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OUR COVER PAGE 37

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Shelling in the South China Sea

JAN O'BRIEN

Tregganu, Western Malaysia

Kuala Trengganu, West Malaysia. Where? If that was your first reaction, you're not alone. To clarify, we are 300 miles NE of Singapore, 250 miles due east of Kuala Lumpur and 120 miles south of the Thailand border on the East coast of West Malaysia. Is that better? No, I didn't think so. I hope some day you may want to know exactly where it is and come for a visit.

This side of West Malaysia is still fairly unspoiled. The people, the food, the weather the traffic and many other things can best be described as hot, slow and gentle. Offshore, there are six major island groups and innumerable small ones. We have snorkeled around most of them, but the one we have the most experience with is Pulau Kapas off Kuala Trengganu. Situated six miles southeast of Kuala Trengganu, it has some of the finest shelling grounds anywhere in the South China Sea. At least we think so. From this island alone we have collected over 100 different species. These include *Cassis cornuta, Lambis lambis, L. chiraga, Phalium glaucum, P. bandatum, Cypraea talpa, C. erosa, C. tigris, C. arabica, C. eglantina, C. argus, C. lynx, Conus betulinus, C. textile, C. marmoreus, C. nusatella, C. aulicus, C. omaria, C. episcopus, C. geographus, C. striatus, C, eburneus, Murex chicoreus, M. brunneus, M. pecten, Tibia fusus* ... o.k., alright, enough already. You get the idea.

All out collecting has been done by snorkeling. The water is only deep enough for tanks in some places and almost all our shells have been found in 30 feet of water or less. Beach walking also yields great finds like Japanese net fishing floats, and you'll usually be accompanied by a gaggle of small brown bodies with big eyes and flashing smiles shouting "Hel-lo, hel-lo", the only word of English they know. If you're a photographer, both in and out of the water, the possibilities are endless. The corals and fish are gorgeous. If you're a sun worshipper, this is definitely the right place. The sun shines an average of 300 days a year and it is 85-87° day and night. You'll be scrumptiously brown before you know it!

So how do you get here? You fly from your home to Singapore or Kuala Lumpur. You can take a bus from Singapore, but it's an eight hour trip and the roads are pretty bad, not to mention the drivers. When you land in Kuala Lumpur, ask Immigration for three weeks. No Visa is required for a two or three week stay, but two weeks is the usual chop. If you are firm and ask politely for three weeks, telling them that you really do need it, they'll usually give it to you. That way, if you only plan to stay two weeks but run over by a day or two, there's no problem. Getting the extension here in Kuala Trengganu is an exercise in patience and beauracracy and takes all day.

You can fly into Kuala Trengganu on Malaysian Airlines System (MSA). It's a one-hour flight, costing U.S. $65.00 round trip. We have two flights a day in and out, but be booked in advance as the flights are usually quite full. Be sure your booking is confirmed and re-confirmed because there is a 25% no-show fee if you miss it.

There are several motels and hotels here in town. The Pantai Motel is the usual choice. It's right on the beach, has a restaurant and cocktail lounge, swimming pool, air conditioned rooms and nearly everybody speaks English. The rates are from $20-30 U.S. per day for a standard room: twin beds and a shower; and $30-40 U.S. per day for a deluxe: double bed, shower and bath. The motel also has their own boat for going to the island, but it's more expensive than a local boat. There are other less expensive hotels that are clean and reasonably safe, but as the price goes down so do the amenities, starting with air conditioning. If you're not used to tropical heat and humidity, that can be a real disadvantage. Restaurants in town range from very posh to street stalls. Experimenting with new foods at the stalls is great fun and unbelievable cheap. You can get four or five dishes for U.S. $2.00. The mainstay of the local people is fish, rice and vegetables, usually cabbage or sawi (a leafy veg that tastes like broccoli). There are so many different kinds of ocean fish at the market I can't begin to name them. A fish-eater's paradise! Freshly caught scallops, cleaned while you watch are $2.50-$3.00 U.S. per pound (that's about 60 scallops!) and large prawns, 6-8 inches, $4.00 U.S. a pound. There's barracuda, eel, shark, crab, lobster, grouper, skate, you see what I mean. Chinese food is exquisite. After "the real thing" here, your old Chinese restaurant back home just won't be the same.

For the boat to the island, we drive to a small fishing village 10 miles south of Kuala Trengganu, called Marang. It's a lovely drive through the countryside and gives you a condensed version of life in Malaysia. There we have a regular boatman who takes us to the island for about $20 U.S. per day. He's an old retired fisherman with no teeth and if you're not a regular customer his rates triple. Bargaining is a way of life here and if you don't, the joke's on you. He's also quite a sheller and knows where most of them are. He stays with us all day and moves the boat wherever and whenever we desire. If we want to sleep on the island he's more than willing, if we provide his "makan" (food). Sleeping on the island is a lot of fun if you like to rough it. You must take everything with you because there's nothing but sand and coconut trees. An air matress is definitely a good idea. Having spent a night or two trying to mold the sand to a tired body, I speak from experience. However, one or two beers (or three or four) usually makes that sand seem a lot softer.

The water here is clear and warm and relatively shark-free. We see small dogfish and an occasional blue-tip, but have never had a problem. There are lion fish and an assortment of eels and rays, but if you don't bother them, they won't bother you. I'm the original "Chicken of the Sea" and I've never been frightened. I have been stung by a jellyfish once, but it wasn't unbearable. We keep a ready supply of all necessary first aid equipment in case of emergency.

There are only one or two things you need to be forwarned about. Malaysia is Muslim and predominantly so here in Trengganu. Women must take care in their dress, no shorts or halter tops in public. Skirts and slacks are fine. Malaria pills are not required unless you go into the jungle. Cholera shots are a good idea, dysentary pills a must. If you have a sensitive stomach, boiled water is best. That's about all I can think of. Please come and visit us, we'd love to show you around. See you soon.

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The Niger & Rostrate Cowries of New Caledonia

CHRIS BARRAND

Bexleyheath, England

These brilliant and magnificently shaped cowries exhibiting melanism and rostration are most commonly known as the "niger" cowries, and, as every collector of *Cypraea* knows, they come from the island of New Caledonia.

However, melanism and rostration is not confined exclusively to New Caledonia; cowries from other parts of the world have exhibited these forms in varying degrees, especially several species from Queensland, Australia. But rarely is this to the degree or beauty of those collected in New Caledonia. Where they occur on the island is very precise and limited range. This restricted area is the southern coastline from the area of St. Vincent Bay, around to Goro Bay. It is only this area, the southern part of New Caledonia, to which this article is focused.

Two recent publications have been surprisingly frank in identifying areas within this region where the "niger" cowries can be found. R. and G. Pierson, in their book Porcelaines Mysterieuses de Nouvelle Caledonie, refer to five specific locations on the south coast where melanistic and rostrate cowries occur more often. Mr. Chatenay, in his book Porcelaines Niger et Rostrees de Nouvelle Caledonie, is even more precise in his reference to geographical location, pinpointing ten locations within this area where these aberrant cowries are collected most frequently. It appears that these unusual shells can be found in greater numbers on the coast line, inlets and inner reefs than offshore or the outer reefs and have been collected from very shallow water to a depth of approximately 24 feet.

It must be explained that within this area there appear more than just "niger" cowries. There are four abnormalities that can occur: rostration, melanism, colouration, depigmentation.

Melanism and rostration can occur separately or together and also with colouration. Colouration and depigmentation always occur with rostration.

ROSTRATION
[also known as aberrant, deformed, distorted, diseased?, gigantic cowries]

Rostration means projecting in a beak-like manner. When applied to cowries it means that additional nacre (calcium) is deposited on the anterior extremity (front) of the cowry, giving a beak-like shape. However, with the rostrated cowries of New Caledonia there is a much greater liberty with the word rostration to describe all varieties of unusual shapes that are not displayed by the normal specimen. The following types of rostration occur singularly and sometimes jointly.

a. elongation (stretching) of anterior and posterior extremities;
b. terminal rostration upwards or downwards;
c. terminal rostration to left or right;
d. rostration of margins.

The degree of these various types of rostration can be from just noticeable, as with *C. nucleus* and *C. talpa*, to extreme as with *C. annulus*, *C. fimbriata*, *C. stolida*, *C. moneta*, *C. hirundo* and *C. eglantina*. Some species have distinct limitations on rostration, exhibiting always in a specific manner, whilst others appear to enjoy complete freedom and can display one or several of all the different forms of rostration to an extreme degree.

With rostration there are other noticeable differences. Not only is rostration a lengthening or widening of the shell, but also a great majority of rostrated cowries are additionally covered with a thick nacre where rostration occurs, giving the shell a heavy characteristic. This nacre is normally translucent, white, or of an ivory colouring and can be so thick as to partially to completely hide the original colouring and pattern of the shell. This nacre, with rostration, can become so severe as to join together the two sides of the exterior or anterior extremities. Occasional rostrated specimens of *C. vitellus* and *C. annulus* are noted as good examples of this peculiarity.

A heavy grey streaky colouring can also be exhibited within this nacre, that makes the shell appear "dirty". This normally appears on or within the interstices (teeth) or on the rostrated extremities. Additionally this nacre is normally of a smooth, swollen nature, but it also occurs in a ripple fashion of layer upon layer. *C. humphreysi* and *C. martini* have exhibited this form.

With extreme examples of rostration, this nacre can occur in a lumpy, large nodular, or indented, appearance which has resulted in erroneous descriptions of "diseased" specimens. Specimens of *C. eglantina*, *C. arabica*, *C. caurica*, *C. lynx*, *C. mappa*, *C. scurra* and *C. stolida* have exhibited this form. Rostration can also affect the interstices, enlarging and distorting them in a remarkable manner. Finally, this nacre can be deposited very heavily yet the colours and markings of the shell are sometimes still retained on top of the nacre.

A further effect of rostration can be gigantism; it is infrequent and does not appear in all specimens that can rostrate. When it does happen it gives much greater emphasis to the abnormality and beauty of the shell. The gigantism is not confined to the area of rostration alone, but to the whole shell. There have been some spectacular and beautiful shells discovered exhibiting gigantism. Fine examples have been noted in *C. annulus*, *C. moneta*, *C. stolida*, *C. scurra*, *C. vitellus*, *C. poraria*, *C. lynx*, *C. cribraria* and *C. erosa*.

One last form of rostration must be mentioned. It is unique to one species - *C. cylindrica*. The rostration of this shell, in rare examples, forms a very flared labial lip with an additional row of teeth "double banking" the normal labial teeth.

MELANISM
[also known as black, dark, niger, melanistic, melanotic cowries]

Melanism is a blackening of the shell that can appear partially to completely covering the shell, normally restricted to the dorsum. Some species have exhibited partial melanism on the base. This has been observed in *C. stolida*, *C. humphreysi* and *C. arabica*.

Most species collected within this area have shown some form of melanism, a few species have shown complete melanism and a few species have shown no form of melanism at all.

COLORATION
[also called colour aberration, unusual colouring, etc.]

This abnormality is most frequently found on the base and margins, when it occurs, and normally where rostration is most apparent. This colouring is usually exhibited as a light orange-brown to rust. Rare examples of this type of colouring have been seen in *C. helvola*, *C. humphreysi*, *C. mauritiana*, *C. errones*, *C. caurica* and *C. arabica*.

There is only a handful of species that can display abnormal colouring on the dorsum. The most popular known is *C. poraria* in which the embellishment and exaggeration of this cowry's own beautiful colouring, coupled with gigantism and rostration is both breathtaking and spectacular.

C. caputserpentis has been found with a light reddish colouring replacing the normal dorsal colour of brown.

C. moneta and *C. annulus* very occasionally give exaggeration to their own normal dorsal colouration.

Where cowries have coloured extremities, then these also give really beautiful and impressive colour variations. This has been evident in *C. isabella, C. staphylea, C. microdon* and *C. fimbriata.*

It must be emphasised that, in all cases, colouration is a very rare occurence, much more so than normal melanism and rostration.

In the collection of Dottie Janowsky, New Yprk, I was priveleged to view a unique specimen of *C. arabica* which exhibited full melanism on the dorsum and, additionally, on top of the melanism was a colouration unlike any New Caledonian cowrie I have ever seen. The colouring was of a beautiful lilac shade in very fine filament lines and covering the rear part of the dorsum and stretching up and over the top of the shell. In places these lines are so numerous as to completely hide the melanism of the shell. The total picture was not unlike a lilac impression of a fern-like plant. Most spectacular!

DEPIGMENTATION
[also called depigmented, albino, white, etc.]

Depigmentation, when applied to these rostrate cowries does not mean a cowry turning white, but more accurately, to think of it as a lightening of its own normal colouring. Because of this most specimens exhibiting this form appear rather insipid. The exception to this is *C. staphylea*. In Pierson and Pierson's Porcelaines Mysterieuses de Nouvelle Caledonie they have devoted a whole page to a single photograph of a *C. staphylea* showing depigmentation in its purest and most brilliant form. One of the most spectacular specimens I have ever seen coming from New Caledonia.

Depigmentation always occurs with rostration and is the rarest of the four abnormalities. It has been observed in only six species: *C. teres, C. carneola, C. erosa, C. poraria, C. staphylea* and *C. stolida.*

C. staphylea, C. teres and *C. stolida* are the three species I know of which are capable of exhibiting depigmentation as well as melanism. *C. staphylea* and *C. stolida* are the only species which have shown depigmentation and melanism on a single specimne. With *C. staphylea*, the melanism is on the extremities, the depigmentation on the dorsum; *C. stolida* has melanism on the dorsal blotch, the depigmentation elsewhere.

A word of warning - depigmentation is not to be confused with sub-fossilized specimens that are occasionally found very faded, but in all other respects in excellent condition with full gloss. To the discerning collector, this should be evident; to the casual collector - beware!

Causes

I have so far covered the various forms of melanism and rostration that have been discovered in New Caledonia. It should now be explained what causes these abnormalities.

To date, I have yet to read of any author being able to give an accurate and exact reason for the causes of these different abnormalities; this does not mean a lack of interest. A lot of detailed study has been done and curiosity is still keen today.

The cause is obviously related to the adult cowry's glandular system and its capability of secreting an amount of calcium different in colour to its normal species colouring and an excessive amount producing the rostration. What triggers this, or how and why has proven too complex to accurately determine. Why only certain shapes and colours, and why only certain species affected is still very much a mystery.

What has been discovered, to date, though is very interesting and useful in discounting a number of erroneous theories.

1. Genetic

Clearly false for no "niger" cowry has been discovered sitting on egg capsules. (To perpetuate the abnormality, if genetic, would require positive evidence of such a discovery.) Additionally, there has been no discovery of a juvenile with any abnormality. Also the additional calcium is always overlayed on top of the normal adult shell and pattern proving juvenile stages are not affected.

2. Locality

There have been a number of suggestions that because of the very heavy mineral deposits in this area that certain elements are causing a reaction in the cowries; yet other parts of the world have similar geographical structures without affecting the local cowry population. Further contradiction of such a theory is the evidence that melanism and rostration occurs so rarely in the affected species, it does not occur at all in certain species and only partially in some, yet all in the same habitat. Surely if a chemical/mineral irritant were the cause many more cowries would be affected.

However, in view that almost all melanistic and rostrate cowries come from such a small and confined area of the world, certainly suggests that locality, for whatever reason, plays an important part.

3. Feeding

Each species appears to have set limitations and abnormal cowries are found feeding in the same area as normal specimens of the same species. This evidence would appear to contradict the popular view of food being the cause.

It has also been noted that the animal colouring of melanistic cowries is no different to its normal species colouring, so the only visual difference appears to be the actual shell shape and colouring.

Whatever the cause, it remains for us to enjoy these beautiful enhancements to the cowry, which in itself is one of the most colorful and popular members of the molluscan family.

In recent years there has been an increasing demand by collectors for these unusual specimens of *Cypraea*, with the corresponding intensive search for them in habitats not previously discovered. Because of this, specimens of species not previously known for melanism or rostration have been collected during the last decade. These include *C. felina, C. catholicorum, C. eburnea, C. martini*. So new specimens are still being found and new discoveries are quite probable.

Unfortunately, available specimens are becoming even more scarce than they already were, and the retail prices prohibitive to most. But every cowry collection must be considered incomplete without at least one or two of these most wonderful and desirable "niger" cowries of New Caledonia.

The following table is based upon my own personal observations and correspondence. It is not intended as a definitive list. I am always interested in hearing of new additions.

Please turn to page 12 for the table.

SHELLS - WORLDWIDE COMMERCIAL & SPECIMEN

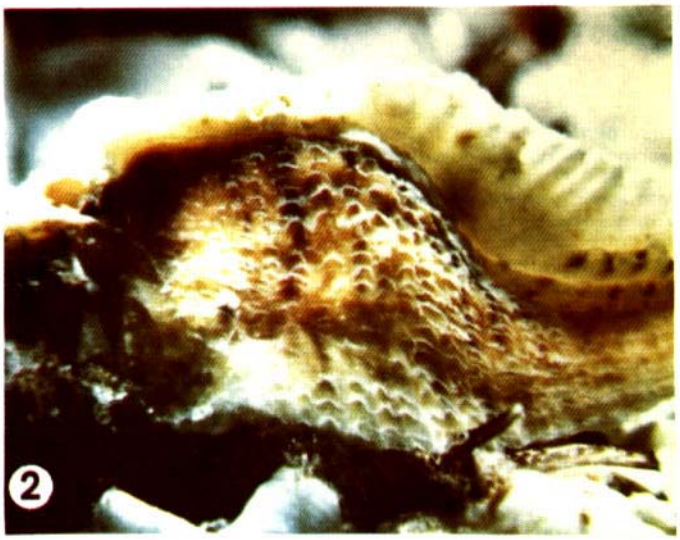
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The Growth & Feeding Habits of a South Australian Murex

CHRIS ILLERT

West Beach, South Australia

The time sequence of coloured photographs (see page 8) was taken over a period of two months during June and July, 1979. The sequence shows one of my aquarium specimens of *Pterynotus triformis* (Reeve, 1845) in the process of enlarging its shell.

The individual photographs were taken with a single lens reflex camera [1] through the glass wall of my aquarium. The murex remained attached to the glass wall for nearly two months (moving away only temporarily - in figure 2 - to escape the overbright photographic lights), so it is not surprising that we see the underside of his foot as a conspicuous white circular patch in each of figures 1, 3 and 4.

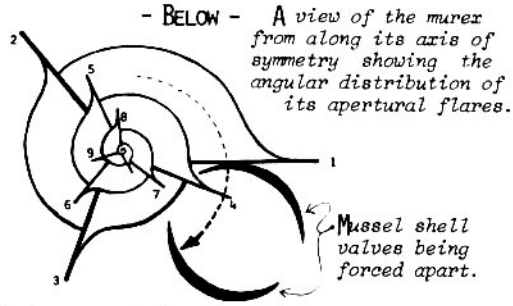
Equally obvious are the two eye-stalks in figures 1 and 3; and the black eye-spot (on the right tentacle) which looks concernedly at the camera in figure 1. By the time the last photograph was taken, the murex had been located in the same place for so long that a small sea star had made its home in the small crevice between the shell and the aquarium's glass wall. Was there a symbiotic relationship between the murex and the sea star???

Almost two months were needed to complete the new segment of shell. This was then followed by a five month period during which the enlarged shell remained unchanged and was used by the gastropod as a tool for the purpose of prying open small bivalves on which it fed.[2] Once the murex had eventually satisfied its appetite, yet another period of shell growth and physical inactivity commenced. During this period a further complete segment was added to the shell. [3]

Obviously these murex shells do not grow continuously; they enlarge, instead, by the continuous addition of essentially discrete gnomonic surface segments [6] - each of which subtends a constant angle (of slightly less than 120 degrees) about the axis of symmetry, and terminates with an outwardly turned apertural flare.

Because the neighbouring flares subtend a constant angle of slightly less than 120° we find that corresponding flares on consecutive whorls are always slightly out of phase. In particular, the first and fourth apertural flares (as measured backwards from the current shell aperture) are slightly disaligned and may consequently be used like the jaws of a vice to hold one valve of a cockle shell whilst its counterpart is forced away by the foot and operculum of the murex.

In order to obtain the maximum mechanical leverage the murex usually attacks the bivalved shell diametrically opposite its hinge and, as the valves are gradually forced apart, it extends its grey spotted white body between the shells to eat its prey; a process which usually takes a couple of days. Often the cockle shell valve which is held between the murex shell flares sustains damage at the point where it bears on top of the murex shell aperture. Consequently, it can be revealing to look at empty cockle shells washed in by the tide to see if their component valves have inexplicable marginal notches.



- BELOW - *A view of the murex from along its axis of symmetry showing the angular distribution of its apertural flares.*

Note how one of the valves is held between the first and the fourth apertural flare.

The use of its shell as a "cockle opener" seems to be the sole feeding technique employed by the murex, *Pterynotus triformis*. I have never observed the murex boring a hole in a bivalve shell. This is in stark contrast to the behaviour of *Ceratostoma nuttalli* which has been reported to have bored holes in the shells of numerous victims under aquarium conditions.[5]



Murex forcing bivalve's valves apart.

About The Photographs

Fig. 1 - (x8) - Caught in the process of enlarging its shell, the mollusc peers timidly out from underneath a white margin of freshly deposited calcareous material. Its pin-hole-camera-eye, on the right tentacle, studiously looks at the camera. The newly created surface segment is scarred by a score of conspicuous sinusoidal white ripples, each of which demarks the termination of consecutive diurnal cycles of growth activity. The photograph is particularly valuable in a scientific sense because these same thin sipples would be gone in a month or so - perhaps redissolved in seawater or worn away - leaving a smooth featureless segment of shell surface whose mode of formation could only (by that time) be established with acetate peels and electron microscope studies. It certainly is easier to watch as growth proceeds rather that to theorise retrospectively. The growing aperture is protected by a thin mucous-like skin which extends a few millimetres back over the most recently deposited shell material - presumably preventing premature exposure to the corrosive sea water.

Fig. 2 (x5) - "Running Away". The murex has temporarily moved off the aquarium wall in an attempt to escape the camera lights. This conveniently provides us with a different view of the newly deposited "growth-ripples". From frill to frill they are separated by a distance of (on average) 0.3 mm. It is interesting to note how far the previous apertural flare, and the fourth on the preceding whorl, have left behind by the steady advance of the new shell margin about the central axis of the shell. The obvious growth check (cone of irregularity), on this newly formed shell segment, records the shock caused by a 25% water change which happened to the aquarium a week previously. This indicates the sensitivity of molluscan growth processes to biochemical changes in the external environment.

Fig. 3 - (x2) - "Sunset in the Aquarium". Several days later the murex has migrated back to its favourite spot on the aquarium wall and its circular white fleshy foot is again seen from underneath as we view through the glass. The shell, as a whole, now rests in a horizontal position with its apex again pointing to the left of the photograph. The aperture has started to flare, but is, as yet, so thin and fragile that it is transparent.

Fig. 4 - (x3) - "The Morning After". A fortnight in the life of a murex passes as eventfully as a single night in the life of a human. Close examination of the substrate reveals that little has altered with the passage of time; except that the flared aperture has thickened up and a small brittle star of the Family Ophiodermatidae has crept between the murex shell and the glass wall for protection or possibly small fragments of food.

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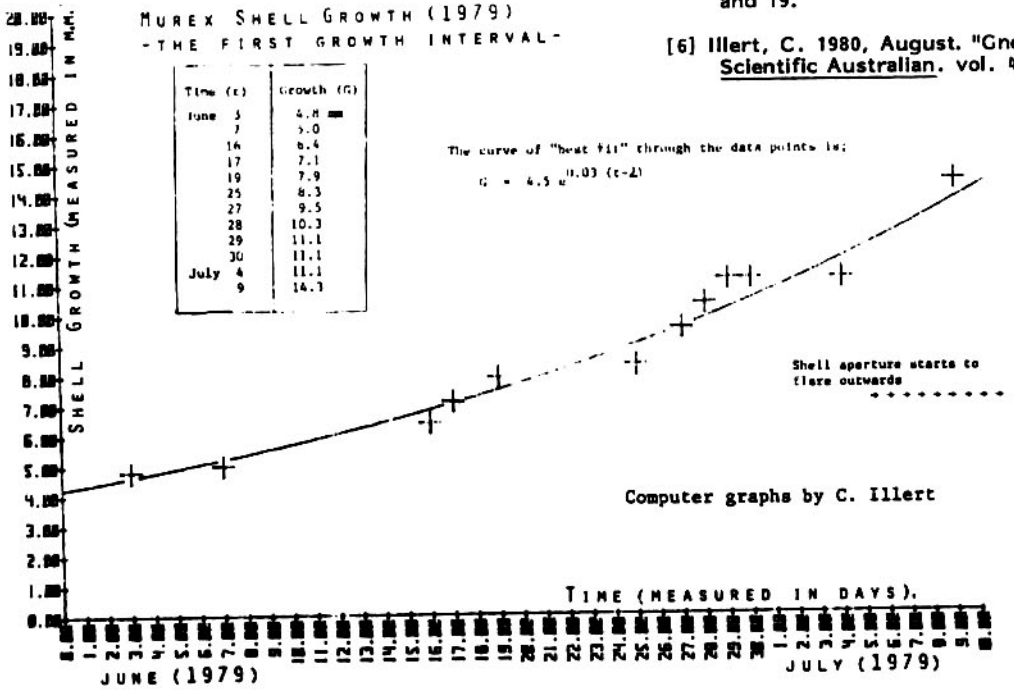
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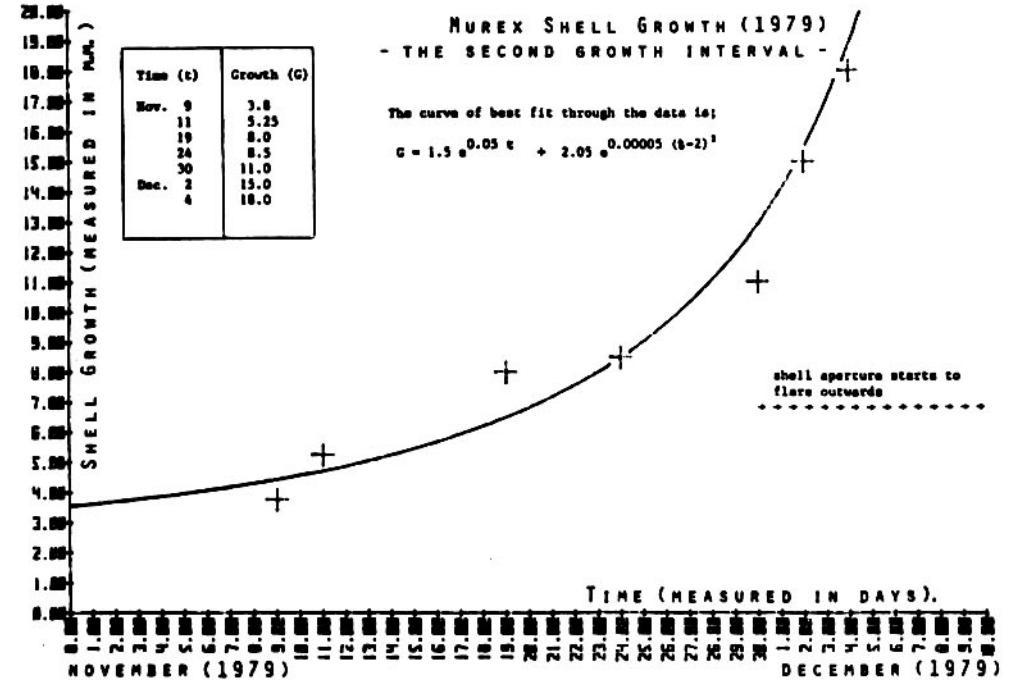
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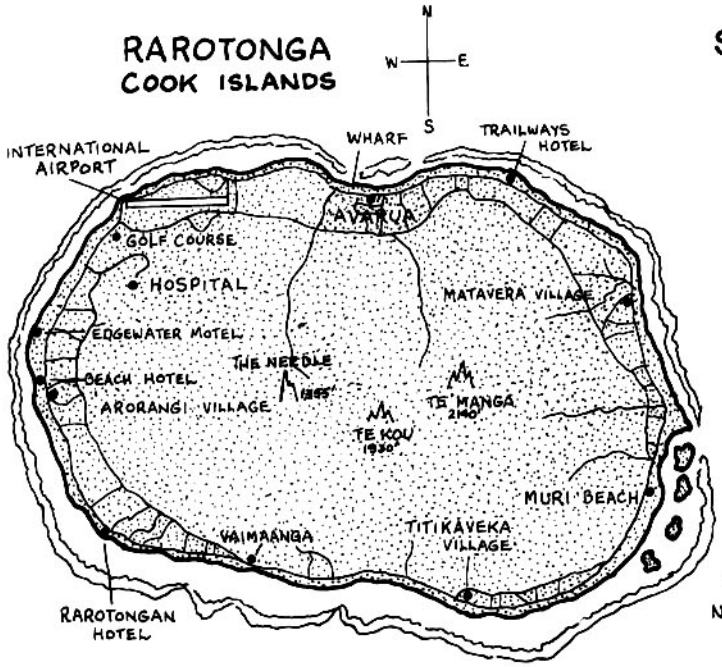
Computer graphs by C. Illert

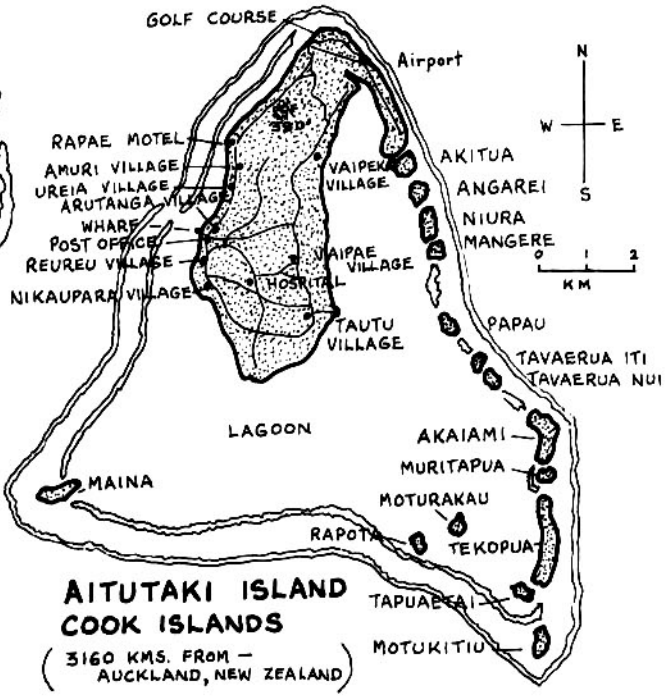


Shell Collecting in the Cook Islands

DOUG SNOOK

Auckland, New Zealand





In September 1980, ten members of the Auckland Museum Conchology Club left for a 16 day trip to the Cook Islands. We visited Rarotonga, population about 10,000, the main island in the group with its high volcanic peaks, and Aitutaki Island, population about 2,500 and low lying by comparison. We spent most of our time on the latter island. There are 15 island in the group, scattered over 751,000 square miles of ocean. The Cook Islands have been self-governing since 1965, with close ties to New Zealand.

Out flight, via Air New Zealand DC-10, left Auckland and 3¼ hours later arrived at the International Airport at Rarotonga, a distance of about 3,000 milometres (1,880 miles). No sooner had we arrived when eight of our group were being ushered away to a nine-passenger Britten Norman twin-engined jet/ptop plane of Cook Islands Airways for the one hour flight to Aitutaki. The remaining two members of our group would catch a flight later in the day.

As we descended to Aitutaki the view was fantastic. Cameras were working overtime with the breath-taking scenery. The large, shallow water, sea green lagoon, approximately nine miles at its widest point and which links the main island with smaller islets, is surrounded by the deep sea blue beyond the outer reef. Once out of the plane we knew, without a doubt, that we had left our cool New Zealand winter weather behind and were now in the tropics with a whole new flora around us. Soon we were being transported by minibus to the Rapae Motel, the only one on the island, beautifully set amongst mature trees and garden, right by the beach. The motel consisted of twelve single units, each sleeping two or three and one family double unit, a restaurant, bar and office. Here we were to spend eleven delightful days. Aitutaki is very fragile, the main export being bananas. Other crops include pineapple, oranges, breadfruit, mangoes, coconuts, paw pae, to name a few.

On Friday evening it was "island night" when many of the Aitutakians joined in for a night of music, singing, floor show and dancing. There was a feast, a time to sample many of the local foods, complete with some V.I.P.'s present. Sunday evening we were treated to a delicious barbeque outside by the beach, when a few of the local notariety were able to join with us. Earlier on Sunday we had gone to the Cook Island Christian Church with the motel manager and his wife. We found the congregation gathered in a large, solid white building near the centre of town. Although most of the service was in Cook Island Maori, we appreciated the singing and had much of the service interpreted for us by locals with whom we sat. Most of the people can speak good English when talking to us, but when speaking amongst themselves prefer to speak their native tongue.

