beach, south Bali. Ecograms for five successive days in the first week of September 1991. Numbers indicate percentages in the beach-found population.

Name of species:	Day 1 (N=1406)	Day 2 (N=1015)	Day 3 (N=1052)	Day 4 (N=1045)	Day 5 (N=861)
<i>C. annulus</i>	19	24	21	22	19
<i>C. moneta</i>	18	18	12	8	18
<i>C. lynx</i>	18	10	11	11	7
<i>C. caputserpentis</i>	11	10	9	6	8
<i>C. staphylea</i>	7	7	10	11	8
<i>C. helvola</i>	7	6	7	5	5

In my opinion these results indicate the value of an ecogram of washed up cowries as a useful tool in the ecology of cowries, provided the samples are large enough. Although not perfectly constant, it demonstrates basic differences in the composition of beach-found cowry populations at different localities.

## Literature:

Krommenhoek, W. 1994. Beach-collecting cowries: Possibilities and limitations. *The Cowry n.s.* 1(1), pp. 17-22.

Table 3. Grajagan Bay, east Java. Ecograms for four years in July. Numbers indicate percentages in the beach-found population.

Name of species:	1990 (N=869)	1991 (N=4832)	1993 (N=1009)	1994 (N=2804)
<i>C. annulus</i>	28	17	25	15
<i>C. moneta</i>	8	11	7	7
<i>C. isabella</i>	5	7	6	7
<i>C. lynx</i>	8	8	14	9
<i>C. boivini</i>	5	7	8	8
<i>C. staphylea</i>	5	7	5	6

Table 4. Ujong Kulon Nat. Park, west Java. Ecograms for two successive years in July. Numbers indicate percentages in the beach-found population.

Name of species: 1993 (N=2000) 1994 (N=3011)

<i>C. caputserpentis</i>	36	29
<i>C. carneola</i>	9	8
<i>C. lynx</i>	7	5
<i>C. arabica</i>	6	3
<i>C. isabella</i>	5	5
<i>C. hirundo/kieneri</i>	5	13
<i>C. interrupta</i>	4	7

Table 5. La Digue island, Seychelles. Ecograms for two years in July. Numbers indicate percentages in the beach-found population.

Name of species: 1989 (N=1458) 1995 (N=2673)

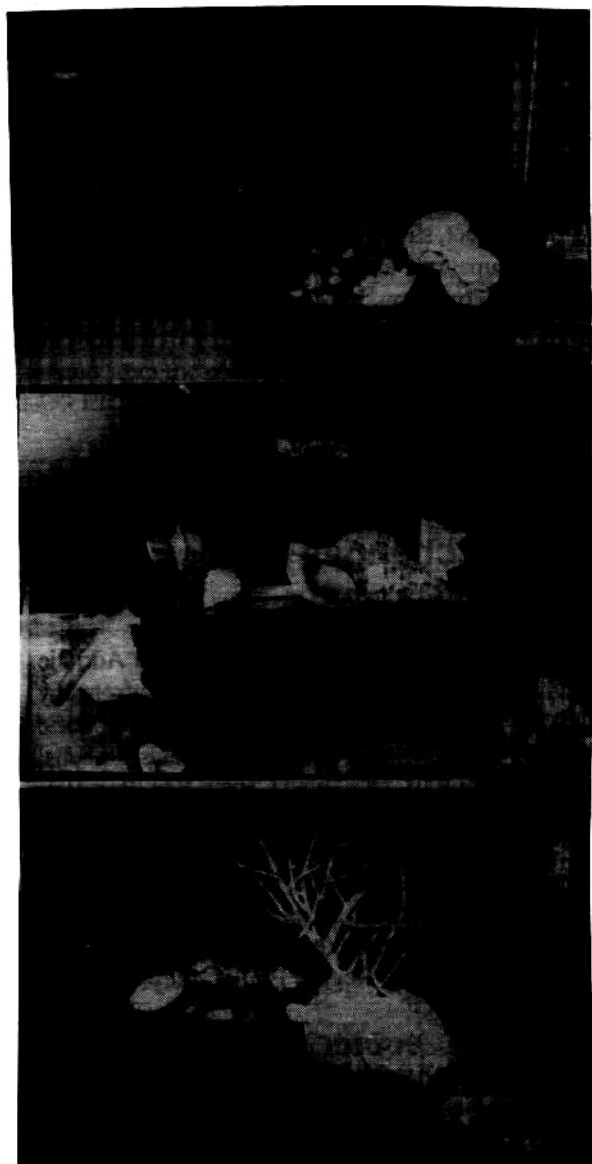
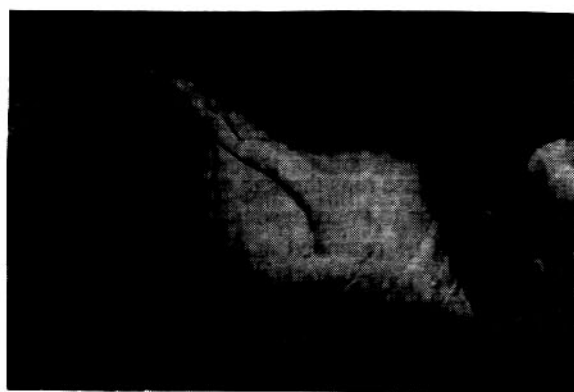
<i>C. helvola</i>	31	27
<i>C. caputserpentis</i>	10	16
<i>C. carneola</i>	8	10
<i>C. histrio</i>	8	7
<i>C. moneta</i>	7	7
<i>C. asellus</i>	6	6
<i>C. annulus</i>	5	7

## MUSEUM MUSINGS

### Lithuania

One of the largest maritime museum and aquarium is located in Lithuania. Unfortunately because of economics they can not afford subscribing to magazines or purchase books for their library. Any donations of materials readers could send would, your editor is certain, be appreciated. Contact Dr. Algirdas Stankevicius; Conchological Museum and Aquarium; P.O. Box 72; 5800 Klaipėda - C, Lithuania.

Photographs on this page show the museum and some of its exhibits.



## Port Gamble, Washington OF SEA AND SHORE, INC.

I hope that many of our readers will get the opportunity to visit our museum during this year. It's entirely possible that this will be our final year of operation. Local readers know the story, but hopefully others will find it interesting.

Port Gamble was founded in 1853 and since that time has been a company town - the company being Pope and Talbot, Inc. (Company founders came from the same Maine town as your Editor's great-grandfather - East Machias - at about the same time) which until the end of 1995 operated the oldest operating sawmill in North America. A decision was made in the fall of 1995 to permanently close the mill (equipment will be auctioned in March and the mill razed in the fall of 1996) and to not renew the townsite lease with the entity that took over the companies land in 1985 (called Pope Resources).

Our Museum's lease runs through the end of 1996 and we await word as to Pope Resources' intentions as to whether it will be extended and, if so, under what conditions. We have heard that they want us to remain indefinitely, but nothing definite has been forthcoming.

So, with that in mind, you might want to no longer delay a visit to us. We may not be here in 1997!

In the meantime, the Museum has welcomed many of our subscribers from around the world during the past few years. 1995 was no exception, with visitors from Russia, Germany, South Africa, Australia, Japan, France, Great Britain, and many other areas of the world and many of the states of the U.S.

We have added some very interesting, we feel, exhibits, and expanded others. On display now is a specimen of a hot-water vent clam from the Galapagos Rift that was collected by Alvin the deepsea submersible. We've added some skulls to that exhibit and some exceptional specimens of local seastars: bat, basket and leather done by a local diver/collector with his special secret formula.

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Do you have a favorite shell museum? Or information about an overseas museum with a shell exhibit. We want to let our readers know about such museums and exhibits. Just drop a line or send us an address and we'll contact them for information. Thanks!

## American Museum of Natural History

After a summer without direct leadership, molluscan activities at the American Museum of Natural History again have a guiding hand. Although the position of department head remains to be filled, the volunteer staff of catalogers, identifiers and shufflers has been led, since early November, by the newly arrived Yae Ri Kim.

Yae Ri (it rhymes closely with Mary) came to the museum from a considerable distance - but in stages. She was born in Seoul, Korea. From the age of two through her high school years, home was Oahu, Hawaii. For college she chose the University of Southern California at Los Angeles. She graduated with a BS in biology, with emphasis on marine biology. Her minor was bioethics. Then it was on to Georgetown University, for a masters in physiology (August 1995).

Yae Ri has been a shutterbug since she was 12. Her favorite subject, she says, is faces. At present, though, her preoccupations are her new work and settling in to Jersey City, New Jersey (home base) and New York.

Milton Werner (in New York Shell Club Notes No. 337, December, 1995.

