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THE PUKA SHELL CRAZE IN HAWAII

by ELMER G. LEEHMAN

Hawaii's "shell people" recently have been inundated with requests for information on, or articles made of — not ***Cypraea tessellata*** or ***Strombus hawaiensis*** or even ***Murex pele,*** but a hot new "species" called **puka** shells.

These suddenly fascinating trophies are made up into necklaces, wrist bands, clothing decorations and hair ornaments, and sold at scandalous prices that seem to skyrocket while you hesitate. Hawaii's beaches are being swept clean as everyone seeks to become a **puka** shell magnate.

But what are **puka** shells?

Strangely, they are not true shells, as collectors know them. They are shiny ocean-washed, beach-polished spires of cone shells — the fragments that traditionally are scorned by collectors. They are the last bits of once-perfect cones that, if left on the beach, soon would be ground to the nothingness from which they evolved.

Puka means "hole" in Hawaiian and refers to the fact that a cone spire, being higher, wears away relatively faster than the base as it tumbles across the reef and rolls in the surf. Eventually the spire is perforated naturally. (Flat-spired shells, and cones that haven't quite reached the **puka** stage, may get an assist from an ice pick or a high-speed drill.)

Collected from the beach drift, and carefully sorted by size and color, the shells then are strung on nylon or monofilament fishline as necklaces or other ornaments. Lately earrings, bracelets and other attractive new items have appeared. A necklace with unusual coloring will bring about double the price of a pure white one.



A handful of puka shells from Oahu.



Terry Wright, daughter of members Russ and Fran Wright proudly sports a puka shell necklace made by Randy Stevens.

The craze has been a real bonanza for many fortunate enough to live near productive beaches. Districts such as the Waianae Coast or the Pupukea area of Oahu are thoroughly combed daily, starting as early as 3 a.m., by ambitious collectors with portable lights. With daylight, snorkellers and scuba divers begin searching at the surf line or in the lagoons. Beach wash is carefully sifted and screened by hard-working folks of all ages. So meticulous is the search, it has become almost impossible to obtain useful **puka** shells on Oahu. The successful collector must be unusually resourceful.

One back-breaking but apparently successful technique is to drive a light truck as close to the water as possible, load up the back with beach drift, then drive home to sort the treasure at leisure. Technically, this violates a Hawaii law, which prohibits sand "mining" from public beaches, but no one seems inclined to do anything about it.

A few local entrepreneurs, undismayed by the difficulty of getting good **puka** shells, have started to import them from the Philippines, and negotiations are well along to obtain supplies from other Pacific islands where cones are still plentiful. At the same time, Hawaiian shell dealers have been receiving frantic queries from their commercial contacts in other areas: "Quick, what are **puka** shells?"

Shell jewelry is not new, of course. But this fad seems to have evolved from the pendant tradition about a year and a half ago, and to have gained momentum early in 1974. At first it was a "hippy thing." A nice one could be bought for a few dollars from a modest display on the hood of a surfer's jalopy. As the popularity rose, so did the prices. By September, a moderately good string was selling in the thirty to fifty dollar range at Waimanalo or at Sunset Beach. The same items were being offered in Mainland shops for $100 and up. And as the prices rose, the "smartness" factor increased.

On a visit to Kauai not long ago, actress Elizabeth Taylor acquired several fine quality necklaces which she displayed widely on her return to the Mainland and which a national magazine showed in color on its front cover. A Honolulu TV station has its newscasters wearing **puka** shell leis on camera. Fashion ads began using them as surety of stylishness.

Selling **puka** shell necklaces today is a Hawaii-wide industry, and business remains brisk. In the meantime, orders from Mainland dealers are increasing in size and are becoming impossible to fill. Consequently, there is intense competition among the potential buyers as well as among the beachcombers and shell stringers.

What does all this mean, ecologically speaking? The answer is not clear.

There have been a few voices decrying the fad, claiming that it is ruining the beaches.

(Cont'd on Page 4)



Two styles of puka shell necklaces.

HAWAIIAN MALACOLOGICAL SOCIETY
(Founded in 1941)
P. O. Box 10391 Honolulu, Hawaii 96816

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The Society meets the first Wednesday of each month at the First United Methodist Church, 1020 S. Beretania St., Honolulu at 7:30 p.m.

VISITORS WELCOME!

Hawaiian Shell News

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Hawaiian Shell News is issued free to members of the Society. Postage rates have been computed and added to membership dues. Single copies of any issue, $1.00, postage included. Individual copies of any issue may be obtained, free of charge, by qualified individuals for bona fide research projects.

HMS DUES FOR 1975

U.S. addresses, including Hawaii, Alaska, Guam, American Samoa, APO, FPO and all others using U.S. Zip Codes	$ 8.00
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Articles of interest to shell collectors are solicited.

Advertisements are accepted at the rate of $10 per column inch per issue. Special rates are available for six and twelve insertions.

HMS Christmas Party

HMS members, including visitors to Hawaii, are reminded of the Society's Christmas banquet and party on Wednesday, December 4, at the Flamingo Chuckwagon on Kapiolani Boulevard. The gathering replaces the regular December meeting.

The buffet dinner will cost $6 per person, tax, tip and parking included. Drinks are available at regular prices.

Reservations can be made with Deane Gonzalez, either by phone after 5 p.m. (395-4607) or by mail c/o HMS, P.O. Box 10391, Honolulu 96816.

Bring an inexpensive shell-related present for the traditional exchange.

REEFCOMBINGS

Male chauvinism has been on quicksand in The Hawaiian Malacological Society for some time. It suffered a further dunking when the all-male Nominating Committee put forward an almost-all-female slate of 1975 officers for approval by the membership at the November meeting. Barring a last-minute manpower resurgence, HMS will be run next year by:

President: Olive Schoenberg, member since 1963, vice president and program chairman in 1974, scuba diver and shell photographer.

Vice president: Ruth Fair, member since 1966, co-editor of **Hawaiian Shell News,** winner of the Smithsonian Award at the 1972 HMS Shell Show, author of **1001 Useful Ideas for Shell Collectors,** and an expert of sorts in the Muricidae.

Corresponding Secretary: Ellen Owens, a member since 1973, public school teacher, scuba diver and the Society's office manager in 1974.

Recording Secretary: Lucy Kwiatkowski, member since 1970 who has served on several committees.

Treasurer: Bob Purtymun, member since 1971, treasurer in 1974, scuba diver, and building construction superviser.

George Cummings, Ed Konopka, Don Grace and Inkie Shields were nominated for elective seats on the Board of Directors. The incoming president will select four additional Directors, under the recently revised Bylaws. The outgoing president, Stuart Lillico, and the editor of **Hawaiian Shell News,** E. R. Cross, will serve ex officio.

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A third edition of Van Nostrand's **Standard Catalog of Shells** is in the works for publication late in 1975 or in 1976, according to Robert J. L. Wagner who, with Dr. R. Tucker Abbott, edited the first two issues of this invaluable work. He refers to the next as the "final" edition.

"We have decided on a completely new set-up," he writes. "We may deviate somewhat from our present intentions, but basically this is it: Name changed to **THE Standard Catalog of Shells**; larger page size (8½ by 11); loose leaf; hard back and cover; about twenty additional families and expansion of present families; no more common names; all measurements in metric; a new scale-of-values arrangement (dropping the present two-column set-up); a new page format; elimination of the list of dealers; a new idea for verification of the record-size shell measurements; a yearly supplement to the catalog; separation of plates from the text, so that they can be replaced more easily with color plates; combined quick lists alphabetically arranged for easier location; a new type index; and many, many more new features."

"Is there a shell named *'Conus merleti'*?" asks Elmer Leehman. "I believe the answer is no."

Leehman is a former president of HMS, a collector of real discrimination, and HSN's authority on rare shells.

"Several HMS members have told me they have bought or traded, at extremely high prices, a shell called ***Conus merleti,*** usually from New Caledonia. They are uncertain of its identity after studying their prize.