Some days we were free to explore the beach and reef by our motel, but on two separate days we went by a 16-foot fibreglass boat, skippered by Sam, out across the lagoon to visit some of the small uninhabited motus (islets). Rapota and Tapuaetai were visited on the first trip and Akaiaoni on the second. Although there is less variety of shellfish in the Cook Islands than there is farther west at places such as the Solomons, Vanuatu (New Hebrides) or the Philippines, the island of Aitutaki was a great experience, with approximately 130 species found by our combined efforts. Here we found places seldom visited by conchologists or tourists. The top shell *Trochus niloticus* was commercially farmed and a harvest took place during our visit.

We also had a couple of night collecting trips out from the motel. *Nerita polita* were everywhere, while during the daytime none could be seen anywhere. At night they had crawled up out of the sand and onto the rocks.

Motor scooters could be hired, and one public taxi could be hired for a tour of the island. Our group also travelled on the tray of a small truck a couple of times, and of course there was the airways minibus for airport trips. When in town we discovered at the Post Office, a complete current set of postage stamps featuring sea shells. It is very doubtful that all the shells featured are, in fact, found at Aitutaki.

It was now time to travel back to Rarotonga, where we were to stay at the Beach Hotel at Arorangi for a few days before our departure. Here we were able to do some shopping. Ararua is the main centre, the administrative centre with government offices, etc. and duty-free shopping. You could spend a day here looking around. We spent time looking through a number of shops that sold souvenirs, crafts and shells. One shop, in particular, had a large selection of shells, most probably imported from the

Philippines, although the pearl shells are harvested from Manihiki Island, another in the group.

On Rarotonga there are a number of hotels and motels, the largest being the luxurious 150-room Raratongan, developed and managed by the Tourist Hotel Corporation of New Zealand. One morning we were taken on a minibus tour around the island, visiting places of interest. The driver, a jovial humerous fellow, had us all in a happy mood.

Our best shelling on Rarotonga was near the airport. Although we did not have much time to collect here, we were limited to a few days. Out time was fully spent taking photographs, shopping, sightseeing, eating, packing, shelling, sleeping, etc.

Our visit was officially mentioned on the front page of the daily newspaper, the Cook Island News, Friday October 3, 1980. The following is a list of the shells I personally found on what was a truly delightful holiday experience.

Cypraea annulus oblevata; C. caputserpentis; C. carneola; C. maculifera, C. globulus, C. tigris, C. isabella (dead); *C. helvola* (dead); *Conus flavidus; C. chaldeus; C. ebraeus; C. miliaris; C. cattus; C. sponsalis; Strombus gibberulus; S. mutabilis; Drupa ricina; D. ricina albolabris; D. morum; D. grossularis; Morula uva; Drupella cariosa; Drupella cornus; Mancinella armigera; Cerithium (Rhinoclavis) asper; C. tuberculatum C. columna; C. sinensis; Tectarius grandinatus; Littorina sp.; Turbo argyrostomus; Architectonica sp.; Trochus niloticus* (common); *Tectus sp.; Bulla sp.; Cylichna sp.; Vanikoro cancellata; Natica sp.; Pyrene testudinaria; Latirus nodatus; Peristernia nassatula; P. chlorostoma; Magilus antiquus* (approx. 20" in length); *Otopleura auriscati; Pyramidella sulcata; Gutturnium muricinum; Cymatium nicobaricum; Nerita plicata; N. polita; Nassarius*, 2 varieties; *Cantharus undosus; Capulus sp. Melampus luteus;* several types of urchins and sea eggs; two small species of land snails; one variety of freshwater gastropod; *Isognomon pernum; Modiolus sp.; Pinctata sp.; Codakia iostoma; C. reflexa; Scutarcopagia scobinata; Quidnipagus palatum; Tonna perdix; Tridacna macima* (very common); *Terebra subulata* (one only, 150mm); *T. crenulata* (dead); *Pupa sulcata Mitra sticta* (dead); *Strigatella virgata; Asaphia deflorata; Arca ventricosa; Barbatia sp.; Pecten sp.; Cafrarium pectinatum; Periglypta purpura; Donax sp.;* 2 varieties of limpets.



Typical beach scene, Cook Islands.

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NIGER AND ROSTRATE COWRIES

Continued from page 7

This is a list of the melanistic cowries of New Caledonia, only.

Columb 1 = Full Melanism
Column 2 = Partial Melanism
Column 3 = Rostration
Column 4 = Colouration
Column 5 = Depigmentation

SPECIES	1	2	3	4	5
ANNULUS			*	*	
ARABICA	*	*	*	*	
ASELLUS			*		
CAPUTSERPENTIS		*	*	*	
CATHOLICORUM		*	*		
CARNEOLA			*	*	*
CAURICA	*	*	*	*	
CLANDESTINA			*		
CRIBRARIA	*	*	*		
CYLINDRICA	*	*	*	*	
EBURNEA			*		
EGLANTINA	*	*	*	*	
EROSA			*	*	*
ERRONES	*	*	*	*	
FELINA	*	*	*		
FIMBRIATA		*	*	*	
GRACILIS		*	*	*	
HELVOLA		*	*		
HIRUNDO		*	*		
HUMPHREYSI	*	*	*	*	
ISABELLA			*	*	
KIENERI		*	*		
LABROLINEATA		*	*		
LUTEA		*	*	*	
LYNX		*	*	*	
MAPPA	*	*	*	*	
MARTINI		*	*	*	
MAURITIANA	*	*	*	*	
MICRODON		*	*	*	
MONETA			*	*	
NUCLEUS			*	*	
PALLIDULA	*	*	*		
PORARIA			*	*	*
PUNCTATA		*	*		
SCURRA	*	*	*	*	
STAPHYLEA		*	*	*	*
STOLIDA	*	*	*		*
TALPA			*	*	
TERES		*	*	*	*
VITELLUS			*	*	

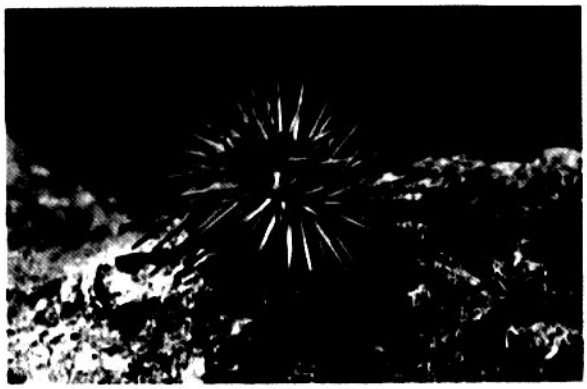


A sandy beach on one of the Cook Islands.

Sea Urchins Have Feet

CORINNE E. EDWARDS

Coconut Grove, Florida



Rock Borer Urchin - *Echinometra viridis*



Variable or Decorator Urchin - *Lytechinus variegatus* (Leske)

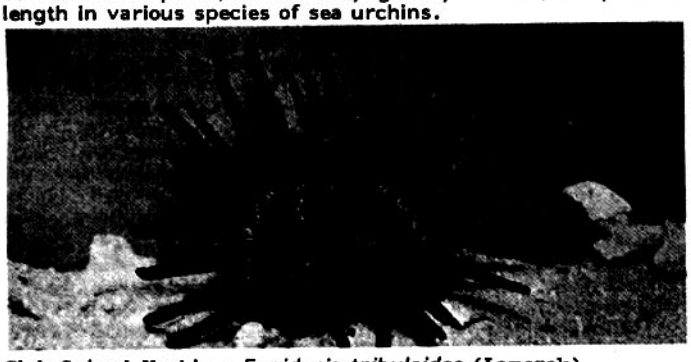
Tube feet, that is. Hundreds of them with neat little sucker disks or suction cups on their ends. However, I read an excellent article by a sheller friend - we first met in Miami, though he lives in Fort Myers. We were searching among deep water shells spewed ashore in an expensive and futile attempt to nourish an eroded beach. We have a mutual admiration for each other, but I felt I HAD to write this dissertation. In his detailed account of a group shelling trip, he wrote about pairs of bivalves found (1) "-- stuck on a sea urchin's spines." (2) "Almost every urchin had bivalves stuck to the ends of its spines --" (3) "Among the many bivalves found on sea urchin spines --"

On soft sandy surfaces, Sea Urchins use the spines on the oral or bottom surface for movement and so they go tilting along as though walking on stilts. The poisonous, purple-black, Long-spined Urchin, *Diadema antillarum*, that likes to congregate, can move along very fast - 3.5 cm in one second.

There are two rock-boring urchins, black *Echinometra lucunter* and the lighter colored *Echinometra viridis*. The rock-borers use their stout spines to brace themselves in rocks or crevices or even cave-like excavations of their own making.

The Club-spined Urchin, *Eucidaris tribuloides* (please don't call it a slate pencil urchin) is a solitary urchin out there on the grass flats. There is another urchin, *Arbacia punctulata*, not as common as *Lytechinus variegatus*, the hero of this epistle. *Arbacia* is often confused with *Diadema* as it has fairly long, black spines, but they are not poisonous.

So much for spines, which vary greatly in size, shape and length in various species of sea urchins.



Club Spined Urchin - *Eucidaris tribuloides* (Lamarck)

Eucidaris - from a Greek term for original or primitive and Latin for a Persian crown; *tribuloides* - Latin for thorny.

There is a water vascular system in all echinoderms - those spiny-skinned, radially symmetrical marine creatures with five radiating parts: - Sea Stars, Brittle Stars, Feather Stars, Sea Cucumbers, Sand Dollars, Cake Urchins, Heart Urchins and Sea Urchins. Sea Urchins are usually strongly arched and circular in outline, though Rock Borers are more oval; they are browsers and grazers. A water vascular ring gives rise to five radial canals under or within the test, shell or external calcareous skeleton. Each canal gives off branches which end in tube feet or podia. By water pressure action these numerous tube feet can protrude through five double rows of perforated pores or minute holes in the skeletal test of the sea urchin. These tube feet are highly moveable and terminate in suction cups. These so-called feet can extend a long way beyond the spines of *Lytechinus variegatus* our most common sea urchin here in Florida, and these podia can contract all the way back to their base.

On hard substrate, Sea Urchins use these tube feet for adherance as they move along the ocean floor, up a sea wall or rock and even up the slick glass sides of an aquarium. Sea Urchins have no definite anterior or posterior ends, no front or back. They can move forward with any side of the body, as can Sea Stars.

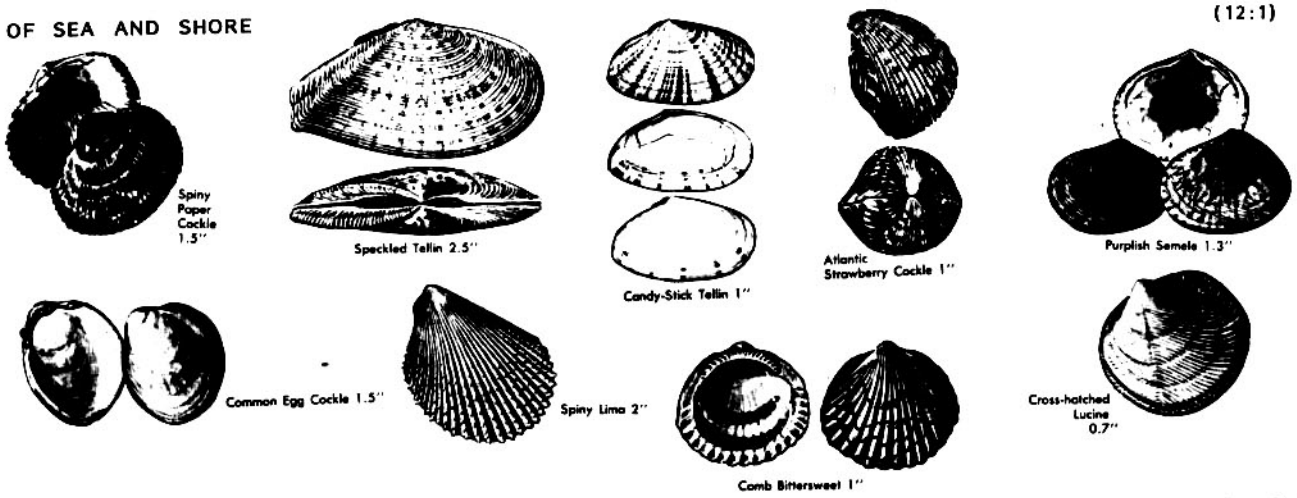
When exposed to the rays of the sun in shallow water, the Variegated or Decorator Sea Urchin uses the tube feet, with those suction cups at the end, to cover its aboral or upper surface with bits of debris, bivalve shells, pieces of Turtle Grass and even hinged pairs of light-weight bivalves. This process is believed to be for protection from the sun. It does camouflage the urchin which is a neat side effect against predation from birds.

My friend, if he is still my friend, mentioned in his article that his group found the following Caribbean bivalve pairs on the sea urchins: Spiny Paper Cockle, *Papyridea soleniformis*; Speckled Tellin, *Tellina listeri*; Bittersweet, *Glycymeris pectinata* and *Lima*. Over the years, I too have stolen many gem quality pairs



Long-Spined Sea Urchin - *Diadema antillarum* Philippi

Diadema - crown in Latin; *antillarum* - of the Antilles.



of light-weight bivalve shells being held by the suction cups on the tube feet over, but not "stuck to", the spines of the Variegated or Decorator Sea Urchin, *Lytechinus variegatus*. This is the most common urchin browsing on the sand and rubble flats of the Finger Channels off the southeast tip of Key Biscayne and the Cape Florida Lighthouse. This area, in Miami, Florida, is now being made into a National Monument under the park system and we fear no more shelling will be allowed out there on those miles and miles of flats exposed at the extremely low tides of certain times of the year.

Shell clubs only make one field trip a year to the Finger Channel Flats. We search for Carrier Shells, *Xenophora conchyliophora*, that look much like sea urchins carrying a covering of rubble. The Decorator Urchins often carry hinged pairs of lightweight bivalves out there also: Egg Cockles, *Laevicardium laevigatum*; Purplish Semele, *Semele purpurascens*; Candy Stick Tellins, *Tellina similis*; Strawberry Cockles, *Americardia media* and Cross-Hatched Lucine, *Divaricella quadrisulcata*.

You can see why *Lytechinus variegatus*, our most common Sea Urchin is also called a Decorator Urchin. Its species name, *variegatus* is appropriate too for its colors are variable. It can be found in a lovely dark-purple color, or reddish-purple, in various shades of green and in pink or near-white. Even the test, when denuded of spines, is nicely colored and intricately designed, in a pattern of five.

Some urchins are known to form aggregations during the reproductive phase, even to pair off (so they say). Eggs are said to be released by the female and the nearest male of the same species is stimulated to release its sperm; fertilization takes place in the water. There are certain species of echinoderms (spiny skinned creatures) that do brood their young. I once heard a local lecturer tell how she discovered that our sea urchins carry their young down at the base of the spines. She probably had seen the movement of the sucker ends of the tube feet as she held an urchin out of water - when its tube feet are quickly retracted. Pick up a live urchin yourself (not *Diadema*!) and feel its tube feet holding to your wet hand as it starts to move, searching for its seawater environment. Should you rudely pull this common sea urchin from where it was attached, tube feet may be torn off, but, like all echinoderms, sea urchins have a marvelous capability and will quickly regenerate lost parts.

Many readers may have a large and colorful pinkish-to-red test of an expensive sea urchin from England, with a night light up through the mouth opening in the base or oral side. The light shines through the delicate, colorful test, but you will also notice light shining brighter through five double rows of holes, where the tube feet once protruded.

Ooops!

In our last issue, Volume 11, Number 4, we included, on page 212, two color photographs by Phillip W. Clover and indicated information on these was on page 211. Needless to say, that information did not appear on page 211, nor elsewhere. Our apologies. Here's what should have been on page 211.

Upper photo, page 212. This beautiful little *Morum* was at first thought to be *M. exquisita* Adams and Reeve. However, it has proven new to science and been named after a well known U.S. shell dealer. It is now called *Morum kurzi* Petuch. Size is 1", color white, brown and orange and it comes from Bohol, the Philippines.

Lower photographs, page 212. A new deepwater species from Bohol in the Philippines. May be in the genus *Asteria*, but I am not certain of this. It is 2 inches across, reddish brown, with a widely flaring lip. PHILLIP W. CLOVER

Upper photographs, page 216. Few shells appear in collections from Honduras. This is due to its remote location and lack of resident collectors. Recently deep water crab nets have yielded several new species of mollusks. Among these is the newly named *Falsilyria morrisoni* Petuch, 1980; named for a well known U.S. shell dealer. It is 2 inches, white to tan color, banded, with occasional black spots on the white bands. It is compared, in the photograph with a similar sized *F. demarcoi* Olsson, also found in Honduras. These species occur on the Caribbean side of the Central American country. PHILLIP W. CLOVER

Exchanges

Would like to exchange self-collected Florida shells for Pecten from all over the world. AL DeMARTINO; 827 92nd Avenue; Naples, Florida 33940. All letters answered.

Will trade Puget Sound marine mollusks for North American land snails. A. TODD MOORE; P.O. Box 221; Port Gamble, Washington 98364.

Wish to trade Shell Club pins, one of mine (Louisville Conch. Society) for one of yours, will buy yours or sell mine also. LOUIS A. BROWN; 2013 Keeneland Blvd.; Louisville, KY 40223

Wish to trade world wide seashells. All families. B.R. EMORY; 5049 McManus Drive; Jacksonville, Florida 32210.

I have Hood Canal (Washington) shells to exchange for shells from your area. Do you have any wants? For list write: CHERYL MILLARD; Box 400 Hwy 101 N.; Brinnon, WA. 98320 USA. Please send your list with first letter.

Will exchange shells for copies of Abbott's "American Seashells" Weaver & duPont's "Living Volutes", Wall's "Cowries", Dance's "Encyclopedia of Shells" and Lozet's "Shells of Caribbean". Please send titles you have available and indicate families of interest. Will offer up to $100 in trade value for Burgess's "Living Cowries". Will consider other titles. MARLO F. KRISBERG; 1530 Bella Casa Court; Merritt Island, Florida 32952.

Send your exchange requests in soon for our next issue. It's a free service to our subscribers.

Strictly for the Non-Professional

GEORGE GALLAGHER

Stratford, New Jersey

Reading the article "Wrangell, Alaska" by Phyllis Dodge, in the Fall 1980 issue of *Of Sea and Shore*, inspired me to write these words of experienced wisdom. It is dedicated to all collectors of shells, who, for reasons of their own, do not skin dive, snorkel, or travel the ocean and its reef in motor driven boats. Oft times poor climate, rough seas, or just plain fright of the ocean's dangerous creatures prevent us from simple snorkeling in waters over our heads, or in reefs where we can encounter these unknown dangers. So to all those who walk the shoreline looking for beach shells or that occasional live specimen the following paragraphs, however wise, are for you.

Finding that live specimen is always far more rewarding to most of us than the whole day's find of beach specimens. So! What do you do when visiting far off coastlines of the Florida Keys, or the islands of the Bahamas and Hawaii when on vacation? What do you do with live specimens when staying at hotels or motels? There isn't a way to cook out the meat, or time to bury the shell for the ants to do the work. Why bother looking for anything live then, when its dead odor will only haunt you on your trip home. Well don't be deceived. I have found a way to combat this situation; in the article I will relate to you my recent vacation trip to Barbados.

Many islands are surrounded by coral reefs, and, because of this, I am told you will find very few shells on the beach, and those you do find are broken or badly beach worn. Don't let this hinder your efforts to add to your collection. You can find a few good beach specimens, but most of all there are many live specimens you can find when looking in the proper places.

I will not try to relate my horrible experience on our ocean cruise trip to Nassau, when I tried to bring live-collected shells and sea urchins home in plastic bags without being cleaned. Needless to say, my wife does not now share my enthusiasm for shell collecting. It was through this esperience that I came upon an idea. I had to find a way to preserve live specimens until I could get them home and properly clean them. My thoughts went back to my school biology days and came up with the solution. Use formaldehyde. With this in mind, I set out to locate a large mouth plastic gallon jar and a suitable carton to pack it in. This completed, I went to my local drug store and purchased three pints of formaldehyde. Placing the sealed pints inside the jar, I tied up the carton and carried it onto the plane for Barbados.

While on vacation, traveling with my wife, I must keep in mind to give equal or more time to that situation. Therefore, I awake about five-thirty each morning (depending on the tides) and head for the ocean's edge. I spend about two hours in sheer relaxing delight, and am back in time to freshen up and begin a day of vacationing fun with my wife and friends. One can sneak an hour or so in the afternoon during sun bathing time, but do not overindulge. All in all I have a very understanding wife, who, as I mentioned, does not share my joy of shell collecting, but is understanding of my joy in it.

Once unpacked I open the containers of formaldehyde and empty them in the gallon jar. This completed I await my first morning's trip ... Taking a plastic bag or container, and a sharp knife, I proceed to the hotel's beach and look for rocks on the shoreline which jut out into the ocean. Fortunately, as in Nassau, I found, within the hotel grounds, a large array of rocks at low tide. I was later told that these were part of a reef that extends quite a ways offshore. Looking down through the rocks and the crevices between, one could see fishes of all sizes and colors; delightful sights of all kinds. I must stop a moment at this point to remind you to wear an old pair of sneakers to protect your feet from sharp rocks and sea urchins. My first close glimpse of the rocks upon which I was standing led me to believe I was in for a great day. I was surrounded by limpets and keyhole limpets of several kinds. When prying limpets from the rocks, do not touch them until you have your knife safely under their body. I find that limpets are slightly raised on the rocks exposing a small portion of their body. If you touch their shell they will clamp down tightly to the rock, and removing them is close to impossible without damaging the shell. Take your knife and quickly slide it under the limpet, and pry upwards. Needless to say, I came home with excellent specimens.

While searching other rocks I came upon chitons and many varieties of snails. Chitons are always difficult for me to pry loose. I usually try to dig into the soft rock, thus getting my knife under them and lifting up am usually seventy-five percent successful. All the snail varieties are easily removed with a slight pull of the hand. Different changings of the tide revealed different species, so try to catch them on the way out and again on the way in. You must also remember to look under ledges and in crevices. I always find Bleeding-teeth Nerites on the incoming tide and usually in family-type clusters.

Once back in my hotel room, I carefully put my finds into the jug of formaldehyde and screw on the lid - tightly. Now to await the next day's excursion.

When finally ready to leave for home, tightly secure your gallon jar in its carton and carry it on board the plane. It will go through the metal detectors with no trouble. Now, when filling out your Customs report before entry there is one question they always ask: "Are you carrying any LIVE snails with you?" I can always answer that with a NO! It's the truth, I am carrying dead, preserved snails. Hopefully they will never change the wording. I have never been stopped bringing specimen shells home in this way. Now, some collectors may tell you this is harmful to the shell, or may discolor it slightly by putting them into formaldehyde. This I can't say for certain. I am not personally aware of anything harmful happening to the specimens I have collected. I now get my specimens home without questionable eddrs or fuss.

Once home I boil the shells (except chitons), rinse them thoroughly and remove the meat from limpets and larger snail specimens. The I soak them in a 50/50 solution of bleach and water, for twenty-four hours. Afterwards I put them in clear water for thirty-six hours, changing the water as often as I can. This way the bleach will soak out of the shell's pores and they will not dry with a white film. Once this is completed I take all the remaining shells, those still containing meat, and put them on a cookie sheet and place them in the oven at its lowest temperature for four or five hours. This dries out the meat and the shells never give off an odor. I only do the latter to small shells and those difficult to clean; this allows the operculum to remain in place.

The following shells were found at Paradise Beach, Barbados:

Diodora dysoni Reeve
Fissurella barbadensis Linn.
Acmaea pustulata Helbling
Cittarium pica Linnaeus
Tegula lividomaculata C.B. Ad.
Astraea tuber Linnaeus
Nerita peloronta Linnaeus
Nerita versicolor Gmelin
Nerita tessellata Gmelin
Littorina ziczac Gmelin
Tectarius muricatus Linn.
Planaxis nucleus Brug.
Cerithium eburneum Brug.
Trivia pediculus Linnaeus
Thais rustica Lamarck
Columbella mercatoria Linn.
Bulla occidentalis A. Adams
Chiton tuberculatus Linn.
Acanthopleura granulata Gm.
Plus a few I couldn't identify.

I also found several beach specimens and, like Phyllis Dodge, I find having a beach specimen is better than having none at all. Collecting your own shells is more rewarding than buying them, so take my ideas, crazy as some may think, and help your collection grow.

Inspired by Seashells

ETHELYN WOODLOCK

Largo, Florida



It is said that artistic talent is inherited; if so, mine came from a great-aunt who lined her walls with enormous gold-leafed framed Victorian scenes and florals. She also painted china and we have her fish set dated 1890. These magnificent French china dishes have soft-colored seaweeds and seashells. Is a love for seashells also inherited?

Back in 1977, the Bergen Community Museum in Paramus, New Jersey asked me to have a two month's exhibit. It was an accumulation of many years of using seashells in my paintings, acquiring shell antiques and collecting rainbow colored seashells. It took over a month to plan the displays for five cabinets and Bill Old came over several times to help. It was his suggestion to put the labels and shells up on boxes - giving a professional touch, so I cut blocks of wood to the desired sizes and painted them a soft green. Fifty-eight items were on the walls: shell paintings with poems, assemblages and constructions, which made it my most ambitious exhibition. It is doubtful if it will ever be repeated!

A six-foot, two-shelved, mirror-backed cabinet have a double view of rainbow-hued shells. The bright red of *Pecten melica* Iredale, orange *P. nodosus*Linn., *P. nobilis* Reeve in all colors, six green *Papuina pulcherrima* L., purple *Janthina*, over a hundred shells, made a breath-taking rainbow right from Heaven and the Ocean. After the exhibition, this cabinet was my gift to the Museum (that it, sans shells).

The bottom section of a large cabinet showed button-making shells, pearl-making shells and specimens before and after polishing. Above was modern shell jewelry, a Chambered Nautilus series - whole, cut, polished and antique soup spoons made in China (gifts from Bill).

A large twin cabinet held mollusks used for food: abalone steak, more expensive than beef; *Strombus gigas* L. for chowder and fritters; pen shell scallops, a little tougher than deepwater ones; soft and hard shell clams; mussels, oysters and the European land shell called *escargot*. American-Italians made a chowder, *scungili*, from our local whelks, *Busycon carica* Gmelin and *B. canaliculatum* Linnaeus.

Above were my Sailor's Valentines and large colored photos of ones I helped friends make. I included an old scrimshaw whale's

tooth and a statue, also made from a whale's tooth, that has been in our family for a few generations. A distant uncle was a Maine seacaptain and we still own his sea chest with rope handles and a much-used game board inside, dated 1874.

For the miniature collector: a shell store with a six-inch attendant holding a feather duster. Mirrors edged with shells, pinhead sized, must be dusted. There are tiny ecology boxes with "specimen" shells, ornaments under glass domes, inch-high jars with shells for sale by the umteenth of an ounce, a cabinet less than three inches high with four drawers that open to show "catalogued" specimens.

A curved-front antique china cabinet contained modern shell items for the tourist trade: shell dolls, animals, boats, mice with driftwood cheese, Christmas cards and trees decorated with shell ornaments - all things that children love (as well as grown-ups).

The exhibition had much publicity and photos were taken of some of my great aunt's plates. Shown accompanying this article are two of these plates and the smaller platter with the shells that were painted on them. It may be interesting to some people to know the shells that a Victorian artist painted. Bill helped select the real shells to place next to the dishes. The small platter pictured here had a perfect *Lyropecten tumbezensis* Orbigny, a bivalve that I called *Limposis sulcata* V. & B., a sea urchin, and Bill's choice for a mystery-to-me was a polished *Trochus caerulescens* Lamarck. A large platter, twenty-four by ten inches had a *Mytilus edulis* L., a *Strombus alatus* Gmelin, another crab and urchin, plus a *Tellina*, which I called *albinella* Lamarck.

Four of the plates were easy: one had a *Haliotis ruber* Leach; another a *Strombus lentiginosus* L. with an *Ensis directus* Conrad; on the third plate - another *Mytilus* with a freshwater *Campeloma decisum* Say, and the fourth - an *Oliva incrassata* Lightfoot, which was almost the right shape.

Two of the shells on the fifth plate were easy, too: a pink *Anadara transversa* Say and another *lentiginosus*. The last shell was puzzling, but Bill thought it could be a *Patella tabularis* Krauss on a rock (2) so he used a *Cellana testudinaria* L. as the smooth edge under the ruffled one. For the *Epitonium* on a sixth plate we used *communis* Lamarck, but the last shell is still questionable. As it is left-handed (1), Bill chose *Busycon contrarium* Conrad. It seems odd that my old aunt drew all of the shells so correctly except for this one. It is unlike anything that Bill has ever seen.

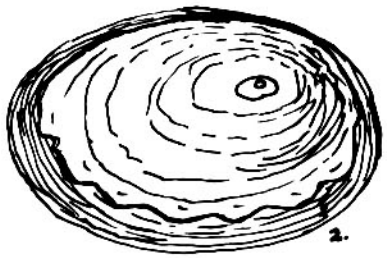
These beautiful dishes formed the border on a three and a half by five foot case, along with the modern Stix plates with brown bands and drawings of *Epitonium scalare*L., *Cymatium lotorium* Philippi, *Conus aulicus* L. and *Harpa davidus* Roding. On a higher level, a brilliant Royal Beyreuth pitcher could have been inspired by *Murex duplex* Roding which has long spines like on the pitcher, but not as colorful.

Many small antique items were included in the large case: a glass clam shell pocket flask, used by sailors on cold nights; an 1880 pewter ice cream mold; a covered glass butter dish with an exact shell duplicate beside it - a *Pecten islandica* L.; a shell-shaped silver dish and a spoon; amd two treasures: a pearlized child's purse and boat, given to me when I was three by an old lady in Hallowell, Maine. Shell collecting must have been my destiny. I feel that most people who love and collect shells had that love start in childhood.

My old aunt who gave me the fish set also gave me my first shell, a beat-up *Lambis lambis* L., which I used in a painting in 1951. Five years later I painted my first purchased shell, *Lambis chiragra* L. It would be impossible to count the number of shells used in my paintings over the years. Someday I may try. The catalogue number, 53, in the brochure for the Museum exhibition was listed as "Some that got away." These were small photos of sold paintings, most of which seem to be in Florida. Of six paintings, borrowed from local people, two were "on loan" from Bill.

Ruth Noble, former president of the Bergen Community Museum, wrote me a letter saying "The Museum is fortunate in being able to offer such an exhibiton to the public."





The above article was, in part, printed in The New York Shell Club Notes, No. 237, December 1977. They printed the drawings of my mystery shells on the old plates, but, of course, could not use the black and white print taken for the New Jersey publicity.

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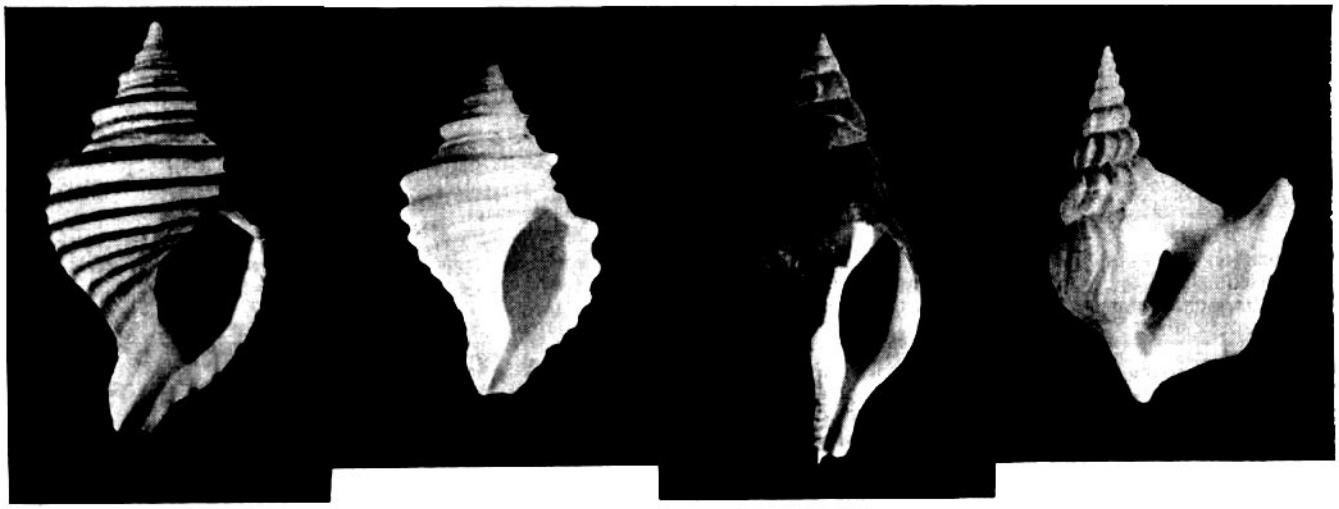
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Shelling the Dumps of New England

STEVEN ROSENTHAL

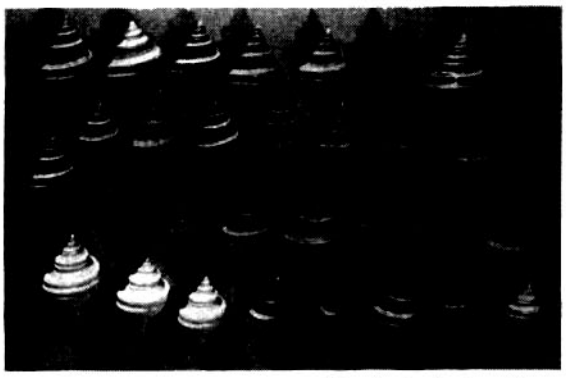


#1. *Neptunea lyrata decemcostata* #2. albino specimen of *N. lyrata decemcostata* #3. *Colus stimpsoni* (Morch) #4. *Aporrhais occidentalis* (Beck)

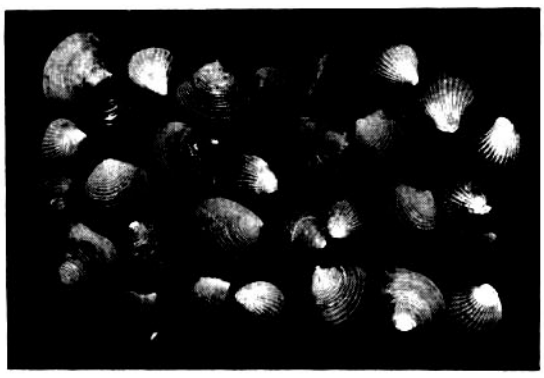
We stood under the midday sun, collecting buckets in hand. The shells were piled well above our ankles. I feared that at any moment one of us would stumble and suddenly find himself buried up to his neck in shells. We were sifting through a solid pile of shells that was nearly six feet high. "Where are we?" you might ask. Sanibel Island? South Africa? Australia? How about inside the trash bin of a scallop-shucking plant in Portland, Maine!