## Exchanges Wanted

I can offer in exchange sea shells from the Adriatic Sea and the Mediterranean as well as slugs from my country. Also souvenir teaspoons, dolls; scientific books on shells of our country, I collect sea shells, minerals and fossils. Dr. Milan Capek; P.O. Box 194; 360 01 Karlovy Vary, Czech Republic

I have Italian Cenozoic fossils, French ammonites and Mediterranean sea shells to exchange for fossils and sea shells of the world. Vecchi Giuseppe; Via P.G. Terrachini, 12; 42100 Reggio Emilia, Italy

Have worldwide specimen shells, many from both coasts of North America. Want Panamic and West Pacific specimens in trade. Steve Rosenthal; 2140 Merooke Drive; Merrick, NY 11566 USA

I would like to exchange marine shells and will send an exchange to all who write. Carol Brunner; 160 N.W. 126th Street; North Miami, FL 33168



## The Money Cowry of the Maldive Islands A miracle of reproduction (?)

Fred Pinn \*

Some of the earliest references to cowrie shells used as money in the Maldives come from the Arab writers who visited the islands long before the arrival of the Portuguese. Thus a Persian trader, Suleiman, recorded about 850 AD that "the wealth of the people (of the Maldives) is constituted by cowries; their queen amasses large quantities of these cowries in royal depots ... The cowries are got by them from the surface of the sea. The head of this mollusc encloses something living. To fish them up they take a branch of the coconut tree and put it in the sea, and the cowries attach themselves to it. The islanders give the cowries the name kabtaj."

About two hundred years later (c. 1030) Alberuni recounts that "these islands are, according to their products, divided into two classes, the Diva-kudha, i.e. the Diva (islands) of the cowrie shells, because there they gather cowrie shells from the branches of the coconut palms which they plant in the sea, and Diva-kanbar, i.e. Diva of the cords (coir ropes) twisted from the coconut fibres and used for fastening together the planks of the ships."

According to Ibn Batuta (1344 AD) the cowrie trade from the Maldives to the Indian mainland was flourishing and he himself engaged in sending large quantities to Bengal. On his departure from the islands he was given a present of twelve million shells.

Ma Huan (1433 AD) a Chinese author, writing about the Maldives, explained: "As to their cowries, the people there collect them and pile them into heaps like mountains; they catch them in nets and let the flesh rot; then they transport them for sale in Thailand, Bengal and other such countries where they are used as currency." It is thought that the cowries used in China long before the Christian era had been brought there by Chinese traders from the Maldives via Thailand.

Duarte Barbosa, a Portuguese resident in Goa in 1515 described how the Malabar merchants bought up "very bad black rice ... to sell it to the lower sort of people who buy it readily as it is good cheap, and by it they make more than by the good rice. They also take much thereof to the Maldive Islands ... as the inhabitants are poor Moors who by reason of its lower price would rather have the black than the white ...

They give it to them in exchange for cairo (coir rope) ... There is in these islands great store of dried fish, and they carry home as well certain small shells (buzios) which are much sought after in the kingdom of Cambaia and in Bengal where they pass current as small change for they hold it to be cleaner and better than copper ..."

For decades the Portuguese carried on their trade between the Maldive Islands and Bengal taking shiploads of cowries to Bengal and exchanging them at a high profit for rice which in turn was taken to the Maldives for more cowries. One French reference will suffice to hint at the quantities of shells carried away: "At first when our people came there, a Portuguese ship of 400 tons was at anchor in the roads, having come from Cochin with a full cargo of rice to take away bolis, or shells, to Bengal where they are in great demand."

Much information on the importance of cowries in the life of the Maldivians is found in Pyrard de Laval's account of his shipwreck in 1602 and stay as a prisoner of the islands. Describing the commercial activities he wrote: "You see merchants from all quarters of the Indian Ocean from Arabia to Sumatra, all coming chiefly for 'cordage', that is the much valued coir ropes. But there is another kind of wealth, viz. certain little shells containing a little animal, large as the tip of the little finger, quite white, polished and bright: they are fished twice a month, three days before and three days after the new moon, as well as at the full, and none would be got at any other season. The women gather them on the sands and in the shallows of the sea standing in the water up to their waists. They call them Boly and export to all ports an infinite quantity in such wise that in one year I have seen 30 or 40 ships loaded with them without other cargo. All go to Bengal, for there only is there a demand for a large quantity at high prices ... All the merchants from other places in India take a large quantity to carry to Bengal ... All these Bolys are put in parcels of 12,000, in little baskets of coco leaves of open work, lined inside with cloth of the same coco tree, to prevent the shells from falling. These parcels of baskets of 12,000 are negotiated there as bags of silver are here (France) which between merchants are taken as counted, but not by others; for they are so clever at counting that in less than no time they will take tally of a whole parcel. Also in Cambaye and

elsewhere in India they set the prettiest of these shells in articles of furniture as if they were marbles and precious stones."

During the 17th century the Portuguese were gradually displaced by the Dutch and English East Indian Companies. The Dutch were particularly powerful and ruthless and tried to monopolise the Maldivian cowrie export. Time and again they attempted to persuade the Sultan to make a treaty by which they would become the sole buyers of shells. The Sultan evaded the issue by sending polite messages but refusing to sign a contract. Nevertheless, for a long time the Dutch were the major exporters of cowries either by their own ships or by Maldivian vessels bringing the shells to Ceylon attracted by preferential treatment and concessions from the Dutch Company. If, however they did not deliver sufficient shells, a Dutch vessel would be sent to the islands to collect what was required.

Records of the transactions in cowries are not easy to come by so it is difficult to calculate the exploitation of this commercial commodity, but the figures that are at our disposal indicate why nowadays *Cypraea moneta* has almost become a rarity on the Maldives.

As has been mentioned all trade in cowries were done by baskets or three-cornered bundles of coconut leaves containing 12,000 cowries each. Such a bundle was called a KOTTA or KOTTE. At times buying was done by weight, each kotta weighing between 25 lb and 28 lb. About the middle of the eighteenth century the Dutch fixed the weight at 25 lb. Weighing, of course, speeded up the process of buying and loading the shells. The following are some mind-boggling figures which allow us to speculate on the astronomical numbers of shells collected by the islanders and carried away by the Dutch traders alone:

1669: The Dutch ship *Cocatoe* brought back 1149 kotta = 13,788,000 cowries.

1721: This year the Netherlands annual demand was 20,000 kottas = 240,000,000 cowries.

1723: The Dutch vessels *Adam* and *Africa* brought back 8,000-10,000 kottas = approx. 108,000,000 cowries.

1727, 1728, 1732, 1734: Dutch vessels are known to have been despatched to the Maldives and returned each time with an average of 9,000 kottas = 108,000,000 cowries which makes a total for these four years of 432,000,000 cowries.

1740: The annual demand from home (Netherlands) was 400,000 lb = 16,000 kottas = 192,000,000 cowries.

1752: Each return vessel to the Netherlands was

expected to take 50,000 lb = 2,000 kottas = 2,400,000 cowries.

1753-1763: Vessels carried 2.4 billion cowries.

1764-1766: Average home demand was 9,000 kottas = 108,000,000 cowries.

This gives a total of 4 billions 709 millions 788 thousand cowries!!!

To the above figures must be added the unrecorded number of shells taken by French, English and Indian traders who paid a higher price than the Dutch and were therefore the preferable customers, so that in 1777 the Sultan apologized to the Dutch authorities in Ceylon for his inability to supply cowries "as usual".

There exists a table of imports from the Maldivian Islands to British India between 1853 and 1881, the date of a survey of the Maldives by H.C.P. Bell. Unfortunately for our purposes "Cowries and Shells" were lumped together and only the total value is given in pounds sterling. But there can be no doubt that the number of cowries fished ran into billions. In 1921 when the same author made another survey of the islands, cowries were still collected partly for the payment of local taxes and partly for export.

In 1993 a visitor to the Islands reported that money cowries, in fact, were hard to find even by an experienced diver. So it does look now as if the miracle of reproduction has been exhausted after at least a thousand years of exploitation.

\*London, England. Article originally appeared in The Conchologists' Newsletter (Vol. 8, Part 1 - No. 134) of September 1995.

### Gastropods Parasitize Fish!

The November 1995 issue of The Festivus (the San Diego Shell Club's impressive publication) has an article by Scott and Jeanette Johnson and Stan Jazwinski. In the article (illustrated with a line drawing and six black and white photographs) the authors' report observing six species of the family Colubrariidae and two species of Marginellidae feeding by parasitizing sleeping fish! Most of the fish belong to the parrotfish family Scaridae and the observations were made off Kwajalein Atoll in the Marshall Islands. Previously published reports by other authors, had been published on Marginellidae feeding on sleeping fish and another reported the California Cancellariidae *C. cooperi* Gabb sucking blood from the ray *Torpedo californica* Ayers. Sort of make you think differently about docile snails, doesn't it?

## Newly Described Non-shelled Marine Mollusks and Non-Marine Mollusks

While our main interest lies in the shelled marine mollusks, there are numerous newly described marine mollusks that have no shells and also many freshwater and terrestrial species of mollusks. The following is a listing of some recent new species. Please refer to the listed publications for further details.

### *Turcozonites anamurensis* Neubert & Riedel in Riedel, 1995

Family: Zonitidae

From: Turkey

In: *Malakologische Abhandlungen*, 17:2, pp. 121-136, June 1995.