"Efforts to locate valid data on *'C. merleti'* have been futile. I can find no evidence that this species has ever been published or accepted by any recognized malacological authority. It is significant that references to the 'species' never include an author and date.

"I am aware that the shell's putative name honors Dr. Yves Merlet, of Noumea, who was killed in a diving accident a couple of years ago. This seems to be a noble gesture. But obviously the name was adopted without adequate taxonomic foundation and even without responsible research. It scarcely does justice to Dr. Merlet's memory.

"I inquired about *'Conus merleti'* from William E. Old, Jr., the widely known cone authority at the American Museum of Natural History in New York. He says he considers the name to be **nomem nudum** — that is, invalid.

"Olds says this shell is actually ***Conus moluccensis*** Kuster, 1838, on which data and photos are available in numerous reputable publications. The same species is found in Okinawan waters, although the New Caledonian specimens seem more knobby with deeper striae. In his opinion — in which I have complete confidence — the two shells are identical, and both are ***Conus moluccensis.***

"This shell is figured in the Stix-Abbott book, **The Shell** (page 128). At the time of publication the identification was uncertain, so the authors called it merely 'Conus species.' This specimen — apparently the first live shell collected for many years — had been found by Dr. Merlet while diving in deep water off New Caledonia and given to Hugh Stix.

"Subsequently a number of HMS members living on Okinawa — I particularly recall Capt. Ed Schelling, Phil Crandall and James Lee Hamasaki — reported that they had found these same shells in about 200 feet of water. Several reported their success in **Hawaiian Shell News** — usually as ***C. moluccensis.*** Some of these rare cones are in Honolulu collections now.

"Collectors who have specimens of this shell, either from New Caledonia or Okinawa, may wish to examine them again. If they are identified as ***'Conus merleti,'*** I suggest that they change the data tag to ***Conus moluccensis*** Kuster. 1838."

EDITORIAL

by STUART LILLICO

Members of the Hawaiian Malacological Society living in the State of Hawaii have been asked to support a proposal "to preserve, protect and, where possible, restore the resources of the coastal zone for the enjoyment of the current and future generations." Those are the words of the preamble to a proposed Hawaiian Shoreline Protection Bill which probably will be presented to the 1975 State Legislature.

The proposal is notable for two facts: it is the product of a "grass-roots" movement to preserve Hawaii's unique shoreline from ruthless exploitation for profit, and it is supported (either vigorously or passively) by a very large number of community associations and civic groups throughout the island of Oahu. The measure is inspired by California's "Proposition 20," which put its entire shoreline under a measure of popular protection for the first time.

The Hawaiian Malacological Society has not taken a formal position on the Shoreline Protection Bill, a step that requires action by the Board of Directors. There is no question, however, that the overwhelming majority of the local membership favors action to achieve what the bill seeks to do.

The popular campaign for the measure is in the hands of the Council of Presidents, a gathering of leaders of most civic groups on Oahu. (HMS nominally participates, although we have had little active contact.) The grouping has caused some dismay and a certain amount of derision in the ranks of politically conscious and money-wise real estate and construction interests. However earnest and active the council leaders may be, they are rank amateurs in a game dominated by professionals.

The Shoreline Protection Bill, nevertheless, is being taken seriously. As the **Honolulu Advertiser** noted editorially, "what's involved is an issue whose time has come and a group that could have increasing influence."

The bill proposes a new section dealing with coastal resource planning and protection in the Hawaii Revised Statutes. The section would:

1. Establish a permit area which would be seaward to the limit of State jurisdiction and landward 1,000 yards from the mean high tide line. Any development activity within this area "with potential adverse affects" would require a permit. This permit would be in addition to the usual County and State permits, and would be consistent with the study and planning being done by the State's coastal zone management plan.

2. Establish a statewide Coastal Zone Conservation Commission and four County-level commissions to implement the bill's provisions. The majority of the commissioners would be members of the general public, rather than government officials or bureaucrats. There would be monthly public meetings at locations convenient to the public. In approving or denying permits, the commissions would follow clearly defined standards. The burden of proof in their hearings would rest with the applicant that his proposal would not adversely affect the coastal environment or negate the State coastal zone management plan.

3. Provide that appeals from the decisions of the commission be open to the applicants as well as to concerned citizens. Judicial reviews could be sought in the courts.

"This bill would not bring all shoreline activity to a halt," according to the sponsors, "but it would allow a final check on each project within the permit area, by representatives of the people most directly affected. It would grant the people a measure of control over their destinies, so closely linked to the seashore."

Recognizing a rare political opportunity in October's hotly contested statewide primary election campaign, the sponsoring Council of Presidents asked each candidate to take a stand on the Shoreline Protection Bill. There was a heavy response; politicians apparently sensed that this was an issue they couldn't safely ignore. Virtually all agreed that existing shoreline protection was inadequate, and several stated that they favored even stronger measures than in the proposed bill.

Not all the supporters were victorious in the primary, of course, and it would be foolish not to expect strong contrary pressure on the successful candidates. Nevertheless, most of those who survive the general election will be to some degree committed to shoreline protection legislation in 1975.

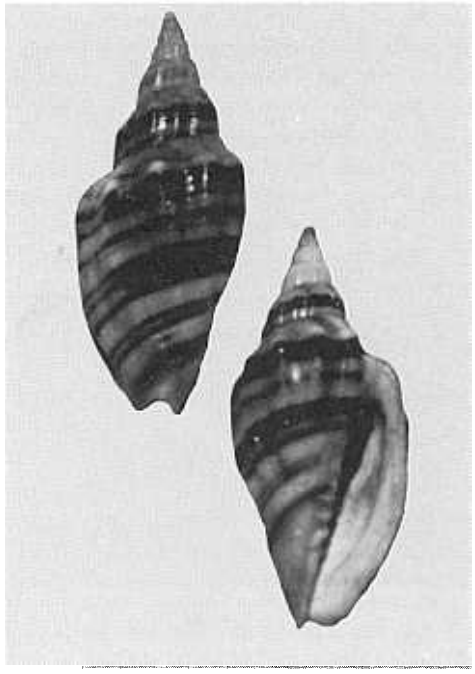
The need to reinforce the existing shoreline protection efforts, such as they are, is clear. A recent review of rezoning proposals before the State Land Use Commission showed that massive plans — there is no other word for it — are being made to commercialize Hawaii's waterfront property. The merest glance at Waikiki shows the inadequacy of existing controls.

Perhaps more than some other elements of the public, however, Hawaiian Malacological Society members will recognize a weakness in the proposed legislation. As Elmer Leehman showed so forcefully in the October issue of **Hawaiian Shell News** ("The Hawaiian Shell Shortage," page three), uncontrolled runoff of soil from building and agricultural operations continues to destroy vast stretches of reef and lagoon. A great deal of this originates outside the proposed 1,000-yard zone. The Shoreline Bill must recognize this and include some provision for runoff control.

(If any Honolulu resident wonders what I am talking about, he can look at the vast scar on Ainakoa ridge, overlooking once-sparkling Maunaloa Bay, and then at the dead, mud-covered reef off Kahala; after that he can turn his eyes eastward to Hawaii Loa ridge, where the bulldozers and graders have begun work on a new project.)

What is happening in Hawaii in 1974 and 1975 may happen in other coastal states in following years. People everywhere are beginning to recognize that ruthless degradation of the environment, merely because it is profitable, no longer is inevitable. Mountains, seashores, scenic vistas and green grass belong to all of us. Their fate should be controlled by all of us.

The Hawaiian Malacological Society would like to think that the proposed Shoreline Protection Bill will make that control surer.



Voluta queketti Smith, 1901.
Photo: Hyland

RARE VOLUTE

An exceptionally fine specimen of the extremely rare *Voluta queketti* Smith, 1901 has come into the possession of HMS member Ed Hyland of Agana, Guam, who sent the two accompanying photos. He reports that he obtained this shell from Mozambique, but he gives no collection data.