The chaos about to be described may be partially attributed to John Brandyberry, an enthusiastic shell collector from a small town called Lynn, which is just outside of Boston. John always has an eye out for new challenges for the enthusiastic collector (as an acquaintance once remarked, "the wheel upstairs is always turning"). During his travels he had come across a waterfront scallop-shucking plant, where fishermen working out of Maine would bring their catches of the ever-so-edible Atlantic sea-scallop (*Placopecten magellanicus* Gmelin) to be shucked and processed inside the plant. After shucking, the empty shells would be placed in plastic tubs and moved outside on a large conveyor belt, where the contents of the tubs would be emptied into a large dumpster. John found that the management was considerate enough to let him into the bin, where he could sort through the tubs and remove whatever he saw fit to remove.

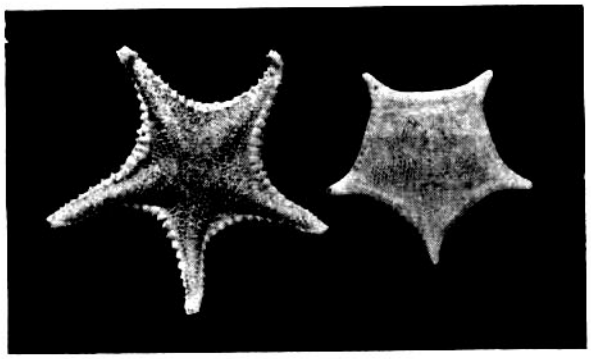
One day last June, Paul Monfils and I joined John at the bin. I was looking forward to collecting some of our more northern coldwater mollusks which are not usually obtainable through near-shore collecting methods; and the discarded dredgings of scallopers seemed to be a good place to start. Things did not start off well. It was a hot day, especially for June. More importantly, we discovered that the dumpster was filled to the top with shells. This would make searching for shells surprisingly difficult. Somewhere in the several tons of shells that had been pouring into the dumpster for a week or two was a miniscule amount (by weight or volume; take your pick) of shells that were not *Placopecten*. All we had to do was find them. To make matters worse, the only portion of the scallop that is used commercially is the adductor muscle; the rest of the animal is tossed into the bin where it quickly rots, attracting a host of flies. It was very easy to find small pinkish, often rayed young scallops (about 8 cm), that went unshucked. The bright orange seastar *Pentagonaster granularis* stood out vividly amongst the less colorful scallops. We also found many specimens of *Cyclocardia borealis*, and several species of *Astarte*, but not much else. John noted that we had not found much compared to his previous luck at this spot. We figured this was because the dumpster was full, and that most of the smaller shells had fallen



#3. *Neptunea lyrata decemcostata* (Say), including three albino specimens; this was most common large gastropod.



#4. *Astarte subaequilatera* Sow., *A. castanea* Say, *A. undata* Gould, and *Cyclocardia (Venericardia) borealis* Conrad



#7. *Hippasteria phrygiana* Parelius and *Pentagonaster granularis* Muller. These bright orange seastars were easy to spot amongst the more drab-colored molluscan shells.

to the bottom, where we could neither see them, or reach them. "Boy", Paul said, "If we could only go to the place where they dump it all, but they probably take it all out to sea." Wrong! About this time a truck came to haul the dumpster away. The driver told us that we could follow him to a farm about 20 miles inland, where the shells would be ground up and used as fertilizer. We were told that the farmer who bought the shells was a friendly fellow, so we figured he would let us sort through his shell collection. We followed the truck, watching the scallops flying over the edge of the dumpster every time the truck hit a bump in the road. Perhaps some lucky sheller would find fresh *Placopecten* some 20 miles from the ocean?

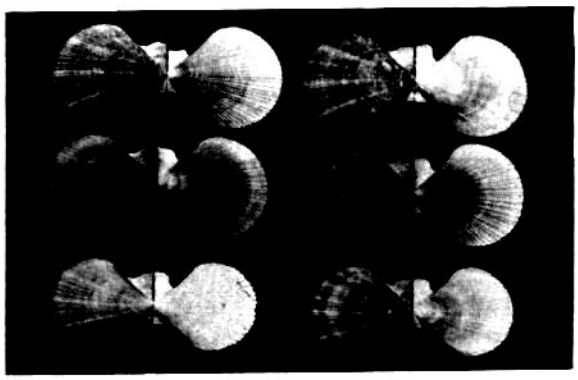
Things were "picking up". The farmer gave us the o.k. to dig in. We were really eager to get to those treasures at the bottom of the pile. Our spirits were somewhat dampened when the driver deposited the contents of the dumpster in their usual resting place - squarely atop the farmer;s manure pile! We now realized that the shells in the bottom of the bin had been there for a while. When the dumpster was unloaded, redistributing those goodies from the bottom of the pile to the top, we were greeted by a horde of maggots, which filled up every shell where the animals had been. Additionally, the entire pile smelled from the chlorine solution used to keep the dumpster and the plastic tubs clean. Our eyes and noses were not amused!

I looked at Paul. Paul looked at John. John nodded. In we went!

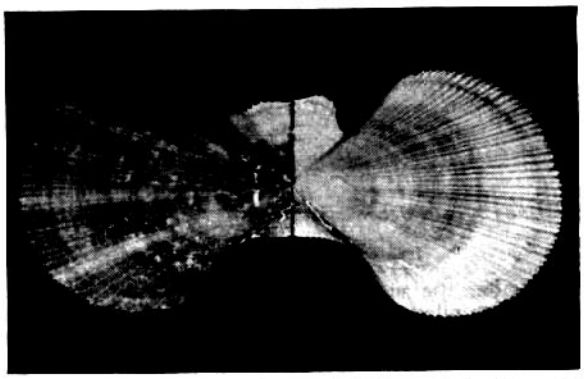
And there we found shells! *Neptunea lyrata decemcostata, Colus stimpsoni* and *Aporrhais occidentalis* (the Atlantic Pelican's Foot) were fairly easy to spot. A few of the fresher specimens still had their opercula. Laborious searching (especially under these conditions) uncovered a few brilliantly colored *Chlamys islandicus*, some *Dentalium entale, Colus pygmaea, Natica clausa*, and single specimens of *Puncturella noachina* and *Nuculana pernula*, along with a few fragments of pycnogonids (sea spiders), and a specimen of *Terebratulina septentrionalis*, the Northern Lamp Shell - this area's only common Brachiopod. All were fresh, and a few still had their opercula. They ALL had maggots!

After about two hours we had found all that we could, or cared to by then. Satisfied with our efforts for the day we headed back towards town, and then home. We looked horrible, and we smelled even worse. But we were happy. And proud. After all, we are shell collectors.

PHOTOGRAPHS BY PAUL MONFILS.



#8. *Chlamys islandicus* Muller was found in a variety of colors and was fairly common in the dredgings.



#9. close up of a 42 mm specimen of *Chlamys islandicus* Muller



#10. The smaller gastropods, including *Colus pygmaeus* (Gould), *Natica clausa* Brod. & Sby., and juvenile *Buccinum undatum* Linnaeus.



#11. The larger gastropods, including *Neptunea, Colus, Buccinum* and *Aporrhais*.

Shelling in Puerto Rico

CHARLES G. MEYERRIECKS

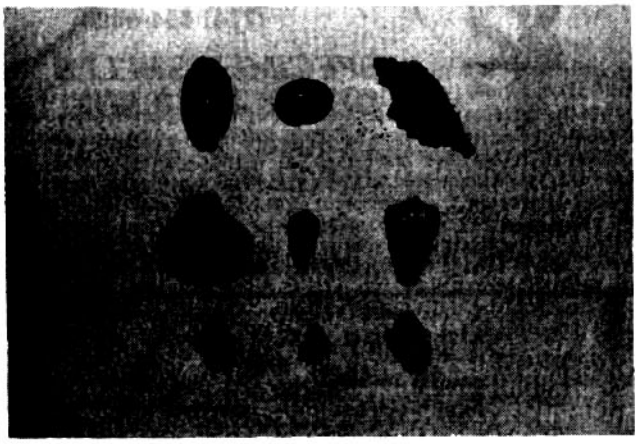


Fig. 1 (left to right) top: *Cypraea zebra, Natica canrena, Cymatium femorale*; center: *Lyropecten nodosus, Conus granulatus, Conus spurius*; bottom: *Bursa granulatus, Bursa thomae, Bursa caelata*

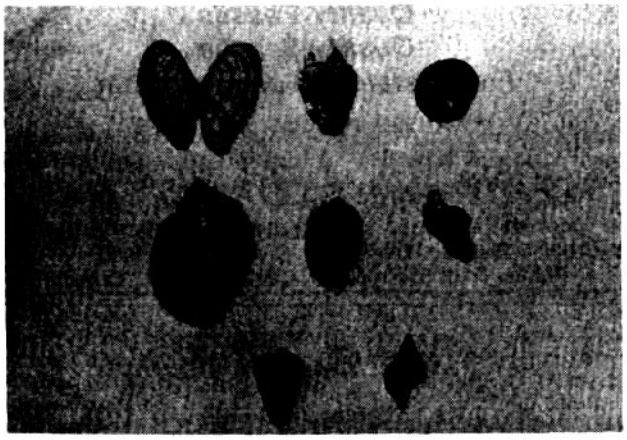


Fig. 2 (left to right) top: *Tellina listeri, Strombus raninus, Astraea tuber*; center: *Tonna maculosa, Cypraecassis testiculus, Cymatium nicobaricum*; bottom: *Conus regius, Cymatium muricinum*

Puerto Rico, located in the Greater Antilles, 1,040 miles southeast of Florida, is a sheller's paradise.

I have been collecting shells for about seven years; six of which have been spent on Puerto Rico. Not being a diver nor a snorkeler, all my shells have been collected in shallow water and are accessible to anyone. Five locations, three on the north side of the island and two on the southern have been of particular significance to my collection.

On the north side are Cantano (Bahia de San Juan), Pinones (behind the International Airport) and Las Croabas (on the northeast tip of the island). Cantano is a wonderful place for beach walking, especially near the Bacardi rum plant, and I have found some interesting and rare specimens there. My prize shell from Cantano is my sole *Conus granulatus*. Thouqh a beach specimen the shell is in fair to good condition (see photograph #1). Pinones has a reef that sits about three feet out of the water at low tide and on this reef you will find ample supplies of various live specimens (see photograph #2). The best shallow water collecting and reef walking has got to be at Las Croabas where there is plenty of coral rubble to look through and large coral slabs to overturn. Here I found two live *Charonia variegata* among the coral rubble in approximately six inches of water (see photograph #3)

The south side of the island is much calmer and indeed a special treat for the shell collector. This part of the island is not nearly as populated and the beaches and inlets not nearly as picked over. Bahia Salinas (on the southwest tip of the island) and Parguera (located halfway between Ponce and Bahia Salinas) are my favorite spots. At Bahia Salinas, near the Cobo Rojo Lighthouse, you will find good shallow water collecting. Here I have found vase shells and a nice size *Cassis tuberosa* (see photo #4). Parguera houses mangrove areas which are easily accessible by boats. The boats are available for rent at a small fee. The areas around the mangroves are shallow so you can get out of the boat to look for good specimens, especially the *Murex brevifrons* (see photograph #5).

I now have 244 species in my collection from Puerto Rico.

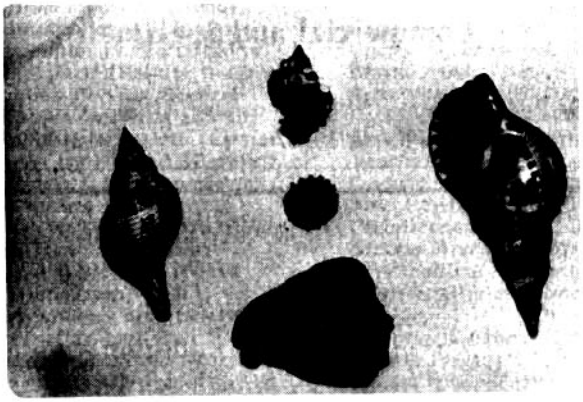


Fig. 3: top, *Murex pomum*; center (left to right): *Fasciolaria tulipa, Astraea caelata, Charonia variegata*; bottom: *Cassis tuberosa.*

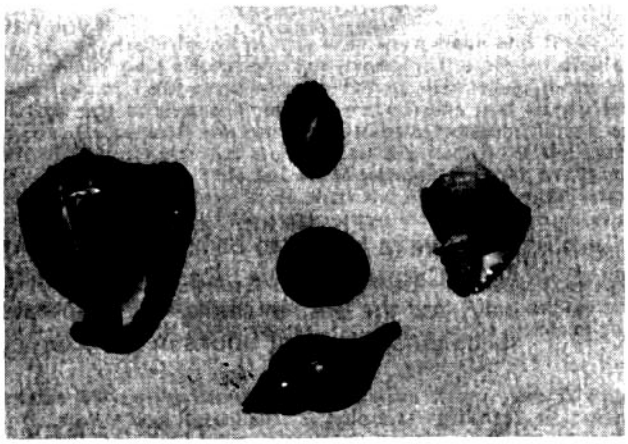


Fig. 4: top: *Purpura patula*; center (left to right): *Cassis tuberosa, Cittarium pica, Vasum muricatum*; bottom: *Fasciolaria tulipa*

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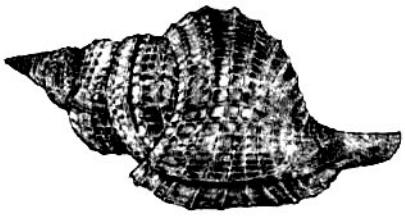
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Shell Collecting in the Sunshine State

JILL RYDER

Sutton Coldfield, England

I first learned of the commercial dredging at Hollywood, Florida from a rather dubious person who offered me marijuana. My first thought was to make a dignified retreat to the safety of my hotel. When he determined that I was only interested in shells, he suggested that I go to Hollywood. After looking at the rather insignificant specimens in my collecting bag, he assured me that there were really big shells there, indicating something more than a foot long! Skeptical, I nevertheless decided that the situation required further investigation.

Having obtained confirmation and directions from the hotel reception, I proceeded to Hollywood the next day, trusty map in hand. I had only a vague idea of where to look for the reclamation area. However, I left the haven of the air-conditioned bus, headed for the beach and strode northwards. I finally found the area after about an hour's walk. Although normally very energetic, I found walking in the ninety-five-degree, humid mid-August sun rather tiring, I was grateful to be enveloped in a layer of sunscreen, an absolute necessity for a pale-face English girl, who spends the greater part of the year looking like she has lived under a rock all winter!

The noise from the pipeline and the shouts of shell collectors were audible from quite a distance and gave me renewed energy. The first indication that something was stirring up the ocean was an increasing number of dead fish at the water's edge. This was attributed to the dredging activity and indicates the adverse effect that this type of operation has on the ecology of the area, however transient. That the fish came from the pipeline was further confirmed by the discovery of a small sting-ray in the water flowing from the dredger - not a creature I should like to have found the hard way!

Commercial dredging operations are the lazy shell collector's dream. However, the aim of the operators is not to supply shells, but to reclaim the beaches. In the past few years, there has been increasing erosion and drift of sand from the south-east Florida beaches. This has been attributed to the construction of harbours further north, whose barrages obstruct the normal longshore drift. The sand, etc., which normally would be deposited on the beaches is, therefore, pushed out to sea. Loss of the sandy beaches would have an adverse effect on tourism and so a temporary solution has been found. This involves dredging sand, coral debris, etc., from the sea bottom, about a mile off shore and pumping it onto the beach. The long-term effectiveness of this type of operation remains to be seen. Two possible disadvantages may be the high cost and the creation of an offshore trench. The effect on the natural ecology of the area is uncertain. Although none of the shells deposited on the beach was alive, this does not give any indication of the effect on the various micro-elements.

In August, 1979, dredging activity was taking place in about sixty-five feet of water at Hollywood, which is about fourteen miles north of Miami Beach. The dredger is situated out at sea and is connected to the shore by a wide-diameter pipeline. The contents leave the pipe under great pressure, so the public is only allowed limited access to the reclamation area, which, I was informed, progressed southwards at approximately one hundred and fifty feet a day.

This area naturally proved very popular with shell collectors, probably because of the dearth of shells on nearby beaches. The water from the pipeline carried with it not only sand, but also large, sharp pieces of coral, so that standing in the direct line of fire for any length of time proved a painful experience. However, there was general agreement that the number and variety of shells provided more than adequate compensation.

I visited the reclamation area twice and found the following species, some of which are regarded as uncommon to rare in south-east Florida:

Astraea americana (Gmelin)
Architectonica nobilis (Roding)
Modulus carchedonius Lamarck)
Cerithium eburneum (Bruguiere)
Cerithium literatum (Born)
Cerithium muscarum (Say)
Crepidula aculeata (Gmelin)
Crepidula fornicata (Say)
Crepidula plana (Say)
Xenophora trochiformis (Born)
Strombus alatus (Gmelin)
Strombus costatus (Gmelin)
Strombus gallus (Linnaeus)
Strombus gigas (Linnaeus)
Strombus pugilis (Linnaeus)
Natica canrena (Linnaeus)
Polinices lacteus (Guilding)
Sinum perspectivum (Say)
Cypraea spurca acicularis (Gmelin)
Cassis flammea (Linnaeus)
Cypraecassis testiculus (Linnaeus)
Cymatium labiosum (Wood)
Cymatium pileare (Linnaeus)
Bursa cubaniana (d'Orbigny)
Murex sallasi (Rehder & Abbott)
Chicoreus florifer (Reeve)
Muricopsis oxytatus (Smith)
Columbella mercatoria (Linnaeus)
Busycon contrarium (Conrad)
Fasciolaria tulipa (Linnaeus)
Oliva sayana (Ravanel)
Prunum carneum (Storer)
Conus jaspideus Gmelin
Conus magellanicus Hwass
Conus stimpsonii Dall
Conus spurius atlanticus Clench
Terebra floridana Dall
Pyramidella candida (Morch)
Bulla striata (Bruguiere)

Arca imbricata (Bruguiere)
Arca zebra (Swainson)
Barbatia cancellaria (Lamarck)
Barbatia candida (Helbling)
Barbatia tenera (Adams)
Anadara ovalis (Bruguiere)
Anadara transversa (Say)
Glycymeris americana Defr.
Glycymeris pectinata Gmelin
Glycymeris undata (Linn.)
Brachiodontes exustus Linn.
Modiolus americanus Leach
Aequipecten gibbus (Linn.)
Chlamys imbricata (Gmelin)
Chlamys sentis (Reeve)
Pecten chazaliei Dautzenbg.
Pecten ziczac Linnaeus
Lima scabra (Born)
Spondylus americanus Her.
Plicatula gibbosa (Lamarck)
Ostrea frons Linnaeus
Cardita floridana Conrad
Lucina pensylvanica (Linn.)
Divaricella quadrisulcata (d'Orbigny)
Codakia orbicularis (Linn.)
Chama macerophylla (Gmel.)
Chama sarda Reeve
Pseudochama radians (Lmk.)
Echinochama arcinella (L.)
Trachycardium isocardia (L.)
Trachycardium muricatum (L)
Laevicardium laevigatum (L.)
Americardia media (Linn.)
Chione cnacellata (Linn.)
Chione interpurpurea (Con.)
Macrocallista maculata (L.)
Ventricolaria rugatina (Heilprin)
Periglypta listeri (Gray)
Tellina laevigata (Linnaeus)
Tellina listeri Gray
Tellina magna Spengler
Tellina radiata Linnaeus
Arcopagia fausta Pulteney
Iphigenia brasiliensis (Lmk.)

Most of the shells found in this area were clean and fresh, but of unusually pale coloration. For example, the normal pink and cream rays of *Tellina radiata* were hardly visible and forma *unimaculata* was dominant. There were specimens that were clearly intergrades between the two types. Many completely white specimens of *Conus jaspideus* were found and none with the normal mottled coloration. This led me to wonder whether the lack of coloration has anything to do with the nutrient supply and/or pollution of the area. This may prove worthy of future study by a qualified individual.

Specimens of *Spondylus americanus* were plentiful. The color variations were limited to reds and oranges. All examples were short-spined, with lower valves attached to large pieces of coral rubble.

Strombs were quite common. The species found were *Strombus gigas* (adults and juveniles), *S. gallus* (fragments), *S. pugilis*, *S. alatus* and *S. costatus*. The large conchs were usually chipped, but, considering their method of carriage to the shore, this was to be expected. The smaller specimens usually reached the beach in near-perfect condition.

Continued on the next page.

Coral and shells left the pipeline at equally high speed, amidst a continuous stream of murky water, so that smaller species were obscured. Although prepared for a full-scale collecting expedition, I had not thought to invest in a small sieve and so I cannot report on the presence of micro-species.

It is of interest that of *Cyphoma gibbosa*, once plentiful in this area, I found represented by only one, badly eroded, but still recognizeable shell.

Single valves of *Ostrea frons* were quite common on the beach. Upon close examination, these purple-brown shells are quite interesting. The external surface has shelly projections, which clasp the branch of the gorgonian, sea-fan, or mangrove, upon which the animal lives. Internally the periphery of each valve has small granulations, about one millimetre from the edge.

Increasing sunburn, hunger, bruises and coral scratches necessitated a return to my hotel, after four or five hours. After sustaining life on yet another tuna salad, I finally persuaded my television to work. Having sampled the joys of American television for an hour or so, I then began the seemingly endless task of rinsing, identifying, labelling and bagging the day's collection. From the dredging operation alone, I had acquired eighty-three species. There were undoubtedly many more, as I should have found, had I stayed longer.

After waiting for several years to visit Florida, I found it very worthwhile, although air fares from England have since become cheaper, much to my annoyance! Anyway, my remaining year or so at university does give me time to formulate a plan of action for my next expedition. Meanwhile, anyone for Tenerife??

Elsie Malone

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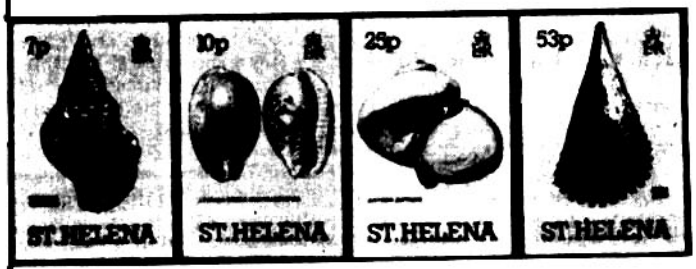
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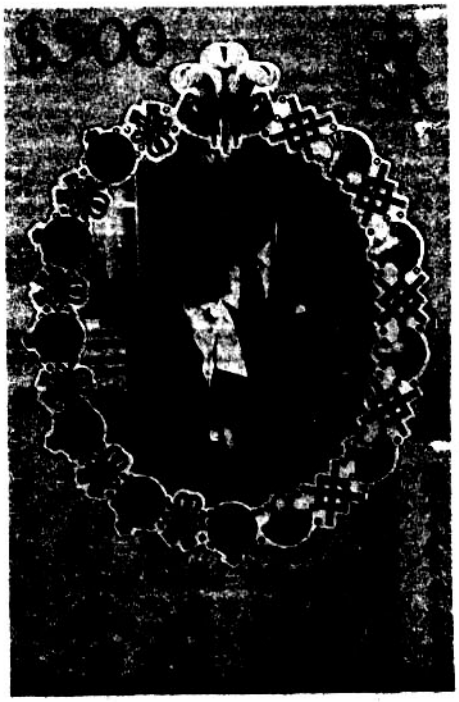
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Mollusks on Stamps







Just a few notes this time on shell stamps. First, May 14, 1981 saw French Polynesia issued an Aquaculture set of two stamps. The 41fr value shows breeding of mussel shells with the shells the most prominent part of the design. Second, St. Helena, an isolated island member of the British Commonwealth will, on September 10, 1981, issue a set of four stamps featuring shells. *Charonia variegata* will be on the 7 pence value; *Cypraea spurca sanctaehelenae* on the 10p; *Janthina janthina* on the 25p and *Pinna rudis* on the 53p value.

Then comes the bad news (or good news) concerning the upcoming Royal Wedding. As with such past events the British Commonwealth of nations will commemorate the wedding by issuing sets of stamps. Part of the design of the set features a combination of the coats-of-arms of the bride and groom. Lady Diana Spencer's family coat-of-arms includes scallop shells and so each stamp using this combined coat-of-arms will have scallop shells in its design. Each of the issuing countries is expected to release three stamps in their set. The countries to issue the stamps (most on July 22) are: Ascension Island, Barbados, Bermuda, British Virgin Islands, Brunei (July 29), Cayman Islands, Falkland Islands, Falkland Islands Dependencies, Fiji, The Gambia, Hong Kong (July 29), Lesotho, Mauritius, Norfolk Island, Pitcairn Islands, St. Helena, Samoa, Sierra Leone, Solomon Islands, Swaziland (July 21), Tristan da Cunha and Vanuatu.

Lumper or Splitter

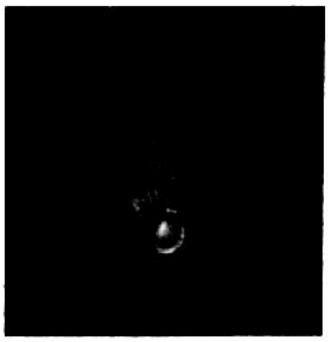
NORMAN D. PASCHALL

Topeka, Kansas



Species in the above photograph are, from left to right:

Cirsotrema dalli Rehder, 1945, Florida; *Cirsotrema cochlea* Sowerby, 1844, Spain; *Cirsotrema pallaryi* deBoury, 1913, Italy; *Cirsotrema martyr* Iredale, 1936, anterior and posterior views, the Solomon Islands.



The newest addition to my collection is a live taken (with operc) specimen taken, by a fine collector, in 10 to 18 meters on sandy bottom off Loanda, Angola, West Africa.

Tom says it's long past time we have an article on *Epitonium*. So here it is.

Tryon's Manual of Conchology, 1887, gave us a species of *Scalaria* - *Scalaria cochlea* Sowerby, 1844 - described as follows:

White, spirally striate, fimbriating the rather numerous, rather thin, sharp longitudinal lamellae with occasional thick tubercal lamellae: whorls 8 with flattened shoulder and deep suture, basal rib fimbriate. Length 1.5 inch. Mediterranean Sea, Maderia, W. Coast of Africa, West Indies.

In 1903 Melville and Standen dredged a 14 mm specimen from the Persian Gulf and named this *Cirsotrema bonum* Melville & Standen, 1903.

In 1911 deBoury collected a specimen in Rio de Janeiro, Brazil. He named this species *Cirsotrema joubini* deBoury, 1911. In 1913 he acquired a specimen, collected in Algeria and named it *Cirsotrema pallaryi* deBoury, 1913.

In 1925 Dall identified a specimen from Honshu Island, Japan, as *Cirsotrema plexis* Dall, 1925.

In 1936 Iredale identified a specimen collected in 115 to 145 fathoms, 55 miles south of Gabo Island, Bass Strait, Australia. He called this *Dannevigena martyr*.

In 1945 Harald Rehder identified a specimen taken in 25 fathoms off Cape San Blas, Florida, as *Cirsotrema dalli* Rehder, 1945 in Johnsonia. Remarks in Johnsonia state: "The present species is exceedingly close to or may be identical with *C. cochlea* Sowerby, originally described from Loanda, Angola on the west coast of Africa. In our opinion, *C. arcella* Rehder is only a small and perfect specimen of *Cirsotrema dalli* Rehder. *Cirsotrema dalli* differs from *C. pilsbryi* McGinty in having a nearly complete secondary surface sculpture."

In 1951 Hertlein and Strong described a specimen from Gorda Bank, Gulf of California, dredged in 50 fathoms, as *Cirsotrema togatum* Hertlein & Strong, 1945. In their description they state: "It is quite similar to the shell illustrated by Dall (Proc. U.S. Nat. Mus. Vol. 24, No. 1264, 1902) under the name of *Scala (Cirsotrema) cochlea* Sowerby from the northern part of the Gulf of Mexico, but is more slender with more axial ribs. The figure of *Scalaria cochlea* Swby. (Thes. Conch. VL. I Scalaria p. 103 bis. fig. 142, April 1844) from Loanda, West Coast of Africa."

In The Veliger (Vol. 16, May 31, 1974) Du Shane states "*Cirsotrema plexis* Dall, 1925, from Honshu, Japan seems closely related to *Cirsotrema togatum*."

In my research and study of these combined species, I have compared and measured the following: 18 specimens from Florida; 1 sp. from Spain; 1 sp. from Italy; 2 sps. from the Mediterranean; 2 sp. from Gulf of Eilat; 2 sps. from Angola, West Africa and 6 specimens from the Solomon Islands, as well as the type specimen of *Dannevigena martyr* in the Sydney Museum and several species of *Cirsotrema* in west coast museums. As yet I have failed to acquire a specimen of *C. togatum* or *C. plexis* for my private collection.

Thus, it seems, we must admit that, because of lack of man's own understanding and ignorance, we have a worldwide deep water species, which needs but one name:

Scalaria cochlea Sowerby, 1844
Synonyms: *Cirsotrema bonum* Melville & Standen, 1906
Cirsotrema joubini deBoury, 1911
Cirsotrema pallaryi deBoury, 1913
Cirsotrema plexis Dall, 1925
Dannevigena martyr Iredale, 1936
Cirsotrema dalli Rehder, 1945
Cirsotrema arcella Rehder, 1945
Cirsotrema pilsbryi McGinty, 1945
Cirsotrema togatum Hertlein & Strong, 1951

I would be most interested in any comments regarding these studies, but must warn you that I have these specimens on hand to back up my arguments and I would defy anyone to separate them if they were ever to be mixed together.

It is interesting to note that Melville's specimen was 4 mm in length, McGinty's was 17 mm in length. From data I have on the 32 specimens studied, the adult specimens seem to range from 17 to 33 mm in length. I have found that a great many of the museum specimens in the older collections have been described from juvenile specimens.

References

Tryon, 1887, Manual of Conchology

Rec. Aust. Museum, Vol. 29(5), 7 April 1936

Johnsonia, Vol. 2, No. 29, Sept. 30, 1950

Mollusks of Mexico and Central America, Aug. 20, 1951

Veliger, Vol. #16, May 31, 1974 supplement

The Epitoniids Secret Graveyard

ROGER A. EVANS

Redondo Beach, California



Fig. #1

I consider the wentletrap to be a desirable and somewhat uncommon shell. Discovering one or more epitoniids on any dive has always provided me with a great sense of personal satisfaction. Even so, the thought of collecting too many epitoniids has recently entered my mind.

On December 22, 1980, I entered the waters off King Harbor in Redondo Beach, California and within an hour I had collected 121 dead epitoniids at a depth of 50 feet. Between December 22, 1980 and January 19, 1981, I logged twenty scuba dives off King Harbor, during which I collected 3,438 dead epitoniids for an average of 172 specimens per dive. My diving partner, Kevin May, collected well over 3,500 epitoniids and Paul Stillians, who accompanied us on one dive, managed to locate approximately 100 specimens. Surprisingly, the shells of over 7,000 dead epitoniids were collected by three divers in less than one month's time.

The epitoniids were collected over a mud-sand bottom, which had recently been contoured in a few small sections with undulating crests and troughs. Dead epitoniids were to be found lying fully exposed at the base of the sand troughs and could be uncovered by fanning the bottom or pushing over the sand crests. The surf was up considerably on many of the dives and the resulting bottom surge was often sufficient to uncover a new supply of exposed shells. The only problems with heavy surf and the accompanying bottom surge are the low visibility and the tendency of the exposed shells to jostle rapidly back and forth along the bottom, just out of reach. During periods of heavy surge, I was forced to watch several beautiful specimens come and go before I could intercept them. There were also numerous occasions when the visibility was absolutely zero and I found myself rolling back and forth along the bottom impatiently waiting for the conditions to improve. But, when the visibility again approached one or two feet and I could see the dozens of newly exposed epitoniids, I began to collect the specimens at a feverish pace, hoping to complete the task before the next period of darkness. No matter how poor the conditions became, I was determined to collect as many wentletraps as possible.