### *Balkanodiscus (B.) beroni* Riedel, 1995

Family: Zonitidae

From: caves of East Macedonia, Greece

In: *ibid.*, pp. 137-150

### *Oxychilus (Retowskiella) menkhorsti* Riedel, 1995

Family: Zonitidae

From: North-East Turkey

In: *ibid.*

### *Vitrea heniae* Riedel, 1995

Family: Zonitidae

From: North-East Turkey

In: *ibid.*

### *Pseudochondrula controversa* Schütt, 1995

Family: Enidae

From: Turkey

In: *ibid.*, pp. 161-166

### *Imparietula ridvani* Schütt, 1995

Family: Enidae

From: Turkey

In: *ibid.*

### *Imparietula microdon* Schütt, 1995

Family: Enidae

From: Turkey

In: *ibid.*

### *Ena yildirimi* Schütt, 1995

Family: Enidae

From: Turkey

In: *ibid.*

### *Ramusculus laevitortus* Schütt, 1995

Family: Enidae

From: Turkey

In: *ibid.*

### *Pyrgulopsis diablensis* Hershler, 1995

Family: Hydrobiidae

From: San Joaquin Valley, California

In: *The Veliger* 38(4): 343-373 (Oct. 1995)

### *Pyrgulopsis longae* Hershler, 1995

Family: Hydrobiidae

From: Great Basin, California

In: *ibid.*

### *Pyrgulopsis taylori* Hershler, 1995

Family: Hydrobiidae

From: south-central coast of California

In: *ibid.*

### *Pyrgulopsis eremica* Hershler, 1995

Family: Hydrobiidae

From: Great Basin, California

In: *ibid.*

### *Pyrgulopsis greggi* Hershler, 1995

Family: Hydrobiidae

From: Upper Kern River basin, California

In: *ibid.*

### *Pyrgulopsis ventricosa* Hershler, 1995

Family: Hydrobiidae

From: Clear Lake basin, California

In: *ibid.*

### *Rhagada marghitae* Falconieri, 1995

Family: Camaenidae

From: Bali and adjacent islands in Indonesia

In: *World Shells* #14, Sept. 1995, pp. 81-84, 11 color photographs

## James G. Westbrook

Word has been received of the death, February 2, 1995 of James G. Westbrook. Jim and Christal Westbrook had been active in the shell world for many years. Christal now lives in South Dakota and has a warehouse of specimen shells she wants to dispose of - interested parties can write her at P.O. Box 27; Nisland, SD 57762. She is interested in selling as a whole lot.

## We Get Letters (and Fax too)!

### Partial Philippine Shell Ban

Dear Tom,

The Philippine government has recently placed several marine products on their CITES list, and *Of Sea and Shore* readers might be interested in some of the products on the banned list. The following marine products may not be shipped from the Philippines, and U.S. Customs will return them to the sender.

All coral; all clam meat; *Cassis cornuta*; *Charonia tritonis*; all *Hippopus* species; *Turbo marmoratus*; *Tridacna elongata*, *T. gigas* and *T. squamosa* and *Placuna placenta*.

Sincerely, James L. Barnett

### Futile Collecting in the South Pacific

Dear Tom,

I recently spent some time in The Fiji Islands (not Fiji), Tonga and Western Samoa. A few comments on the shell collecting are in order.

Most of the time in Fiji was spent at Savusavu. I was able to spend about six hours collecting. Very little luck. A local collector that I contacted had nothing but very common stuff. The local market (not a tourist market) had a few common *Cypraea* and turbos. At Nadi, where I was assured I would find loads of goodies in the BIG flea market, very little except common stuff. I purchased two shells just to buy some shells. At a native settlement I talked to a fellow who claimed to be a collector (he was 6th generation descended from a New England sailor who jumped ship). His collection was again common *Cypraea*. I tried to contact the Fiji Shell Club, but no luck. I was told it was defunct.

On Tonga it was pretty much the same story. I had an excellent contact there and she tried to find local contacts for me. No luck. She had never heard of any local collectors, although she was well aware of local, commercial, tropical fish collectors. I had no time to collect while in Tonga. The local women's craft shop, which was aimed at the tourist trade, had a lot of nice large trumpets and *Bursa*, but few in good condition. The local market and street vendors again had a few common *Cypraea*. Purchased one shell.

Western Samoa had two MAJOR hurricanes in the early 90's which destroyed the reefs and generally made a mess of things. The reefs are mostly sand bars and the inshore areas a mess of coral rubble. Local contacts produced nothing. Local village people produced nothing, in spite of that fact that the village chief had put out an announcement several days before my arrival, that an Anglo sucker was willing to pay good money for shells.

I had planned to spend a week on Savali, Western Samoa with collecting the major goal. A busted hip shot that plan down but good. However, inquiries beforehand produced nothing. I was told that bivalves, once collected for food and plentiful, were now scarce.

So much for shell collecting in that part of the South Pacific. They, shells that is, are probably out there, but where?

Good Shelling,

Dick Jones; South Euclid, Ohio

### More on "Octopus giganteus"

To the Editor: (Fax transmission)

Re: the new theory that a giant, octopus-like blob found on a Florida beach in 1896 was actually the remains of a whale ("The Most Recent Report on 'Octopus giganteus'," Fall 1995).

There have been thousands of known cases of beached cetacean carcasses -- Do these animals commonly fall apart with their skulls and the rest of the skeleton slipping out, leaving only the skin and blubber layer behind? Indeed, has there ever been a single documented instance of such a phenomenon?

Of course not. And this laughable hypothesis is just one more example of a deeply disturbing trend in which impossible explanations are being seriously proposed as solution to zoological mysteries.

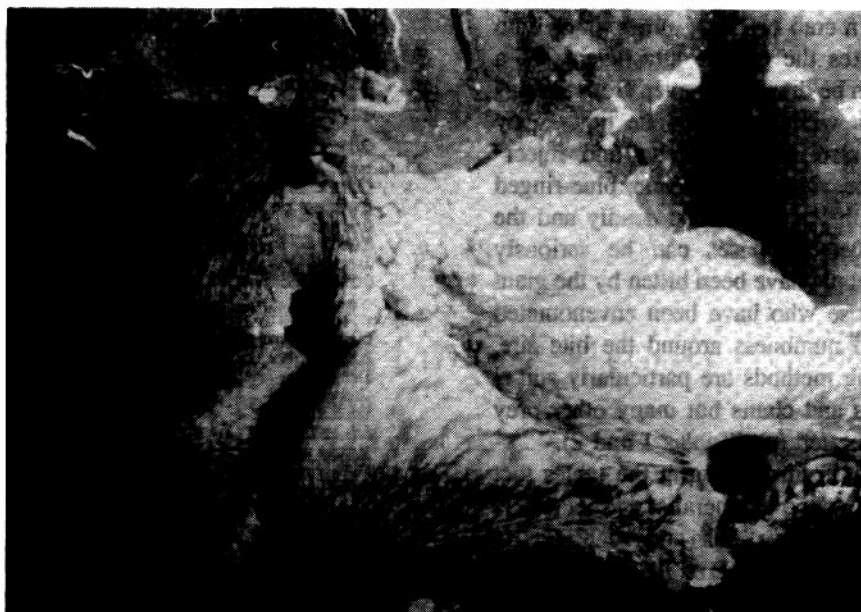
The deskulled whale carcass scenario follows closely on the heels (or fins?) of the widely-publicized claim that the most famous Loch Ness image, the 1934 "Surgeon's Photo" taken by Lt. Col. R. Kenneth

Continued on page 194



## WHAT DOES A GIANT PACIFIC OCTOPUS EAT?

Roland C. Anderson



Photograph by Leo Shaw

The world's largest octopus species is the giant Pacific octopus (*Octopus dofleini*) of the North Pacific. It grows to a maximum size of 150 to 500 pounds, depending on your source. The 500 pound animal was taken in the early 1950's and its weight was estimated since no scales of a suitable size was available. Nowadays any animal over 100 pounds is rare. Inexperienced scuba divers sometimes report giant octopuses to the Seattle Aquarium. Such "monsters" usually turn out to be about half the estimated weight when they are actually put on a scales. A "monster" octopus was reported to us by local divers and we decided to collect it to weigh it. It was reported to be 200 pounds, with suckers six inches across. We collected the animal (with considerable effort!), took it back to the Aquarium and weighed it. It was 83 pounds, a very respectable beast, but no monster. This demonstrates how reports of large octopuses can be exaggerated.

Giant Pacific octopuses get that big by being generalist feeders. They have been reported to feed on everything from crabs to carrion. Their diets in the wild have been determined by examining the remains of their meals left in front of their dens, a trash pile known as a "midden," named after the kitchen middens of prehistoric Scandinavians. Other documentation of giant octopus diets come from observations by scuba divers, shore observers watching intertidal dens, and public aquariums that display giant octopuses.

Being generalist feeders, giant octopuses need to have several methods of feeding or capturing prey. An evolutionist might argue that having different methods of feeding, the octopus became generalist feeder, but I'll let others argue about that. An octopus can reach out with an arm, attach suckers onto a crab and draw it to its mouth or it can suddenly pounce on a crab and envelope it with many sucker-clad arms. The octopus can use exploitive prey-gathering techniques by spreading the webbing out between its arms and throwing it over a rock or a school of shrimp like a throw net. The octopus then feels under the web with its arm tips as the water is squeezed out. Octopuses can also dig for clams in sand or gravel by blowing the sand away with their funnels providing the water jet. This method works so well that some populations of octopuses eat mostly clams.

Once a prey item is captured it is passed by suckers to the octopus's mouth located under the center of the body where the arms come together. Inside the mouth the giant octopus has a horny beak, much like a parrot's beak, which it uses to bite off pieces of soft prey or crush or crack hard prey like clams or crabs.