It is the rarer banded version, which is figured and described in Weaver and duPont's **Living Volutes** (plate 6, page 24).

Normally, this shell is only found dead, either ex pisces (from the stomach of a deep-water fish) or as part of the adornment of a *Xenophora* carrier shell. Hyland's shell, however, appears to have been collected alive, although the photos do not show the horny operculum that characterizes this species.

This specimen is the finest the writer has ever seen. It measures 50.2mm and has reddish brown banding on a purplish-white base.

Previous specimens of *Voluta queketti* have come from South African waters.

Elmer G. Leehman

PUKA SHELLS (Cont'd from page 1)

Some have expressed fear that a vital natural element in the marine environment — namely, the calcium carbonate of the shell fragments — is being destroyed. Frankly, this seems far fetched. I would rather see people collecting **puka** shells than sweeping the reefs and wave benches clean of live shells for which they have no real use!

By and large, the fad is not destructive. The shells involved are "dead." Left alone, they soon would revert to beach sand and would eventually disappear. The volume of shell material — while significant economically — is negligible physically. The upheaval of the beach as whole families dig for fragments is scarcely comparable to the effect of a normal winter storm.

I think it is significant that among the most ardent of the **puka** shell hunters have been the hard-pressed low-income families making their homes along the Waianae Coast and the North Shore of Oahu. The fad must have brought them a most welcome addition to their pocket money — which they probably have not bothered to report for tax purposes!

A necklace made of well matched **puka** shells can be a gorgeous work of art. There is substantial variation in shape and color among the fragments, and a true artist enjoys great latitude. It is ironic that "serious" shell collectors have been looking at these broken pieces for years without much interest. After all, they are not specimens.

It all goes to prove that the sea has many gifts for those with eves to see them.

Just Stringing Along

This week's fad on Hawaii's beaches is collecting tiny ***foraminifera*** and stringing them into multi-strand necklaces. In less time than it takes to get out an issue of **Hawaiian Shell News**, "forams" have seriously eroded the supremacy of **puka** shells for personal adornment.

Foraminifera are single-cell protozoa with tiny calcareous exoskeletons. The "shells" — easily mistaken for the discs spewed out of the office paper punch — are found among the coarse sand of a flat beach. Nature provides them with a tiny hole through which a fine fishline can be threaded.

Not only are the "forams" fragile, but they are backbreaking to collect and sheer hell to string. No wonder they are popular!

SHELLS FOR SALE

Golden Cowries from East Samar
(See HSN Aug. 1974)

Deep orange to red. Some with pinkish purple base. Very reasonable prices. Write: Olive Schoenberg, 3265 Huelani Dr., Honolulu, HI 96822.

EXCHANGES

Steve Carr, 2440 Date Street, Honolulu 96814 writes that he has an excellent worldwide ***Cypraea*** collection that he wants to trade for Hawaiian shells with data. In addition, he has some ***Cypraea semiplota*** (live-taken in 1974), ***C. tessellata*** and ***Murex torrefactus*** for exchange. (Hawaii members: Steve's phone number is 955-3609.)

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Want some cowries and cones from New Caledonia? Lo Abel, B.P.3606, Noumea, is ready to exchange. Send him a list of what you have, indicating size, quality and value.

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After "five glorious years" of collecting in the Philippines, HMS member Joseph Martinez has returned to the United States, where his new address is 3684 Jomar Drive, Napa, Calif. 94558. "I have a very large collection with many tentatively record size, perfect specimens," he writes. "Anyone interested in seeing them or making an offer" is invited to write.

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Miss Barbara J. Nielsen is anxious to establish contact with other HMS members interested in bivalves. She is assistant curator in charge of marine molluscs, National Museum of Victoria, Melbourne 3000, Australia, which, she says, does not permit private collections by its professional staff. "However, donations of bivalves particularly, even common ones, with good localities and other relevant data, would be greatly appreciated," and she wants to "exchange ideas and information either with serious amateurs or professionals." Miss Neilsen says she is basically a taxonomist and ecologist, specifically interested in Australian and Pacific bivalves, particularly members of the family Arcidae.

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From Mr. J. Hermans, Waterstraat 132, B.-9110-Sint-Armandsberg, Belgium comes the following exchange information. "I would like to exchange shells with shell collectors. I have more than 300 species in stock for exchange, from common to very rare, intertidal to very deep; from subtropical to shells from very cold seas (Iceland, etc.). I will reply to all letters."

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Following the Society's recent move to permanent quarters in the First United Methodist Church, Honolulu, Vice president Olive Schoenberg and Recording Secretary Inkie Shields have been trying to get the Wray Harris Memorial Library back into order. They say they are appalled at the number of missing volumes, and they ask every member — particularly those who have moved away from Hawaii in the past year or two — to search his library shelves for HMS books.

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COWRIES OF THE GULF OF EILAT

by BARUCH SCHEINBERG

TEL AVIV — In three years of collecting with both snorkel and scuba in the Gulf of Eilat (called Gulf of Aqaba on some maps), I have found fourteen species of cowries. At least three others inhabit the area, although I have not found them myself. Some additional species have been reported, but I have no direct knowledge of them and I prefer not to discuss them.

The seventeen about which I can speak with assurance are:

Cypraea arabica grayana, C. carneola. C. isabella, C. caurica, C. nebrites, C. turdus, C. talpa, C. pantherina, C. lynx, C. pulchra, C. gracilus notata, C. erythraeensis, C. macandrewi, and ***C. globulus*** (although I have just a shade of doubt about the identity of the last), plus ***C. camelopardalis, C. staphylaea*** and ***C. teres,*** which I have not found personally.

I hope soon to be able to report authoritatively on some other species that are reputed to occur in the Gulf, but about which I am not sure.

It is my observation that generally the cowries from the Gulf of Eilat are bigger and nicer than the same species found in Ethiopian waters farther south in the Red Sea. This is particularly true of ***Cypraea nebrites, C. turdus, C. pulchra*** and ***C. erythraeensis.***

All the species listed above, except ***C. pulchra, C. turdus*** and ***C. pantherina*** were found under rocks, dead coral or, occasionally, iron scrap on the bottom. Generally, ***C. turdus*** is found in the sand, in which the dorsum is visible. I found one, however, crawling in the grass at a depth of seven meters, and several under stones at one meter or so.

Some years ago, ***C. turdus*** were here in large numbers. These days, they are hard to find.

The ***Cypraea pulchra*** I have found have been on the eastern side of the reef at depths ranging from half a meter to 1.5 meters. When collected at night, however, they were in crevices at depths of about seven meters.

My experience with ***Cypraea macandrewi*** already has been reported (see HSN, August, 1974).

To my personal knowledge, two specimens of ***C. camelopardalis*** have been found in Eilat and one at Sharm el Sheikh (near the tip of the Sinai Peninsula). The aperture of these specimens is bigger than that of shells from Ethiopia. In addition, there is a difference in shape and color.

Cypraea pantherina are more frequent. I once found nine in a single dive in about 4.5 meters of water. Eight were on branches of dead coral; one was on live branch coral. All were found during daytime. All were covered with their mantle, which was gray-white. Each shell was alone.

As I noted above, some specimens of ***C. staphylaea*** and ***C. teres*** have been found in the Gulf of Eilat, but not by me. Nevertheless, I am certain of their genuineness.

One other observation: the color of the mantle of ***C. erythraeensis*** is gray-white, as is the animal's foot.

As I write this, I still have not quite convinced myself of the identify of the three shells I list as ***C. globulus.*** I found the three together, empty, in three meters of water. I am seeking confirmation, however, and will report when the matter is cleared up.

Here are a few random notes on shelling in the Gulf of Eilat and the Gulf of Suez. As an aftermath of the recent hostilities there, I have been able to dive in some areas that previously were closed to me. Conditions are subject to change, of course, as the efforts to establish peace make their faltering progress.