During one dive on January 19, a grey whale approached within fifteen feet of me as I collected in the sand troughs. The passing of the whale, which was moving quite close to the bottom, disturbed the sediments and again I found myself in zero visibility. It would seem that whales have very little respect for collectors.

Several live *Asperiscala bellastriata* and a few *Nitidiscala sp.* were observed moving about the crests and troughs. Yet, there were countless numbers of dead epitoniid shells in this area and I can't help but wonder how long some of them had been buried beneath the sand. Had it been months, years, or longer? I collected four *Asperiscala minuticosta*, all of which were in excellent condition. Yet, this species is reported to be collected as a fossil specimen only in southern California. Were my four specimens of *Asperiscala minuticosta* fossils, or were they the remains of recently dead animals? Unfortunately, it is often difficult to distinguish fossil epitonlids from those of recent specimens by the appearance of the shell alone. Whatever their age, the majority of the epitonlids I collected were of a very acceptable quality and many were absolute gems.

Following my twentieth dive off King Harbor, extremely heavy surf began to pound southern California with waves well over ten feet in height. These unfriendly conditions continued for several days, forcing me to delay my collecting efforts temporarily. On January 26, I again entered the waters off Redondo Beach to find that the crests and troughs had been obliterated erased from the sand and in their place was a smooth, barren bottom, void of all shells. On subsequent dives to this area, my diving partner and I fanned the bottom in an attempt to uncover buried specimens, without success. The collecting was over for the moment; yet, with the proper conditions, the vast number of epitonlids, now buried, will once again litter the ocean floor.

The epitoniids of southern California are a difficult and often confusing group of mollusks to classify. It would seem that epitoniids have little use for uniformity or consistency. Even within the various species of this group there exists a high level of diversity. A variant of one species may appear quite similar to a variant of yet another species and, with a large number of specimens lined up side by side, it is possible to observe a fairly smooth transition of characteristics between certain species.

St rangely enough, after counting the costae and examining the characteristics of several hundred epitonlids, my eyes are still somewhat functional. However, if it was not for the classifying assistance of Mr. Bertram C. Draper (Conchological Club of Southern California), I might still be suffering from extreme visual distress.

I would also like to give credit to my diving partner, Kevin May, who discovered the epitoniid graveyard and finally convinced me that the site was worth diving.

May the following list of specimens collected during my twenty dives render you (and your spouse) truly thankful that you were not required to clean and classify all of these specimens*:

Photos

#1. *Asperiscala bellastriata* (Carpenter, 1864); Jan. 12, 1981. The following are on the page opposite.
#2. *Nitidiscala sp.*; collected December 30, 1980.
#3. *Nitidiscala hindsii* (Carpenter, 1856); 19-24mm
#4. *Nitidiscala sawinae* (Dall, 1903); 25.7 mm
#5. *Asperiscala bellastriata* (Carpenter, 1864); 20 mm
#6. *Asperiscala bellastriata* (Carpenter, 1864); 19-20 mm
#7. *Nitidiscala catalinae* (Dall, 1908); collected Jan. 19, 1981; 10 - 17.8 mm
#8. *Nitidiscala catalinae* (Dall, 1980); 21 mm
#9. *Nitidiscala hindsii* and *N. sawinae* [center specimen, aperture showing].

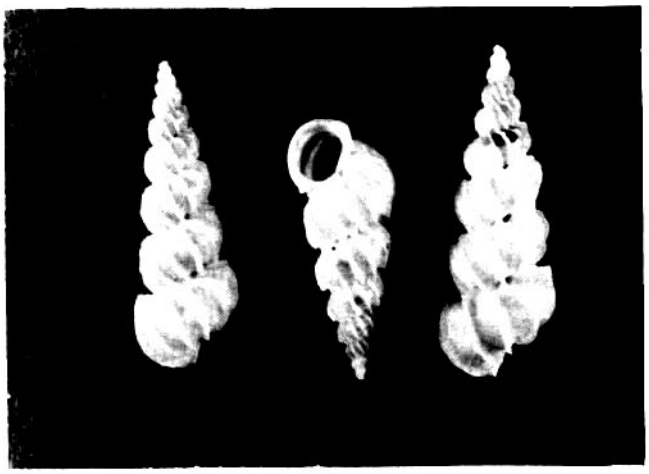
Reference

DuShane, Helen. 1979. The Family Epitoniidae (Mollusca: Gastropoda) in the Northeastern Pacific. The Veliger. Vol. 22; No. 2. Pages 91-134.

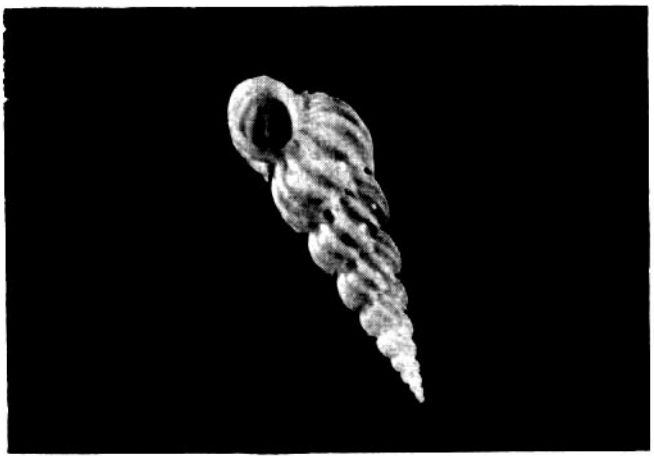
*See list on page 37



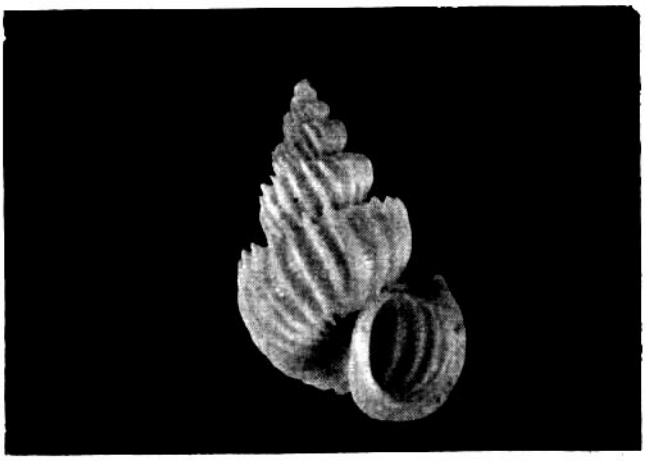
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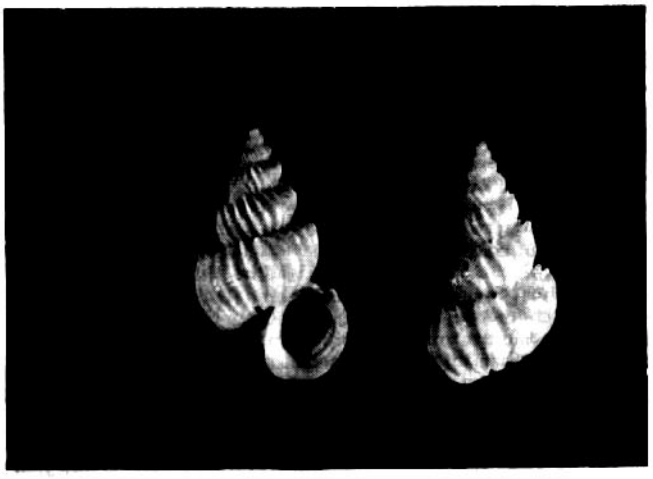
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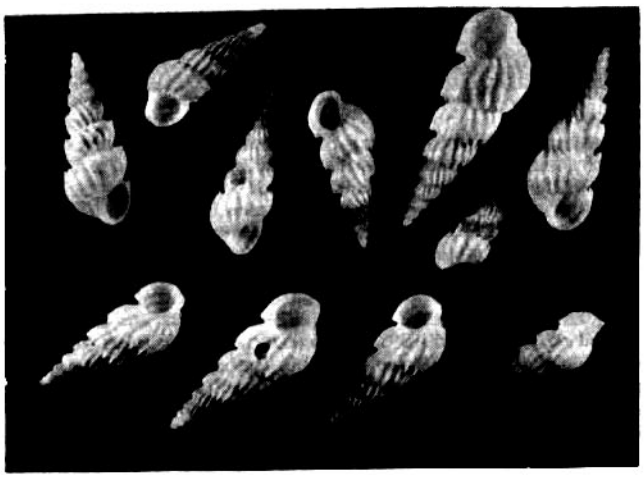
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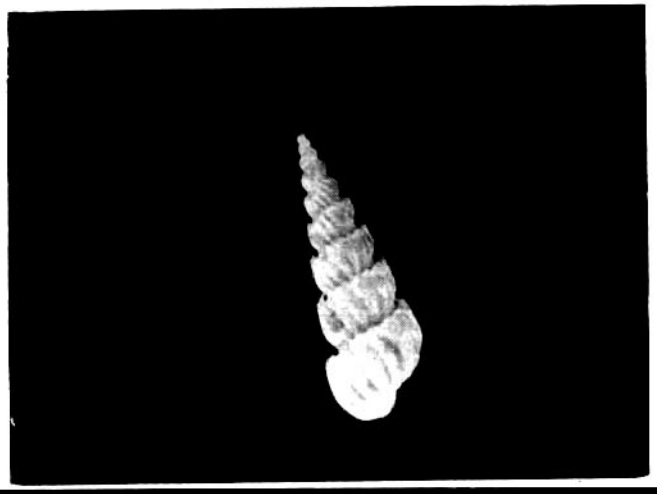
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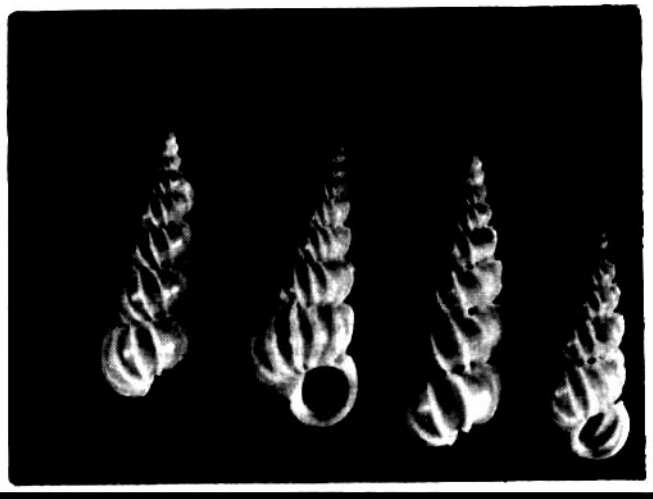


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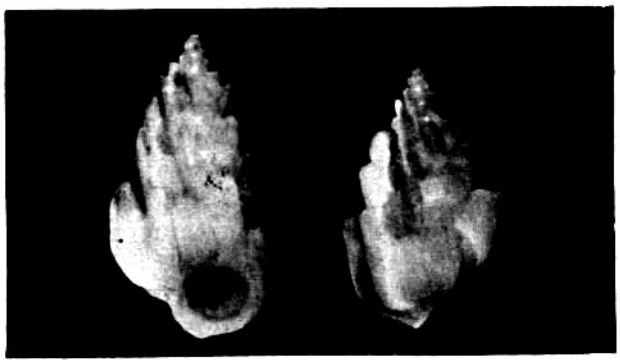




Observations of Live *Nitidiscala statuminata* (Sowerby, *1844*)

BARBARA D. CORNER

Ocean Springs, Mississippi



#1



#2



#3



#4

The beautiful, intricate sculpture of the Family Epitoniidae, commonly known as the Wentletraps, has fascinated man for centuries. While in Panama in the spring of 1980, it was a privilege to be shown the habitat of one of the more beautiful and elusive wentletraps, *Nitidiscala statuminata* (Sowerby, 1844). [Fig. 1] This Epitoniidae had rarely been seen in collections and, as far as I can determine, live specimens were non-existent or at least extremely rare.

The local collectors should be congratulated for finding the habitat of this littleknown species. This determination began with the finding of dead, crabbed specimens. They all agreed that because of the number of dead specimens being found, the habitat of live specimens had to be nearby. After much searching the habitat was finally discovered. *Nitidiscala statuminata* are found intertidally in Panama Bay, Republic of Panama, in muddy sand near gravel flats in association with small algae-covered rocks (10-20 cm). The Epitoniids can be found at the base and on the sides of these small rocks at low tide, normally at night.

One night I was lucky enough to find five specimens. I must admit that this would have been almost impossible without knowledge of the habitat. I also collected two of the rocks with live *N. statuminata* to take back so that I could, hopefully, photograph the live Epitoniids under better conditions. Almost immediately upon placing the rocks and specimens in seawater, the Epitoniids became very active as they extended their white foot and crawled over the rocks probing the rock's surface with their white proboscis. [Fig. 2] After several minutes I realized that they were probing the apertures of one of the species of vermetids tentatively identified as *Petaloconchus (Macromphaga) innumerabilis* (Pilsbry and Olsson, 1935). As the proboscis was extended into the aperture of the tube worm, the Epitonild shell would sometimes be brought into a perpindicular position to the rock [Fig. 3]. At other times, after probing the aperture, the animal would position itself over the tube thus obscuring the proboscis. [Fig. 4]

Most feeding observations of Epitoniids have been in association with various species of anemones. However, it is known that the coral *Tubastrea tenuilamellosa* (Milne-Edwards and Haime, 1848) is the host for *Asperiscala billeeana* (DuShane and Bratcher, 1965); therefore, it is recognized that Epitoniids are not limited to a symbiotic relationship with anemones. Furthermore, Fretter and Graham theorize that Epitoniidae may feed on either annelid worms or nemerteans because of the abnormally long acrembolic proboscis.

Observations of the five *N. statuminata* were made over a four hour period and only after an examination of stomach contents could a positive statement regarding the food preference of *N. statuminata* be made with certainty. These observations only indicate the possibility that a food source of *N. statuminata* is *Petaloconchus (Macromphragma) innumerabilis*

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Fretter, Vera and Alastair Graham. British prosobranch molluscs, their functional anatomy and ecology. London, Ray Society, 755 pp., 1962.

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What's New?

The Veliger. Published by the California Malacozoological Society Inc.; 1584 Milvia Street; Berkeley, California 94709. Vol. 23, Number 1, July 1, 1980. The following articles are contained in this issue: "Identification of Some Planktonic Prosobranch Larvae Present off Beaufort, North Carolina" by Catherina Thiriot-Quievreux (pp. 1-9, 57 photographs). "Review of the Muricid Genus *Acanthotrophon* (Mollusca : Gastropoda)" by Emily H. Vokes [pp. 10-14, 18 photographs]; a new species, *Acanthotrophon striatoides*, is described as a fossil from Veracruz, Mexico and Florida and as living in southern Florida waters. "A New Species of *Favartia (Caribiella)* from the Galapagos Islands" by Emily H. Vokes and Anthony D'Attilio [pp. 15-18, 3 text figures; the new species is *Favartia (Caribiella) purdyae*]. "A New Species of Muricacean Gastropod" by B. M. Olivera [pp. 19-20, two plates of photographs. New species is *Murexiella peregrina* from Panglao, Bohol Island, Philippines and is closely related to *M. martini* Shikama, 1977]. "Synopsis of the Genus *Piseinotecus* with Description of *Piseinotecus evelinae* spec. nov." by Luise Schmekel [pp. 21-24, 5 text figs., species is from Italy]. "The Digestive System of the Moon Snail *Polinices lewisii* (Gould, 1847) with Emphasis on the Role of the Oesophageal Gland" by Robert G. B. Reid and Joan A. Friesen [pp. 25-34, 7 text figs., plus 1 plate]. "The Ultrastructure and Mineralogy of the Dart from *Philomycus carolinianus* (Pulmonata : Gastropoda) with a Brief Survey of the Occurrence of Darts in Land Snails" by Alex S. Tompa [pp. 35 - 42, 1 plate, 2 text figs.]. "Movement, Reproduction, Defence, and Nutrition as Functions of the Caudal Mucus in *Ariolimax columbianus*" by Klaus O. Richter [pp. 43-47, 1 plate]. "Terrestrial Pulmonate Reproduction: Seasonal and Annual Variation and Environmental Factors in *Helminthoglypta arrosa* (Binney) (Pulmonata : Helicidae)" by Kenneth L. van der Laan [pp. 48-54, 1 text fig.]. "A New Species of *Lepidopleurus* Risso, 1826 (Mollusca : Polyplacophora) in the Deep Waters of the Eastern Pacific" by Antonio J. Ferreira [pp. 55-61, 1 plate, 5 text figs., *Lepidopleurus scrippsianus* from a depth of 2891-2507 meters southwest of Cabo San Lucas, Baja California Sur, Mexico]. "Growth and Mortality in the Ribbed Mussel *Geukensia demissa* (Bivalvia : Dreissenacea)" by Mark D. Bertness [pp. 62-69, 5 text figs.] "Life History Studies of the Estuarine Nudibranch *Tenellia fuscata* (Gould, 1870)" by Larry G. Harris, Mark Powers and Julia Ryan [pp. 70-74]. "Late Quaternary *Bankia* (Bivalvia : Teredinidae) from Humboldt County, California" by George L. Kennedy, Anthony D'Attilio, Samuel D. Morrison and Kenneth R. Lajoie [pp. 75-76, 1 text fig.] "The Organisation and Chemistry of the Byssus of some Bivalves of the Waltair Coast, India" by Anisa Banu, K. Shymasundari and J. Hanumantha Rao [pp. 77-82, 3 test figs.]. "Sublittoral Observations of Behavious in the Chilean 'Loco' *Concholepas concholepas* (Mollusca : Gastropoda : Muricidae)" by Random DuBois, Juan C. Castilla and Roberto Cacciolatto [pp. 83-92, 2 text figs.]. "Range Extensions of Three Species of Teredinidae (Mollusca : Bivalvia) Along the Pacific Coast of America" by Michel E. Hendrickx [pp. 93-94]. "Notes on Recent and Fossil Neritidae. 9. On the Alleged Occurrence of Neritina cf. *N. donovani* Recluz in the Vigo Formation, Luzon, Philippines" by Henk K. Mienis [page 95]. Notes and News, Book reviews, etc. fill out this 108 page number.

The Veliger, Volume 23, Number 2, October 1, 1980 contains these articles: "The Sexual Cycle and Reproductive Modality in *Littorina saxatilis* Olivi" by Dominique Caugant and Joseph Bergerard [pp. 107-±±±, 4 text figs.]. "Two Disjunct Populations of *Euglandina singleyana* (W.G. Binney)" by Raymond W. Neck [page 112]. "Heat Tolerance in the Black Abalone, *Haliotis cracherodii* Leach, 1814: Effects of Temperature Fluctuation and Acclimation" by Anson Hines, Susan Anderson and Michael Brisbin [pp. 113-118, 3 text figs.]. "Food Sources and Feeding Behavior of *Nautilus macromphalus*" by Peter Ward and Mary K. Wicksten [pp. 119-124, 1 plate, 2 text figs]. "Crude Oil Effects on Mortality, Growth and Feeding of Young Oyster Drills, *Urosalpinx cinerea* (Say)" by Steven F. Edwards [pp. 125-130, 3 text figs.]. "A Survey of the Softbottom Molluscs of Cockburn Sound, Western Australia" by Fred E. Wells and Timothy J. Threlfall [pp. 131-140, 7 text figs.]. "Larval and Postlarval Development of the Window-Pane Shell, *Placuna placenta* Linnaeus, with a Discussion on its Natural Settlement" by Adam L. Young [pp. 141-148, 3 plates, 1 text fig.]. "*Pulsellum salishorum* spec. nov., A New Scaphopod from the Pacific Northwest" by Elsie Marshall [pp. 149-152, 1 plate, 5 text figs.]. "A Note on the Diet of *Beringius kennicottii* (Dall, 1871)" by Ronald L. Shimek [pp. 153-154, 1 plate). "The Effect of Salinity on Crystalline Style Occurrence in the Estuarine Snail, *Ilyanassa obsoleta* (Say), and its Possible Significance with Respect to Local Distribution" by Lawrence A. Curtis and L. E. Hurd [pp. 155-158, 1 text fig.]. "A Possible Relationship between Size and Reproductive Behavior in a Population of *Aplysia punctata* Cuvier, 1803" by Cary Otsuka, Yves Rouger and Ethel Tobach [pp. 159-162]. "Reproductive Biology of *Assiminea californica* (Tryon, 1865)" by Bruce H. Fowler [pp. 163-166, 3 text figs.[. "Magnetic Radular Teeth and Geomagnetic Responses in Chitons" by Jack Tomlinson, Debra Reilly and Rovert Ballering [pp. 167-170, 1 text fig.]. "Collections of Gastropods from the Cascade Mountains of Washington" by Branley Allan Branson [pp. 171-176]. "Spawning in a British Columbia Population of Northern Abalone, *Haliotis kamtschatkana*" by Paul Allan Breen and Bruce Edward Adkins (pp. 177-179.). "Habitat Notes on *Gastrocopta riograndensis* Sterki" by Raymond W. Neck [pp. 180-182].

The Veliger, Vol. 23, Number 4; April 1, 1981. The following articles are included in this issue: Comparative Shell Ultrastructure of Lyonsiid Bivalves by Robert S. Prezant; Growth, Mortality and Longevity of *Cerithidea decollata* Linnaeus from Bayhead Mangroves, Durban Bay, South Africa by Victor G. Cockcroft and A.T. Forbes; Effects of Temperature and Salinity on the Embryological Development of *Murex pomum* Gmelin, 1791 by Euna A. Moore and Finn Sander; Redescription of a Rare North Atlantic Doridacean Nudibranch, *Aegires sublaevis* Odhner by T.E. Thompson; Preliminary Studies on the Association between *Plenosporium squarrosum* (Rhodophyta) and *Cryptochiton stelleri* (Polyplacophora) by Karla McDermid; Temperature and Growth of Maturing *Haliotis kamtschatkana* Jonas by A.J. Paul and J.M. Paul; A New Species of *Stenosemus* Middendorff, 1847 (Mollusca: Polyplacophora) in the Abyssal Northeastern Pacific by Antonio J. Ferreira [new species is *Stenosemus chiversi* Ferreira, 1981]; Four Previously Undescribed Indo-Pacific Terebridae by Twila Bratcher (see accompanying article); Distribution, Activity and Food Habits of Juvenile *Tegula funebralis* and *Littorina scutulata* as they Relate to Resource Partitioning by Jeffrey T. Jensen; "New Species of *Fusinus* from the Tropical Eastern Pacific by Leroy Poorman [see following story]; The Littoral Polyplacophora of Shell Beach, San Luis Obispo County, California by Barry Folsom Putman; Neustonic Feeding in Early Laevae of *Octopus dofleini* (Wulker) by Jeffrey B. Marliave; *Casmaria atlantica* Clench: Thoughts on its Evolution by J. Gibson-Smith and W. Gibson-Smith; The Status of *Pholadomya candida* G.B. Sowerby I, 1823 by J. & W. Gibson-Smith; Biting as a Defense in Gastropods of the Genus *Busycon* by Paul J. Weldon; *Chaetogaster limnaei* (Oligochaeta: Naididae) Inhabiting the Mantle Cavity of the Asiatic Clam, *Corbicula fluminea*, in Barkley Lake, Kentucky by James B. Sickel & Mark B. Lyles; A Comparison of Fijian Forms of *Conus coronatus* and *Conus aristophanes* by C.P. Lewis.

The Nautilus, Vol. 94, number 2 (April 30, 1980) published by American Malacologists, Inc., P.O. Box 2255; Melbourne, Florida 32901. Articles include: "Reproductive Cycle Patterns in the Chiton Genus *Mopalia* (Polyplacophora)" by John H. Himmelman [pp. 39-49, 11 text figs.]. "*Goniobasis virginica* (Gastropoda: Pleuroceridae) in the Connecticut River" by Douglas G. Smith [pp. 50-54, fig. 4]. "Microstructure of the Crystalline Style of *Spisula solidissima* (Bivalvia : Mactridae)" by Harlan K. Dean [pp. 54-58, 6 figs.). "A New Preparation for Obtaining Chromosome Smears in *Hydrobia* (Hydrobiidae)" by R. N. Howard, B. Z. Lang, and R. L. Carr [pp. 58-59, 2 figs.]. "Snails from Quaternary Valley Fill at Chaco Canyon, New Mexico" by Stephen A. Hall [pp. 60-63, 1 fig.]. "Drilling Predation on Some Miocene Marine Mollusks" by Elizabeth C. Dudley and E. Christopher Dudley [pp. 63-66, 3 figs.]. "Invertebrate Faunules of Late Pleistocene Age, with Zoogeographic Implications, from Turtle

Continued on page 32

Four new species of Indo-Pacific Terebridae are described in above cited Veliger number in an article by Twila Bratcher. We are reproducing the type figures here and will repeat some helpful material from the original descriptions.

Terebra boucheti Bratcher, 1981

Philippines (type locality) to Solomon Islands; 47.5 mm.

"The most outstanding feature of this species is the long whorled protoconch followed by extremely angulate early whorls caused by a keel of small nodes in the center of the first whorls of the teleconch. This is one of the shiniest of the terebrids. Of the paratypes, 3 are white, the remainder blotched with orange brown."

Terebra troendlei Bratcher, 1981

Entrance to Hana Hevane Bay, Tahuata Island, Marquesas Is., French Polynesia, depth 10 meters, sand bottom.

"In shape this species resembles both *Terebra chlorata* Lamarck, 1822 and *T. felina* Dillwyn, 1887, though the whorls are shorter than those of either species. The color pattern differs from both. The holotype of this species was illustrated by Salvat & Rives as *Terebra sp.* "A" in Coquillages de Polynesie."

Terebra swobodai Bratcher, 1981

Type locality: Zamboanga, Mindanao, Philippines, on *Xenophora pallidula* Reeve, 1842, from net traps.

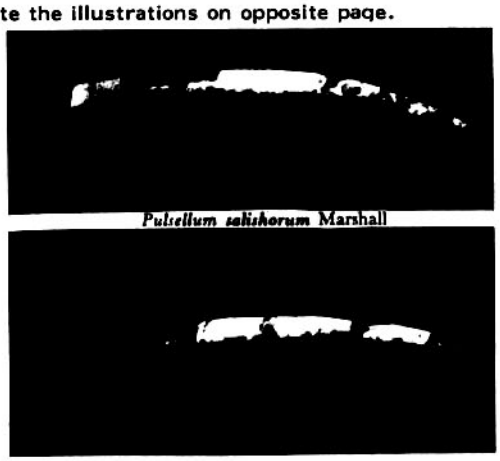
"The most outstanding feature of this species is the large square pits formed by the crossing of heavy spiral and axial cords. The number of spiral cords may vary from 2 to 4. In all specimens examined, the axial and spiral cords are of equal strength."

Terebra turschi Bratcher, 1981

Type locality: Hansa Bay, North coast of Papua New Guinea, in 36 meters, mud bottom.

"This species may be separated from *T. polygyrata* Deshayes, 1859, which has a broader, heavier shell and a quadrate aperture. It also has wide spaces, thicker ribs. *T. turschi* also somewhat resembles the eastern Pacific *T. iola* Pilsbry, 1932, which has a small brown shell with many spiral cords between narrow ribs. It lacks the parietal callus, the light band anterior to the suture, and the groove between the ribs marking the subsutural band."

Please note the illustrations on opposite page.



Pulsellum salishorum Marshall

Five new species of *Fusinus* are described by Leroy Poorman in this same issue of The Veliger. All are from the Tropical Eastern Pacific.

Fusinus consagensis Poorman, 1981

Type locality: off Consag Rock, Gulf of California, 56 specimens dredged in 20 to 30 meters on sand. Height 68.7mm, maximum diameter 23.4 mm.

".. it is unique from any recognized Eastern Pacific fusinid, being easily determined by: the angulate outline of the whorls, the subdued quality of the sculpture on the later stages, the disproportionately large body whorl, the narrow canal bent to the left, and the pinched-in outer lip at the lower part of the aperture."

Fusinus humboldti Poorman, 1981

Type locality: off Duncan Island, Galapagos Islands, Ecuador, 5 specimens dredged in 400 meters.

"this species is very close to *Fusinus paulus* described herein. *Fusinus humboldti* differs in being more slender and in having a proportionately longer canal. Also, the outer lip is lirate within. The major difference, however, is in radula morphology."

Fusinus magnapex Poorman, 1981

Type locality: WSW of Todos Santos, outer coast of Baja California Sur, Mexico; 4 specimens dredged in 160 to 220 meters. 25.4 mm.

"This new species superficially resembles a small specimen of *Fusinus ambustus*. It differs radically in having such a large protoconch with a tilted first turn, and in being proportionally shorter and stouter. Also, it is unique in having so many cusps on the lateral tooth of such a small animal."

Fusinus paulus Poorman, 1981

Type locality: San Jaime Bank, W of Cabo San Lucas, Baja California Sur, Mexico; 6 specimens dredged in 150 meters on rock. 19.2 mm.

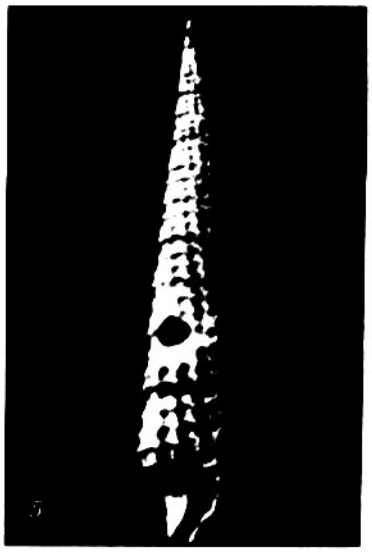
"This new species superficially resembles *Fusinus humboldti* described herein. It differs from the Galapagan species in having a broader, more open canal, in radular variations, in being smooth within the outer lip, and in having an internal cord of callus at the top of the aperture."

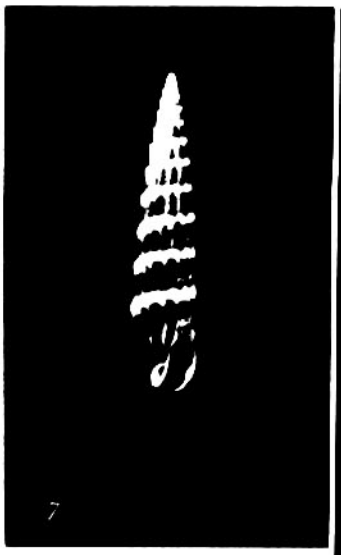
Fusinus sonorae Poorman, 1981

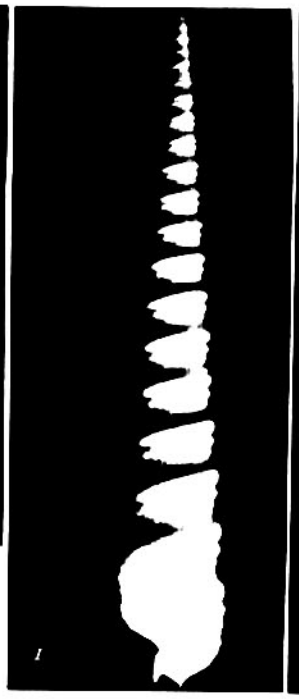
Type locality: 5km SE of Punta San Antonio, near Guaymas, Sonora, Mexico; 7 specimens dredged in 100 to 120 meters on sand and dead shell.

"The protoconch is of the same type as *Fusinus zacae* Strong & Hertlein, 1937; and the shell morphology is similar. However, differences in coloration and the outlines of the spires readily separate the 2 species. *Fusinus sonorae* is much stouter and has a turreted spire. The shoulders are high and rounded and the spiral cords are of nearly equal strength from suture to suture. The subsutural region is concave and nearly tangent to the whorl above. The spire of *F. zacae* is sharply angulated by a strong peripheral cord which rises to prominent crests over the ribs. The shoulder is concave and the lower part of the whorl is only slightly convex. The suture is distinct and incised."

Please note the illustrations of these new species, reproduced from The Veliger on the opposite page.









#1.- *Terebra boucheti* Bratcher, 1981, HOLOTYPE, Philippines.
#3.- *Terebra troendlei* Bratcher, 1981, HOLOTYPE, Tahuata Island.
#5.- *Terebra swobodai* Bratcher, 1981, HOLOTYPE, Zamboanga, Philippines.
#7.- *Terebra turschi* Brattcher, 1981, HOLOTYPE, New Guinea.

#1.- *Fusinus consagensis* Poorman, 1981, HOLOTYPE, Consag Rock, Gulf California.
#2.- *Fusinus humboldti* Poorman, 1981, HOLOTYPE, Duncan Island, Galapagos.
#3.- *Fusinus magnapex* Poorman, 1981, HOLOTYPE, Todos Santos, Baja California.
#4.- *Fusinus paulus* Poorman, 1981, HOLOTYPE, San Jaime Bank, Baja California.
#5.- *Fusinus sonorae* Poorman, 1981, HOLOTYPE, near Guaymas, Sonora, Mexico.