In addition to the beak the octopus has a radula for rasping holes in shells. It also has an "accessory boring organ," a salivary papilla or "tongue" that aids in drilling holes in shells by

dissolving shell material. Moon snails also have such a device. Once a hole has been drilled into a prey animal, a venomous secretion is injected which paralyzes and kills a crab or clam, allows entry into the meat, and relaxes the muscle attachments of a crab so the meat can be drawn out, even from the tips of the legs or from within the intricate inner body shells. Octopuses also use this "bite and inject" method for defense. The bite of the blue-ringed octopus of the South Pacific can be deadly and the bites of many other octopuses can be seriously debilitating. Few people have been bitten by the giant Pacific octopus; those who have been envenomated report swelling and numbness around the bite site. Giant octopus eating methods are particularly suited to preying on crabs and clams but many other prey items have been reported (see Tables 1 and 2).

It's obvious from looking at the tables that *Octopus dofleini* is indeed a generalist and its diet is varied, including even live fish and seabirds, on which it can grow to a large size in a remarkably short life span of just three to five years. To paraphrase the old joke: what does a 500 pound octopus eat? Anything it wants!

## References

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Kyte, et al

TABLE 1

Prey items eaten by *Octopus dofleini* in the field

FOOD	REFERENCE
Crustaceans	
<i>Cancer productus</i>	Hartwick, et al, 1981
<i>C. magister</i>	"
<i>C. gracilis</i>	Anderson, 1994
<i>Pugentia</i> sp	Hartwick, et al, 1981
<i>Telmessus cheiragonus</i>	"
<i>Scylla aquifrons</i>	Hartwick and Thorarinsson, 1978
Bivalves	
<i>Clinocardium nuttallii</i>	Hartwick, et al 1981
<i>Protothaca staminea</i>	"
<i>Tresus capax</i>	"
<i>Gari californica</i>	"
<i>Saxidomus giganteus</i>	"
<i>Chlamys hastata</i>	"
<i>Macoma</i> sp	"
<i>Crassadoma gigantea</i>	"
<i>Semele rubropicta</i>	"
<i>Diplodoma orbellus</i>	"
<i>Humularia kennebecensis</i>	"
<i>Panopea abrupta</i>	"
<i>Modiolus rectus</i>	"
<i>Pododesmus macrochisma</i>	"
<i>Solen sicarius</i>	"
<i>Entodesma navicula</i> (=saxicola)	Hartwick, et al, 1981, Anderson, 1994
<i>Mytilus trossulus</i>	Anderson, 1994
<i>Glycymeris subobsoleta</i>	Hartwick, et al, 1978
<i>Mytilus californianus</i>	"
Gastropods:	
<i>Halionis kamschatkana</i>	Hartwick, et al 1981
<i>Polinices lewisii</i>	"
<i>Diodora aspera</i>	"
<i>Crepidula</i> sp	"
limpets	"
Cephalopods	
octopuses	"
Echinoderms	
<i>Strongylocentrotus</i> sp	"
Brachiopods	
<i>Terebratalia</i> sp	"
Vertebrates	
rockfish	High, 1976
glaucous winged seagull	Sharpe, et al, 1990
pigeon guillemot	"

Table 2

Prey items eaten by *Octopus dofleini* reported from captivity

FOOD	REFERENCE
<i>Homarus americanus</i>	Bronikowski, 1984
<i>Callinectes sapidus</i>	"
<i>Penaeus</i> sp	"
<i>Squalus acanthias</i>	Anderson, 1991
<i>Hydrolyagus collieri</i>	"
<i>Oncorhynchus tshawytscha</i>	"
<i>Sebastes nigrocinctus</i>	"
<i>S. ruberrimus</i>	"
<i>Clupea pallasii</i>	"
<i>Embiotoca lateralis</i>	"
live shrimp	"
<i>Cancer magister</i>	Anderson, 1995
herring	"
smelt	"
squid	"
fish filets	"
clam meat	"

## INVESTIGATE THOSE HOLDFASTS !

STEPHANIE PRINCE

While walking along the beach at T Street in San Clemente, California on August 21, 1994 - it was 3:00 p.m. - I found a washed-up holdfast. People were pulling marine life out of the two-foot in diameter mass of tangled branches and placing them into a pail to observe. They assured me that they would return the creatures, but, alas, I'm afraid it was too late for some.

The ocean was rough with a high surf - three to four feet, some six feet - and it was a medium high tide. Water temperature was warm, 70 degrees F. Several large holdfasts had been stranded at the high tide line.

Looking in one bucket, I saw six purple sea urchins, about 1½ inches in diameter, crawling on the bottom and sides. I was surprised at how rapidly they were moving. They all looked very healthy.

One small orange Bat Star or Sea Bat (*Patiria miniata*) was found in the mass. It was about two inches in diameter. This Sea Bat had a kind of brownish tinge to the top of its body - I would guess to camouflage itself in the holdfast. Usually these creatures live in rock crevices or in tidepools amongst the rocks.

One six inch Brittle Star (*Ophionereis annulata*, the Ringed Serpent Star) was deep inside the tangled mass. A woman was trying to pull the delicate creature out. These stars can usually be found under shoreline rocks and in deeper water too. It was greenish-tan, with an olive-greenish-tan band on each arm; about nine rings to each arm. The tiny central disk was only about 1½ inches in diameter.

There were also three small orange-tan Sea Cucumbers. All had lighter tan bumps on their backs. They measured about four inches in length and two in width. They were soft and lumpy.

One small Long-fingered Shrimp (*Betaeus longidactylus*), reddish-brown in color, was found crawling amongst the holdfast's tangled branches. It was only one inch in length and when placed into the pail swam rapidly about.

One small (½ inch) brown California Cone (*Conus californicus*) was nestled within the holdfast. The shell was a mottled brown and tan.



Lima hemphilli



Brittle star



Sea Hare



Long-Fingered Shrimp



Sea Cucumber

Three dead Sea Hares were nearby on the sand. They were already hard from laying in the sun. The carcasses were about three inches wide and five in length. They were olive-brown in color. The parapodia or wing-like flaps on their backs were now glued down against the body. The Gulls did not seem interested in eating these.

Two File Shells (*Lima hemphilli*), about ¾ inch in length were nestled in the holdfast. The boys pulled them out and dropped them into the pail. The File Shells opened a millimeter or so and all their tentacles immediately started to move; they even moved the shell along the bottom of the pail.

An interesting walk and an unexpected discovery. Remember to look at those holdfasts you see washed ashore.

# SAND HOPPER OBSERVATIONS

STEPHANIE PRINCE



Amphipod Crustaceans

Large Beach Hopper - *Orchestoidea californica*  
tannish-yellow-shiny sandy beaches  
1 to 2½ inches long  
comes out on dark, cloudy days and at night

Giant Beach Hopper - *Orchestoidea corniculata*  
tannish-white-yellow sandy beaches  
about 3 inches in length  
comes out at night and on darker days

Small Beach Hopper - *Orchestoidea benedicti*  
tannish white - yellow sandy beaches  
about 1½ inches in length  
comes out in the daylight

On August 15, 1994, at the State Park Beach, San Clemente, California - about 4:30 p.m. - I observed many of the small beach hoppers scurrying all over the high tide splash zone. They were being washed out of their holes by the high tide and accompanying high surf.

I observed three of the creatures hopping and jumping, headed towards the warm, 72 degree F, water, as if being confused by the water flooding them out of their homes. These were all about 1½ inches in length. I couldn't tell which species they were. It seemed like their burrow-holes were small ½ inch slits in the damp sand and were located on a foot-tall sand bluff built up by the high tides.

I also observed several sea gulls daintily picking up these creatures and eating them. I understand that at certain seasons these creatures make up a major portion of the plankton.

The family has requested that those who wish to give memorial contributions make them to the Bailey-Matthews Shell Museum, P.O. Box 1580, Sanibel Island, Florida 33957.

## FROM THE EDITOR'S DESK

It's been a sad year for the popular side of malacology. In July we lost Walter Sage III and now on November 3rd R. Tucker Abbott left us for that neverending molluscan-rich beach in the beyond. I never had the pleasure of meeting Walter, but I did have the distinct pleasure of Tucker's presence several times over the past fifteen years. Of course prior to that we'd corresponded and talked on the telephone. But thoughts of those intervening years bring back some fond memories -

Parking my motorhome in Tucker's back yard in 1980 when I made the shell show circuit; eating geoduck steak together at a restaurant near Port Gamble when Tucker and Cecilia visited; enjoying Tucker's exclamation over the wild blackberry pie (I picked the berries, my mother baked the pie) that was desert; watching Tucker mesmerize an audience with his ability to explain in simple terms the complex goings on of our favorite invertebrates. Too few memories, too little time.

The Conchologists of America has set up a scholarship fund to honor the memory of Walter Sage. Contributions, with an explanatory cover letter, should be sent to Dr. Gary Rosenberg, Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103-1195. Make checks payable to the Academy of Natural Sciences, Philadelphia.

Contributions to either or both of the above are encouraged. And they are tax deductible.

As you read this your editor will, hopefully, be mucking about on some beach in the Philippines pursuing marine molluscan specimens, or pushing his way through the undergrowth of a Philippine hillside attempting to locate a terrestrial species. From there it's on to Thailand for more searching, before returning home the end of February, just in time to get out another edition of The Catalog of Dealers' Prices for Marine Shells.