The Gulf of Suez is relatively shallow with a sandy bottom. I have collected ***Cypraea pantherina*** (the nine specimens I referred to earlier) at Ras es Sudr, within about twenty-five miles of Suez, at the northern end of the gulf. Somewhat to the south, I got a single ***C. talpa*** at El Tur, a coastal point best identified as lying close under Mount Sinai.

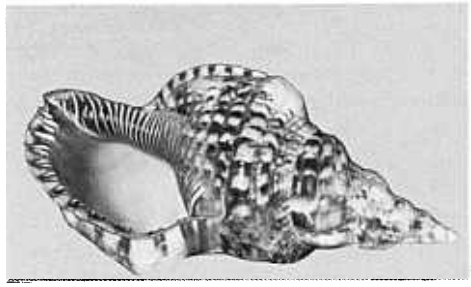
Turning the corner into the Gulf of Eilat, I have been quite successful at Sharm el Sheikh, where I found a dozen species. I did rather well, also, at Nabq, on the coastal track just at the narrowest point of the Strait of Tiran.

The Gulf of Eilat is very deep, reaching 1,800 meters off El Hibia, about midway between the strait and the city of Eilat. As most readers probably know, the gulf fills a section of the Great Rift that extends from Central Africa, through the Red Sea to the Dead Sea and the Sea of Galilee.

The most productive spot in the entire coast for me has been a small cove that seems to have no particular name, situated on the Sinai shore of the gulf about twelve miles southwest of Eilat city. The productiveness may be deceptive, however. The spot is fairly easily accessible from Tel Aviv and secure for visitors, so that I have been able to collect there quite often. It is probable that other points along the coast would be equally rich in cowries if they could be searched as thoroughly.

World Record Shells

by MORTON HAHN



*The record **Charonia variegata.***

Photo: Rosenberg

RANDOLPH TWNSP, N.J. — I presently hold eight world-record size shells. They are:

Charonia variegata — 358.8mm
Conus marmoreus bandanus — 150.0mm
Bursa rana — 91.4mm
Liguus virgineus — 66.9mm
Purpura persica — 81.0mm
Cypraea miliaris — 40.7mm
Turbo cornutus — 103.2mm
Bursa bufo — 266.7mm

These have been measured by Bill Old of the American Museum of Natural History and confirmed by Bob Wagner.

My first contact and interest in world record size shells occurred back in 1972 when I picked up a 7.1 inch ***Busycon canaliculatum*** at Jones Beach, New York. At the time Bob Wagner accepted it as a world record but, of course, it has long since been surpassed. Since that time I have devoted practically all of my spare time to collecting world record size shells. In addition to the above world records, I have eight waiting to be submitted to Bill Old for measurement. They are:

Conus litteratus — 143.5mm
Cypraea inocellata differens — 52.1mm
Conus imperialis — 104.3mm
Voluta vespertilio — 117.6mm
Conus figulinus — 98.6mm
Murex regius — 181.0mm
Turritella terebra — 157.5mm

I have data on most of my record specimens — except the ***Bursa bufo.*** I found that in an old barn at Washington, N.J., with no indication of its history!

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Two Reports on Cypraea serrulifera

by MANFRED BLOCHER

DRISBURG — I can report an interesting extension of the range of one of our acknowleged but less well known cowries — ***Cypraea serrulifera*** Schilder & Schilder, 1938. Dr. C. M. Burgess in **The Living Cowries** reported findings only from the Tuamotus, Jarvis Island, Cook Islands and Canton Island — almost due south of Hawaii. I found one live specimen and one beach shell on Bali, and identified two others in collections there.

After viewing the photos sent by Blocher, Dr. Burgess expressed reservations on the identity of the specimens found at Bali.

"I believe it is ***Cypraea hammondae,*** *" he said. "But I can't be positive until I see the actual shell. I am asking Mr. Blocher to send his find to Honolulu for examination."*

I spent several weeks on Bali in March 1972. Although the Balinese people, their history, religion, culture and customs interested me most, I made several tries at shelling. I dreamed of finding a good specimen of *C.* ***vredenburgi,*** but never found even a trace. Shelling conditions along the southeast and southwest coasts of Bali were not favorable in that month. The surf was big on the southwest and access to the sea was limited. The southeast was a little better, but visibility was poor and the bottom was hard coral and impossible to move.

The best place I found was Padangbay, about 40 miles east of Denpasar, the island capital. Padangbay was an important harbor during the Dutch regime. Rusting lighters dating from this period can still be seen on the beach there. Ferries now run between Padangbay and the neighboring island of Lombok. The bay is well protected from the sea and shelling was relatively good, despite occasional strong currents.

On my first day there I found beneath a coral head a tiny cowry covered by a bright red mantle. It measured a bit less than 8mm (about 1/3 inch). On comparing my specimen with the Schilders' publication, I found that it corresponded exactly with their description of *C.* ***serrulifera.***

I tried, of course, to find more specimens, but time was short. It takes a good bit of luck to find such a small shell in the current and surge. Despite my failure there, however, I later found a beach specimen on the outer reef, and in collections I visited in other parts of Indonesia I saw *C.* ***serrulifera*** from Bali. These had erroneously been identified as *C.* ***microdon*** in one case and *C.* ***minordens*** in another.

I would not be surprised, if other collections were carefully examined, to find among the Palmadusta *C.* ***serrulifera*** from points between Polynesia and Indonesia.

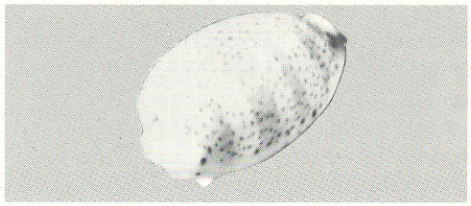


Photo: Blocher

* * *

by J. C. ASTARY, M.D.

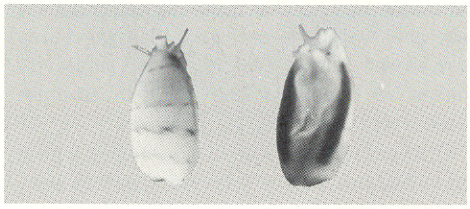


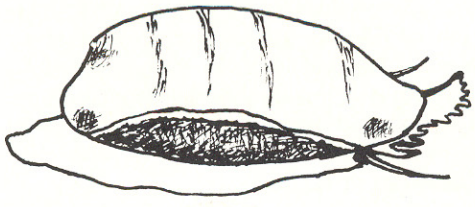
Photo: Astary

UTUROA, French Polynesia —In this monograph, **The Living Cowries,** Dr. C. M. Burgess noted that the animal characteristics of ***Cypraea serrulifera*** Sch. & Sch. had not been recorded, and that it could only be assumed that its habitat was in shallow water fairly close inshore. I may be able to contribute some information on both these points.

During my residence in the Society Islands, I was lucky enough to find some living specimens of *C.* ***serrulifera*** among dead branch coral in about three feet of water in a pass through the reef. The water was distinctly "stirred up."

On another occasion, I found specimens at night crawling in the weed on top the barrier reef.

I took photos of the shells, and the live animals, and I did a sketch of the animal to show some details.



In addition, I have tried to describe the *C.* ***serrulifera*** animal, as follows:

Mantle: seems not to wear filament or papilla. Color, red-carmine (more or less dark, sometimes punctated with brown) on margins and dorsal face, which is edged with a cream-color strip fringed by a brown line. The mantle is cream color against the base of the shell.

Foot: creamish-white beneath; cream-color above.

Siphon: whitish, with a dentate edge, the denticulations growing longer toward the base where they become true filaments.

Tentacles: pointed, orange color.

Eyes: black, situated at the base of the tentacles, rather beneath and outside them.

One distinctive characteristic of the animal is worth noting — the extreme swiftness which it pulls its mantle into the shell when light reaches it.

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COWRY HUNTING ON KWAJALEIN

by SCOTT JOHNSON

KWAJALEIN — Some of the terms I use in these reports on cowry hunting in this atoll may not be familiar. I have sketched a generalized profile of the atoll and the lagoon, noting the principal features and listing the species usually found there.