Figure 4



Figure 5

Photographs from The Veliger, Vol. 23, Number 4, April 1, 1981.

See article information on page 30.



Figure 1



Figure 2



Figure 3

WHAT'S NEW

Continued from page 29

Bay, Baja California Sur, Mexico" by William K. Emerson [pp. 67-89, 2 figs., 2 tables]. "Freshwater Bivalves of Tygart Creek, Northeastern Kentucky" by Ralph W. Taylor [pp. 89-91, 1 map, 1 table]. An obituary for Wendell Oliver Gregg (1898-1979) concludes the issue.

The Nautilus, Vol. 94, No. 3 (July 30, 1980). Contents: "Notes on the Prehistoric and Present Status of the Naiad Fauna of the Middle Cumberland River, Smith County, Tennessee" by Paul W. Parmalee, Walter E. Klippel, and Arthur E. Bogan [pp. 93-105, 2 figs., 4 tables). "The Systematic Position of *Couthouyella* (Gastropoda : Epitoniidae)" by Anders H. Waren [pp. 105-107, 8 figs). "Crab-crushing of Periwinkle Shells, *Littorina littorea*, from two Adjacent Geographical Provinces" by Robert Dudley [pp. 108-112, 3 tables]. "*Lymnaea (Pseudosuccinea) columella* in Colombia" by Emile A. Malek and Frank B. Cogswell [pp. 112-114]. "A New *Falsilyria* (Volutidae) and a New *Conus* (Conidae) from Roatan Island, Honduras (Atlantic)" by Edward J. Petuch [pp. 115-118, 15 figs.] (NOTE: See *Of Sea and Shore*, Vol. 11, No. 2 [Summer 1980], fig. 1, color page 140); new species are *Falsilyria morrisoni* and *Conus kulkulcan*. "*Laevicaulus haroldi*, a New Veronicellid Slug from Natal, South Africa, (Gastropoda : Pulmonata)" by Dee Saunders Dundee [pp. 118-120, 2 figs.]. "*Pisidium fallax* (Bivalvia : Pisidiidae) in the Southwestern Ozark Plateaus" by Mark E. Gordon, Gerry L. Mackie, and Arthur V. Brown [pp. 120-21]. "*Sassia lweisii*, a New Cymatiidae Gastropod from the Caribbean Sea" by M. G. Harasewych and E. J. Petuch [pp. 121-122, 3 figs]. "Drilling Predation in a Population of the Edible Bivalve *Anadara granosa* (Arcidae)" by Geerat J. Vermeij [pp. 123-125, 1 table]. "A Note on Encapsulation of Detrital Grains Within the Skeletons of Fossil Mollusks" by William Miller, III and Samuel I. Fuerst [pp. 125-127, 6 figs.].

Archiv fur Molluskenkunde, Band 110 (1979) Number 4/6. The following articles are included: "*Zur Kenntnis griechischer Hydrobiiden*" by Hartweg Schutt [pp. 115-149, 42 photographs, 5 text figs., 4 maps. New taxa include: *Trichonia*, new genus; *Iglica (Raphica) maasseni*, new species; *Iglica (Rhaphica) sidariensis*, new species; *Belgrandiella (Litthabitella) chilodia ionica*, new subspecies; *Belgrandiella (Turcorientalia)*, new subgenus; *Bythinella cretensis*, new species; *B. kosensis*, new species; *Pseudamnicola pieperi*, new species; *P. malickyi*, new species; *Horatia (Daphniola)*, new subgenus; *Horatia (Hauffenis) raehlei*, new species.] "*Revision der lebenden Arten der Gattung Poiretia*" by Peter Subai [pp. 151-172, 2 plates (25 figs], 10 text figs., 1 map. New taxa includes: *Poiretia dilatata peloponnesica*] "*Uber* Helicigona (Josephinella) hemonica (Thiesse)" by Laszlo Pinter and Peter Subai [pp. 173-177, 5 figs.]. "New classification system for the family Physidae" by George A. Te [pp. 179-184]. "*Die systematische Stellung bon Gastranodon). Boettger*" by Adolf Riedel and Harald Pieper [pp. 185-189, 4 text figs.]. "On the exact state of *Helix lineata* Olivi, 1792" by Folco Giusti [pp. 191-197, 5 figs.]. "*Land- und Susswassermollusken von Kephallinia und Zakynthos (Ionische Inseln)*" by Wolfgang Rahle [pp. 199-224, 3 text figs. A new species described here is: *Vitrina (Oligolimax) cephalonica.*). "*Die pliozane Land- und Susswassermolluskenfauna von Sessenheim¿Krs. Hagenau (Unterelsass)*" by W. Richard Schlickum and Fritz Geissert [pp. 225-259, 5 plates. New taxa described includes: *Acicula (Acicula) fusca fuscosa, Columella hartmutnordsiecki, Vertigo (Vertigo) hohenstaufenorum, Eucobresia forcarti, Oxychilus (Oxychilus?) ileckensteinensis, Janulus germainae*, and *Fortuna wernerti*.]. "*Die Typen und Typoide des Natur-Museums Senckenberg, 63: Mollusca: Zonitacea: Zonitidae: Vitreinae*" by Adolf Zilch [pp. 261-279, 13 photographic figures]. "*Die Typen und Typoide des Natur-Museums Senckenberg, 64: Mollusca: Oleacinacea*" by Adolf Zilch [pp. 281-300, 16 photographic figures].

Bulletin of the Institute of Malacology Tokyo, Vol. 1, No. 3, February 26, 1980. 1,500 Japanese Yen from the Institute of Malacology; 6-36, Midoricho 3 Chome; Tanashi City, Tokyo 188, Japan. Includes: "Study on the Collection of Mr. Victor Dan (1) Descriptions of New Species of the Genera *Perotrochus, Anharia* and *Latiaxis*" by Sadao Kosuge. [pp. 35-39, plates 7 (color) to 9. New species described are: *Perotrochus vicdani, Angaria vicdani* and *Latiaxis vicdani*.]. "Description of New Species of the Genus *Ginebis* from the South China Sea" by Sadao Kosuge [page 40, plate 9; new species is *Ginebis hamadai*.). "Descriptions of Six New Species of the Genus *Latiaxis* from the Philippines Sea" by Sadao Kosuge [pp. 41-45, plates 9-10. New species described are: *Latiaxis (Echinolatiaxis) problematica, L. (E.) fenestratus, L. (E.) tuberosa, L. (Babelomurex) castaneotinctus, L. (B.) tumidus*, and *L. (B.) nagahori*.]. "Description of New Species of the Genus *Mitrella*" by Sadao Kosuge [page 46, plate 9; *Mitrella celinae* is described from the South China Sea.]. "Descriptions of Four New Species of the Genus *Plicifusus* (Bussinidae, Gastropoda)" by Ranji Tiba [pp. 47-50, plates 11-13. The new species are: *Plicifusus levis*, from off Rikuzen, Iwate Prefecture, Japan (250-300 meters], *P. parvus*, from off Dal'Negorsk (400 m deep), *P. saginatus*, from off Egorofu Island, Sakhalin (about 400 m deep) and *P. hastarius*, from off Kushiro, Hokkaido (80-100 m deep)].

Bulletin of the Institute of Malacology Tokyo, Vol. 1, No. 2. November 30, 1979. 1,000 Japanese Yen. Contents: "Description of a New Species of the Genus *Calliostoma* from the Central Pacific" by Sadao Kosuge [page 19, plate 4; new species is *C. imperialis*, taken at about 1,000 meters depth northeast of Midway Island]. "Description of a New Species of the Genus *Guildfordia*" by Sadao Kosuge [page 20, plate 4; new species is *G. aculeatus*, taken in 200 meters off Mactan Island, Cebu, the Philippines]. "Descriptions of New and Rare Cones from the Western Pacific" by Sadao Kosuge [pp. 21-22, plate 4; new species are: *C. (Profundiconus) nigrostriatus*, from 100 meters, South China Sea.]. "Description of a New Species of the Genus *Penicillus* from Okinawa (Ryukyu Group)" by Sadao Kosuge [page 23, plate 4; new species is *P. (Warnea) nagahamai*.]. "Report on the Mollusca on Guyots from the Central Pacific Collected by 2nd and 3rd Cruises of R/V Kaiyomaru in 1972 to 1973 with Descriptions of Twelve New Species" by Sadao Kosuge [pp. 24-35, plates 5 and 6. The twelve new species are: *Bittium midwayensis* taken at a depth of 365 meters off Midway Island; *Polinices medeopacificus*, taken at a depth of 84 meters off Midway; *Bursa pygmaea*, taken at 380 meters off Midway; *Fusinus midwayensis*, taken at a depth of 76 meters off Midway; *Pseudolatirus leucostriatus*, from a depth of 365 meters off Midway; *Mitra (Chrysame) midwayensis*, from a depth of 383 meters off Midway; *Terebra castaneostriata*,, from a depth of 84 meters off Midway; *Architectonica nomotoi*, taken from a depth of 270 meters off Midway; *Solariaxis nasui*, at a depth of 365 meters off Midway; *Solariaxis granulata*, at the depth of 365 meters off Midway; *Bullina rubeopunctata*, from a depth of 350 meters off Midway; *Euciroa mediopacifica*, 370 meters off Midway.]

Occasional Paper, Institute of Malacology Tokyo. North Pacific Shells (1) Genus *Volutopsius*. Cost 1,050 Japanese Yen. 26 pp, 10 species on 12 plates (showing many variations and specimens from various localities). By Ranji Tiba and Sadao Kosuge, this pamphlet is written mostly in Japanese, but with the original descriptions of the species in their original language (Latin, English), synonymy in English and Latin.

Quarterly Journal of the Taiwan Museum, Vol. XXXII, Nos. 1 & 2, June 1979, contains an article of interest: "A New Cone from off NE Taiwan and a New *Chlamys* from the Ryukyu Islands, Japan" by Phillip R. Crandall. The two new species are: *Conus (Profundiconus) lani* and *Chlamys dianae*.

Bulletin of Malacology Republic of China (Bulletin of the Malacological Society of China), Vol. 6, November 1979, contains the following: "Morphometric Studies on *Corbicula fluminea* (Muller, 1774) (Bivalvia : Corbiculidae)" by Wen-lung Wu, synopsis in English, main article in Chinese; "*Hemiphaedusa janshanensis* n. sp. from Taiwan (Pulmonata : Clausiliidae)" by Kuan-min Chang and Wen-lung Wu [pp. 13-20, text in English, 5 text figs. and two tables]; "Turban Shells and Star Shells of Taiwan" by K. Y. Lai [pp. 21-32, text in Chinese, synopsis in English, 7 full page plates); "Geographical Variation in the Landsnail, *Formosana swinhoei* (Pfeiffer, 1865) from Northern Taiwan (Pulmonata : Clausiliidae)" by Wen-lung Wu and Kuang-min Chang [pp. 33-45, English text, 7 figs., 5 tables]; "Numerical Analysis of Intertidal Mollusk Fauna on Rockyshore at Northeast Part of Taiwan" by Chi-chung Wan and Yien-shi Tan [pp. 46-66, Chinese text, synopsys in English]; "Geographical Distribution of *Unio douglasiae* (Griffith & Pidgeon, 1834) in Taiwan (Bivalvia : Unionidae)" by Wen-lung Wu [pp. 69-74, 2 maps, text in Chinese, English synopsis].

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Publicaciones del Departamento de Zoologia, Universidad de Barcelona, Facultad de Biologia, IV: 7-11, 1979. Among the articles are several on mollusks: *Bossellia mimitica* Trinchese 1891 y *Elysia timida* Risso 1818, dos sacoglosos nuevos para la fauna iberica" by Manuel Ballesteros, text in Spanish [pp. 13-17, 3 text figs.); [Summary: In this paper the first records for Spain of two species of Sacoglossa Opisthobranchs are given. *Bossellia mimetica* is new to the general spanish fauna whereas *Elysia timida* is new to the Iberian Peninsula.] "Sobre un nuevo habitat de *D. graeca* L. (Molusco Arqueogastropodos)" by Fernando Pereira [pp. 19-21], text in Spanish. [Summary: In the present work we described a new habitat for *Diodora graeca* L. (Mollusca Archaeogastropoda). Several specimens have been found inside a sponge *Ircinia fasciculata* Pallas, living together with other invertebrates. Two facts suggest the adaptation to this new habitat: the difficulty in leaving the sponge and the absence of pigmentation due to the strictly carnivorous diet.]

Il Naturalista Siciliano, Vol. III, N. 3-4, 30 December 1979, the following should be of interest to our readers: "Note sui Trochidae. I: Riscoperta del "*Trochus pumulio*" Philippi 1844" by Marco Curini Galletti and Stefano Palazzi; [pp. 83-90, 3 figs.], text in Italian.

Travaux du Museum d'Histoire naturelle Grigore Antipa, Vol. XX, 1979, Bucarest, Romania. Of interest to molluscan researchers: "Eine neue Gastropodes-Art: *Monachoides bacescui* sp. n. (Helicidae, Hygromiinae)" by Alexandru Grossu [pp. 21-25, 3 figs., text in German); "Beue Gastropoden-Arten fur die Fauna Rumaniens (Helicidae, Helicellinae)" by Alexandru Grossu [pp. 27-34, 4 text figs., text in German].

Basteria, Vol. 44, No. 1-4, 19-VI-1980. Published by the Nederlandse Malacologische Vereniging, Rijksmuseum van Natuurlijke Historie, Raamsteeg 2, Postbus 9517, 2300 RA, Leiden, Netherlands. In this issue: "Pigmentation of the mantle border in Polish representatives of the subgenus *Radix* (Lymnaeidae, Basommatophora, Gastropoda)" by Andrzi Falniowski [pp. 3-8, 19 figures]; "*Hydrocena (H.) cattaroensis* (L. Pfeiffer, 1841) (Prosobranchia, Neritacea) und ihre Lebensbedingungen" by E. Gittenberger and W.J.M. Maassen [pp. 9-10, 3 text figs.); "New data on four European terrestrial gastropoda" by E. Gittenberger H.P.M.G. Menkhorst and J.G.M. Raven [pp. 11-16, 5 figs.]; "Alphabetical revision of the (sub)species in recent Conidae 3. *albus* to *antillarum* with the description of *Conus algoensis agulhasi*, nov. subspecies" by H.E. Coomans, R.G. Moolenbeek and E. Wils [pp. 17-49, 5 plates]; "On the identity of *Helix montiscarmeli* Tristram, 1884" by Henk K. Mienis [page 51]; "*Helicodiscus singleyanus* (Pilsbry, 1890) in Nederland [page 52, text in Dutch).

Journal of Conchology, Vol. 30, Part 3; June 1980. The Conchological Society of Great Britain and Ireland; Hon. Secretary: Mrs E. B. Rands; 51 Wynchwood Avenue, Luton, Bedfordshire LU2 7HT. "Studies on the Reproductive Biology of Gastropods: Part III. Calcium Provision and the Evolution of Terrestrial Eggs Among Gastropods" by Alex S. Tompa [pp. 145-154]; The Land and Freshwater Mollusca of St. Ives, Cornwall Part I: Shell-bearing Species" by John Humphreys [pp. 155-166]; "A Redescription of *Placida viridis* Trinchese, 1873 (Gastropoda : Ascoglossa)" by T. Gascoigne [pp. 167-179]; "The Mollusca of Acid Woodland in the Italian Province of Novara" by M. J. Bishop [pp. 181-188]; "Coexistence of Two Closely Related Species of *Arion* in Natural Habitats" by B.A. Conroy [pp. 189-199; species are *Arion ater* and *A. lusitanicus*]; "Observations on the Dispersal of Two Species of British Land Snail" by Robert H. Cowie [pp. 201-208; species are *Candidula intersecta* and *Cernuella virgata*]. "Whorl Number, Shape, and Size of Shell in Some Pulmonates" by A.J. Cain [pp. 209-221]; an obituary (John Wilfrid Jackson 1880-1978) and book reviews take up the remaining four pages of this number.

Malacologia. Vol. 20 No. 1, 1980. Published by the Institute of Malacology (2415 South Circle Drive, Ann Arbor, Michigan 48103). Subscription offices are: Department of Malacology, The Academy of Natural Sciences of Philadelphia, Nineteenth Street and the Parkway, Philadelphia, Pennsylvania 19103. Articles included in this number are: "Proserpinoid Land Snails and Their Relationships Within the Archaeogastropoda" by Fred G. Thompson (pp. 1 - 33; a new superfamily Helicinacea and a new family Ceresidae are promulgated, a new generic name *Archecharax* replaces *Cyane* H. Adams, 1870 [non *Cyane* Felder, 1861 in Lepidoptera]; and a new species, *Archecharax glaeserius* [from Ecuador] is described; also newly described is *Proserpina (Despoenella) scudderae* [from the Dominican Republic] as is *Proserpina (D.) planior* [from Haiti].) "The Abundance, Distribution and Diversity of the Molluscs of Wester Port, Victoria, Australia" by N. Coleman and W. Cuff [pp. 35-62, 15 text figs. (maps & charts)]. "Genetic Divergence Between Populations of *Goniobasis* (Pleuroceridae) Occupying Different Drainage Systems" by Steven M. Chambers [pp. 63-81, 7 text figs., including shell illustrations; Florida area species). "The *Goniobasis* of Southern Virginia and Northwestern North Carolina: Genetic and Shell Morphometric Relationships" by Robert T. Dillon, Jr. and George M. Davis [pp. 83-98; 5 text figs. (one showing specimens of *Goniobasis simplex* and *G. semicarinata*), 6 tables]. "Development and Feeding of Larvae of the Nudibranch Gastropods *Hermissenda crassicornis* and *Aeolidia papillosa*" by Leslie G. Williams [pp. 99-116; 17 text figs., 6 tables). "Observations on the Anatomy and Life History of *Modulus modulus* (Prosobranchia : Modulidae)" by Richard S. Houbrick [pp. 117-142, 8 text figs., 7 tables). "On *Patro australia* with Comparisons of Structure Throughout the Anomiidae (Bivalvia)" by C. M. Yonge [pp. 143-151, 9 text figs.). "Episodic Growth in Gastropoda" by Robert M. Linsley and Mahdokht Javidpour [pp. 153-160, 7 text figs.). "The Giant White Clam from the Galapagos Rift, *Calyptogena magnifica* species novum" by Kenneth J. Boss and Ruth D. Turner [pp. 161-194, 13 text figs. Describes the fascinating clams taken in 1977 and 1979 associated with deep water thermal vents in the rifts at depths between 2450 and 2600 meters. These clams measure 250+ mm and are the largest of the Family. In Appendix 1, C. Berg and R.D. Turner describe living specimens, while in Appendix 2, K. Boss provides an annotated checklist of ten fossil and seven living species of *Calyptogena*.] [NOTE: see "Oases of life in the cold abyss" by J.B. Corliss and R.D. Ballard, 1977 152(4): 441-453, National Geographic.]

La Conchiglia (The Shell), September-October 1980 Includes: "Pectinoidea from the European coasts, Continued" by Maurice Lucas [pages 3 to 7]; "A Gallery of Australian Volutes" by Frank Abbottsmith [1 page, 5 color illustrations]; "The Ringiculidae living in the Mediterranean" by Giuseppe Schiro [3 pages, 10 species and/or varieties illustrated in black and white]; "The *irrorata-glabella desjardini-sebastiani* complex (Prosobranchia - Marginellidae)" by Carlos Buey Suarez [3 pages, color illus.]; "The Buccinids from the European Seas" by Tom Pain [4 pages 10 color and 2 black and white illustrations]; "A new Linne wanted" by Guglielmo Biraghi [discussing problems within the Family Cypraeidae between using a single genus (*Cypraea*) and breaking it into several genera, especially with the specific and subspecific names *mariae* and *vredenburgi*].

Smithsonian Contributions to Zoology, Number 289, The Marine Mollusks of Easter Island (Isla de Pascua) and Sala y Gomez by Harald A. Rehder (1980). 167 pages, 14 black and white plates covering a study of more than 7000 specimens of mollusks, 133 species (18 identified only to genus or family), 48 of which are endemic. Forty species and two subspecies are described as new and three new genera are proposed. This is an especially welcome book to me, as our museum has a small collection of several hundred specimens collected and donated to us by Father Englert and Yewell Cox several years ago.

Smithsonian Contributions to Zoology, Number 313, Scanning Electron Microscopy of Shell and Mantle in the Order Arcoida (Mollusca : Bivalvia) by Thomas R. Waller. 58 pages, 46 figures, 1 table.

Smithsonian Contributions to Zoology, Number 321 (1980). Review of the Deep-Sea Genus *Argyropeza* (Gastropoda: Prosobranchia: Cerithiidae) by Richard S. Houbrick. 30 pages, 12 figures, 8 tables. Five species of the genus, closely related to *Bittium*, are recognized. The species live on soft sediments of continental slopes and island groups in the Indo-Pacific, most frequently at bathyal depths.

Nemouria, #22, Occasional Papers of the Delaware Museum of Natural History, Oct. 30, 1979. "Review of the Subgenus *Pterynotus* (Gastropoda: Muricidae) in the Western Atlantic" by M. G. Harasewych and R.H. Jensen comprises the entire issue. In the paper's 16 pages five species of the genus are discussed, three being described for the first time. Those which have been previously described are: *Pterynotus (Pterynotus) phaneus* (Dall, 1889) and *P. (P.) phyllopterus* (Lamarck, 1822). The following are the species newly described:

Pterynotus (P.) guesti Harasewych & Jensen, 1979

Type locality: ESE of Key West, Florida, in 275 meters; known only from the type locality.

Discussion: This new species very closely resembles the Paleocene *Pterynotus mathewsensis* (Aldrich, 1886)[Vokes, 1970, pl. 1, fig. 1a,b] and the Eocene *P. stenzeli* E.H. Vokes, 1970 [Vokes 1970, pl. 1, fig. 5a,b]. It may be distinguished from all other Recent Atlantic species by the presence of a tabled shoulder and a channelled posterior spine. That *P. guesti* is very similar to the Japanese *P. vespertilio* (Kira) [Radwin and D'Attilio, 1976, pl. 9, fig. 2) is not surprising since there has been so little morphological change in this line since the Paleocene. *Pterynotus guesti* differs from *P. vespertilio* in having a more elongate shell with narrower varical webbing and by the presence of reddish brown color inside the aperture. This new species honors Arthur T. Guest of Bailey's Bay, Bermuda, in recognition of his assistance in our work on the mollusks of Bermuda.

Pterynotus (P.) lightbourni Harasewych & Jensen, 1979

Type locality: Off St. David's, Bermuda, in 275-600 meters; known only from the type locality.

Discussion: The three apertural color patches [faint golden tan] as well as shell size and shape, serve to distinguish this species from other western Atlantic taxa. It resembles *P. leucas* from the eastern Atlantic but differs in having a proportionally smaller aperture, wider varices, and a single intervarical node. It it also similar to Recent specimens of *P. flemingi* Bue, 1967 [Beu, 1970, pl. 2, figs. 23-26] from New Zealand. *Pterynotus flemingi* also has the color patches outside the aperture, as well as a single intervarical node, but differs from *P. lightbourni* by having a much larger aperture and a greater spire angle.

We take pleasure in naming this species in honor of John R.H. Lightbourn, of Bailey's Bay, Bermuda, in recognition of his contributions to the studies of the deep-water mollusks of Bermuda.

Pterynotus (P.) radwini Harasewych & Jensen, 1979

Type locality: R/V Pillsbury station P-610, east of Turneffe Islands, Belize, in 296-329 meters. Known only from the type locality.

Discussion: At first glance, this species more closely resembles the ocenebrine *Pteropurpura macroptera* (Deshayes, 1839) than any *Pterynotus*, but closer examination reveals typically muricine radula and operculum. It can readily be distinguished from *P. lightbourni*, its nearest congener, by its coffee color, lack of apertural color patches, lack of axial sculpture, prominent spiral sculpture, and strongly digitated varices.

This species is named in honor of George E. Radwin, who would have described it were it not for his untimely death.

Several articles of interest to our readers have appeared in recent issues of National Geographic Magazine. "British Columbia's Cold Emerald Sea" text by Larry Kohl, photographs by David Doubilet (Vol. 157, No. 4, April 1980, pp. 526-551) includes photographs of several mollusks including *Melibe leonina*, a 10 inch nudibranch. "Undersea World of a Kelp Forest" by Sylvia A. Earle, photographs by Al Giddings (Vol. 158, No. 3, September 1980, pp. 410-426) concerns these giant algaes of the Pacific Coast. The article deals with the area sround Catalina Island, California and photographs include one of *Norrisia norrisi* crawling on a kelp stipe.



Fig. #4 & #5 - *Pterynotud (P.) phaneus* (Dall, 1889); #4 from off Key West, Florida, in 174 m. #5 Arrowsmith Banks, off Isla Mujeres, Q.R., Mexico, in 245-250 m.
Fig. #6 - *Pterynotus (P.) guesti* Harasewych & Jensen, 1979, ESE Key West, Florida, in 275 m. HOLOTYPE.
Fig. #9 - *Pterynotus (P.) lightbourni* Harasewych & Jensen, 1979, Paratype 1, off St. David's, Bermuda, in 600 m.
Fig. #10 - *Pterynotus (P.) radwini* Harasewych & Jensen, 1979 HOLOTYPE, east of Turneffe Islands, Belize, in 296-329 m.

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WHAT'S NEW

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Malacological Review; Vol. 13, Number 1-2, 1980. The following research articles are included in this dual number issue.

A Comparative Study of Distributions of the Mudwhelks *Terebralia sulcata* and *T. palustris* in a Mangrove Swamp in Northwestern Australia by Fred E. Wells.

Parthenogenesis and Biochemical Variation in Southeastern *Campeloma geniculum* (Gastropoda: Viviparidae) by Alvan A. Karlin, Virginia A. Vail and William H. Head.

Utilization of Solar Energy in Acheiving Favorable Rural Ecology in Egypt by the Year 2000. Mass Snail-Host Eradication by Solar Energy by Hassan H. Khalil.

Samoana jackieburchi, New Species (Gastropoda: Pulmonata: Partulidae) by Yoshio Kondo. A new sinistral species of *Samoana* from Tahiti; unique in having a sinistral shell shaped and colored exactly like its Tahitian co-inhabitant, *Partula otaheitana rubescens*. (A color plate illustrates the new species.)

Factors Influencing Gestation Length in Two Land Snails, *Achatina fulica* and *Macrochlamys indica* by S.K. Raut and K.C. Ghose.

A New Helicarionid Land Snail from the Southeastern United States by Fred G. Thompson and Harry G. Lee. A new genus, *Dryachloa* Thompson and Lee, 1980 is proposed, with the new species, *D. dauca* Thompson and Lee, 1980 its sole member. The minute species (2 millimeters or less) has been collected from its habitat deep in grass roots in wet and marshy habitats, in Florida and Alabama. A bright carrot-colored body makes the tiny species more easily spotted. See illustration lower right.

An Anatomical Redescription of *Pleiodon (Cameronia) spekii* (Pelecypoda: Mutelidae: Pleiodoninae) by William H. Heard and Brian J. Dougherty.

A Review of Sacoglossan Diets, With Comparative Notes on Radular and Buccal Anatomy by Kathe R. Jensen.

Also in this issue are two extensive papers on freshwater snails. A Practical Guide to the Identification of African Freshwater Snails by F. Frandsen, F. McCullough and H. Madsen [pp. 95-120] and A Guide to the Freshwater Snails of the Philippines by J.B. Burch [pp. 121-144] comprise the remainder of this issue; except for the usual reproductions of contents pages from major molluscan periodicals from around the world. Both articles contain useful keys to identification, but the Philippine species are keyed only to the generic level. Line drawings accompany both keys and four black and white plates are included in the first.

Subscriptions to Malacological Review are $10 U.S. per year for individuals and $17 U.S. for institutions. Address is P.O. Box 420, Whitmore Lake, Michigan 48189 U.S.A.

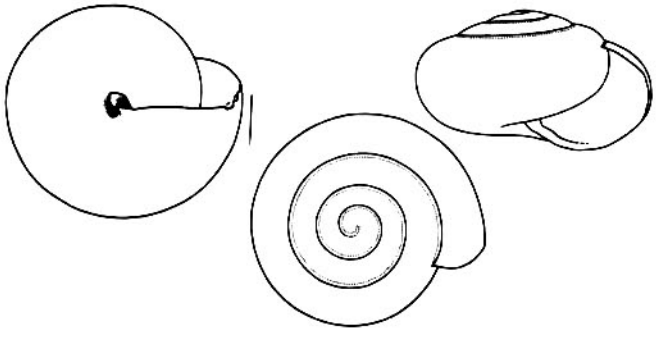
Sea Frontiers, published by the International Oceanographic Foundation, 3979 Rickenbacker Causeway, Virginia Key, Miami, Florida 33149. Items of interest to our readers have appeared in two recent issues. Vol. 26, No. 3, May-June 1980: Inside the front cover is a color photograph of a cuttlefish [a mollusc of the Class Cephalopoda]. "The Florida Out-Islands and Their unique Animals" by Charles D. Getter and Edward J. Petuch, in the same issue, contains material on mollusks, and three color photographs [*Melongena corona bicolor, Cerodrillia clappi* and *Conus floridanus burryae*]. The inside of the back cover has a color photograph of a pteropod, unidentified.

Skin Diver (June 1980) contains an article of interest: "Golden Cowry Dive" by Scott Johnson, about the search for *Cypraea aurantium* on Kwajalein Atoll. "The Caribbean Conch, An Epicurean Delight" by Gary Wescott is also in this issue - has two recipes for using conch, breaded conch steaks and ceviche de caracol [raw marinated snail], plus step-by-step method of getting the animal out of its shell (unfortunately by putting a hole in it) and obtaining the edible portions. You can write Skin Diver at P.O. Box 3295 (6725 Sunset Blvd.), Los Angeles, California 90028.

International Wildlife (September-October 1980) contains an article "Looking in on shells" by Jonathan Fisher, photographs by William A. Conklin, includes nine color photographs and nine x-ray photographs of the same shells. In connection with the Galapagos Rift investigations [see mention of new bivalve in Malacologia] an article in the November-December 1980 issue "Fred Grassle dives to a strange new world" covers the Alvin dives that explored these fascinating areas. Write National Wildlife Federation, 8925 Leesburg Pike, Vienna, Virginia 22180 for subscription information.

Archiv fur Molluskenkunde; Band 111 (1980) Nummber 1/3 (see address information on page below.
Richard Schlickym (1906-1979) by A. Zilch, including a listing of malacological articles by Schlickum. Vergleichend morphologische Untersuchungen an der Radula der Landnacktschnecken, I. Limacoidea und Zonitoidea by Jungbluth, Likharev and Wiktor. Zur Kenntnis korfiotischer Limas-Arten by Wolfgang Rahle. Eine unbekannte Russe von *Cochlostoma achaicum* aus dem Peloponnes by Hartwig Schutt - including a new species, *Cochlostoma (Holcopoma) achaicum parnonis* Schutt, 1980. *Orculella traperzensis* n. sp., eine neue Landschnecke aus Trabzon (Turkei) by Franz Stojaspal. Eine neue *Acicula* - Art aus dem Iran by Peter Subai; the new species is *Acicula (Acicula) persica* Subai, 1980. The occurrence of *Proserpina* in the British Tertiary, with the description of a new species by R.C. Preece; the new taxon is *Proserpina woodwardi* Preece, 1980. Unbekannte westeuropaische Prosobranchia, 2), by Hans D. Boeters and includes the following new species and subspecies: *Hauffenia (Neohoratia) coronadoi schuelei* Boeters, 1980; *Fissuria* [new genus] *boui* Boeters, 1980; *Pseudamnicola gasulli* Boeters, 1980; *Moitessieria simoniana lescherae* Boeters, 1980. Fossile Clausilien V, Neue Taxa neogener europaischer Clausilien, II by Hartmut Nordsieck includes following new species: *Serrulella andreaei* Nordsieck, 1980; *Serrulella multiplicata* Nordsieck, 1980; *Serrulastra* [new genus] *laevissima* Nordsieck, 1980; *Serrulastra (Serruplica)*[new subgenus] *falkneri* Nordsieck, 1980; *Regiclausilia* [new genus] *patula* Nordsieck, 1980; *Cochlodina (Miophaedusa) oppoliensis* Nordsieck, 1980; *Cochlodina (Miophaedusa) oppoliensis oppoliensis* Nordsieck, 1980; *Pseudidyla (Canaliciella)*[new subgenus] *boettgeri* Nordsieck, 1980; *Trolliella* [new genus] *silesiaca* Nordsieck, 1980; *Serrulastra* [new genus] *(Serruplica)*[new subgenus] *trolli* Nordsieck, 1980; *Serrulastra (Serruplica) ptycholarynx galli* Nordsieck, 1980; *Serrulastra (Serruplica) brandti* (Schutt) [placed here from genus *Serrulina*]; *Cochlodina (Miophaedusa) oppoliensis* Nordsieck, 1980; *C. (M.) oppoliensis hollabrunnensis* Nordsieck, 1980; *Serrulastra (Serrulastra) michaudi* Nordsieck, 1980; *Serruluna* [new genus] *anodon* Nordsieck, 1980; *Macrogastra (Macrogastra) multistriata* Nordsieck, 1980. Fossile Clausilien, VI, Die posteozanen tertiaren Clausilien Mittel- und West-Europas by Hartmut Nordsieck. Revision des Genus *Alopia*, II, Zur Nomenklatur einiger Gipfelformen von *Alopia* by Hartmut Nordsieck. Die Typen und Typoide des Natur-Museums Senckenberg, 65): Mollusca: Clausiliidae (6): Alopiinae (4); Montenegrinini by Adolf Zilch. Die Typen und Typoide des Natur-Museums Senckenberg, 66): Mollusca: Stenothyridae by Adolf Zilch.
Address: Senckenbergische 25; 6000 Frankfurt Am Main 1, West Germany.