So, until the Spring issue -

*Tom*



# Size Distribution in Beach-found Populations of Six *Cypraea* Species in Indonesia & the Seychelles

Willem Krommenhoek

**Abstract:** The size distribution in death assemblages of washed-up cowries on beaches in Indonesia and the Seychelles, is basically a Gausse curve and for only two out of six species investigated it is found that the peripheral populations have a larger average length.

## Introduction

When beach-collecting is done at uninhabited locations with a steady wave action over a not too wide reef, all sorts of debris and plenty of washed-up cowries can be found. I used to collect large numbers of cowries in order to establish frequency of different species by producing ecograms. However, some species can be found in numbers so large that I decided to use them for a study of size distribution encountered at different locations. Material for this purpose was collected in the period July/August 1993, 1994 and 1995. *C. asellus*, *C. caputserpentis*, *C. carneola*, *C. helvola*, *C. isabella* and *C. lynx* were outstanding for this purpose. The shells are easy to recognize and plenty of specimens can be collected. Unfortunately, this was not always possible for both sides of the Indian Ocean. The shell-length was measured with calipers down to the nearest millimeter and the results were plotted to generate size-distribution curves.

## Results

Material was collected at the following locations:

1. South shore of Ujong Kulon National park in the extreme west of Java, Indonesia. I will refer to this site as W. Java.
2. South shore of Grajagan Bay, in the extreme east of Java, Indonesia. This site will be referred to as E. Java.
3. Nyang-nyang beach in south Bali, Indonesia, to be referred to as Bali.
4. Southern tip of La Digue Island, Seychelles, to be referred to as Seychelles.

All locations are faced to heavy wave action due to strong monsoonal winds, located between 4° and 6° S, and facing south. Locations 1 and 2 are 800 km apart; 2 and 3 about 80 km; and 1 and 4 are separated by 5,500 km of ocean.

***Cypraea asellus.*** For this species material from two locations could be compared: 78 specimens from W. Java and 143 from the Seychelles. In W. Java the majority measured 10-12mm, whereas most of the Seychelles specimens are 14-16mm (see Table 1).

***C. caputserpentis.*** Three populations were compared: 200 from W. Java, 149 from Bali and 158 from the Seychelles. All specimens are between 22 and 40 mm long, the majority measuring 30-32 mm. The distribution curves are symmetrical, so washed-up specimens of this species have the same size-distribution at all three locations.

***C. carneola.*** For this species death assemblages of 216 specimens from W. Java, 97 from E. Java, and 189 from the Seychelles are compared. In W. Java and the Seychelles most specimens are between 25 and 27 mm long. However, the size-distribution curves are not symmetrical. There is a sharp drop on the left side, meaning that few specimens are smaller than the most common size, and a long and gradual decline to 50 mm on the right side. The same, but less pronounced pattern, is found in the E. Java material.

***C. helvola.*** Only 36 specimens from E. Java were compared to 155 of the Seychelles. Nevertheless, the size-distribution curves were identical and symmetrical, all specimens measuring 13-26 mm, with the majority being 18-20 mm.

***C. isabella.*** Three populations were compared: 250 specimens from W. Java, 186 from E. Java and 74 from the Seychelles. No difference in size-distribution was observed, at all three localities the majority measured 25-27 mm. Remarkable is a hump on the left side in the distribution curve for W. Java, indicating the presence of a relatively high number of smaller specimens.

***C. lynx.*** A number of 235 specimens from W. Java was compared to 239 specimens from E. Java. The majority of the W. Java material measures 32-35 mm, where in E. Java this is 26-29 mm (see Table 2). Unfortunately, not enough specimens were found in the Seychelles to compare.

Table 1. Size distribution in mm of *C. asellus* from W. Java (N= 78) and the Seychelles (N= 143).

Locality:	8	10	12	14	16	18	20	22 mm
W. Java	7	38	23	12	2	0	0	
Seychelles	0	3	35	49	38	13	1	

Table 2. Size distribution in mm of *C. lynx* from E. Java (N= 239) and W. Java (N= 235).

Locality:	17	20	23	26	29	32	35	38	41	44 mm
E. Java	4	20	51	63	41	21	9	9	6	
W. Java	0	0	13	48	51	68	38	12	6	

### Discussion

One might think that the size of a shell is an expression of age and that the curves indicate age distribution. However, it is well known that growth stops when the outer lip or labium is formed. What follows is only thickening of the shell. Since all measured specimens did have a labium, the differences cannot be the result of age.

As the curves basically resemble Gausse curves, we can only interpret the differences in terms of variability. Within the living population variability occurs due to differences in depths, habitat, food availability, wave action, etc., resulting in what may be called ecomorphic races. The curves thus are best regarded as expressions of environmental differences in populations with basically the same genetic backgrounds. Summarizing, one may say that individuals of a species develop within a certain range of sizes. If all conditions are favorable they will attain a maximum size, whereas if all conditions are unfavorable a minimum size will result. Because in most populations some factors are favorable and others unfavorable, most individuals reach intermediate sizes. The fact that there is a clear difference in the length of the majority of specimens between assemblages from different localities, like in *C. asellus* and *C. lynx*, is most likely the result of genetic differences. Such differences, however, have been mentioned before. Schilder (1962) described the same for *C. tigris* and mentioned it for *C. arabica*. He formulated: "The average length in central populations usually is smaller than that in peripheral populations in north and south as well as in east and west".

If we accept the Moluccas in East Indonesia as the center of evolution of cowries, then the data for *C. asellus* and *C. lynx* as given in this article, fit in this rule. The Seychelles in the western Indian Ocean are peripheral in the distribution area for the species, just as W. Java is a more distant location from the Moluccas than E. Java. However, this leaves the question why only two out of the six species investigated show this tendency. The only possible explanation I can bring up is the supposition that some species are more apt to genetic changes than others. But as long as the background of this phenomenon remains obscure, we better concentrate on research instead of interpretation.

### Reference

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### COMING SOON!

### OF SEA AND SHORE INDEX

At the end of March 1996 we will have available an index for the magazine from Volume 1 Number 1 through Volume 18 Number 4. The index lists articles and illustrations. Price will be \$3.00 plus postage (add \$1 to U.S., \$1.25 Canada, \$1.50 Mexico, \$1.75 Central & South America, \$2.25 Europe, \$2.50 Africa & Asia, \$2.75 Pacific Rim)

## A Discussion of the Validity of Some *Cypraea* Species

Willem Krommenhoek, Ph.D.

In previous articles I have not accepted some types of cowries as valid species, e.g. *C. ursellus* (Krommenhoek, 1992, 1995). In this article I will once more demonstrate why, in my opinion, it is incorrect to designate certain types as distinct species. In the cases mentioned here I have found the characters used to species distinction not constant and gradually changing in expression. Splitting in taxonomy is one thing, but using variable characters for specific distinction is unacceptable. It dates from the time that too few specimens were studied and with too little knowledge of the variability of characters. Doing so produces a system that may have some economic value for dealers, but it stands far from biological reality and taxonomy. If it comes to the distinction of valid species, only constant characters can be taken into account and variable characters must be regarded as intraspecific.

*Cypraea histrio* Gmelin, 1791 and  
*C. grayana* Schilder, 1930

Burgess (1985, p. 63) gives the following description of *C. histrio*: (1) spire blotch prominent and constant; (2) shall pale; (3) reticulations large, uniform and delicate; (4) barely noticeable longitudinal lines on dorsum; (5) base convex. *C. grayana* is described as follows: (1) spire blotch absent in about half, usually small and inconspicuous; (2) a definite hump on the dorsum; (3) longitudinal lines usually interrupted by the reticulations; (4) transverse embryonal bands very prominent; (5) base convex; (6) definitely pointed extremities in most specimens.

He concludes (p. 70): "It (*C. grayana*) can usually be differentiated from *C. histrio* by the darker transversely banded dorsum and the lack of a prominent spire blotch". Lorenz and Hubert (1993, p. 59) add the following: oval to rhomboidal (*C. grayana*) and elongate oval to depressed (*C. histrio*); teeth fine, brownish (*C. grayana*) and teeth reddish (*C. histrio*). And also: "The status of this taxon is not fully agreed upon by all authors".

After carefully examining 26 specimens of the *histrio-grayana* group, collected on La Digue Island, Seychelles, I come to the following conclusions: (1) The characters for specific distinction between *histrio* and *grayana*: humped (*grayana*) versus not humped

(*histrio*); and the absence (*grayana*) versus presence (*histrio*) of a prominent spire blotch are very variable and mixed. E.g. *histrio*-like forms with a prominent spire blotch occur with and without hump, and humped as well as not-humped specimens occur both with and without spire blotch. (2) Transverse banding, a characteristic for *grayana*, is equally present in humped and not-humped specimens and in specimens with or without spire blotch. (3) Reticulations and longitudinal lines are not constant, neither is the color of teeth.

After reading Burgess's description of the animal, it is obvious that neither the color of the animal, mantle, papillae, siphon, tentacles and foot, nor the shape of these organs provide convincing diagnostic characters. In his own words: "I have found from careful study that the animals of *maculifera*, *eglantina*, *arabica*, *histrio* and *grayana* resemble each other very closely in most anatomical characters". Taking all this into account, I cannot consider *Cypraea grayana* as a valid species.