As you probably know, Kwajalein is a huge atoll — the largest in the world — with low islands on the circumferential reef. Except for the channels, the reef is mostly exposed at extreme low tide. The lagoon, on the other hand, is more than 150 feet deep in many places.

A feature of the lagoon is the presence of pinnacles of coral ("patch reefs") extending up from the bottom, often to within a foot or two of the surface at extreme low tide. The story is that, as hazards to navigation, the tops of many of these patch reefs were blasted off during or after World War II, creating the great amounts of coral rubble in which the small cowries now hide.

Bottom conditions vary as you traverse from the outer slope of the leeward (western) reef across the lagoon to the outer slope of the windward reef. Trade winds blow from the east-northeast.

Working eastward from the leeward drop off, I identify the reef features as follows:

A — Leeward Lower Outer Slope: Unexplored.

B — Leeward Upper Outer Slope: A slope of 45 to 60 degrees, honeycombed with holes, caves, sand and rubble pockets. ***Cypraea argus, C. aurantium, C. beckii, C. bistrinotata, C. carneola, C. childreni, C. chinensis*** (rare), ***C. cicercula*** (rare), ***C. cribraria*** (very small specimens), ***C. dillwyni, C. fimbriata, C. helvola, C. irrorata*** (one found), ***C. isabella, C. labrolineata, C. lutea*** (rare), ***C. mappa, C. margarita, C. mariae, C. microdon, C. nucleus, C. poraria, C. punctata, C. talpa, C. teres, C. testudinaria, C. tigris, C. ursellus,*** and ***C. ziczac*** (rare) are found in this zone.

C — Reef Front: Either flat hard limestone reef or undulating sandy-bottom surge channels with ridges of limestone reef separating the channels. Thirty to fifty feet deep, ridges ten to twenty-five feet high. ***Cypraea arabica, C. argus, C. aurantium*** (rare in surge channels), ***C. beckii, C. bistrinotata, C. carneola, C. childreni, C. chinensis, C. clandestina, C. depressa, C. dillwyni*** (rare), ***C. fimbriata, C. fischeri*** (only one found), ***C. helvola, C. hirundo, C. isabella, C. labrolineata, C. maculifera, C. margarita, C. mariae, C. martini*** (one), ***C. microdon, C. nucleus, C. poraria, C. punctata, C. scurra, C. talpa, C. teres, C. testudinaria, C. tigris, C. vitellus.***

D — Seaward Reef Margin (Leeward): Right where the waves break. All of the locally collected ***Arabica*** group* except ***C. eglantina,*** plus ***C. annulus, C. moneta*** and ***C. ventriculus.***

E — Leeward Reef Flat: Hard limestone reef with some ***Pocillopora sp.*** and small flat ***Heliopora, Porites sp.*** and others. Mostly unexplored but ***Cypraea caputserpentis, C. moneta, C. annulus, C. felina*** and ***C. ventriculus*** have been found here.

F — Lagoon Upper Slope: Gradual drop off from six to twenty feet. Lots of live coral making it difficult to find shells except in certain areas. ***Cypraea arabica, C. argus, C. asellus, C. carneola, C. caurica, C. chinensis, C. clandestina*** (common), ***C. cribraria, C. depressa, C. eglantina, C. erosa, C. fimbriata, C. helvola, C. hirundo, C. goodalli, C. isabella, C. lutea, C. lynx, C. maculifera, C. mappa, C. microdon, C. nucleus, C. poraria, C. punctata, C. scurra, C. stolida, C. talpa, C. teres*** (rare), ***C. testudinaria*** (not common), ***C. tigris*** and ***C. vitellus.***

G — Lagoon Lower Slope: Generally sandy. No cowries.

H — Lagoon Floor: Mostly sandy, with some deep-water corals. Unexplored.

J — Patch Reefs: Usually lots of live coral on the sides. Somewhat bare on top. Many reef tops blown off, leaving lots of dead rubble. Cowries are plentiful: ***Cypraea argus, C. beckii*** (not common), ***C. bistrinotata*** (common), ***C. childreni, C. chinensis*** (on top, but rare), ***C. cicercula, C. eglantina*** (sides), ***C. erosa*** (sides), ***C. fimbriata, C. globulus, C. helvola, C. hirundo, C. isabella, C. labrolineata, C. limacina, C. lutea, C. lynx*** (sides), ***C. mappa*** (sides), ***C. mariae*** (rare), ***C. martini*** (dead specimens), ***C. microdon, C. nucleus, C. poraria, C. punctata*** (rare), ***C. scurra*** (common), ***C. staphylaea, C. talpa, C. testudinaria*** (top), ***C. tigris*** (rare), ***C. ursellus, C. vitellus*** (sides).

K — Lagoon Lower Slope of Windward Reef: Sandy. No. cowries.

L — Lagoon Upper Slope: Lots of loose coral, but usually not as alive as on leeward reef. Common cowries are plentiful: ***Cypraea asellus, C. carneola, C. caurica, C. clandestina, C. eglantina, C. erosa, C. helvola, C. isabella, C. leviathan, C. lynx, C. mappa, C. martini*** (two dead), ***C. poraria, C. punctata, C. scurra*** (rare here), ***C. staphylaea*** (rare), ***C. stolida, C. talpa, C. testudinaria*** (rare here), ***C. tigris, C. vitellus, C. ziczac*** (rare).

M — Windward Reef Flat, Inner Area: Lots of ***Heliopora*** and ***Porites*** flat coral "paddies." Some ***Acropora*** and ***Pocillopora. Cypraea annulus, C. caputserpentis, C. carneola, C. caurica*** (rare), ***C. chinensis, C. clandestina, C. cribraria, C. eglantina*** (rare here), ***C. erosa, C. felina, C. fimbriata, C. helvola, C. hirundo, C. isabella, C. labrolineata*** (rare), ***C. lutea, C. lynx, C. maculifera, C. moneta, C. nucleus, C. ovum*** (one reported), ***C. poraria, C. punctata, C. talpa*** (rare), ***C. teres, C. testudinaria, C. tigris, C. vitellus*** (rare), ***C. ziczac*** (rare).

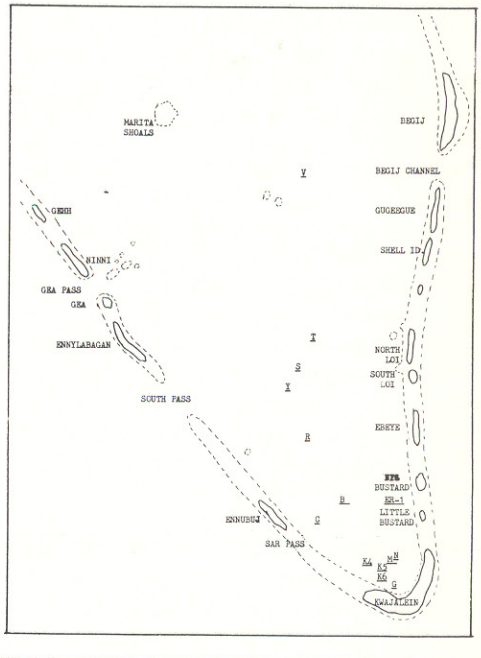
N — Windward Reef Flat, Outer Area: Mostly flat hard limestonelike reef with little coral. Some ***Porites*** and ***Pocillopora*** very low and close to reef. Some large boulders broken off algal ridge (0). ***Cypraea annulus, C. arabica, C. caputserpentis, C. depressa, C. goodalli, C. helvola, C. isabella, C. maculifera, C. mauritiana, C. moneta, C. poraria, C. ventriculus*** (rare).