Dryachloa dauca Thompson and Lee, 1980



Miscellania

A THOUGHT FOR TODAY

Time has slowly, but progressively unfurled to man the inspiring beauty of the World of the Shell, a world hidden mainly under the mantel of the sea and known only to the inquiring few. With the coming of education to all, and with it the stimulation to inquire into the unknown, the shell has burst upon mankind like a flash of light into a darkened world. At a time when values are changing and the soul of man being hardened by the mercenary values of today, the shell with its diversity of colour and form, makes man take another look at life.

The timing of the unveiling is perhaps just a progression of events - clinical and inevitable. Or, perhaps it is more? The answer to this question is not to be given by one man. Each and every one of us must ponder and come to his or her own conclusion.

E. W. UNWIN; Dorset, England

OLD MYTHS AND NEW REVELATIONS

Dear Tom,

Back in the dear dead days when I was a kid, I learned two fascinating bits of nature lore. One, if I could find a really round, perfectly white rock, and crack it open, it would have gold inside. Two, if someone had a seashell with a neat round hole in it, that shell had once been Indian money.

I spent a lot of time in the gravel pile before I finally learned gold didn't come in geodes of white.

And sometime down the pike I discovered that oyster drills and such antisocial little cannibals were the unromatic drillers of holes in shells.

But now I discover that octopus do such nefarious tricks too! Gets farther from Indian money all the time.

This new information inspired me to poetry, as follows:

Little hole in the clam
How I wonder why you am!
Were you made by oyster drill
Boring in to eat his fill?
Or, this time was the ornery cuss
A sneaky lurking octopus?
Unless I find you by his lair
I'll never know he put you there.
Hole, hole, in the shell -
How you're made you'll never tell!

PHYLLIS DODGE; Wrangell, Alaska

THOUGHTS ABOUT REEFS

Dear Tom,

I wrote the following poem while I was going to college in Florida in 1973. I was studying for my degree in Marine Biology and, as you can tell by the poem, I was quite disturbed about the deterioration of the world's coral reefs. I was an active scuba diver at the time, and an avid shell collector. I was also a conservationist, and still am..

I have not scuba dived in the ocean since being in Florida, about four years ago. I now live in New Jersey and am told the visibility here is a maximum of 10 feet. New York and New Jersey have been dumping garbage and sewage into the ocean for as long as I can remember. There used to be a time when my father and I would go deep sea fishing and come home with a trunk full of fish. Now things have changed. The pollution inland is driving the fish out deeper. There was a time last summer that many of the beaches had to be closed because of raw sewage ending up on the beach.

I recently read in Sea Frontiers that Australia had finally preserved a part of the Great Barrier Reef to the south. I believe the fight for this park between the oil companies and marine conservationists went on for quite a number of years. They are now proposing another section of the Reef, to the north, for protection. I hope the oil companies lose their battle in Australia because I'm afraid they may be winning one here in the United States.

There is a coral reef, called "The Sea Gardens", 100 miles off the coast of Texas. This reef is not very large, but the beauty and variety of fish and coral is overwhelming. Oil tankers have been seen dumping garbage over this reef time and time again. It seems the oil companies want to win permission to drill there. The Environmental Protection Agency, on the other hand, has proposed the Sea Gardens for a Marine National Park. Both sides have been in court for quite a number of years and the issue is still unsettled. If the dumping keeps up there may not be an issue too much longer.

I am also disturbed over the extending of Miami's beaches. They have been pumping sand for a few years now to replenish and extend the beaches in this area. I am apalled to think this is happening. The sediment brought up while pumping is enough to choke a reef within a few months, let alone kill all the sand dwelling invertebrates and fish that get deposited on the beach. I'm sure the Bahamas are seeing the effect of this foolish pumping.

I just hope that man's quest for property and power can somehow be stalled long enough to let him realize the destruction his oil tankers and pumps are doing. I would like to think that our childrens' children can still witness and enjoy the beauty and splendor of a coral reef as I saw it the year I wrote this poem.

CORAL ... YEAR 1981 A.D.

It was once what it isn't today,
Gardens of fauna have died off.
What remains are junk piles,
Mounds of useless rock,
Serving no purpose to mankind.
A burden to ships
A hazard to swimmers.

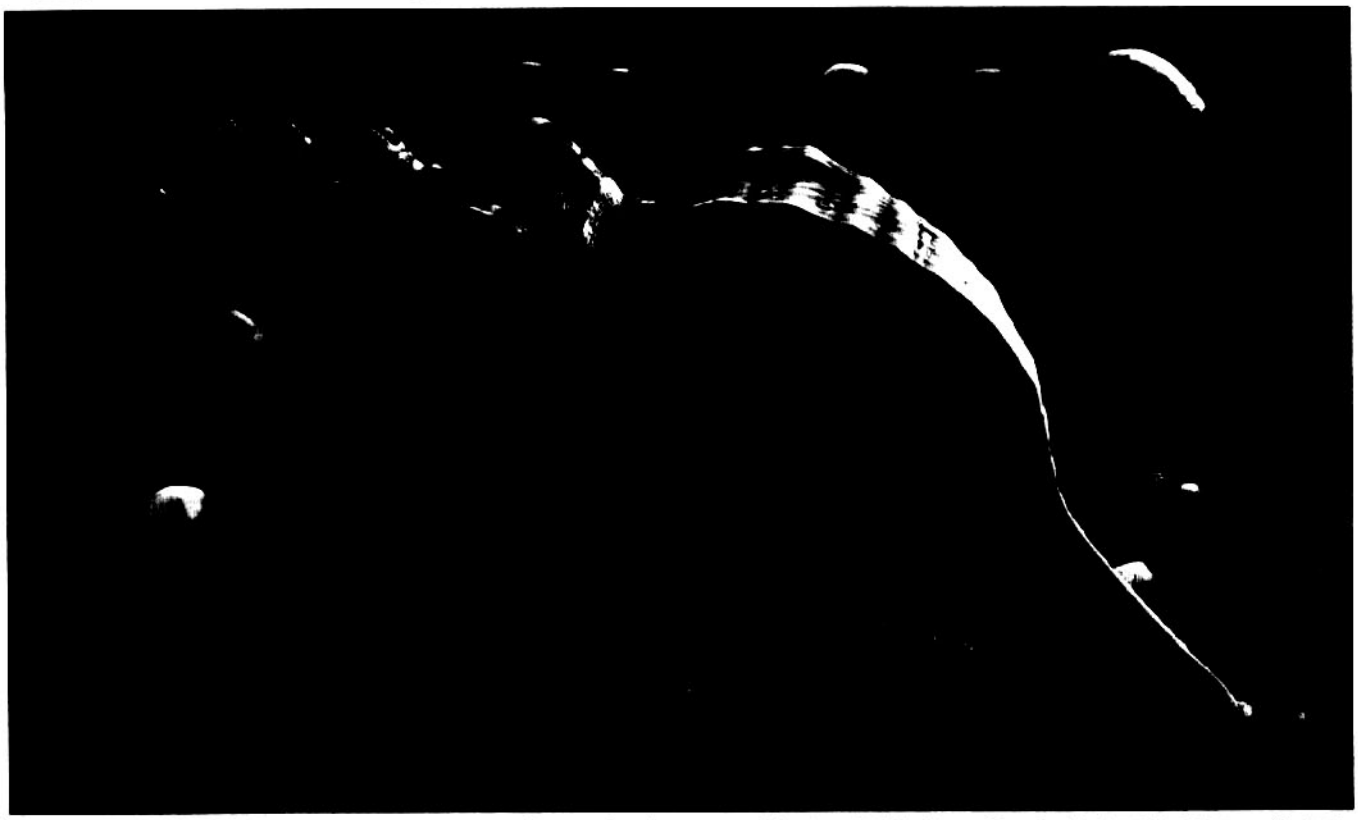
Coral used to be defined as many living organisms,
Each living dependent on the other.
They used to cover the entire body of ocean.
Now a diver would be lucky to catch a glimpse of a sea fan
or a star fish
Why has this happened ... ask man why the air is filthy.
Ask man if 20 years back he cared whether a coral reef
lived or died.

Then the oceans were yet to be explored,
When man was dumping vast amounts of
waste into the sea
Did he stop to think of where it was going,
Or what it was doing to the living things
in the sea.

Now man is aware of the mistake
Only if he could reverse the tragedy
Only if man would have stopped to think
about the future,
Instead of thinking of the present.

WILLIAM RIEKEN
New Milford, New Jersey

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Sept. 1981 thru December 1982

THE EPITONIIDS SECRET GRAVEYARD

Continued from page 27

Specimens Collected During 20 Dives off King Harbor

Number Collected	Species	Largest Specimen
1302	*Asperiscala bellastriata* (Carpenter, 1864)	20mm
4	*Asperiscala minuticosta* (DeBoury, 1912)	15.4mm
245	*Nitidiscala catalinae* (Dall, 1908)	21mm
1879	*Nitidiscala sp.*	26.6mm
	- Approximately 98% of the above sp. are *Nitidiscala hindsii* (Carpenter, 1856)	
	- Most of the remaining 2% are *Nitidiscala sawinae* (Dall, 1903)	
	- There are a few questionable specimens in this group which are beyond my abilities and patience to classify	
3	*Nitidiscala tincta* (Carpenter, 1865)	12.5mm
4	*Opalia borealis* Keep, 1881	22.5mm
1	*Opalia funiculata* (Carpenter, 1857)	19mm

3438 Total Number of Specimens Collected

Specimens Collected During Most Productive Dive
January 4, 1981

120	*Asperiscala bellastriata* (Carpenter, 1864)	10-16.8mm
32	*Nitidiscala catalinae* (Dall, 1908)	10-17mm
190	*Nitidiscala sp.* (mostly *N. hindsii*)	9-22,5mm
1	*Nitidiscala tincta* (Carpenter, 1865)	10mm

343 Total Number of Specimens Collected

OUR COVER

Our cover, this issue, shows a living *Cymatium intermedia* taken underwater at Fort Kam Reef, Hawaii by Phil Nudelman and Scott Johnson.

FROM THE EDITOR'S DESK

I trust this issue reaches you safely. Should you ever fail to receive an issue due you please advise us of the fact and we'll rush a replacement copy to you. If you are moving, please let us know as soon as possible concerning your new address. It takes a while to change our computer's listings and also if we do not have your new address your magazine will be delayed in reaching you. Neither of us wants that!

You may note a small change in this issue. We are using only volume and issue numbers; no longer will there be Spring, Summer, Fall and Winter issues. Page numbers have also been moved to the right and are accompanied by (in parentheses) the volume number and issue number on each page.

Check your address label, we include the last issue you are scheduled to receive on your current issue on the same line with your zip code. 12:1 means this issue is your last, and we should have stamped, in red, that fact on your mailing sheet or envelope. Should you fail to notice that your subscription has expired, have no fear - we notify you by post card as the next issue is about to go to press so you won't miss anything.

Many thanks for all the kind comments about our magazine. I also appreciate the constructive criticisms. I especially appreciate the use of commemorative stamps on your letters! As a stamp collector longer than a shell collector, I am always interested in your country's new issues. And this is a great way to obtain them!

TOM RICE

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Local Shell Identification Books: A Possible Answer to High Prices

JOSEPH L. BUELNA

Dugway, Utah

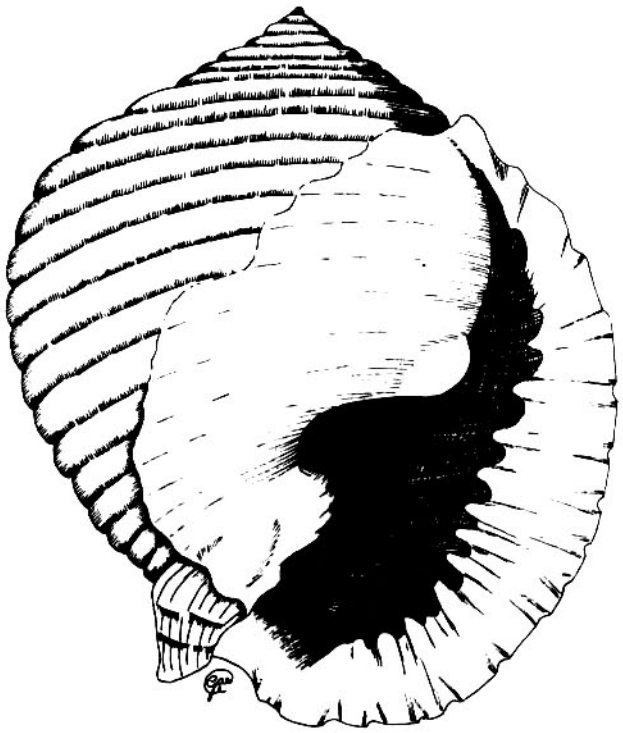
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Muricanthus radix

53

Malea ringens



Anyone who has been interested in buying shell identification books for their personal collection has encountered a sad, but true, fact: there are basically two types of identification books on the market. One is the highly specialized book, covering a particular location (Seashells of Tropical West America, for example) or a particular family (The Murex Book). These books usually carry a hefty price tag of over $20.00. The other type of book is one that covers all species and all areas, and while these may be less expensive than the first type, they are often awkward to use and do not cover any one area in detail. Is there an answer to this problem?

While serving a tour of duty in Panama, as a librarian for the Army, I became involved with shell collecting on the fertile beaches of that country - involved to a point where our library sponsored the only shell club in Central America. As a result of my interest in shelling and also because it was such a popular hobby with a majority of the people living in Panama, our library purchased most of the shell identification books on the market and became known as a main source for this type of information. I mention this only to point out the fact that people who could not afford the expensive books looked to the library to furnish them. It was easy to justify them in Panama, but I would imagine that a librarian in Davenport, Iowa or Tooele, Utah would raise a jaundiced eye at a request from a shell collecting patron to buy a $30.00-plus book that would be used by only a few people. As an aside, I suggest to shellers that they offer to assist their local librarians in the selection of shell books; most librarians tend to go with something like The Golden Book of Shells without knowing that there are better books available that will not destroy their budgets.

Local shell clubs might consider undertaking a project that proved to be successful in Panama and which could provide an alternative to personally buying expensive books and relying on the local library to supply them. I'm referring to a locally prepared and printed publication on the shells of a specific area. In Panama, I persuaded the Army to print up a booklet entitled "The Shells of Panama", which contained pen-and-ink drawings and descriptions of 74 commonly found shells on both sides of the Isthmus of Panama.

Since it was printed by the military, the booklet was distributed free to residents of Panama. Your publication will probably not be free, but the sale of it would provide your club with revenues with which you could purchase more expensive publications for

your club's library. A locally prepared publication should not, and does not have to, be a cheap, quickly run-off mimeographed booklet. Advances in high-speed reproduction has made it possible for several copies of a booklet to be prepared on good quality paper for a surprisingly low price. What you do need is an artist and a committee to decide on which shells to include, and I'll state here and now that the artist is perhaps the most important aspect of your decision to prepare such a booklet. Since photographs would be prohibitively expensive to reproduce in your booklet, you're going to have to go with drawings and you've got to be certain that the artist is able to capture every aspect of a particular shell. Murex need varices shown, olives need the patterns drawn precisely, and raised parts on shells need to be defined. Hopefully, there will be someone in your club who is a master at making shells come alive in black and white, pen-and-ink drawings; if not, some of your budget will have to go towards paying an artist since the work is exacting and demanding.

Deciding which shells to include is also important. If you want to include every shell found in your area, you'll not only wind up with a several hundred page booklet, but also with an artist who will become tempermental after about the fiftieth drawing. You've got to narrow the shells to be included to those that are commonly found or that are representative of your region. Our Panama booklet, for example, had illustrations of *Oliva porphyria*, a shell that is not all that common to the beaches of Panama and which is found elsewhere in the Panamic Province, but which is perhaps the most beautiful of the olives and a goal for many collectors.

When you've narrowed the entries in your booklet to a manageable number and when you've coaxed your artist into tackling a difficult project, you're going to have to shop around for a printer and here again, care is needed. Off-set printing is the best you could hope for in an inexpensive publication, but be certain to view proof-sheets before committing the printer to the entire project. Not only must the illustrations be clear, but the text in which you identify the shells must be free of error. Go over the galley sheets with a fine-tooth Venus comb and be sure that the final product will be something everyone will be proud of.

If you don't want to tackle an identification booklet, or if you want another challenge, why not consider making a shell club Shell Calendar for the coming year? It's a sure-fire fund-raiser and if you can include such information as daily tide charts and cleaning tips, the calendar will be of even greater value.

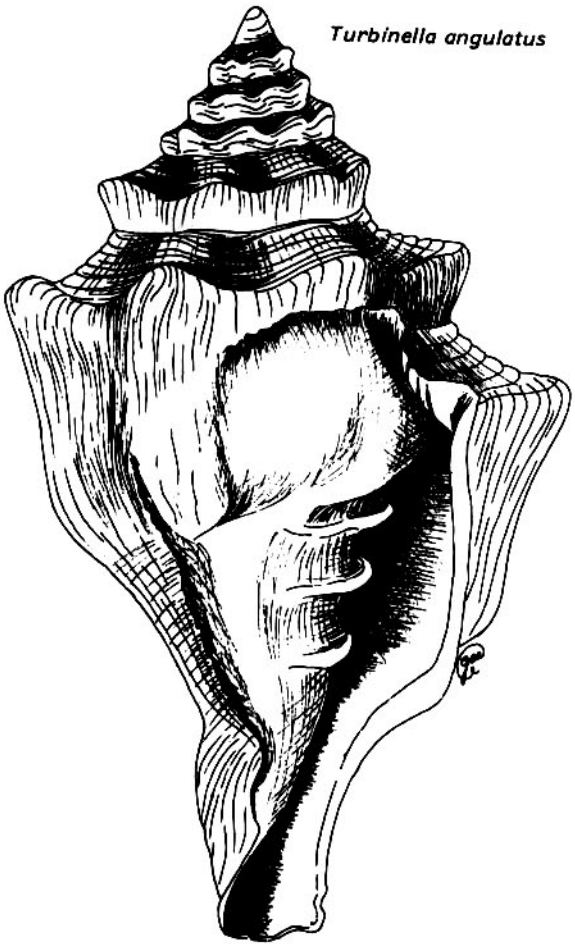
Preparing a local shell identification booklet can be a rewarding experience, and one that will more than overshadow any problems you may encounter in its initial stages. Your local library has a number pf books on writing and editing books that will give you valuable tips on your own publication. You'll find that the end product is one that will enable your members and other collectors to readily identify shells from that region without going into bankruptcy buying the more expensive books. I would be very willing to discuss my experiences in Panama with anyone interested in undertaking their own publication: just drop me a line at P.O. Box 476; Dugway, Utah 84022.

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Opeatostoma pseudodon

73



Turbinella angulatus

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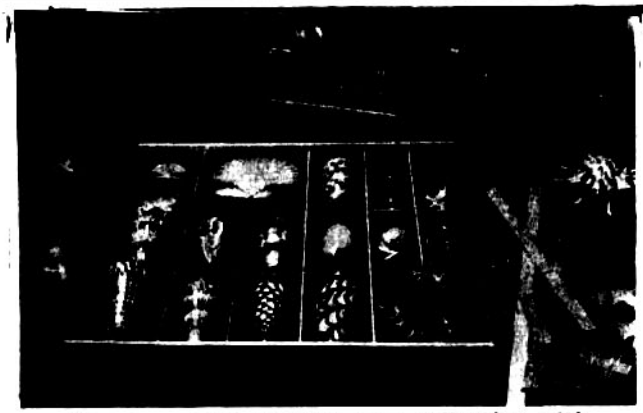
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Searching for Murex penchanti the Hard Way - Upsidedown!

LEO BRUNNER

Severn, Maryland

It was early in the day and we didn't gave a thing to do, so I suggested to David that we go down to the reef by the fishermens' port. We hadn't been down there in a very long time. This reef isn't noted by other shell collectors as a potentially good spot to find anything.

Since Okinawa is a fairly small island, and this particular reef is only five miles from our homes, it was easy to get there. And since we weren't old enough to drive, all we had to do was walk up to the military shuttle bus station, across from the Kadena base exchange, ride the bus to Gate One and get off. Then we walked the rest of the way, about a half mile down the highway. Sometimes we would stop at the little pet shop along the way. We passed the road that leads to the little fishermens' port to a little dirt path past some type of pumping station and right down to the beach.

For about a hundred yards there was sand and scattered rocks and pebbles; occasionally a clump of green seaweed. To the left were big chunks of rock which probably were part of the reef before the Japanese built their little port. We were headed out to a little island of once-connecting reef, surrounded by sand. In front of us was a channel of seawater where the fishermens' boats came in and out of the port; the channel cuts us off from the rest of the reef. When we were only a few yards from the hard sand and rock, we started to sink into a black muck that was hidden by sand. We were lucky it wasn't deep and only our shoes were covered.

David and I started exploring the reef, but didn't find anything. There was only a small section to still be explored when I found my first *Murex penchanti*. It was dead and didn't look very good. We kept on looking and had soon found four specimens, none good enough to keep. The piece of reef we were exploring protruded out of the sand about a foot and was five feet long. David started looking into the coral and holes, and I finally found the first live *M. penchanti* - David soon found several as well. Looking into all the holes and crevices, we found murex covered with mud, others so covered with calcium you couldn't see the color of the shell; others so deep in the holes we needed a probe to pull them close enough for us to grab. We sometimes found two or three in the same hole. It was awkward looking into a dark hole, trying to find a murex that looks a lot like its surroundings. Our hands were soon sore from pushing ourselves up everytime we moved to a new spot, and our stomachs and legs had imprints from the coral we lay upon, but it was all worth it!

While David continued his search for murex, I walked over to the large chunks of rocks I mentioned earlier. Right next to one of the rocks, on the sand, I found an orange murex, perfect with just a little mud on its shell. It was one of the smallest specimens found that day, about 18 mm.

When we couldn't find any more murex, we decided to try the other side of the channel. It looked more promising and we had a larger area to search. We still had to lay down and hang over the edge of the reef to find the murex. The *Murex penchanti* were found only on these two sections of the reef and no where else in the area.

We went back to this reef several times during the summer. As summer ended the murex disappeared. I think they are a seasonal animal, returning into the deeper water at summer's end.

Shells for the the Blind

E. W. UNWIN

Dorset, England

In December, 1980, I received a phone call which at first caused me some bewilderment. It was from the Secretary of the Poole Young Blind Club. Would I please give a talk to the blind on sea shells? I pondered for a moment, wondering what to say - surely shells were a thing which needed to be seen? Soon came the obvious answer - physical contact with the shells. I agreed to give the talk (still with some feelings of trepidation) and it was arranged for early January, 1981.

Now to plan the talk, which was to last approximately 45 minutes. The basic outline was:

1. Introduce myself.
2. Tell them when I started collecting and the circumstances.
3. What is a shell.
4. How many different species of shells there are.
5. Fossil shells (ammonites).
6. What is the study of shells called.
7. What is a shell made of.
8. Sexes.
9. Feeding habits (diverse).
10. Shell shapes (the real basis of the talk). "As I said earlier, the variety of shell shapes is large. To illustrate this point I am now going to pass amongst you a small collection of different shaped shells." I then passed around, in this order, the following shells:

    a. European Cowrie (*Trivia monacha*) the smallest shell in my collection.
    b. Australian Trumpet (*Syrinx aruanus*) my largest shell.
    c. Venus Comb Murex (*Murex pecten*) [one lady said it felt like a spider].
    d. Thorny Oyster (*Spondylus americanus*)
    e. Limpet Shell (*Patella longicosta*); drawing attention to the rough surface being the outer one and the smooth surface being the inside.
    f. Tulip Shell (*Fasciolaria tulipa*).
    g. Cameo Shell (*Conus striatus*).
    h. Cone Shell (*Conus striatus*).
    i. Giant Spider Conch (*Lambis truncata truncata*) and, finally,
    j. A Cowrie Shell (*Cypraea tigris*). I allowed each person present [about 25] to keep a *Cypraea tigris*.

I use, at all times, the common names and not the Latin - the Latin names used in this article are for the benefit of the reader.

It made the passing around of the shells easier to have everyone seated in a large half-circle. I would point out at this stage that not one shell was damaged as it was handled, no matter how delicate the shell.

Whilst shells were being passed around I asked for questions. (Now please bear in mind that although all were blind, some had had sight in their earlier years.) The questions were many and varied, but the two that remain in my mind were questions on

i. color
ii. camouflage

I then spoke briefly on: shell collecting - general; mollusks and man; and finally on cowrie shells - their place in mythology, and their use as money.

Talking was kept to the minimum and I did no more than outline briefly the subjects mentioned in the article. The briefness was in no way meant to be detrimental to the intellect of those present (which was, of course, varied). I did not want to bore!

The comments at the end of the talk included such words as "interesting", "exciting" and "stimulating" and I have been asked

continued to the left

back at a later date to give a further talk. It was all very worthwhile and I am sure that I got more pleasure out of it than they did. The purpose of this article? To encourage others to talk to the blind on shells.

Sharlie : A Preliminary Report of Possible Large Animals in the Payette Lakes of Idaho

GARY S. MANGIACOPRA

[Copyright 1980, Gary S. Mangiacopra]

The field of cryptozoology is a complex and fascinating study of accounts of possible large, undescribed species of animal life throughout the world. One problem of this field, which I am personally pursuing, is that several lakes of the North American continent contain large soecies of freshwater animals frequently reported and collectively called lake monsters for lack of a better term.

In 1978, in this journal, I published a two part series on the "monster" of Lake Champlain (on the border of Vermont and New York). This included accounts of sightings from the first by French explorer Samuel de Champlain in 1609 to recent times and included some guesses as to what the animal might be. [1,2]

But what of other large lakes on our continent? Is Lake Champlain a singular incident, or do other lakes also have unknown animals in them?

My investigations suggest that at least one other lake may have a "what-is-it". The lake is located in the state of Idaho. The animal in question has had the dubious honor, for several decades, of being named "Sharlie - of Payette Lakes".

To understand Sharlie, we need to, first, consider some facts about the region around the lakes. The Payette Lakes Recreational Area is a series of lakes and rivers. The largest lake is Payette, 7 miles long on which the resort town of McCall is located at the southern end. At the northern tip of the lake a river connects the larger lake to a smaller one, called Upper Payette Lake. To the south is the Payette River, which originates in the area of McCall and runs to the Cascade Dam Reservoir, constructed in 1926; the town of Cascade is located on the southeast shore of the reservoir.

The major lake was formed by glaciation, possibly modified by faulting and is at an altitude in excess of 5,000 feet. It is rimmed by high mountains, pine forested ridges and fed by a roaring canyon-hemmed river. Surface area of this lake is approximately 5,000 acres and maximum depth is about 650 feet. The drainage is 144 square miles and is primarily of granatic origin, and produces rather sterile water, indicating it is oligotrophic. In post-geologic times the lake was 150 miles long. [3,4,5]

History of Sharlie

The early history of Sharlie is very brief. Indians avoided the area because of belief that an evil spirit inhabited the lake. The earliest reported incident involving a white man was circa 1920, when workers cutting ties at the upper end of Payette Lake, near the river inlet, thought they saw an eight foot log in the lake. The "log" began to move. Perhaps it was a large fish. Unfortunately, we have no further facts to rely upon.

During this early period a favorite site for appearances of the "what-is-it" were the still waters of the log pond near the lumber mill. One day it was watched for fifteen minutes by fifteen workers returning after lunch. Only once did it show its head, but they did see 12 feet of something undulating through the water and leaving a definite wake.

Eastern boys, in McCall with the Civilian Conservation Corps in the 1930's, returned from a fishing trip in the lake wanting to know what kind of big fish was in the lake. They described it as having a head showing a face and ears resembling those of a bull dog, held 20 inches above the water. [6]

Sharlie's reputation became nationwide during the war years with an article in Time Magazine. Written tongue-in-cheek, it mentioned a number of sightings that occurred during the summer of 1944.

The first sighting of 1944 occurred on 14 April. Mr. and Mrs. John McKay sighted an animal moving through the lake. It had a long, dark body with humps.

Beginning in July of 1944 some thirty people reportedly saw something with a periscope-like head. The first person willing to discuss it publically was Mr. Thomas L. Rogers, an auditor with a Boise, Idaho firm. He was quoted in Time: "The serpent was about 50 feet away and going five miles an hour with sort of undulating motion. His head which resembles that of a snub-nosed crocodile, was 18 inches above the water ... he was 35 feet long." [3]

One scoffer, Walter Bowling who owned the Bowling Lodge, was soon to change his mind. Looking out on the lake from his dock, Bowling saw water being churned some 1/8th mile away, but he could not see any boat which could be responsible. He thought he saw a series of large fish, or what he assumed to be their heads, breaking the surface. On closer observation what he thought were four fish turned out to be one enormous fish. Each hump was similar in shape to a camel's, 18 inches high, moving in an undulating motion. The head was not seen. The creature was approximately 35 feet long and seemed to be covered with a protective case or shell.

Shortly after the Bowling sighting, Mrs. George Van de Steeg of Napa, Idaho, a guest at the camp, watched "what-is-it" through a powerful Army binoculars. She saw a disturbance on the water and, following it, saw a very large fish. When asked her first impression she answered: "... perhaps it was a carry over from childhood, but my first impression was that it was a whale". [7,8]

During the next week five different observers saw, or assumed they saw, Sharlie.

The only known attempt to photograph Sharlie was by B. L. Fagen, a Twin Falls, Idaho theatre man. Three stories have been put forward concerning the filming: the films whereabouts are unknown, the camera was out of focus, when developed the film was blank.

A mill employee, Matt Heikkola, next spotted Sharlie. He watched for a half hour as Sharlie disported itself at the Narrows.

Sharlie next appeared to the Editor of the Payette Lakes Star. Mr. Seaquist was walking along the shore near the mill when he noticed a great commotion in the water. No details were given, except that it had a greenish yellow color. Other observers had mentioned some iridescence if seen in the full sun. [7,9,10]

[1] Mangiacopra, Gary S. Lake Champlain: America's Loc Ness, part 1, Of Sea and Shore, Spring 1978, pages 21-26.
[2] ibid. part 2, Summer 1978, pages 89-92.
[3] Slimy Slim, 21 August 1944, Time Magazine, page 22.
[4] Idaho Serpent Is Back Again. 31 August 1944. source?
[5] Hank M. Shank, private communication, 3 Oct. 1978.
[7] Sea Monster Swins Again, by Dabney Taylor, 1956. Scenic Idaho, Vol. II, No. 2, pp. 8,9,56-58.
[8] What is it, Fish or Monster? 15 June 1977, Star News, Cascade, Idaho.
[9] The King's Pines of Idaho by Grace Jordanc, 1961, pp. 150, 151, 224.
[10] Founding of McCall, Frank P. Rowland, 1960; Caxton, Idaho; 24 pages.

Sharlie made his last appearance of the year on the 30th of August. Mrs. Jack Hogue, of Payette, Mrs. R.V. Eaton, of Emmett, Virginia Burroughs, of Boise, and Mrs. John Eaton, of Emmett, reported their sighting. Details included a dark green color, appeared as a dark wave on the water 150 feet off shore and remained on the surface for several minutes. They said it was 30 feet long, with a head somewhat like a submarine periscope that reared two feet from the water at a time. [4, 7]

During the summer of 1945, Homer Martin, member of a distinguished pioneer family of lawyers, saw Sharlie. During this same period, Mrs. Chick Hyatt, of Twin Falls, pointed it out to her guests, Mr. and Mrs. D.L. Hyatt of Winchester, as it leisurely swam past her resort cabin along the western shore of the lake. Unfortunately, the details were never recorded. [7, 11]

Two years later - 1947 - two Oregon fishermen, F.M. Christiansen and Hubert Keith, were trolling on the west side of the lake. They sighted a big wake in the water, followed by three humps. As they headed towards the creature, one part moved in a wide circle around the boat while the other half moved towards the narrows of the lake. The two animals appeared to be forty feet long.

An entry, from 1947, in a diary reads: "Heard that two men were fishing through the ice, on Payette Lake, saw two sturgeon swim by under the ice, one behind the other."