*Cypraea labrolineata* Gaskoin, 1849 and  
*C. gangranosa* Dillwyn, 1817

Burgess (1985, p. 222-223) gives the following descriptions *C. labrolineata*: (1) dorsum with circular discrete white spots, no dark spots of any kind; (2) no color in the canal. *C. gangranosa*: (1) dorsum with 10-20 discrete brown often ocellated spots; (2) color in the canals.

About the animal Burgess says: "This cowrie (*gangranosa*) demonstrates clearly the changes in shape and color, presumably influenced by external stimuli, that can occur in the animals of cowries. For them to be of specific value the anatomical differences must be definite and consistent in several specimens. Like the conchological characters, they may vary only in degree".

Lorenz and Hubert (1993, p. 193, 202) add to this: *C. labrolineata*: (1) elongate; (2) teeth rather strong; (3) margins spotted; (4) extremities usually blotched; (5) dorsum greenish-brownish. *C. gangranosa*: (1) oval; (2) base and fine teeth white; (3) tips blotched; (4) terminal blotches distinct and divided; (5) dorsum greenish-gray. Despite all these distinctive characters, they add: "*labrolineata* can be similar to *gangranosa*. Shells with spiny, dark stained teeth and others with shorter, plain white ones occur".

About 100 specimens of the *labrolineata/gangranosa* group were examined by me. All were collected on the islands of Java, Bali and Lombok, Indonesia. I come to the following conclusions: (1) The main characters for distinction between the species: dorsum with white spots together with the absence of color in the canals (*labrolineata*) versus brown spots and the presence of color in the canals (*gangranosa*) are not constant and mix. In about 5% of the specimens there are white spots only and no color in the canals, or there are brown spots and there is no color in the canals. (2) In about 10% of the "*gangranosa*"-designated specimens, there are only 4-5 very faint brown spots instead of the 10-20 as indicated, and there is very little color in the canals. Considering all this, I cannot accept *C. labrolineata* and *C. gangranosa* as distinct species. What we actually see, in my opinion, is intraspecific variation as a result of changing expression of certain characters.

*Cypraea cicercula* L., 1758, *C. globulus* L., 1758  
and *C. bistrionotata* Schilder & Schilder, 1937

Burgess (1985, p. 175) gives the following descriptions: *C. cicercula*: (1) spire blotch constant; (2) dorsum usually granulate; (3) basilar spotting absent; (4) extremities more produced than in any other of the group. *C. globulus*: (1) dorsum entirely smooth; (2) teeth short, anterior columellar teeth never cross the lateral carina; (3) sides and dorsum discretely spotted; (4) prominent posterior dorsal callus; (5) extremities less produced, blunt; (6) four basilar spots not constant. *C. bistrionotata*: (1) dorsum granulate in adult specimens; (2) teeth more prominent, anterior columellar teeth reach the lateral part of the dorsum; (3) three pairs of brown blotches evenly spaced along the length of the dorsal sulcus; (4) four constant basilar spots. The main conchological character for distinction of *C. bistrionotata* being the 4 constant basilar spots.

Lorenz and Hubert (1993, p. 218) add the absence of a spire blotch (*bistrionotata*) versus the presence of it in *cicercula* and a humped dorsum without basal blotches in the Seychelles form of *globulus*.

Examining 65 specimens of this group from the Seychelles and about 30 from Java, Indonesia, I noticed the following. In the Seychelles material with a smooth *globulus*-like dorsum there were 5 specimens with basilar spots, while the dorsum showed humps in different degrees. Among the specimens from Java there were two with well-developed *bistrionotata*-like basal spots, but without a granulate dorsum. Taking into account Burgess's remarks about the animal of *globulus* in the Seychelles, which differs in colorations of the tentacles, siphon and foot from specimens in the Pacific region, I feel once more that *C. gangranosa* cannot be

a valid species, as the characters for its specific distinction are not constant.

*Cypraea pallida* Gray, 1824 and  
*Cypraea vredenburghi* Schilder, 1927

Burgess (1985, p. 162, 163) says about these two species: "*Cypraea pallida* Gray is similar to both *Cypraea vredenburghi* Schilder and *Cypraea xanthodon* Sowerby. It can be differentiated from *C. vredenburghi* by the absence of a fossula and denticles". And also: "The dorsum of *C. vredenburghi* is crossed by 3 brown embryonal bands". About the animal he states: "The animal (*C. vredenburghi*) closely resembles that of *C. pallida*."

Lorenz and Hubert (1993, p. 124) mention about *C. vredenburghi*: "Similar to *pallida*, clearly distinguishable only by its denticulate fossula". (Fossula = a depression or groove in the anterior part of the columellar sulcus of a cowrie shell.)

Examining 30 specimens of this group from east Java, Indonesia, I noticed that all specimens had a fossula, and the embryonal bands being present in some specimens and vague or absent in others. Also taking into account the resemblance of the animals of both types, there is, in my opinion, no sufficient reason to consider these types as distinct species.

*Cypraea carneola* Linné, 1758 and  
*Cypraea leviathan* Schilder & Schilder, 1937

Last, but not least, I feel the same doubt in considering *C. carneola* and *C. leviathan* as distinct species. Conchologically the only character for differentiating between the two is the margin of the shell, which is smooth (*C. carneola*) versus more or less tuberculate (*C. leviathan*), (Burgess, 1985, p. 79).

After examining 90 specimens from the Seychelles, where *C. leviathan* is not supposed to occur, I found full grown adult specimens with smooth margins among more or less tuberculated ones. Again, this character for specific distinction appears to be variable. However, Burgess (1985, p. 79) and Lorenz and Hubert (1993, p. 69) mention a constant difference between the two types in the papillae: slender and flat with spear-shaped branched tips (*C. carneola*) versus huge branched broad-based ones in *C. leviathan*. But it is very questionable whether this is enough substantial difference for distinction on the specific level. In my opinion it is not and *C. leviathan* should be considered as a variety of *C. carneola* only.



### Discussion

In my opinion, too many new species have been created and new names given to forms which are only variations of existing species. I want to demonstrate my views with another example: *Cypraea boivini* Kiener, 1843.

Burgess (1985, p. 208) says about this species: "The slate-grey or milky-blue dorsum, with indistinct brown spots surrounded first by a light zone and then a ring of darker brown, distinguish *Cypraea boivini* from all others".

Lorenz and Hubert (1993, p. 193) describe it as: "Dorsum grey, profusely mottled with white, darker brown and ocellated spots". Next they show specimens from the Philippines with a grey, bluish and greenish dorsum, without mentioning these color variations in their text.

In 80 specimens from east Java, Indonesia, I found four types: (1) with a grey dorsum; (2) with a milky-blue dorsum; (3) with a bluish-green dorsum; (4) with an olive-greenish dorsum. In each type there were specimens with vague and blurred white, blue and

brown spots, and with white and ocellated spots. It occurs to me that these variations are the result of Mendelian genetics, producing different phenotypes as a result of the presence of different alleles for coloration in the population. That means that these variations are basically intraspecific, a fact upon which obviously all authors agree for this species. However, in my opinion the same Mendelian genetics are responsible for the variations mentioned in *C. grayana*, *C. labrolineata*, *C. gangranosa*, and *C. bistrionotata*, and, therefore, I cannot accept these types as distinct species. I hope that these remarks will invite further study.

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## More About Size Distribution of Indo-West Pacific Cowries

Willem Krommenhoek, Ph.D.

In an article elsewhere in this issue, I wrote about size distribution in six *Cypraea* species in Indonesia and the Seychelles. It was mentioned that in four species (*C. caputserpentis*, *C. carneola*, *C. helvola* and *C. isabella*) the same size distribution was found in beach-collected material from Java, Indonesia and LaDigue Island, Seychelles. In one case (*C. asellus*), it was found that specimens from the Seychelles were significantly larger than those from Indonesia, the majority being 14-16mm versus 10-12mm. This observation was in line with earlier observations mentioned in the literature that specimens tend to grow larger in the periphery of their distribution area.

However, after careful study of beach-found specimens of *C. clandestina* the opposite situation is observed: the Seychelles specimens being smaller than the Indonesian ones (see table below).

This observation is contradictory to the general trend mentioned above. But is it really strange? I think it is not.

All species considered are Indo-Pacific and frequent, and collecting sites in Indonesia and the Seychelles are situated on the same latitude and facing south, subject to the same heavy wave action as a result of monsoonal winds. This excludes climatic differences as a means of explanation. The fact that four of the species measured did not differ in size distribution between these locations is a strong indication that changes in environmental factors like the presence of food, neither are responsible for the differences. Therefore, in my opinion, the observations are a strong indication that genetic factors must be held responsible for the differences in size. I think it is quite well possible, like it is found in other

**Table 1:** Size distribution in mm of *C. clandestina* from Java (N = 78) and La Digue island, Seychelles (N = 57).

	8	10	12	14	16	18	20mm
Locality:							
Java	1	15	30	22	6	1	
Seychelles	6	23	22	5	1	0	

organisms, that body length is the result of polygenic inheritance, whereby the number of dominant alleles determine final body length and environmental factors shape the size distribution curve of the population. In case an extra dominant allele is present in a population, the population as a whole will grow larger, just as it will grow smaller in case a dominant

allele is lost. In this view it is not surprising that populations which are isolated by 5,500 km of ocean, in a number of cases, underwent some genetic differences, resulting in opposite effects. However, much effort and time is needed to collect sufficient data to formulate a more accurate model.

