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Texas

# CONCHOLOGIST

VOLUME XV NO. 1

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The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas. It is distributed as part of the dues to all members.

The Society holds regular meetings the fourth Wednesdays of the following months: August, September, October, January, February, March, April and May. The meeting is held the third Wednesday in November. Meetings are held at the Houston Museum of Natural Science, Caroline Street in Hermann Park, beginning at 7:30 p.m.

The TEXAS CONCHOLOGIST is published October, January, April and July. It is mailed postpaid to regular members in U.S. postal zones. Overseas members will be charged additional postage. Only one copy will be mailed a family membership.

Dues extend from the beginning of the fiscal year of June 1 through May 31. However, the July issue of the TEXAS CONCHOLOGIST each year is the fourth quarterly due on the regular dues year beginning June 1 of the previous year. Memberships will be accepted throughout the year but will receive the quarterlies of that fiscal year. Members receive meeting Newsletters and have all other privileges provided by the Society's by-laws.

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The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the Editor. Manuscripts should be typed, double spaced and should be in the hands of the Editor the first day of the month preceding publication dates. Photos accompanying such material are welcomed.

FROM THE EDITOR

Beginning with this issue, the Texas Conchologist will be published quarterly the months of October, January, April, and July. We request that copy be in the hands of the Editor by the first day of the preceding month of publication.

We hope that you like some of the changes in format. There will probably be more improvements from time to time as we develop the possibilities of new style due to the change in printer.

We are very happy to acknowledge the addition of a new staff member, Herschel Sands, who has been instrumental in securing the services of a new printer. Publishing the Texas Conchologist will not cost the society more because we are able to have the publication printed by a non-profit organization. Herschel has helped to plan the new cover and has been, and will continue, serving as our typist so that our material is uniformly presented for offset printing.

We are open to suggestions for new features for our quarterly. We solicit your short or long articles about your observations of Texas mollusks or your adventures elsewhere. Suggestions on cleaning, housing, studying, or finding mollusks are welcome.

Constance E. Boone

SOMETHING NEW FOR YOU

The Houston Conchology Society has adopted the Epitonium angulatum (Say, 1830) as its official seashell, and we have incorporated it into our new logo, patch and name tag. Patches and name tags are available thru Herschel S. Sands, 8902 Cadawac Road, Houston, Texas 77074, phone number (713) 772-6613 (evenings), or (713) 790-4511 (Monday thru Friday, 8:00 A.M. to 5:00 P.M.). The patch is \$2.00 and the name tag is \$5.00.

If you live out of the city, Herschel will be happy to mail your order to you, otherwise the order will be delivered to the next regular meeting.

Don't delay - order today!!!

## SEARCH AND SEIZURE

By Constance E. Boone

Our new logo, developed from the design from the society's new patch available now to members, finally puts us in the category of shell clubs represented by specific shells.

Epitonium angulatum was chosen after discussion at a board meeting last year where it became evident that several shells we might have selected were already firmly in use by other clubs. The Galveston Shell Club uses the left-handed whelk, Busycon perversum, so do the San Antonio Shell Club and a Florida shell club. Murex fulvescens is used by a club and is the well-known figure on Mildred Tate's stationery. The Coastal Bend Shell Club of Corpus Christi, Texas, uses Amaea mitchelli, a much-prized epitonid named for an early Texas collector.

The board thought about various bivalves. Helmer Odé would like us to use a bivalve! However, at present we have featured a bivalve, Tellina alternata, on our membership cards, and since there is some discussion about this species and another species or subspecies, T. tayloriana, mingled in our area, it seemed unwise to choose this complex. Actually, we seemed to want something to look good on the patch and on our new membership name tags, and we ended up choosing Epitonium angulatum which is a beautiful, glossy white, one-inch staircase or wentletrap shell that can be found up and down the Texas coast, sometimes in great numbers.

I have never thought there was much of a problem about identifying E. angulatum according to the literature. Now, for me anyway, I have "opened up a can of worms". Thomas Say, often called the "father of American malacology", was the author of many of our common land, freshwater and marine shells, including this species. William J. Clench and Ruth D. Turner monographed Epitoniums, and Number 30 of Johnsonia discusses the synonymy and history of this species. Say's type specimen was unknown when the monograph was written, and I have not heard that a type specimen has been located.