Shortly thereafter, W.E. Davis and son Melvin reported, from the Narrows of the lake: "That long snouted 8 foot sturgeon poked its ugly head above the water, revealing the greenish back and forked tail high in the air as it dove beneath the waves with a mighty splash. It just made the water boil when it went down." [10]

Sturgeons may be the explanation for some of the Sharlie sightings. Former conservation officer, P.J. McDermott stated that, during the 1920's, fertilized sturgeon eggs had been planted in the Payette Lakes. [9]

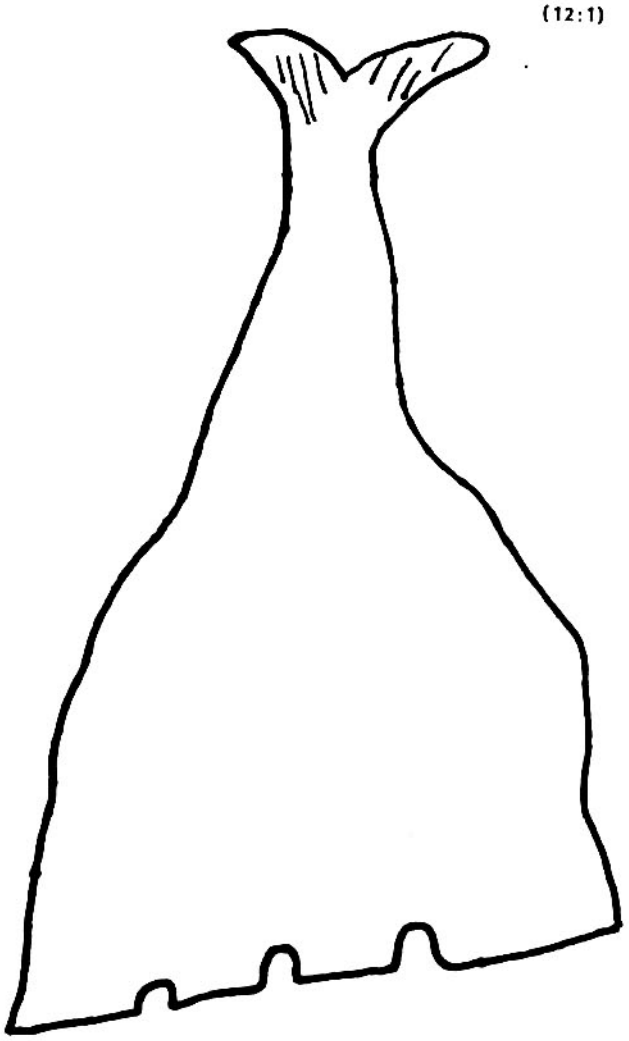
On Labor Day, 1951, Ernest R. Rost, his wife and parents saw something. He reported, in an interview: "... about 35 feet long and 18 inches in girth ... black and had a large flat tail and its snout was blunt. It moved up and down like a roller coaster ... moved right along the surface until a motorboat came along, then it submerged, but not much, and we watched its wake for 10 minutes." [7]

Skeptics contend that most sightings are at some distance. Not so with that of Mrs. Pauline Miller. Sitting in her real estate office in the Lake View Hotel (since burned down), across the main street from the lake, she noticed what looked like a big boat floating near the city dock. Crossing the street to inspect it, she came within a few feet of the creature and viewed it for a period of two to three minutes. I was very fortunate to have been able to contact Mrs. Miller, who at the age of 84 graciously gave her personal account (and a sketch) of what she had seen.

"It is huge, must be 50 or 60 feet long. I could have taken a good picture of it but I had left my camera on my desk in my office ... I stood on this wharf and looked down at it. I could have stepped from the wharf to its back. It was that close ..."

Giving her dimensions of the animal, using the term fish to describe it: "... front ... about 10 feet across ... could not see what kind of head and neck it had. As it moved along the water poured across the 3 ditches on the front of the body and spread out over the huge smooth back. The back looked like wet rubber. Shiny dark in color. Underneath was the huge body. Must have weighed tons and had mostly white with huge scales all along its side. The big shiny covering over the back did not follow all the way down the body. Just part way. Resembled the back of a Rula fish. It must have had its head under water eating. I could not see a head since I was seeing its back and side only." [12]

[11] McCall's Lake Monster Rival Space Stories, by Suzanne Taylor, Idaho Sunday Statesman, 16 August 1964.



Mrs. Pauline Miller's Sketch of her 1952 encounter.

The animal turned sideways revealing a distinct line at the bottom of a shell-like covering over its back. The "scales" glistened in the sun like mother-of-pearl. The submerged posterior end tapered back to about three feet in thickness whereas the rest of the body was as wide as a car is long. [13]

As shown in Mrs. Miller's sketch, the animal was observed from directly overhead, showing a large bluky shape, in general outline like that of a fish, but with one important feature that may help to identify it. The tail, as sketched, was shown in a horizontal position, not a vertical one - as is always the case with fishes. Unless we are willing to assume, as unlikely as it is, that the animal was a huge fish lying on its side, the animal is not a fish. If the tail was in a horizontal position, as the sketch indicates, the animal is a mammal. As seen in cetaceans (whales) and pinnipedia (seals), observed from directly overhead, the outline of the tail would look just as sketched by Mrs. Miller. An unidentified woman, sitting on the bank, told Mrs. Miller that she had watched the large fish pass by three or four times that afternoon.

On November 12th, Chet A. Stevens, City Marshall of McCall, along with Gus and Betty Herchberger and 4 unidentified others saw Sharlie swimming 100 yards off the city dock. Marshall Stevens recounted that he saw the animal emerge from under the logs east of the public dock and move towards the west side of the lake. It was in view for about thirty minutes. The dark object was eight to ten feet long and left a large wake. There were no boats or similar objects on the lake. [7]

[12] Mrs. Pauline Miller, private communication, October 1978.
[13] McCall's Missing Monster, by Stephen C. Bunk, 31 March 1974, Idaho Statesman, Boise, page 4-C.

One of the witnesses to this account, Mrs. Betty Herschberger, gave me the following statement; "When I first looked at the lake (at a point about 300 yards from shore) I thought it was muskrats playing off the logs. Then as it came closer, it looked like geese, emerging at intervals from beneath the water. I ran to call people's attention to it, when it was about 100 yards off shore. Suddenly it submerged and several huge waves hit the shore ... I could not see any distinct form."

Mrs. Herschberger was also quoted in a 1956 magazine interview: "At first I thought it was two geese under the water bobbing up and down ... on closer observation I saw it was one black body between 25 and 30 feet long."

The next day Sharlie reappeared. M.C. Hawkins, motel owner, saw it near the log boom of Brown Mill, at a distance of 200 yards. It seemed to him like a snake 12 to 14 feet long, though he doubted it was a great sturgeon. [7]

During the fifties many other people saw Sharlie. Mrs. Martha Ann Peabody (now deceased) saw it twice in a week, swimming near shore close to the McCall city dock. Mrs. Crawford McBride spotted it while picnicking on the eastern shore of the lake, near Pilgrim Cove. Leslie H. Ulmer, former superintendent of the Lakeside Saw Mill, sighted it as did fellow employee Blake Hancock. [13]

The late Dave Speilman saw Sharlie twice in a three year period. The first sighting was in 1958, the second in 1961 and the latter was recorded in detail. Speilman was at the Circle R grocery store, across the street from the lake, when Don Park rushed in to tell him of a disturbance on the lake. The water was frothing and churning for at least a half-mile radius. Fred Freeman, and Corinne and Gordon Rowland also watched the commotion. Through their field glasses they saw two finned tails rise above the water as if some giant fish were fighting or playing. [13, 16]

From the early sixties to the mid seventies sightings of Sharlie were almost nonexistent. But on Friday, the 23rd of July, 1976 an unexplained ripple appeared on the lake. Nick McGough, Mike Snelling (both of Boise), a McCall woman and a couple from Oregon watched for about a minute and a half at about 6:00 p.m. as an elevated swatch of water moved from a position parallel to them to a position perpendicular to them. The disturbance finally disappeared beneath the surface at the same time a whirlpool-like effect was noticed. [17]

This incident was probably an underwater disturbance of natural causes and not Sharlie.

A more recent sighting occurred on June 12, 1977. Cathleen B. Milburn and her son. Doug Crowther, viewed something while fishing from their small motor boat in the northeast sector of the lake. I was fortunate enough to be able to contact them and the following is a summary and comparison of their accounts.

The sighting occurred between one and three p.m. and lasted for one to two minutes. Mrs. Milburn states: "My son, Douglass, and I were trolling - very slowly - for kokanee, in an oblong off the southern tip of Cougar Island - and a small bay, Tamaracy Bay ... fishing was good and, as the water skiers had gone in to shore ... lake was, as I recall, smooth. I was standing in the boat facing the bow as the boat was coming around and sort of facing N/E. As I was casually looking I noticed what I first registered as rocks with water 'lapping' around them - the sight attracted my attention and I recall quite clearly thinking, 'Where did those rocks come from?'. As we made many passes around in the same general course. The 'rocks' registered as 'moving'. I believe my first words were to my son - 'Doug, what in hell is that?!' 'Where?' 'There!' - 'It's Sharlie!' - By now the rocks had sort of strung out and now appeared as three distinct humps with a wake, and to me, seemed like inner tubes from huge truck tires. The humps were traveling from the east shore toward what I felt was the northern end of Cougar Island. My son wished to accelerate the boat and see it more closely. My immediate thought was for our tackle which was very light and insisted we 'reel in'. My memory ... although the humps were moving and producing a wake, or 'lapping' along its sides (an afterthought - 'wake' ... give the impression of my having been aware of a wake behind what I saw. I only was aware of water up along the side of what I saw.) somehow it wasn't moving too very fast and we would have time to reel in and still get closer before it went too far ... I had vague feeling of not wanting to scare it - a reaction that is common to anyone who spots a wild animal ... I do not recall feeling frightened in the least ... the tackle in - we kept watching - my son was most impatient to get going toward the humps. I do not really recall the moment of losing sight. I recall it had swum or gone into a little bay of Cougar Island. When we got ... to the northern end of the island we searched for signs in the dark water - nothing. We continued our fishing ... until we had to return to dock of the marina for lack of fuel. I do not know what it was. I never saw what I could ever call a head or a tail." [18]

By comparison, Douglass Crowther reported: "We were fishing for Kokanee salmon in a boat off Cougar Bay when my mother asked me what some white caps were in the bay about 500 yards off the boat to the north. When I looked I saw what appeared to be boat wakes, but no boat was around or had been around for about 10 minutes. As I looked closer I saw something black behind them, three humps spaced apart and about 30 feet long for the whole amount, the middle hump was the largest, and maybe 10 feet long, while the front was a small one only about 5 feet or less in length with the rear one about 7-8 feet in length. The thing didn't stop, slow down or seem to have any movement except for it was moving along at a fairly good clip. When I realized what I was seeing I told my mother it was 'Sharlie' and my mother said she thought I was right and that it hadn't even occurred to her to think of that. My first impulse was to get as close as possible to it as I possibly could with the boat ... we reeled in as quickly as possible we ran over to see what it was by this time it was gone it had gone below just before reaching the split between the island and the land. We cruised around a while trying to spot something, but after about 5 minutes we stopped and went back to fishing ..." [19]

The two accounts agree on weather conditions - clear sky, warm to hot temperatures and calm water surface. Also in agreement was that neither head nor neck were seen and that the color was black to dark green; also that the skin appeared smooth and the animal paid no attention to the viewers.

There are slight differences regarding specific details: Douglass gave the distance as 500 yards at the closest, his mother 100 to 150 yards; Douglass estimated size at 30 feet, with the humps of 5, 15 and 7 feet, his mother estimated the length at 14 to 16 feet with even humps of five feet each. However, these differences can be attributed to two observers estimating sizes.

Two weeks later, about June 26th, three McCall residents were sitting on the lakeside deck of the Log Jam Cafe eating lunch when they noticed several foot-high waves about 100 yards off the nearby city dock. Linda Palmiter described something big and brown, "round like a watermelon" moving swiftly towards the dock and rising 3 to 4 feet from the glass-smooth lake. "I don't know. It looked like it was pushing something ... there was a little white cap up front. I couldn't see a head or tail. We guessed it to be about 30 to 40 feet long." The object disappeared before reaching the dock. This was the last report prior to this article.

Hank M. Shank, a forester in the Payette National Forest, has an explanation for these sightings. "Stories and reported sightings of a sea serpent in Payette Lake have been going around for years ... I have fished the lake as a youth in the late 1930's and fairly intensely from 1963 to the present. I have seen conditions of over-lapping waves (from power boats) and beaver and muskrat swimming - which with some imagination could be

[16] Sharlie - The Sea Serpent, by Mary Jane Williams, Summer 1971 issue Incredible Idaho, Vol. 3 #1, pp. 11, 12.
[17] Odd Ripple Revives Old Legend, 27 July 1976, Idaho Statesmen, page B-9
[18] Cathleen B. Milburn, private communication, 26 October 1978.
[19] Douglass Crowther, private communication, 26 October, 1978

convincing evidence of a monster to some people. My skepticism is based on what I would consider a poor habitat for a creature of any size to persist in Payette Lake ... Aquatic plant life is modest as is aquatic feed. Fish populations (which include sculpin, squawfish, trout, kokanee, suckers, perch, and Mackinaw) are enhanced by regular plantings of legal sized trout. Kokanee sustain a good population naturally, but sizes are modest - possibly indicative of poor food supply. If a 'sea monster'(s) was present and of any size, the food sources of the lake appear scant for prolonged sustenance of Sharlie. Until I have observed something which reasonably convinces me I have seen 'Sharlie' ... I remain a skeptic." [5]

Summary and Conclusions

Physical Characteristics of 'Sharlie'

From the few precise details reported we can ascertain something of Sharlie's features. The most often used term to describe the shape is that it is like those of a giant fish. Most often seen is the huge back, smooth rubber-like, sometimes described as a shell-like covering; sometimes three "humps" were seen. The tail, described as like that of a fish, is often seen - once in a horzontal position. Coloration is constant - a dark color, described as black / brown / dark green.

There was no discernable neck; the head, though seldom seen, gave indications of a small, blunt snout. Estimates of size have varied from 12 to 60 feet, with an average range of 30-35 feet. The width has been estimated at between 18 inches and 10 feet for the portion of the back out of the water. When swimming, it has an undulating movement, indicating it is a mammal; it can achieve five plus miles per hour speed.

Available Food Supply in the Payette Lakes

The Payette Lakes are oligotrophic: nutrient poor, low plant production, good oxygen condition, good transparency, excellent water quality, largely trout/salmonid species. The following fish are known: sculpins (small fish often used as bait); squawfish (giants of the minnow family); trout (regular plantings of legal size); kokanee (land-locked salmon, plentiful, but rarely exceeding one foot in length); mackinaw (lake trout); suckers (one to two feet in length) and perch. Information is unavailable as to the molluscan and crustacean populations of the lakes. The major food supply of a Sharlie would, undoubtedly, be fish.

Possible Identification of 'Sharlie'

Giant Fish

Though Sharlie has, on occasion, been described as a giant fish as to its shape, there have never been descriptions of a dorsal fin seen when the animal's back was above water. The undulating motion often reported would also eliminate a giant fish. Sturgeons, however, could account for some sightings with lengths of 12 feet or less reported.

Whales

Could Sharlie be a small species of landlocked cetacean (whale)? The impressions of Mrs. Van de Steeg (1944) and Mrs. Miller (1952) of an enormous back and horizontally positioned tail lend credence to this theory. But the lack of any observations of a dorsal fin, which is common and necessary to the majority of whales in order to maintain themselves when swimming, makes this identification doubtful. Also there has been a lack of observation of the animal breaking the surface at regular intervals in order to breathe. Another major problem would be in the availability of feed; whales which were filter-feeders would be unable to survive in the lake; a fish predator species would be the only type that could survive on the available food. I reject the proposition that Sharlie is a cetacean.

Seals

The last remaining possible identification is that Sharlie could be some type of pinniped (seal). Of the features attributed to Sharlie, lack of a discernible neck, huge back and, importantly, the often seen fish-like tail (or more correctly the two hind flippers, which is spread might give the impression of a fish-like tail) and the lack of any dorsal fin fit this identification best.

But what known species could it be? With a reported length of nearly 30 feet? The only known living species anywhere near that size is the Northern Elephant Seals, *Mirounga angustirostris*. These Pacific seals range from their breeding grounds on the islands off the coast of Mexico and California, to as far north as Kasaan Bay, Alaska. Males of the species have been recorded as reaching nearly 20 feet and weight in excess of 5,000 lbs. Females are much smaller with a length of about 12 feet. Life spans are 25 years for the male and 15 for the female. Their food includes fish, cephalopods and crustaceans.

We can theorize the possibility that, in the far distant past, a small group of elephant seals migrated from the Pacific coast, through then existing interconnecting river systems which terminated in the then much-larger Payette Lakes. These marine ancestors became adapted to a totally freshwater environment and survived over the years as the water area of the region shrank to its present size. They became totally locked within the lake with the construction of the dam in 1926.

I must put forward some reservations to this possible identification. Elephant seals stay ashore for a length of time when bearing their young and mating; there has never been a report of Sharlie on shore. During mating season the bulls give out loud mating calls which can be heard for a considerable distance; no such sounds have been associated with Sharlie. Most importantly, the lakes freeze solid; in order to survive these animals would have to seek out breathing holes through the ice; there have been no reports of such breathing holes being sighted.

But there are several features which make this identification attractive. Because of their diverse feeding habits, the Payette Lakes could support such a group of animals. Also, who would notice a snout of a foot or so in length breaking the surface to breathe, keeping the bulk of the large body underwater?

The Future of 'Sharlie'

Because of the present small size of the Payette Lakes, we must have a very small breeding population, not more than four individuals. In 1947 and 1961 there were two incidents when two separate animals were seen at the same time. Since the 1960's sightings only random sightings have been reported, indicating possibly a declining population. Inbreeding since the lake was isolated by the dam may be causing the ultimate genetic death of the group. Sharlie is either on the very edge, or has already begun the decline towards extinction.

Acknowledgements

I wish to thank Mrs. Pauline Miller, Cathleen B. Milburn and Doug Crowther for allowing the details of their observations to be known. Thanks also to the following who supplied information which aided in the completion of this report: Hank M. Shank, Mrs Liz Herchberger, Mrs Robert McBride, Miss Jan Whitmore (Reference Librarian, Boise Public Library), Ms Martha Citwood (Librarian, McCall Public Library). Thanks too to Tim Church for supplying me with published accounts of Sharlie. And thanks to Assistant Professor Ron Westrum, Eastern Michigan University, a good friend and my proofreader. To all of the above I am indebted for their efforts and courtesy.

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Shelling the Caymans

ELAINE & RON MORRIS

Oakmont, Pennsylvania

Gavin Maxwell sat on the Scottish coast with his charming otters and observed:

> "If one waits long enough, practically every imaginable household object will sooner or later turn up on the beach."

Well, Rum Point was one of those beaches where your needs would have to be very limited: a green plastic flip flop, a doll's arm and a few Heiniken bottles (beginning their long journey toward sea glass) dotted the thin line of seaweed and tar bits. Any island which boasts 250 species of shells -- so states a tourist folder for Grand Cayman - invites anticipation. But, this wind blown point looked pretty barren. Of course, I was going to take a good look, after all that's why we had come 2000 miles -- and the restaurant didn't open for two hours.

My wife moved quickly ahead: shoulders back, stomach in - practicing her beach appearance. She wasn't going to be much help. I assumed an uncomfortable sheller's slouch and started up the wasteland - a striped False Limpet, many small *Puperita pupa*, a few *Prunum guttata* - nice, but I had hopes for a *Conus dominicanus* at the least!

A tiny spot of brilliant blue caught my eye - only one shell has that color - twice I had almost collected one. The first time, the delicate shell had crumbled in my hand. The second had left Antigua cottoned down in a small box and arrived in New York in pieces. Now, a third chance, to have a *Janthina janthina*. Where you find one there are usually more. I carefully turned over the seaweed. Yes! Many tiny bright violet blue dots appeared. Some were almost fingernail size, others were babies (pinhead size).

By now my wife had covered the beaches length and was on her way back - face up, gathering tan. She looked down at my burrowing and quickly joined me. I had her interest now. She covets tiny things for her doll's house cabinets.

We picked up two or three and the added dividends of taking a close look: three lovely Emerald Nerites, *Smaragdia viridis*, ("You can only find these little green things here" - a sun baked vacationer had told me on Cozumel. Sorry sir, you're wrong about that.) And two *Fissurella rosea*. ("Those are indiginous to Green Turtle Cay, no where else", a proud resort owner had boasted. Sorry sir, wrong!)

The day's catch made it safely from Rum Point to Pittsburgh. The best reside in the compartments of Printer's Cabinets in the company of other Camanian aristocrats: *Astraea tuber* and *Conus regius*. The lesser ones have found a happier life. They sit beneath the glass top of a miniature Duncan Phyfe table. Tiny dolls gaze wide eyed at the wondrous things which come from beaches they will never see.

The following is a list of 36 of the more significant shells we found during our ten day visit on Grand Cayman:

Astraea americana (American Star Shell); *A. tuber* (Green Star Shell); *Bulla occidentalis* (Common Bubble); *Cerithium litteratum* (Lettered Horn Shell); *Cittarium pica* (Magpie Top Shell); *Columbella mercatoria* (Common Dove Shell); *Conus regius* (Crown Cone); *Conus verrucosus* (Warty Cone); *Cymatium pileare* (Atlantic Hairy Triton); *Cyphoma gibbosum* (Flamingo Tongue); *Cypraea spurca acicularis* (Yellow Cowry); *Cypraecassis testiculus* (Baby Bonnet); *Epitonium krebsi* (Kreb's Wentletrap); *Fissurella rosea* (Rosy Keyhole Limpet); *Janthina janthina* (Violet Snail); *Morum oniscus* (Atlantic Wood Louse); *Natica canrena* (Colorful Moon Snail); *Nerita peloronta* (Bleeding Tooth); *Nerita tessellata* (Checkered Nerite); *Nerita versicolor* (Variegated Nerite); *Polinices uberinus* (Dwarf Milky Moon Shell); *Prunum guttatum* (Spotted Marginella); *Puperita pupa* (Zebra Nerite); *Purpura patula* (Wide Mouth Rock Shell); *Pyrene ovulata* (Ovate Dove Shell); *Siphonaria pectinata* (Striped False Limpet); *Smaragdia viridis* (Emerald Nerite); *Spirula spirula* (Ram's Horn); *Strombus gigas* [Juvenile] (Queen Conch); *Tegula fasciata* (Colorful Top Shell); *Thais deltoidea* (Deltoid Rock Shell); *Thais rustica* (Rustic Rock Shell); *Tonna maculosa* (Partridge Tun); *Trivia antillarum* (Antillean Trivia); *Trivia quadripunctata* (Four-spotted Trivia); *Turbo castaneus* (Knobby Turban).

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Shells in Sitka, Alaska

STEPHANIE PRINCE

Laguna Niguel, California



Low tide, Sitka, Alaska; August 1980.

Yes, there are lots of shells in Sitka, Alaska, so don't believe those people who tell you, "You can't find shells in Alaska!" Either they are not particularly interested in shells, or their cruise ship pulled into port in the afternoon. Our cruise ship, Sitmar, came into Sitka about 4:00 a.m. so, even by the time we were up and out about 8:30, the tide was still low. As a matter of fact, the tide was so low it left vast rocky areas exposed, along with a host of varied sea animals and plants, including the many mollusks peculiar to this area.

In this exposed lowest tidal region I found many colonies of live California Mussels, dead and open Fucan Cockles, dead and open Kennerley's Venus and dead and open *Saxidomus giganteus*. These were the most plentiful species left high and dry, so I took a few of each, being careful not to upset the fragile balance of nature in the exposed tidal region.

I found very little seaweed in this particular area; a few sparsely patched areas of eel grass, being the most abundant. I was observing the shore tide pool life, taking photographs and collecting shells for about 2½ hours. The sun was unusually warm, 70°F, on this August 11, 1980 and the sky was clear and blue, adding to the pleasure of this shell collector.

I was happy to return home with several new species and several perfect, familar species, to add to my collection. The following shells were especially exciting to me to find:

2 whole, freshly dead False Pacific Angels
2 live (under a small rock, overturned) Northern Margarites
2 dead (one valve only) Alaskan Astartes
2 (not perfect) Ringed Whelks
1 Phoencian Whelk
1 valve of the Iceland Scallop
1 whole and 1 valve Ringed Lucine
This whole shell was dead with only a small tip exposed in the gooey mud. It was a perfect specimen because it was buried in the mud and spared from the relentlessly pounding surf beating against the rocks.
5 (somewhat sunbleached) Northern Moon Snails
many Sitka Periwinkles
many File Dogwinkles
many Native Pacific Oysters
1 Emarginate Dogwinkle (*projecta* form)

ONE DIVE - Continued from page 49

1	*Nitidiscala tincta* (Carpenter, 1865)	8 mm
1	*Hipponix antiquatus* (Linnaeus, 1767)	16 mm
7	*Hipponix tumens* Carpenter, 1864	12-24 mm
2	*Crepidula onyx* Sowerby, 1824	14-15 mm
1	*C. perforans* (Valenciennes, 1846)	23 mm
3	*Crepipatella lingulata* (Gould, 1846)	14-20 mm
1	*Sinum scopulosum* (Conrad, 1849)	9 mm
5	*Erato vitellina* Hinds, 1844	11-14 mm
1	*Erato columbella* Menke, 1847	6.4 mm
30	*Pusula californiana* (Gray, 1827)	6-10.5 mm
3	*Pusula padreserrai* Cate, 1979	15-18.5 mm
1	*Cypraea spadicea* Swainson, 1823	29 mm
11	*C. spadicea* Swainson, 1823 (bullas)	15-28 mm
5	*Simnia vidleri* (Sowerby, 1881)	13-19 mm
2	*Pteropurpura festiva* (Hinds, 1844)	17-20 mm
1	*Maxwella gemma* (Sowerby, 1879)	20 mm
4	*Maxwella santarosana* (Dall, 1905)	15-23 mm
3	*Nassarius perpinguis* (Hinds, 1844)	13-23 mm
10	*Olivella baetica* Carpenter, 1864	12-16 mm
4	*Conus californicus* Reeve, 1844	13-30 mm
1	*Bulla gouldiana* Pilsbry, 1893	20 mm
2	*Acteocina culcitella* (Gould, 1853)	14-18 mm
1	*Ventricolaria fordii* (Yates, 1890)	17 mm

Eliminate the Smell: Microwave It!

PEGGY WILLIAMS

Sarasota, Florida

If you haven't yet invested in a microwave oven, this may be the argument that clinches your decision to buy! You can kill your live-collected molluscs in one, ready for pulling, in 30 seconds to twelve minutes, maximum, with a minimum of smell.

Put the living (preferably fresh and active) mollusc in a container to catch the water that will come from the animal. You don't have to cover it. Cook in high power until you hear a "pop" or until you can easily pull off the operculum. Remove the container and run cold water over the shell (it will be hot!), then pull out the animal as usual.

This method has several advantages: it is quicker than boiling and doesn't smell up the kitchen to offend the rest of the family; you don't have to wait for days, as you do if you freeze the shell; and the operculum comes off easily and clean. I have had somewhat better success at getting the whole animal out than I have by freezing or boiling. If you break off that last coil, it will usually shake out, having been shrunk somewhat by the microwave action. If you break off more, well, that often happens anyway!

I have tried this methond on: *Melongena, Busycon, Fasciolaria Oliva, Murex, Polinices*, etc. Bivalves, of course, are easy.

Cook small shells (1¼" and under) 30 seconds or longer, until they "pop". A 4" *Melongena corona* takes 5-7 minutes. A 12" *Busycon contrarium* may take 9-12 minutes. Put large shells in for a few minutes, turn and cook a little longer, til the operculum comes off with a gentle tug.

Happy cooking!

Dov Peled Hazalatim, 6 HAIFA, ISRAEL

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One Dive: March 9, 1981

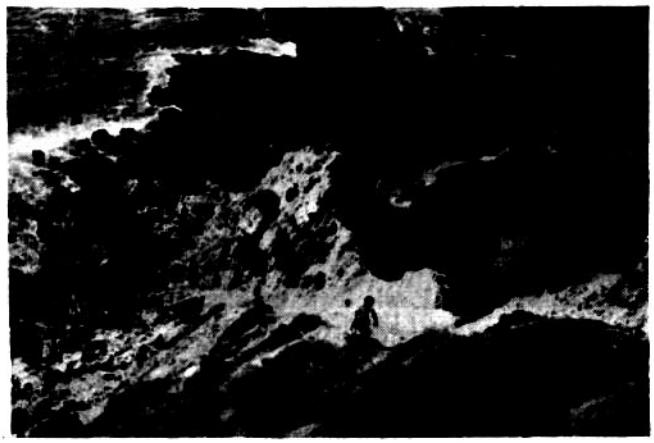
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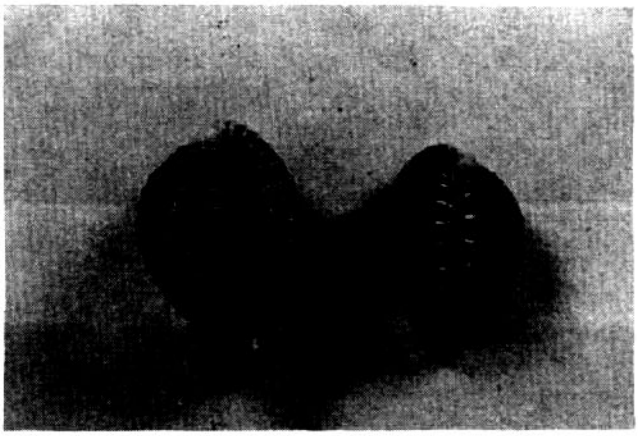
#1



#3



#2



#4

Figures 1 through 3 - cliffs of the Palos Verdes Peninsula, California, near Flat Rock.

Figure 4. *Pusula padreserrai* Cate, 1979

On March 9, 1981, I completed a scuba dive off the Palos Verdes Peninsula of southern California at a site known as Flat Rock. There was a slight swell developing and the water visibility varied from 10 to 20 feet. This area has a sandy bottom which separates a number of finger reefs running perpendicular to shore in 10 to 40 feet of water. Much of the area lies under the canopy of a kelp bed, that provides a home for the easily noticed *Norrisia norrisi*. Three live *Pteropurpura festiva* and one live *Crassispira semiinflata* were observed on a sandy bottom beyond the reefs in 40 to 45 feet of water. However, I was not concerned with living molluscs on this dive.

My collecting efforts took place in sand troughs where, occasionally, large numbers of recently dead shells accumulate. Sand troughs are valley-like depressions in the sand, resulting from wave activity and are commonly found on sandy bottoms. The physical contours of the shallow ocean bottom are constantly changing resulting in fluctuating collecting conditions. The positioning of sand troughs in any one area may vary from time to time as will the contents of those troughs. Some surf conditions produce a shell cluttered bottom, while other wave patterns may result in a barren site for the collector. It is the task of the shell diver to discover sand troughs with recently dead shells in plentiful supply.

The following specimens were trough collected as dead shells in 40 to 45 feet of water and reflect an average dive in this area. The measurements given represent the greatest dimensions of the various species collected, be it height, width, or length.

Although these specimens were collected as dead shells, they are, for the most part, comparable in quality to live taken specimens. A number of the specimens from this dive have been donated to the Western Society of Malacologists for use in their shell auction, to be held in San Diego at the WSM Annual Meeting during June, 1981.

Number Collected	Species	Size
1	*Megathura crenulata* (Sowerby, 1825)	18 mm
3	*Calliostoma gloriosum* Dall, 1871	7-14 mm
1	*C. supragranosum* Carpenter, 1864	8.6 mm
1	*Astraea undosa* (Wood, 1828)	12 mm

Continued on page 48



Rare Shell Show





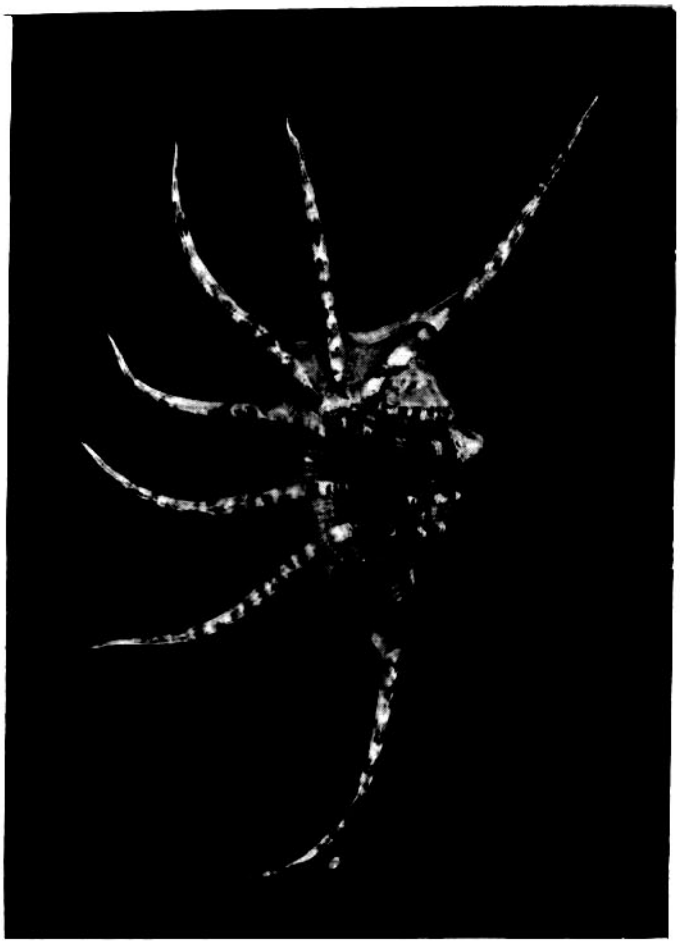
Man and Shells Through the Ages was the these of an exhibit at the famous Tidepool Gallery in Malubu, California from May 16 to May 24, 1981.