## About *Cypraea kieneri* Hidalgo, 1906, *C. hirundo* L., 1758 & *C. ursellus* Gmelin, 1791

Willem Krommenhoek

**Abstract:** After careful examination of over 300 specimens of *C. kieneri*, *C. hirundo* and *C. ursellus*, the conclusion is drawn that the characters to separate these three species are not sufficient. Especially the characters for distinction between *C. hirundo* and *C. ursellus* are not constant and actually link the two. Therefore, I cannot consider *C. ursellus* a valid species.

In a previous article (Krommenhoek, 1994) I have not accepted certain species of cowries as valid, e.g. *C. ursellus*. In this article I want to explain the reason, in my opinion, that *C. ursellus* cannot be a valid species.

The characters of *C. kieneri*, *C. hirundo*, and *C. ursellus* are given by Burgess (1985) and Lorenz & Hubert (1993) as follows:

*C. kieneri* Hidalgo, 1906: (1) shape elongate-oval (L & H); (2) teeth rather coarse, extending except at anterior columellar side (L & H); teeth which are on the anterior columella markedly attenuated (Burgess); (3) base white, margins spotted (L & H); (4) dorsum covered with three bluish-green zones and small brown spots (L & H).

*C. hirundo* Linnaeus, 1758: (1) shape oval to cylindrical (L & H); (2) teeth fine, extending over base (L & H); teeth which are fine and cross most of the base (Burgess); (3) margins finely spotted (L & H); (4) dorsum with three blue to gray zones spotted with brown, often blotched (L & H).

*C. ursellus* Gmelin, 1791: (1) inflated, with rostrate extremities and ribbed posteriorly (L & H); (2) teeth fine and reaching finely spotted margins (L & H); (3) dorsum with three dark bluish-green zones, mostly blotched (L & H).

Burgess (1985, p. 157) remarked that "A study of literature leaves doubt about just what cowries are represented by the names *C. ursellus* Gmelin, 1791 and *C. hirundo* Linnaeus, 1758"; Lorenz and Hubert (1993, p. 171), however, are of the opinion that "The fine but distinct ribbing of the posterior extremities (in *C. ursellus*) can easily be overlooked. There are no doubts on the validity of this name (*C. ursellus*) on account of this unique feature, despite its similarity to *hirundo*".

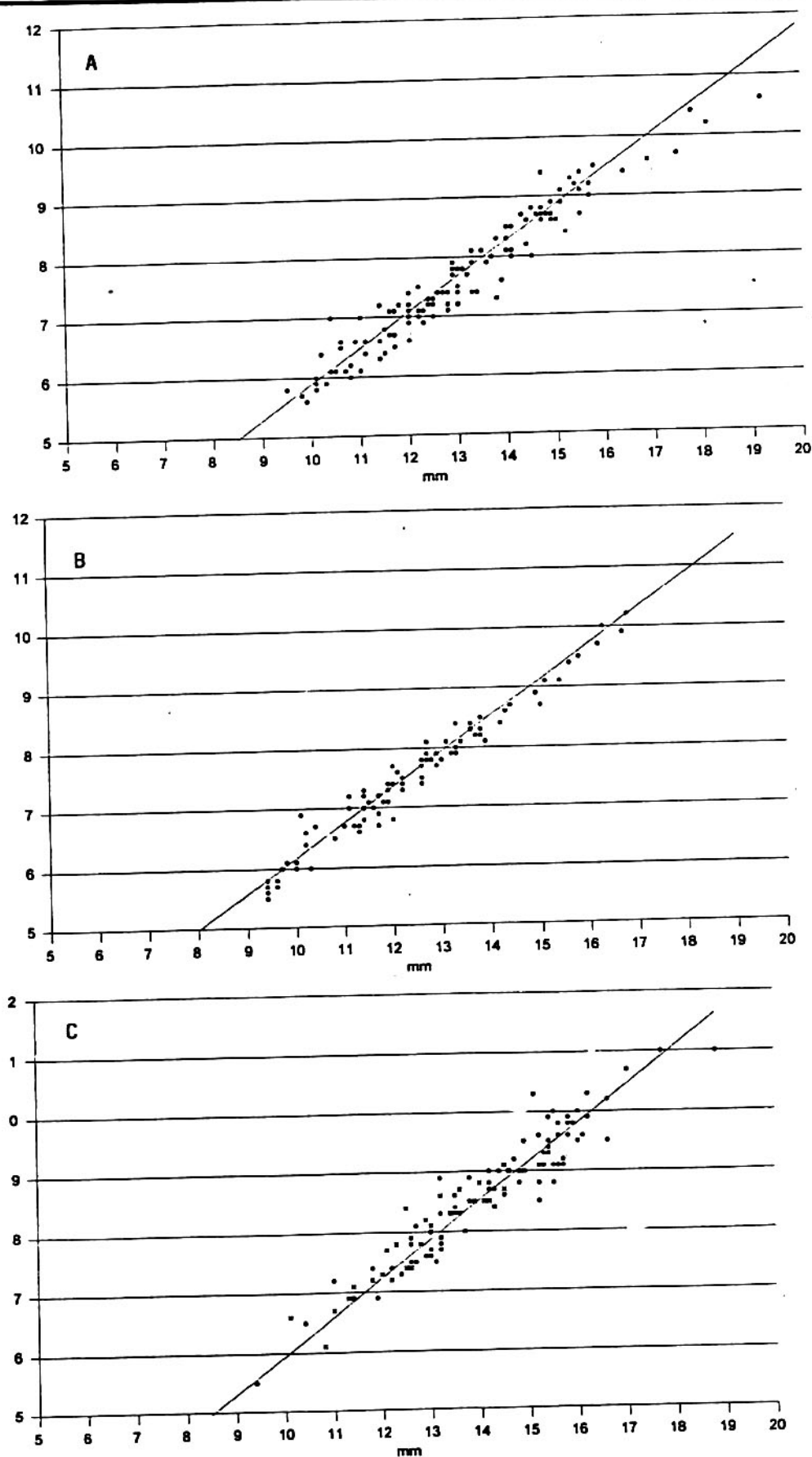


Fig. 1. Length-width diagrams of *C. kieneri* (A; N=119), *C. ursellus* (B; N=90), *C. hirundo* (C; N=78), and undifferentiated *C. ursellus/C. hirundo* (x in C; N=38) from Java, Indonesia.

There are over 300 specimens of these three cowries in my collection from Java, Indonesia. The length and width of each specimen were measured to the nearest 0.1 mm with Mitutoyo calipers. This included 119 specimens of *C. kieneri* (Fig. 1A), which could easily be recognized from the teeth; 90 specimens of *C. ursellus* (Fig. 1B), identified by the fine teeth and presence of clear posterior ribbing; 78 specimens with fine teeth, but without posterior ribbing which were considered *C. hirundo* (Fig. 1C); and 39 specimens with fine teeth, but with a very faint posterior ribbing or with barely visible lines in place of ribbing (x in Fig. 1C).

It is clear from Fig. 1 that the three cowries have the same shape. This is demonstrated by the steepness of the line connecting the average length-width values for each type. Describing *C. kieneri* as elongate to oval and *C. hirundo* as oval to cylindrical is therefore meaningless. However, these two species are distinguishable by their dentition.

A more serious problem arises in separating *C. ursellus* from *C. hirundo*. As they have the same shape, the only conchological characters left for differentiating between them are color and the posterior ribbing in *C. ursellus* and the absence of it in *C. hirundo*. However, in the collection available to me about 20% of the specimens with fine teeth have weak to barely visible ribbing or faint lines on the posterior extremities. Therefore I have to conclude that this feature is not

constant and hence useless for species distinction. That leaves the color of the shell, the dorsum with blue to gray zones in *C. hirundo* and with bluish-green zones in *C. ursellus*. But neither this is a clear and constant character. The animals differ only in the length of the papillae (shorter in *ursellus*), color of the tentacles (orange in *hirundo*, yellow in *ursellus*), and presence (*hirundo*) versus absence (*ursellus*) of dustlike spots on the siphon (Burgess 1985, pp. 156-57). Judging by the variability of these parts in other cowry species, these differences appear to be intra- rather than inter-specific a contention further supported *C. hirundo neglecta* Sowerby, 1837 which is said to be anatomically identical with *C. ursellus* and possibly its synonym (Burgess, 1985, p. 157).

As there is no real character to differentiate between *C. ursellus* and *C. hirundo*, there is no ground, in my opinion, for regarding *C. ursellus* as a separate species.

#### References

- Burgess, C.M. 1985. *Cowries of the world*. Seacomber Publications, Cape Town. xvii + 298 pp.  
 Krommenhoek, W. 1994. Beach-collecting cowries: Observations from the field. *The Cowry n.s.*, 1(2): 43-48  
 Lorenz, F. & A. Hubert. 1993. *A Guide to Worldwide Cowries*. Crista Hemmen, Wiesbaden. 571 pp.