Using the Johnsonia Monograph, I reviewed the synonymy of E. angulatum. It follows:

- "Scalaria clathrus angulata Say 1830  
American Conchology, #3, pl. 27, two upper figures  
(South coast of the United States.)
- Scalaria turbinata Conrad 1837, Journal Academy Natural Sciences Philadelphia #7, p. 263, pl. 20, fig. 26  
(near Beaufort, North Carolina).
- Scala angulata Say, Pilsbry 1890, Nautilus #3, p. 106."

What could I find out by reading about this species in the literature available to me?

In Johnsonia, Dr. Clench and Dr. Turner restricted the type locality to Charleston, South Carolina, an area from which they said Say had received much material. They said the range was from Long Island to Florida (but not the Keys) and to Texas. Dr. Tucker Abbott in 1974's edition of American Seashells adds that Rios lists this species from Brazil.

O.K., I have no type to compare our specimens with. I have many modern pictures. What can I learn from the early descriptions and figures I can see here. I do not have Say's original material, but I am able to read

Say's original discussion in Binney's compilation of the "complete writings of Thomas Say on the conchology of the United States". The plates were printed from the original coppers of American Conchology. Here, I note the first mystery for me. Johnsonia, and Abbott, 1974, both list this species as (Say, 1830). The Binney edition lists Say's description of variety c which is angulata as September, 1831, of Part III of American Conchology.

Say's plate with two figures in Binney's edition looks like our angulatum. Most professionals have thought so too.

Say described this variety c of Scalaria clathrus, a European edipitoid, as conic, turreted, imperforate, white, immaculate, whorls 6 to 11 touching each other only by the ribs and with very narrow intervals; nine ribs to each evolution with the ribs prominent, simple, a little oblique, somewhat recurved and with a more or less obvious, obtuse angle or shoulder above near the suture. Aperture oval-orbicular; base a little angulated; labium distinct; length  $3/5$ ths to  $9/10$ th of an inch.

Say observed that the European specimens of S. clathrus were often colored and even spotted and banded sometimes but that they didn't have obvious angles or shoulders on the ribs near the suture. He said he had been led to describe the American epitoid species under the name angulata (did he do this in 1830, maybe, that I don't know about?) but that he now wished to make it a variety of clathrus with the name angulata because our epitoid was so variable and he had decided it was a form of clathrus. Or so I interpret this.

I probably wouldn't have thought much about going into more synonymy except for the fact that the modern literature always seems to point out that this species of ours should not be confused with Epitonium humphreysii, a similar species authored by Kiener in 1838 in Iconographie des Coquilles Vivantes 10, p. 15, pl. 5, fig. 16 (Atlantic Ocean to South of Carolina), a work not available to me. That started me on the synonymy of this species. Sowerby in Thesaurus Conchyliorum I, pl. 86, pl. 32, fig. 5, 1847, lists S. angulata Say and synonymizes S. humphreysii Kiener with angulata. The plate of angulata is a good figure of what we think of as angulatum.

Next I went to Pilsbry's discussion on Scala angulata Say, in Nautilus #3, p. 106. Pilsbry gave Dall credit for separating Say's clathrus material in the U.S. into two species, saying that Dall had been correct in thinking the smaller, more slender, less angulated form was separate. However, he said that Dall's name of Scala sayana for this second form could not be used since this was the true S. humphreysii of Kiener described and figured many years before 1889.

Next I reread Dall's material on Epitoniums in my Blake report "reprint", Bulletin of Museum of Comparative Zoology 18, p. 309. Dall did not make Scala sayana a new species but simply was naming one form of Say's clathrus, it seems to me. I have reread that first paragraph under S. sayana over and over. It seems to me that Dall was synonymizing S. humphreysii Kiener and Conrad's S. turbinata both under Say's angulata. Dall was describing what he saw as the typical clathrus of Say which he said had not been named. He said his S. sayana was more slender and more delicate than the European "clathrus" (which he said was S. communis) and that there was a

deeper notch where the varices of one whorl joined those of the preceding whorl, that there was a longer curve which combined the varices around the spire, and that there was no prolongation of the anterior margin of the lip which he said was a marked feature of S. communis of Europe. Dall said his lots of S. sayana included some Epitoniums from Corpus Christi, Texas.

Now I would really like to know what Kiener's description said and what his figure was like, and I am anxious to see some of the specimens which Dall called S. sayana.