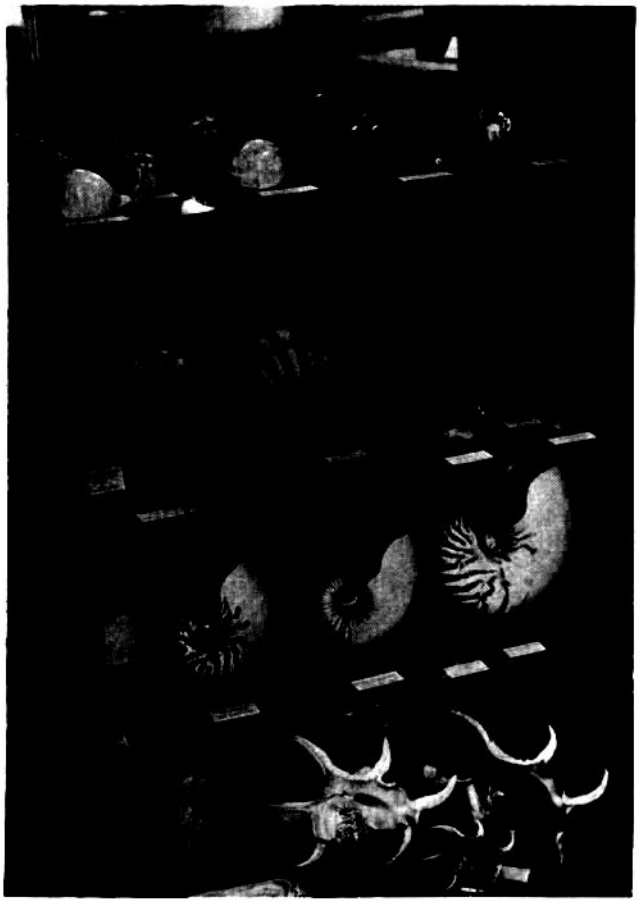
In addition to exhibits concerned with the show's theme, rare shells were exhibited by the following collectors:

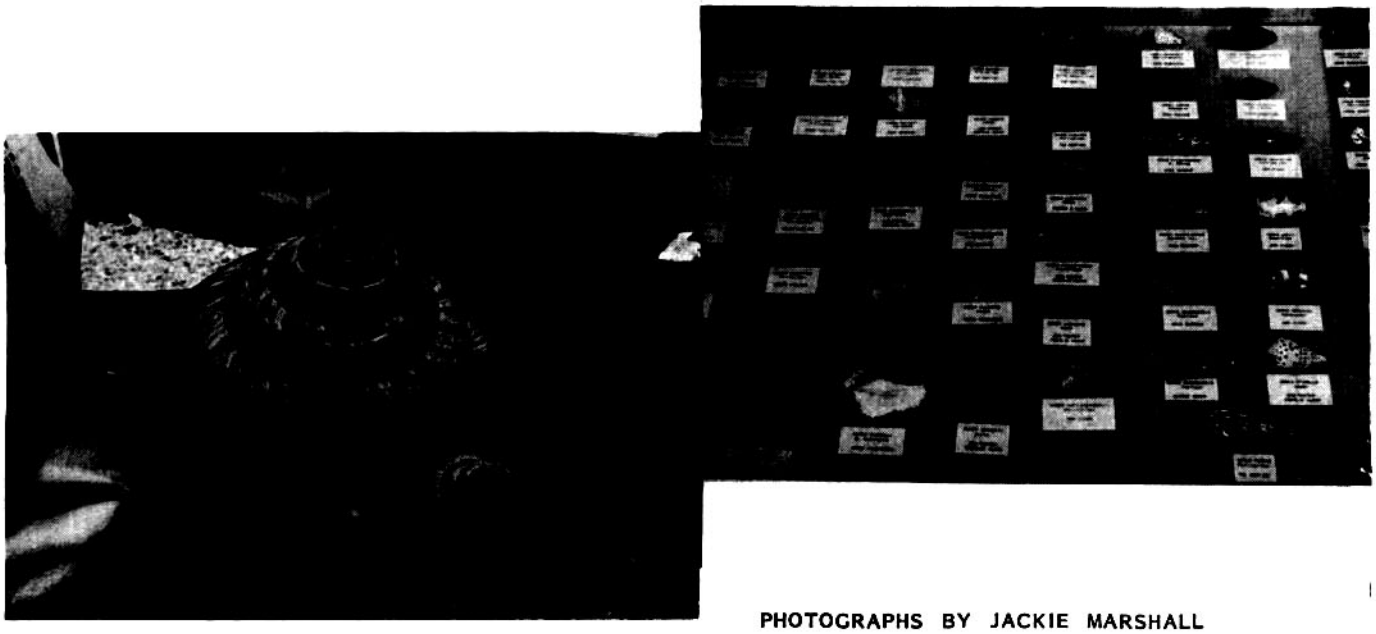
Bill Bledsoe
Evans Frankenheimer
Don Pisor
June and John Jones
Mary Flenz
Helen Collins
Chuck Powell
Tom Rice
Dennis Mock
Foster and Glass
Jim Tobin
Irene Robertson
Marty Beals
Yvetta Williams
The Martin Brothers
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The photographs on these two pages show a few of the shells exhibited by those listed above.

at the Tidepool Gallery







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(Edited By R. Tucker Abbott)

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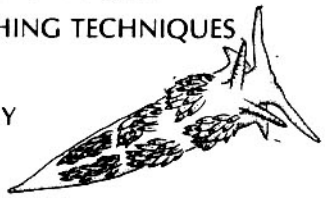
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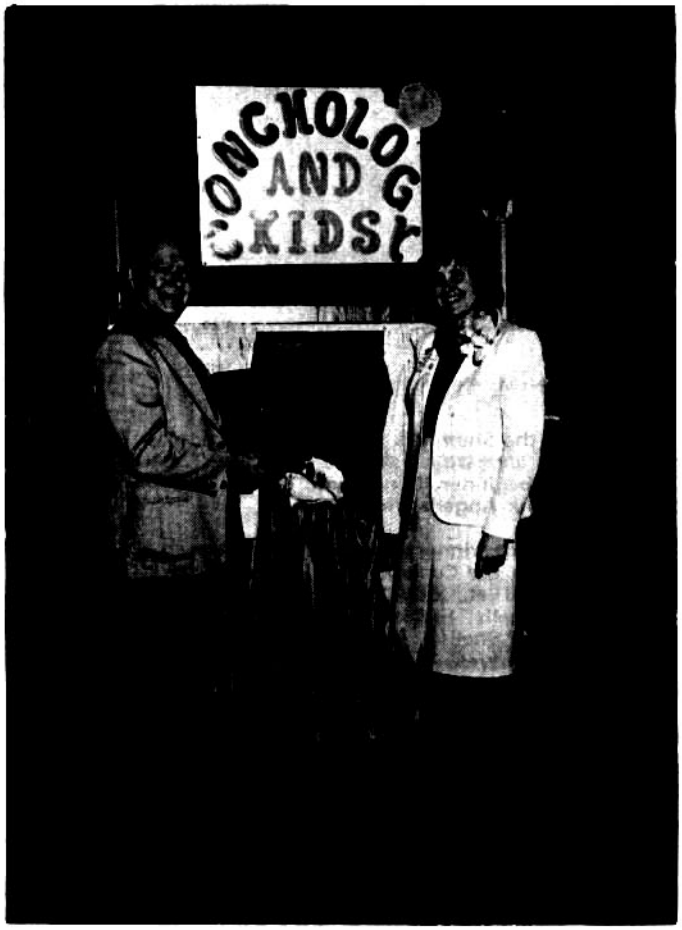


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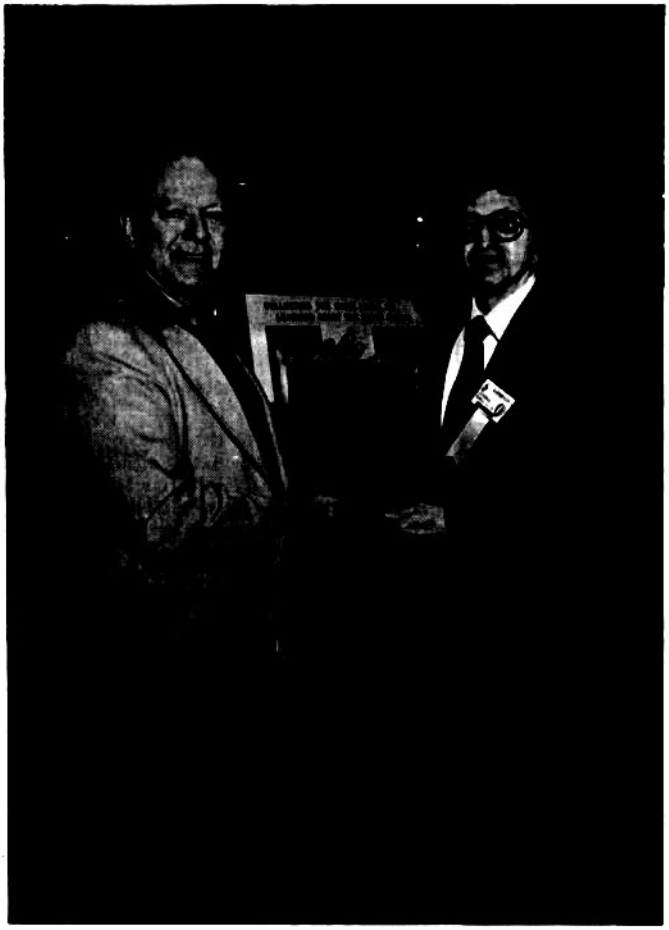


With the Clubs

GEORGIA



Judge Russ Jensen presents DuPont Trophy to Kay Reissing in front of her display.



Ken White receives the Conchologists of America Award from Judge Russ Jensen at the Georgia Shell Show.

The Georgia Shell Club held its Third Annual Shell Show at the Perimeter Mall in Atlanta from March 13th through 15th, 1981. Perimeter Mall management estimated that 100,000 people saw the show during the weekend. It was a show highlighted by beautiful exhibits and a wonderful slide lecture by Russ Jensen of the Delaware Museum of Natural History.

Ken White won the Conchologists of America Award for a 28-foot exhibit of marine shells of the Florida/Caribbean area. Kay Reissing won the Du Pont Trophy for an educational exhibit entitled "Conchology and Kids". Pete Maltese won the Georgia Shell Club's Award for an exquisite display of Spiny Oysters on coral, encased in a dome. Louise Compton won the Special Merit Ribbon for a 22-foot exhibit of Muricidae.

In the artistic division, Mae Webb won the Creativity Award for her display of animals made from shells. Sarah Lyons won the Special Merit Award for her exhibit entitled "Seaside Shop - a miniature replica of a shell shop.

Judges for the show were Russ Jensen of the Delaware Museum of Natural History, and Gary Magnotte of Pompano Beach, Florida judged the scientific display; the artistic displays were judged by Rudi Magnotte (Gary's wife), longtime artistic shell show judge and Stella Woodman, of Atlanta, an accomplished artist and teacher.

A special thanks is due Peter Maltese for exhibiting his C.O.A. Award-winning display of cowries as a non-competitive display.

This show was a true success for the Club in that it gave a large segment of people from the Atlanta area a chance to see the advanced quality of exhibits assembled by Georgia Shell Club members. It was an enjoyable and educational event.

JACKSONVILLE SHOW

The 17th Annual Shell Show of the Jacksonville (Florida) Shell Club, Inc. will take place the weekend of July 31, August 1, 2, 1981 at the Flag Pavilion, 101 North Second Street, Jacksonville Beach, Florida. Hours are: Friday, 1 to 6 p.m.; Saturday 10 a.m. to 8 p.m. and Sunday 10 a.m. to 6 p.m.

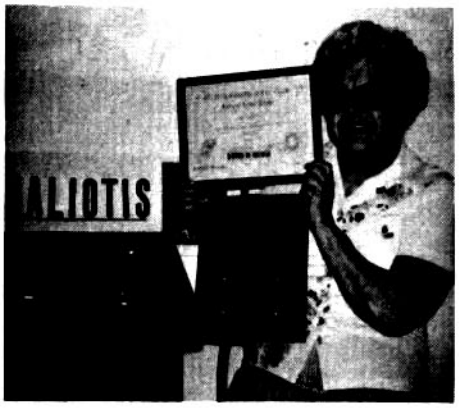
MIDWEST SHOW

The Third Annual Midwest Regional Shell Show will take place on August 15th and 16th, at the Glendale Shopping Mall in Indianapolis, Indiana.

For entry forms and/or more information contact: Denver D. Howlett; Show Chairman; 3507 Whitcomb Avenue; Indianapolis, Indiana 46224.

ST. PETERSBURG





Jo Kotora shows her trophies and displays at the 34th Annual St. Petersburg Shell Show.

The St. Petersburg Shell Club held its thirty-fourth Annual Shell Show, February 26th through March 1st at the National Guard Armory, St. Petersburg, Florida. Exhibits were well done with beautiful and educational displays of worldwide seashells, fossils, land and freshwater shells and shell art and craft exhitibts.

Judges this year were Dr. R. Tucker Abbott, well-known author, editor and president of American Malacologists, Inc. a publisher of molluscan material; William G. Lyons of the Florida Department of Natural Resources and Leonard C. Hill of the U.S. Department of Commerce. Cecelia Abbott judged the shellcraft displays.

The Smithsonian Award went to Jo Kotora of St. Petersburg for her outstanding exhibit entitled "Study of *Haliotis*", featuring a complete representation of the group. Jo also won the Conchologists of America Award for her beautiful exhibit "Artistic Creations by a Mollusk" featuring shapes and forms, designs and patterns, and colors of worldwide shells. The following week Jo won the DuPont Award with her *Haliotis* display at the Central Florida Shell Show in Orlando.

The Shell of the Show was part of L.C. Strong's volute exhibit - *Notopeplum annulatum*. The Self-collected Shell of the Show was won by a beginner, Don Young, for his *Cyrtopleura costata*, a beautiful pink Angel's Wings.

Other first-place winners were: Rick and Marsh McCarthy [An Introduction to the Cones]; L.C. Strong, Jr. [Cymatilnae]; Peggy Williams [Eat - But Avoid Being Eaten]; Pepper Williams [Costa Rican Shells, Junior Exhibitor winner[; Daryle Ann Trick [Pliocene Fossil Shells]; Peggy Williams [chitons]; Ed Haviland [Australian Bivalves; commercial division]; Ethelyn Woodlock [shell art - What's In a Name]; Nikki Rosenberg [shell craft]; William Bond [shell craft]; Elaine Phillips [Apple Murex, one species]; Yvonne Bequet [Worldwide Bivalves]; Debby & Robert DeHare [Shell Key & South Channel Shells, one locality]; Eleanor Rothoff [Panamic Shells, one region]; John Hoft, Jr. [A Variety of Florida Seashells, Florida and Caribbean]; Jo Kotora [World Wide]; Bruce D. Trick [Fossil Shells by Trick, beginner award]; Jim & Susan Bates [Shelling the Shallows, self-collected award].

ELIZABETH S. DALRYMPLE

PACIFIC

The Pacific Shell Club, Inc. invites visitors to attend their monthly meetings when you're in the Los Angeles area. The meetings are at 1:30 p.m. the first Sunday of every month Oct. thru June at the Los Angeles Museum of Natural History, 900 Exposition Blvd., Los Angeles (off Menlo), back entrance, the Basement Lounge; free parking in rear.

LONG BEACH

The Long Beach (California) Shell Club has a new meeting place. The monthly (except July) meetings are on the second Sunday at 2:00 p.m. in the Long Beach Main Library, Ocean Boulevard and Pacific Avenue. Entrance is on the north side with free parking on the south side of Broadway and Chestnut. Meetings are held in the "Meeting Room" on the lower level.

PALM BEACH

The Annual Shell Show of the Palm Beach County Shell Club, Inc. (Florida) was held in February at the Colonnades Beach Hotel, Singer Island. According to both judges and the public the exhibits were of top quality. Attendance was good. Anita Blondon was Chairperson. Winners included: Professors Paul and Paula Mikkelsen (DuPont Trophy); Phyllis Diegel (Conchologists of America); the Binghams (best Caribbean and best Self-Collected); Kathy Fry (self-collected Founders Trophy). An added attraction were tanks of live tropical fish, mollusks and sea life. Corinne Edwards was on hand to talk to the school children who came by the bus load, as well as to the public.

NORTH CAROLINA

The North Carolina Shell Club has elected new officers for 1981. President: Charlotte Dexter; Vice President: Thomas Vanlandingham; Treasurer: Elizabeth Naumuk; Corresponding Secretary: Paul Jennewein and Recording Secretary: Carolyn Smith.

BOOK WANTED

Dear Tom Rice,

For years I have been looking for a copy of Pectinidae of the Eastern Pacific by Gilbert Grau (1959), but with no success. Perhaps someone who reads *OS&S* has a copy they will sell. H. J. Dijkstra; Gravinneweg 12; 8604 CA Sneek, Holland.

WINNERS

Winners have been announced in the 1980 drawing held by Carfel Shell Export (Manila, Philippines). The following were winners in the 7th annual raffle: Nick Katsara, New Jersey (1st); Lawrence Strange, New Jersey (2nd); Antoine Manes, Seychelles (3rd); Brookman and Sons, Australia (consolation); Fred Hinkle, Kuwait (consolation).

HOW?

Dear Tom Rice,

Corinne E. Edward's article "Children Are Like Sponges" reminded me of a question I've been trying to get answered for a long time. How, and where, do you put holes in a Queen Conch or Horse Conch, to make a shell horn; or in a Babylonian Spiral to make a whistle? Perhaps you can request such information from your subscribers. Bill Heyworth; 8466 N. Irish Road; Otisville, Michigan 48463



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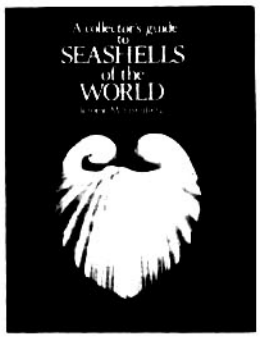
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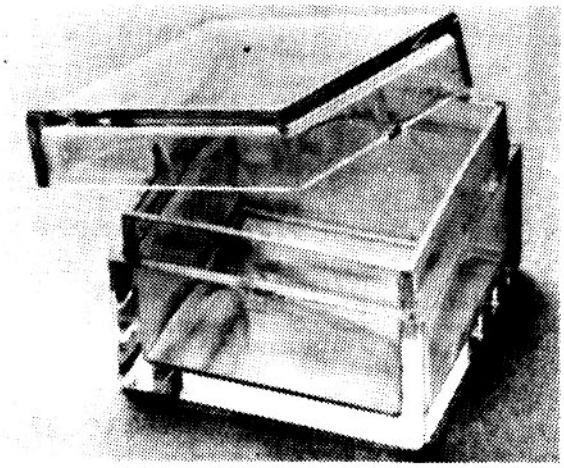
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The volutes shown on this page are specimens taken by fishing boats off the Caribbean coast of Nicaragua. The center photo on the bottom row is a typical *Falsilyria demarcoi*, some of the others may be color forms of that species; one new species from these will be described shortly. These shells are in the collection of Emilio Fabián García of Lafayette, Louisiana who states that the nets seldom bring up more than a single specimen at a time and on a two-month trip only three specimens were collected; as a matter of fact these photographs represent seventy percent of all the specimens of these forms he had collected on all of his trips to the area.



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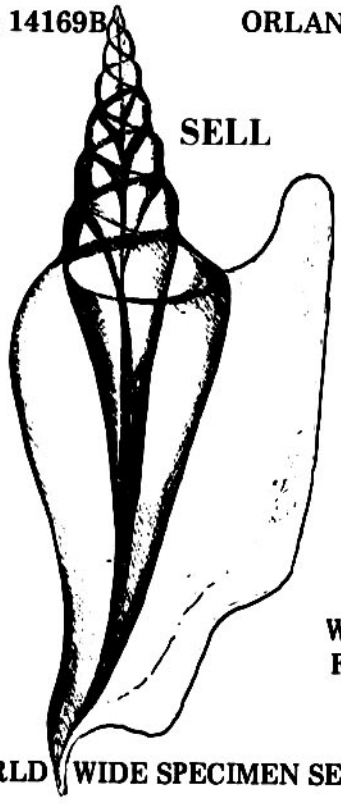
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Sponges and Murex: A Mutualistic Relationship?

MARY K. WICKSTEN

Department of Biology
Texas A & M University

Mutualism is defined as "a relationship between two or more species that benefits all parties to the relationship" (Rickleft, 1977). There are many well-known examples among marine species: the association between clownfishes and sea anemones, hermit crabs that carry sea anemones on their shells, gobies that serve as "watch dogs" for snapping shrimp, and many others. There seems to be a mutualistic relationship between murexes and sponges as well.

Murexes (Family Muricidae) often have spiny or frilled shells encrusted by other organisms. Bryozoans, coralline algae, tube-building polychaetes, and other small invertebrates may settle on the rough surface of the shells.

While diving in 1978-81, I noticed three species of Muricidae thinly encrusted by orange to reddish sponges. These sponges gave the shells bright colors, attracting my attention. Sponges also at times were present on rocks or coral near these gastropods.

On July 25, 1978, I found a Brown Murex, *Chicoreus brunneus* (Roding) at 5 m depth under coral rubble off Dravuni Island, Fiji. The murex was encrusted by an unidentified red sponge. On May 23-24, 1980, I collected two Denuded Murex, *Chicoreus denudatus* (Perry), off Bowen Island and near Point Perpendicular, Jervis Bay, New South Wales, Australia. Both were encrusted by orange sponges. The sponge from Point Perpendicular later was identified as a siliceous sponge of the Family Halichondridae. This same species of murex encrusted by an orange sponge has been photographed by Deas (1972, pg. 13).

I often have found the Festive Murex, *Pteropurpura festiva* (Hinds), encrusted by a calcareous sponge, *Clathrina blanca* (Miklucho-Maclay). This association is common, but not obligatory among murexes on the inside of the San Pedro breakwater in Los Angeles Harbor, California at 6 to 8 meters. Individuals without sponges also occur at that depth and up into the intertidal zone. I also collected four Festive Murex encrusted by unidentified sponges at Abalone Cove at 9 m on rocks. Festive Murex collected in tidepools west of Point Fermin, San Pedro, always lacked encrusting sponges, but occasionally were encrusted by tube-building polychaetes (Family Serpulidae).

Sponges, unable to move, could benefit from attaching to a crawling gastropod. Movement by the murex would enhance feeding currents, disperse the population, and prevent grazing by sponge-eating predators. The murex probably would not obtain any benefit in feeding. (They usually eat barnacles, other species of mollusks, or carrion.) However, the sponge might help reduce predation on the murex.

In an aquarium, I have observed predatory gastropods (*Fasciolaria* sp. and *Pleuroploca gigantea* [Kiener]) to feed on *Pteropurpura festiva*. A spiny lobster, *Panulirus interruptus* (Randall), ate a Festive Murex by cracking the aperture of the shell with its mandibles. Other potential predators of Festive Murex include the knobby starfish (*Pisaster giganteus* [Stimpson]), rock crabs (*Cancer anthonyi* Rathbun), crabs of the Family Xanthidae, and the Kellet's Whelk (*Kelletia kelletii* [Forbes]).

Might a covering of sponge distract predators? Some species of sponges are toxic (Bakus and Green, 1974). Other sponges interfere with hunting by predatory invertebrates. Forester (1979) found that the sponge *Haliclona panicea* (Pallas) on the scallop *Chlamys varia* (Linnaeus) interfered with the attachment of tube feet of the starfishes to the scallop. Vance (1978) discovered that the covering of epibionts on the bivalve *Chama arcana* Bernard (as *C. pellucida* Broderip) lessened predation by *Pisaster giganteus*.

Evidence so far is lacking that the sponges on the murex significantly interfere with predation. In the enclosed environment of the aquarium, predators eventually eat all the murex, with or without sponges. However, in the natural habitat, a murex might have a slight advantage in being covered by a sponge. The coating might mask the metabolic products released by a murex, making hunting by chemosensation more difficult for predators. The slimy texture of the sponge might interfere with tactile sensation in hunting or result in a loose grip on the shell. The widespread occurrence of murex encrusted by red or orange sponges suggests that there is indeed some mutual advantage to be gained by this association.

I thank Gerald Bakus, University of Southern California, for identifying the sponges.

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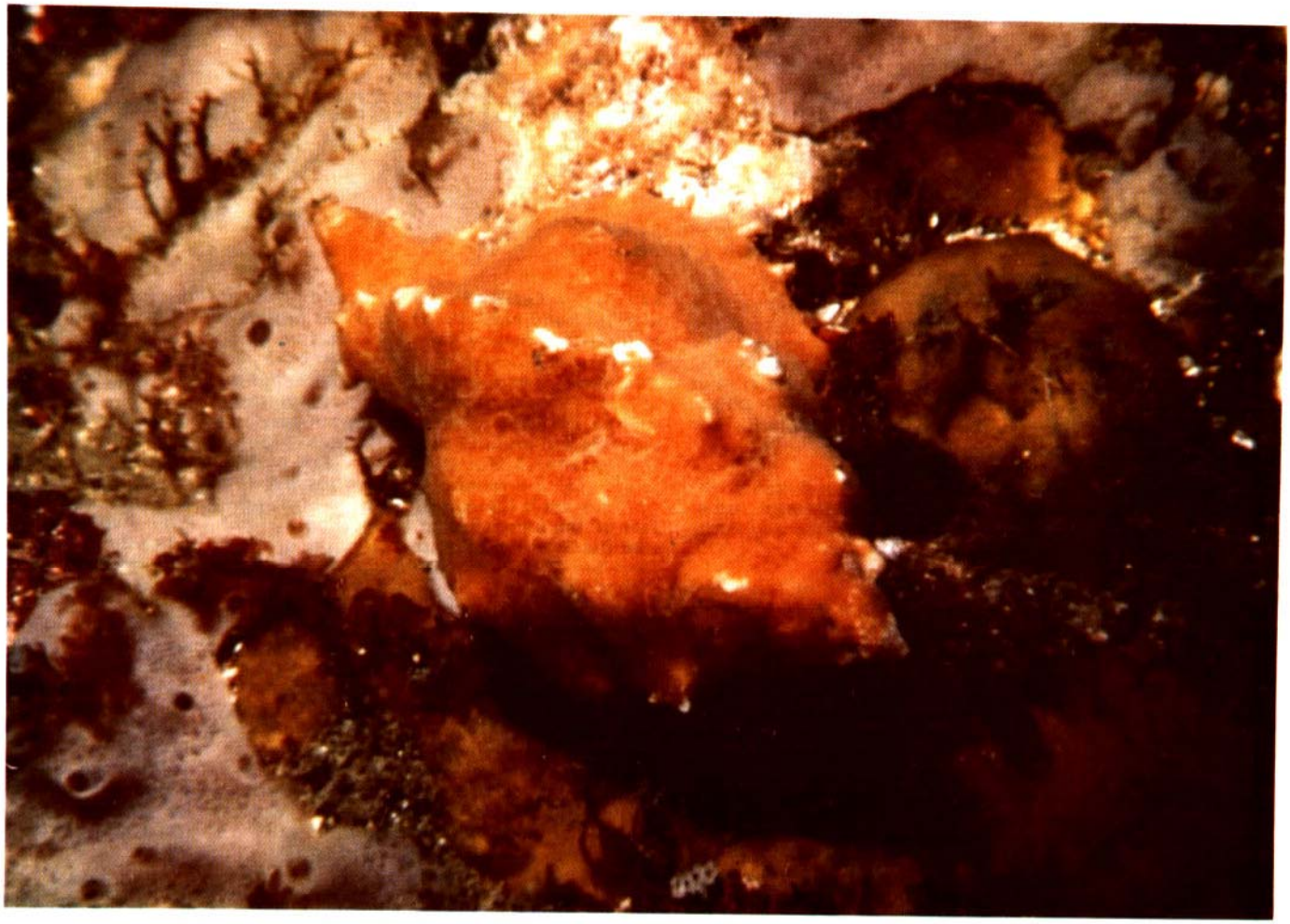
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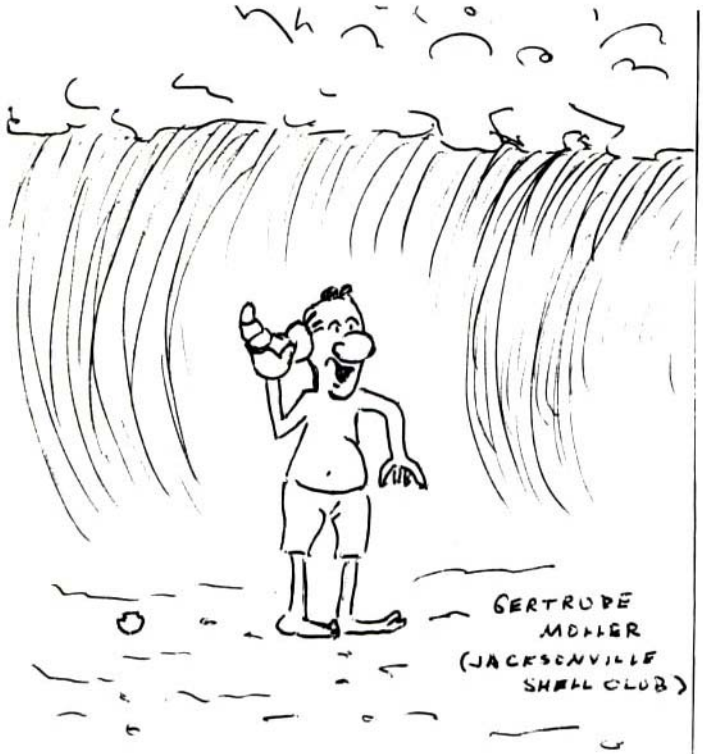
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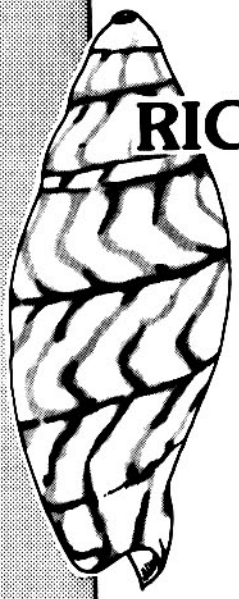
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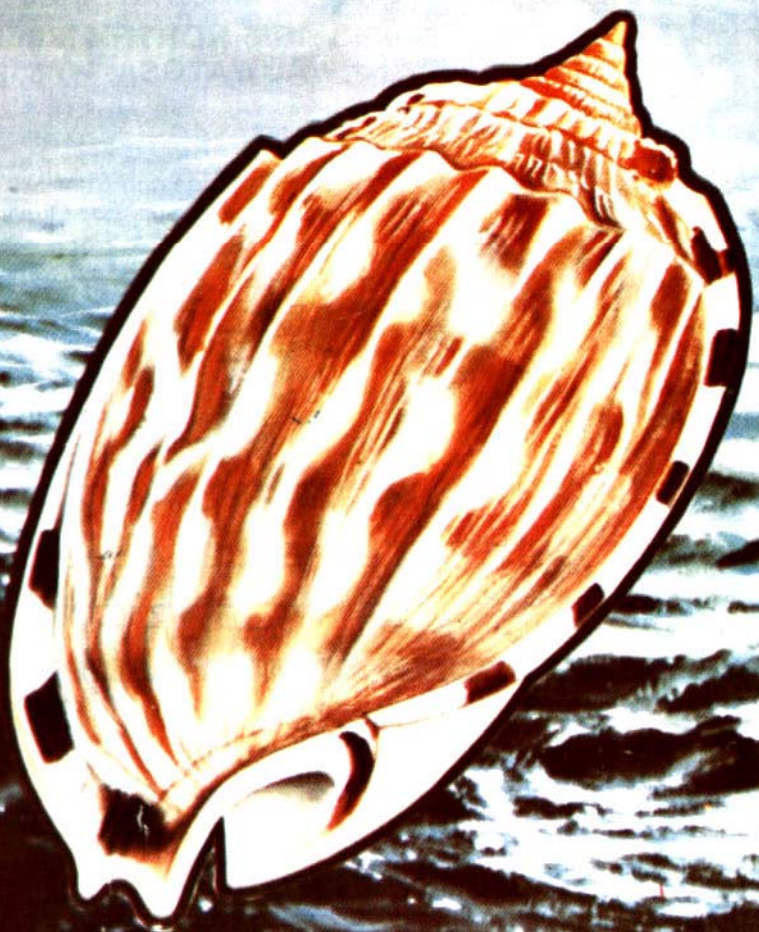
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