## New Publications

### New South Wales (Australia)

*Seashells of Central New South Wales (Australia)* by Dr. Patty Jansen is expected to be published in the next few months. 150 pages, soft cover, black and white line drawings. A large portion of the book is dedicated to the micromolluscs. Privately published by the author, the book sells for A\$35 before publication or A\$40 after publication, plus postage of A\$7 surface or A\$12 economy air outside of Australia (postage free within Australia). Contact Dr. Patty Jansen; 11 Eden St.; Belgian Gardens, Queensland 4810, Australia (tel: +61 77 727743)

### Maltese Land Snails

Monograph 15 of the Museo Regionale di Scienze Naturali (Torino, Italy) is entitled "The non-marine molluscs of the Maltese Islands" by F. Giusti, G. Manganelli and P.J. Schembri and contains 635 figures in its 587 pages. Price of the volume is 130,000 Italian Lira, plus postage. Order forms can be obtained by writing the Museum at Via Giolitti, 36 - 10123 Torino, Italy.

### South African Land Snails

Several special publications from The Conchological Society of Southern Africa may be of interest to our subscribers. Special Publication No. 5 "Personal Names in South African Conchology" (67 pages, cost is R32 or US\$10, includes postage) and gives short biographical sketches of persons associated with the shells of the region. Special Publication No. 6 is "The Streptaxidae of South Africa" by the late Don Aiken and covers the land mollusca of this particular Family. (describes 136 species, of which 83 are illustrated in line drawings; 23 pages) Price is US \$10 and includes postage. Either of these titles can be ordered from The Conchological Society of Southern Africa, 7 Jan Booysen Street, Annlin, Pretoria 0182, Republic of South Africa.



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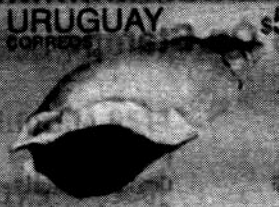


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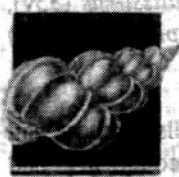
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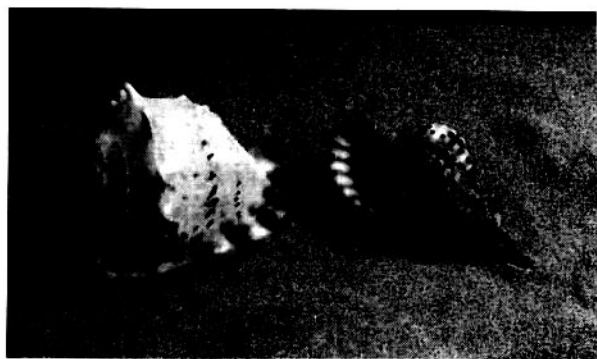
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## Shells On Stamps

See illustrations on page 233.

There has been some activity in the shells-on-stamps field. specially noteworthy, for us Yanks anyway, is the appearance of a U.S. issue prominently featuring a Triton Trumpet (*Charonia tritonis*). The issue is in honor of the anniversary of the establishment of the Republic of Palau which had been, since the Second World War, administered by the United States. Palau has also issued a stamp with similar design.

I want to thank several South African subscribers for forwarding sets of that countries new shell stamps. Thanks Dawn Brink, Michael & Dawn Meyers and Stephen Whatmough!

The stamps have no value indicated, just "Standard Postage" inscribed. Five pairs of gastropods are shown: *Afrivoluta pringlei*, *Lyria africana*, *Marginella mosaica*, *Conus pictus* and *Cypraea fultoni* (with the genus spelled "*Cypreaea*").

The Islamic Republic of the Comores (all of the islands formerly called The Comoros, except for Mayotte which has remained a part of France) has issued another nice shell stamp set. Also note the

small bivalves in the upper corners of the stamp design. Shells shown are: *Lambis chiragra* (75F), *Strombus lentiginosus* (125F) [the species name is spelled "*lentinosum*"], *Tonna galea* (200F), *Cymbium glans* (300F) and *Lambis crocata* (450F).

The South American nation of Uruguay has issued a min-sheet set of shell stamps, all with a \$5 denomination. This is only the second group of shell stamps from Uruguay, two others were issued in 1968. The species shown are: *Zidona dufresnei*, *Buccinanops duartei*, *Olivancillaria uretai* and *Dorsanum moniliferum*.

From the former New Hebrides, now known as Vanuatu, comes a pretty set of four shell stamps. *Epitonium scalare* (25v), *Strombus latissimus* (55v), *Conus bullatus* (90v) and *Pterynotus pinnatus* (200v) are the shells used.

Our next issue will have more details on these and other issues. I appreciate your comments and additions concerning these stamps.

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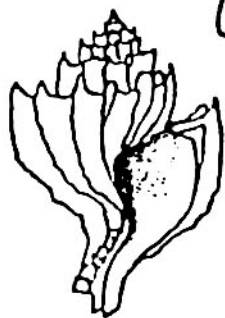
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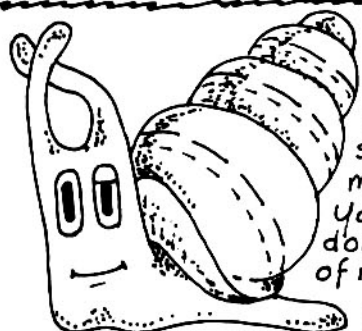
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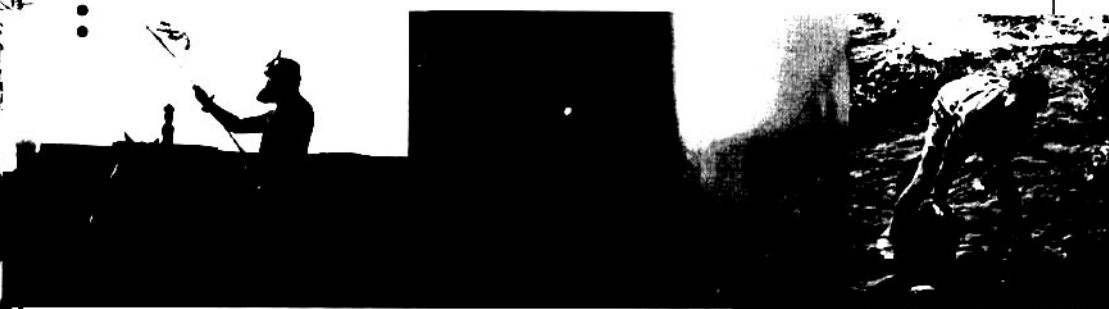
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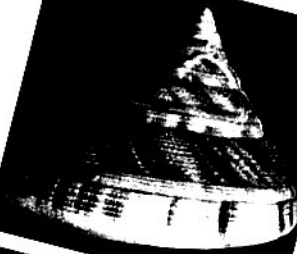


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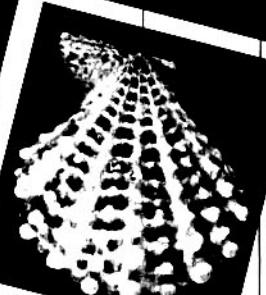
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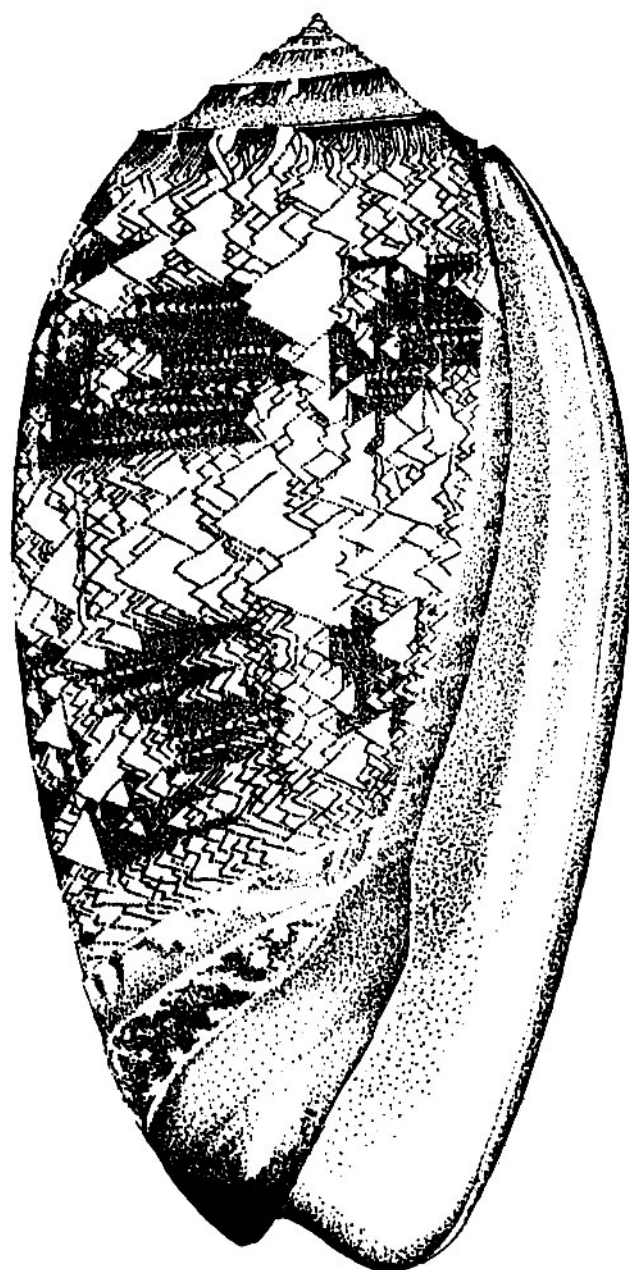
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