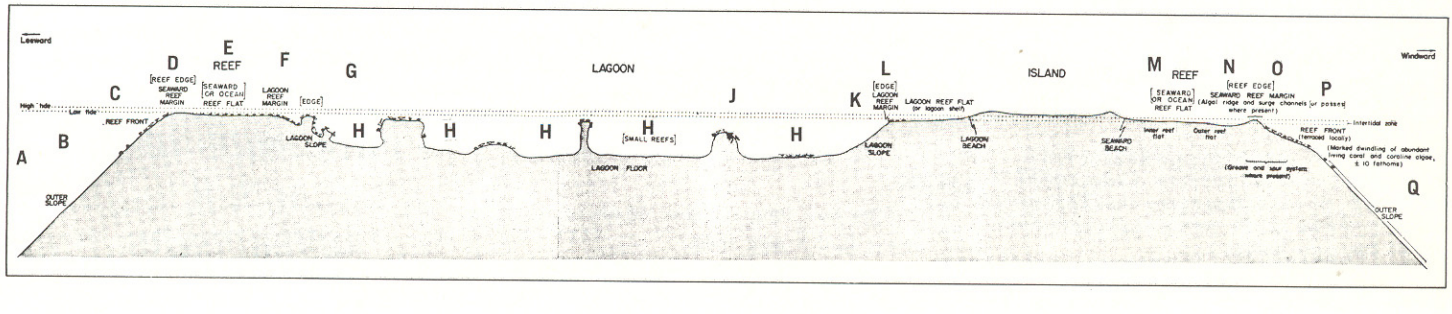
O — Algal Ridge: The point where surf breaks. Few shells. ***Cypraea arabica, C. caputserpentis, C. maculifera, C. mauritiana, C. moneta, C. ventriculus*** (rare).

P — Windward Reef, Upper Seaward Slope: Gradual slope to sixty-eighty feet, where zone Q starts. Mostly unexplored.

Q — Windward Reef, Outer Slope: Rough water, lots of coral and lots of sharks. Diving infrequent and area mostly unexplored. Fragments of ***Cypraea aurantium*** wash up on seaward beaches occasionally.

**Cypraea histrio and C. arabicula, for example, are not known from Kwajalein.*





The Other Shell Clubs

YEPPOON — The Keppel Bay Shell Club badge depicts a specimen of ***Voluta pulchra*** Sowerby, 1825, (top of col. two). This species was chosen because of its traditional association with Captain Cook and his voyages of exploration along the Great Barrier Reef and the Queensland Coast north of here. It is possible that the first specimens of the species came from Keppel Bay itself.

Unlike any other club I have encountered, the Keppel Bay Shell Club has its very own "official club specimen" of ***V. pulchra.*** Found and donated by Tom Nielsen, the shell bears a natural K in its markings.

The Keppel Bay club started in 1962 when some thirty residents of the Yeppoon-Imu Park-Rockhampton area met at the high school here. The volute emblem was adopted soon afterward and the present attractive badge was designed the following year. Membership has grown steadily to more than 400, many of whom live in other parts of Australia or overseas. The club publishes its own **Keppel Bay Tidings**, and it organizes an annual Shell Show that attracts exhibitors from all parts of Australia.

I believe that the K.B.S.C. is the only shell club in Australia with its own club house. It was bought and equipped through the fund-raising efforts of the local members, with some assistance by nonresident members. The project was financed entirely without resort to the club's general funds, and without using any money from dues. A shining example, indeed!

When the club decided to buy the derelict "Scout Hall" in 1971 it was in poor condition. Working bees were organized, with local members and any visitors joining in the extensive repair work. Each person contributed his own particular skill. The result today is an attractive, useful and unique headquarters.

Two successful shell conventions have been hosted by the Keppel Bay club at Yeppoon. Those of us who have been lucky enough to attend can easily see the reasons for the success of this club. It has a hard core of local members who are prepared to devote much time and effort to the benefit of the group. A team that can organize two shell conventions, catering to hundreds of visitors down to the last lunch for the offshore shelling trips, and without dissolving in hysterics, cannot be praised too highly!

The Keppel Bay Shell Club certainly is an organization to which anyone would be proud to belong.

Thora Whitehead

For much of the factual information of KBSC I am indebted to Club Secretary Ced Coucom and to Mrs. Blanche Boorman, the **Tidings** editor. Don Byrne kindly provided me with the photo of the club badge.

T.W.

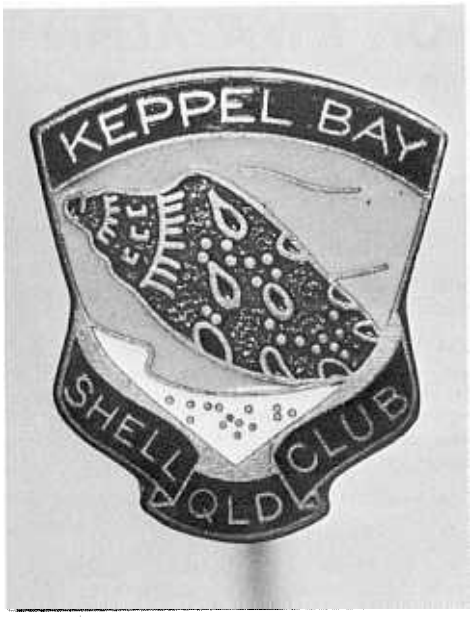


Photo: Don Byrne

Oahu Observations

Live ***Nassarius hirtus*** Kiener is one mollusk that has eluded me during my stay on Oahu. Dead shells I have found in fair quantities all around the island, usually crabbed and in fairly shallow water. There were some semifossilized ones in the ancient reef deposits at Barbers Point, several in the dredgings on Ford Island in Pearl Harbor, and a few in the high-rise diggings at Waikiki. But no live shells turned up. Then I took my mainland nephew, Jeff Randall, out to Magic Island to teach him how to snorkle.

Once a sheller, always a sheller. I just had to flip over a rock or two. Under one was a fine ***Cymatium pileare.*** Then, a few rocks later, my first live ***Nassarius hirtus.*** Elated, I dropped him into my goody bag. Out of habit, I glanced at the sand where the rock had lain, to find two more. Jackpot!

In a two-gallon observation aquarium at home, they were extremely active for about two days, after which they settled into a peaceful sleepy life, except when food was dropped into the tank. Then there was a startling transformation. With syphons extended and waving wildly, they would almost instantly start to track the food scents in the aquarium water currents.

Their exposed body coloration was much the same as their larger cousin, ***Nassarius papillosus:*** pale yellow, with random-size black spots scattered over all exposed parts, even the syphons and tentacles. The operc is very small — about one third the size needed to cover the aperture.

No matter how long you dive on Oahu, you can always find a new shell.

Bob Purtymun

OCTOBER MEETING

The Society's own Betsy Harrison-Gagne was the speaker at the October general meeting in the First United Methodist Church, Honolulu. Her topic was only slightly malacological, dealing primarily with botanical and ornithological research done by a group of UH students during the past two summers in the rain forest above Hana, on the island of Maui.

Her talk was accompanied by color slides that dramatically showed what life was like in the clouds.

The membership voted to adopt the revised Bylaws presented for consideration at the September meeting. The changes affect the election of officers for 1975, scheduled for the November meeting, and will be fully in effect from January 1, 1975.

CORRECTION

Don't blame Elmer Leehman for the illustration with his article on ***Conus milneedwardsi*** in the October HSN. The co-editor handed the wrong photo to the printer. It was ***C. bengalensis.*** Sorry about that!

About the Insert

This year, **Hawaiian Shell News** presents another reproduction of a fine malacological illustration of yesteryear.

It is from Kiener's **Iconographie Coquilles Vivantes** volume on the Turbinidae. The quality of workmanship of Kiener's artists and engravers was always high, and probably the most accurate portrayals of the subjects for that time period (1834-1879) came from his artists.

The original plate was somewhat smaller, and the reproduction has been enlarged to fit the format of **Hawaiian Shell News.** We hope you enjoy this special Aloha gift from us to you.

AMU Shelling Book

The American Malacological Union expects delivery soon of a new printing — with a new title — of its long-popular, **How to Study and Collect Shells.** Its contents cover fresh-water and land snails, as well as salt-water mollusks. Two new chapters have been added.

A notice from the AMU says the price has gone up to $2.50 a copy. To cushion the blow, however, the publishers will give generous discounts to organizations and local groups who want to order in lots of ten or more.

Write to Paul R. Jennewein, Corresponding Secretary, AMU, P. O. Box 394, Wrightsville Beach, N.C., 28480 for details.

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RECENT FINDS

by LYMAN HIGA

Harold Achtor, HMS member from Florida and Wisconsin, visiting Honolulu with his wife, went snorkelling on the Windward side of Oahu and found a live *Cypraea sulcidentata* and two *Conus pennaceus* in five feet of water at Punaluu Beach Park. Not bad for a man who only recently has overcome a heart condition that had vetoed activities of this sort!

On another day, Achtor went out with Jim and Ruth Fair and Ellis Cross for a day of deep-water dredging off Keehi Lagoon, Honolulu aboard Cross' **Joli-Jac.** They brought back a hatful of *Murex torrefactus* (mostly live) plus a number of not-yet-fully identified miters.

Raymond Estives is the latest to find a live *Murex elongatus.* He was diving in sixty feet off Makua, Leeward Oahu. Although still rare in Hawaii, *M. elongatus* has been found by a dozen or more divers in the past year.

Diving at fifty to sixty feet off the Halona Point Blowhole, Oahu — an area that is seldom accessible in small boats — HMS past president Wes Thorsson hit the jackpot for six large *Cypraea gaskoini.*

Kirk Miller has a candidate for a world record *Cypraea vitellus* with a 86.3mm giant found in two feet of water at Bishop Point, at the entrance to Pearl Harbor.

Sonny Takara found a sixteen-inch *Charonia tritonis* in eighty feet of water in Moanalua Bay, Honolulu. He reports it was in beautiful condition.

Cypraea semiplota Mighels, 1845 is one of Hawaii's endemic species. Dr. Burgess gives it a rarity rating of 8. Although it was once found fairly frequently, for the past thirty years it has seldom been found alive and even beach specimens have been rare. Recently, however, *C. semiplota* has reappeared. During the past summer a number of divers and snorkellers working in the murky water off Fort Kamehameha Reef, at the entrance to Pearl Harbor, were rewarded with more than a dozen live specimens, usually from about ten feet of water.

I have a report from Karen Yamada, of Honolulu, that she found a live *Cypraea margarita* while on a holiday at the Kona Diving Lodge, on the island of Hawaii. No details on habitat, etc. I understand the animal is thriving in a home aquarium, where its identity perhaps can be fully established. If it checks out, this will be a range extension, I believe.

A group of HMS diver-members spent a week in Maalaea Bay, Maui and on Molokini islet. Despite its traditional murk, Maalaea Bay was productive of large cowries — including nine *C. tessellata,* eight *C. chinensis,* two *C. talpa,* a very large *C. leviathan,* a fine *C. rashleighana,* and numerous *C. sulcidentata,* plus several uncommon endemic *Fusinus undatus,* the so-called Maui spindle. The party included Andy Butler, Dr. Martin Redlich, Olive Schoenberg, Stu Lillico, Gordon Damon, Graydon Wollaway, and Mike McEvitt.

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Conus victor follow-up

by ELMER G. LEEHMAN

Miss Renate Wittig of Bangkok reported last year on her successful search for the habitat of the extremely rare *Conus victor* Broderip, 1842 as well as suggesting the existence of two variations of this species (HSN, Dec. 1973). Her article gave the world its first well-documented information on the shell.

On a recent second trip to the same area, Miss Wittig found a few more live *C. victor* specimens, and made additional first-hand observations. She carefully preserved the animals found during this expedition. They have been submitted to *Conus* expert William E. Old, Jr. of the American Museum of Natural History in New York, for scientific study.

All the shells found on this expedition were of the golden variety. No animals of the darker type are presently available for comparison, but Miss Wittig has promised a further search.

When Old inspected the initial specimens sent him early in 1974 he theorized that the golden shells might be juveniles. Since that time, however, Miss Wittig and Ed Skinner, who accompanied her on the second search, have found full-size adult golden shells, as well as juvenile brown specimens.

In addition, they report, the dark shells are found exclusively near Bali, Indonesia, while the golden specimens come from nearly 500 miles to the south, directly north of Broome, Australia. At no time have the two color forms been found together.

Miss Wittig goes on to report that both variations have similar habitats, in sand pockets adjacent to living coral, often near colonies of lilac-color anemones and patches of eel grass. These shells usually bury themselves in the sand.

She also positively confirmed that *Conus victor* is venomous and must be handled with appropriate care.

SHELL GRADING STANDARDS IN ACTION

Two years ago, Elmer Leehman and Stuart Lillico began extensive research, attended numerous meetings and ground out reams of correspondence in an effort to devise a set of terse but descriptive universal shell grading standards. They published their proposals — which they call "Hawaiian Malacological Society International Shell Grading Standards" or HMS—ISGS, for short — in **Hawaiian Shell News** for July 1973.

This system has been accepted by collectors and dealers to a surprising degree. After more than a year of testing in use, no revisions of the basic plan have been seriously proposed.

"HMS—ISGS has well fulfilled the original purpose of making the same standard mean the same thing to everyone in the shell world," Leehman remarked recently. "Anyone who has not converted his ratings to the new system should do so at once.

"Bob Morrison, of the Morrison Gallery at Sarasota, Florida, has been enthusiastic from the outset. He told me that conscientious use of HMS—ISGS has cut his returns to virtually nil, permitted more concise price lists, and about eliminated correspondence regarding quality data. Both buyer and seller know exactly what is being offered, he said.

"Similarly, Kirk Anders, Ormond McGill, Art West and Joan Grace in Honolulu have expressed their satisfaction with the system. Previously, each dealer and collector had his own method of describing specimens. Dissatisfaction as well as confusion often resulted."

It was the uncertainty of meaning, along with complaints regarding such terms as "gem quality," that inspired the preparation of the HMS—ISGS in the first place.

As it does from time to time, **Hawaiian Shell News** takes this opportunity to reprint the standards. If they haven't already done so, readers may wish to cut out the list and paste it near their collection. (If you don't want to cut your HSN, Xerox the page!)

HMS INTERNATIONAL SHELL GRADING STANDARDS

GEM quality

A perfect specimen, with an unblemished spire, unbroken spines and lip without chips, fully adult and normally colored. A shell without a flaw. Well cleaned, both inside and out. Cowries must have original color and gloss. Bivalves must have both valves, properly matched and unbroken.

FINE quality

An adult shell with only minor flaws and with not more than one shallow growth mark. Must have original color and gloss. A cone may have a rough lip OR one small chip. The spire must be unblemished. A *Murex* may have not more than two minor frond breaks. No repairs — filed lips or mended knobs, for example — permitted.

GOOD quality

A reasonably acceptable shell, with a few defects such as growth marks, broken spines, worn spire, or lip chips. Minor fading of color permitted. Specimen may be slightly subadult. A good quality shell must faithfully display all the basic characteristics of the species.

FAIR quality

May be obviously dead or beach collected with chipped lips, faded color, growth faults or imperfect spires. This grade — comparable to the present "commercial" quality — is not acceptable for mail order retailing and should not be offered as collectors' specimens.

Standard symbols

W/O = with operculum

F/D = full data (area of origin, habitat, date and original collector)

B/D = basic data (less than full data)

WHAT HAWAIIAN SHELL SHORTAGE?

Midway in a week of scuba diving in Maalaea Bay, Maui, a group of Honolulu members of HMS (see Recent Finds on page 9) paused to sort their booty. On display is a jumbo-size *Cypraea talpa* (uncommon in Hawaii), eight *C. tessellata* (hard-to-find and valuable), two *C. chinensis* (rare in Hawaii), several *C. granulata* and some *C. gaskoini.*

Most of these were found in isolated coral (including spoil heaps from the dredging of Maalaea boat harbor a few years back) in forty to sixty feet of water.

The harbor is scheduled to be a port of call for the interisland hydrofoil service to begin service in 1975. In the past, the bay has been accessible only to yachtsmen and commercial fishermen.



Photo: Redlich

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PLANNING TO MOVE?

Advise the Society as early as possible, to reduce postage costs and avoid delay in delivery of Hawaiian Shell News.

CLAVUS MUREX
(Cont'd from Page 12)



Fig. 6. Lacy corrugations on outer lip, aperture incomplete.

fer to speculate that the animal is capable of performing the necessary removal of this obstruction by dissolving it or perhaps by using its radula.

The last photo, Fig. 9, illustrates a characteristic which I have repeatedly observed in ***P. elongatus,*** as well as in other species. The outer wing of the shell had suffered major damage. The animal, instead of repairing the damage by filling in the missing areas, simply constructed another wing immediately below the damaged one. Like a child who makes a mistake in the middle of a song, and can only recover by starting again at the beginning, the mollusc apparently cannot build part of a varix but must repeat the process from start to finish.

As I mentioned, most of the shells in this series appeared to be poor specimens. Indeed, they were in danger of being discarded before I appreciated their significance. Needless to say, they now form a prized display in my cabinet.

DUES REMINDER

This is your next-to-last issue — pay NOW for uninterrupted shell news for '75.

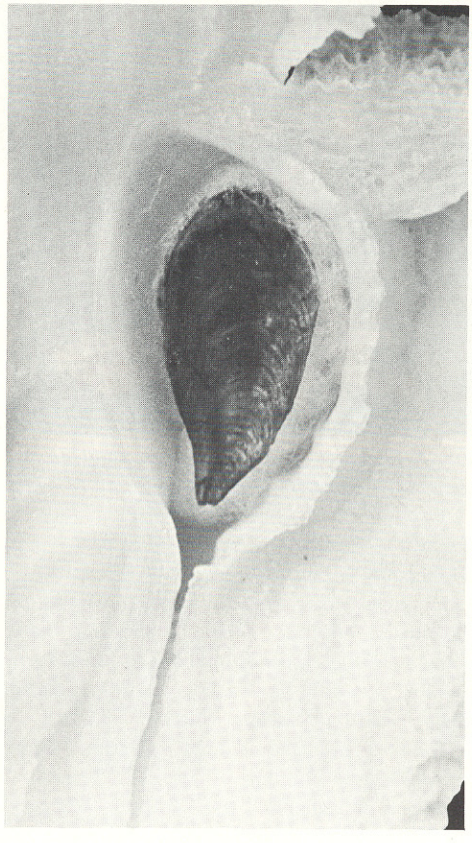


Fig. 7. Aperture complete.



Fig. 9. Damaged wing, showing new wing underneath.



Fig. 8. Partial removal of wing obstructing columnella extension.

Publication Review

CARD CATALOGUE OF WORLD-WIDE SHELLS. Pack No. 5 — Strombacea. Sally Diana Kaicher, ed., St. Petersburg, Fla. $3.25 per set (subject to change).

This newest section of Sally Ann Kaicher's innovative card file lives up to the quality of the previous packs. The black and white photos, of good quality, usually show more than one view of the shell. The smaller species have an actual-size photo; for the larger shells, the size is indicated in the descriptions. Key identification features are well covered. The nomenclature appears to be up-to-date, although one would wish that the year of description had been included with the authors' names.

I was especially pleased to find that the pack includes, in addition to Family Strombidae, the Aporrhaidae and Struthiolariidae — in short, all the Families of Superfamily Strombacea. I have not seen these latter two families covered **in toto** in any other publication. The ***Tibia, Varicospira, Terebellum*** and ***Lambis*** are included with their relatives, the ***Strombus.***

Ms. Kaicher is to be congratulated on this latest pack and, indeed, on the entire project. Not too many years ago a card file such as this on Strombacea would have been worth its weight in golden cowries to me. It is a pleasure to find it now available, doubly so since the cost is so reasonable.

Charles S. Wolfe

SOME NOTES ON THE ELEGANT CLAVUS MUREX

by CHARLES S. WOLFE

Among the many pleasant memories of my thirty-plus years with the U.S. Air Force, the recollection of my 1967-70 tour of duty in the Philippines, including almost a year at Mactan Air Base near Cebu City, stands out. So it was with great interest that I read Father Al Lopez's article, "A Visit With the Clavus King of Cebu," (HSN, May 1974). Like Father Lopez, I count Evaristo Zambo as a good friend and owe much to him and to other Filipino friends for fostering my interest in shells and collecting.

Father Lopez mentions the profusion of Muricid species native to the Mactan Island area. I can attest to the truth of his comments, having personally collected most of the species he names. One which eluded me, however, was ***Pterynotus elongatus*** (Solander in Lightfoot, 1786). This was especially frustrating since the Clavus (or Key) Murex, although found in most tropical Pacific areas, seems to have its population center at Mactan Island. I was simply never able to pinpoint the Clavus habitat. It may well be below the twenty-five feet or so which I was able to reach while snorkeling.

The Mactan Island ***P. elongatus,*** in addition to being less rare than elsewhere, attain the greatest size and beauty of form and color. Fr. Lopez mentioned white, lavender, brown, pink and orange. I would add yellow to the list, and of course the shell is found in many intermediate shades. All I have seen from other areas are white and seldom have the graceful perfection of form which most Mactan specimens show. Most Hawaiian specimens of ***P. elongatus,*** for example, seem poor country cousins to their beautiful Philippine counterparts.

I bought a good number of ***P. elongatus*** while in the Philippines, with the intent of using most for exchange later. Among the "seconds" in my purchases were some which had been collected in various stages of adding a new body whorl. These "seconds", put together in the proper order in a series, clearly illustrate the way in which ***P. elongatus*** grows. The series has been invaluable to me in understanding the growth process of other species as well.

An end view of ***P. elongatus*** (Fig. 1) shows there are three varices or wings to a whorl. Every wing is positioned slightly less than 360 degrees from the third preceding varix, thus giving a slightly twisted effect to the spire. This feature also tends to cause erosion of former varices, since they project slightly downward when the animal travels.

The first step in adding a new whorl is shown in Fig. 2. The columnella has been extended spirally around the axis of the shell. In the left center, the upper portion of a former wing is visible; it is apparent that the major lower portion of the wing had to be moved to permit extending the columnella. More on this later.

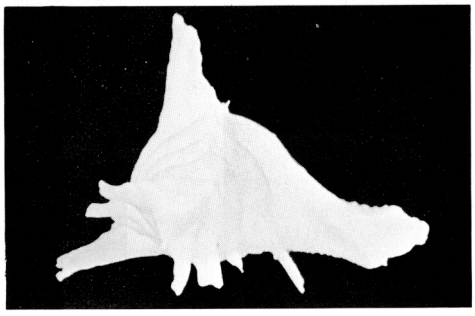


*Fig. 1. End view of **P. elongatus,** showing arrangement of varices, or "wings."*

The next phase of the process — extending the outside wall of the shell — is shown in Figs. 3 and 4. In Fig. 4, the animal has begun to turn the lip outward, having reached the proper angle from the previous wing.

The next three photos, Figs. 5, 6 and 7, show the process of building up the lacy "corrugations" on the expanded wing and the construction of a projecting lip around the aperture.

Perhaps the most interesting specimen of the series is shown in Fig. 8. In the foreground can be seen the beginning buildup of the outer shell wall. A former wing is in the background, and it is apparent that the visible lower portion of this wing must be removed before the animal can curl the columnella around the axis. As a matter of fact, a large part of the center of the wing is already missing. This could have occurred accidentally during collecting or cleaning, but I pre-

(Cont'd on Page 11)



Fig. 2. First step in growth process, extension of columnella.



Fig. 3. Buildup of body wall.



Fig. 4. Beginning of wing construction, turning outer lip outward.



Fig. 5. Strengthening outer lip.