Kiener's shells were evidently finally deposited in the Museum d'Histoire Naturelle de Geneve, Switzerland. Have these been checked out to see that the original specimens of E. humphreysii Kiener are still intact and authentic? The picture of Epitonium humphreysii sent to Dr. Clench from the Swiss museum and published in Johnsonia is puzzling to me because the specimens really don't look like the species we separate as E. humphreysii today. Were Kiener's specimens some of the variable E. angulatum?

There are two species, it seems, that have been confused by collectors through the years and were originally confused by authorities doing the naming of the species. You could make a lot of "varieties" from E. angulatum. Professionals have been handed a large lot of Epitoniums from beach collections and one day they would name them all E. angulatum. Several days later they would be handed the same lot and would name them all E. humphreysii.

Some of our common beach batches of E. angulatum exhibit specimens with strong costae and some that are more slender, some that have no angles.

Dall did not publish a figure for his S. sayana in the report on the Blake Gastropoda (MCS Bulletin 18) but in the U.S. National Bulletin #37, plate 50, figure 10 is supposed to represent his S. sayana. The curious part of this is that this is the exact figure, it seems to me, that appears in Binney's edition of Dr. Gould's Report on the Invertebrata of Massachusetts, p. 312, where the figure was used for S. lineata Say, a different species altogether (now known as E. rupicolum). The figure is of a more slender, less-angled Epitonium and the ribs seem heavier. I do not know what Epitonium actually was used by Binney when he had an artist do the figure for use in his edition of Gould's report. Dall remarked on Binney's error for this figure and said it was like his S. sayana.

I have come to know E. humphreysii as smaller, duller white, sometimes even silky-clothlike, often with stout, "rolled" costae with some angles at the shoulders. The shells we have been led to believe are E. humphreysii are shells we find in the bay or near passes like San Luis Pass, Galveston, Texas, and the ship channel near the Coast Guard Station at South Padre Island, Texas. I have seen and have specimens from the East coast that agree with my understanding of this species. Collectors there send these kind of specimens to me as E. humphreysii. There is a consistency of thickness of the costae, never bladelike in look. While I would have once tried to pick out E. humphreysii from beach collections of Epitoniums, I now would not confuse humphreysii specimens with the

shinier, usually more globose, sharper costae E. angulatum I find along our coast. The whole batches washing in several times at Matagorda, for instance, when I picked up hundreds live, were E. angulatum, variable but still E. angulatum. Although there were some other species in these bountiful harvests, I would not pick out humphreysii from those live batches.

Even when very young, the two species I find can be determined. The puzzle in my mind is the question whether what I am determining here is E. humphreysii is what was named the second species years ago. Were they all part of E. angulatum? Someday I'd like to really investigate this by seeing the early collections and the original literature and figures. You see, humphreysii often, to me, has angles, almost right angles; the angles are certainly more obtuse in angulatum. They are thick and not sharp for humphreysii, often sharp and thin for angulatum.

This has been an exercise in study. I can't settle the questions I have at this time. But I shall certainly continue to collect Epitoniums, preserve them, offer them to professionals who wish to study them. Someday some new study will help solve the problems.

Meanwhile, I promise to help every club member collect the society's shell, E. angulatum, and maybe even E. humphreysii! Next time you see me fall behind on the sand bars on a field trip at San Luis Pass and carefully examine each tiny trail you may be sure I'm looking for Epitoniums! I may even growl at you if you tramp down these trails!



Epitonium clathrus Linné.

Drawn from one-inch specimen  
in author's collection.



## 'SCOPING THE MEMBERS

By Tina Petway

Recently I learned that a number of you were under the impression that this series of articles was discussing Microscopes. We are not discussing microscopes; we are taking a close look at the people who make up the membership of the Houston Conchology Society. As you use a microscope to discover details of a shell, so this series' purpose is to help you discover details about each other so we know each other better. Therefore, we have changed our title.

In 1973, Ruby McConnell became an active member of H.C.S. She began her shelling interests while walking Galveston's beaches with her late husband, Bill Ray. They picked up live olives and large cardiums and wondered how to find out more about them. So Ruby called the Public Library and they said to call the Houston Museum of Natural Science. She found out there was a shell club and attended one of our shell shows at a local shopping mall, met some of our group and decided to join H.C.S. While on a field trip to Christmas Bay Connie Boone showed Margie Woods and her how to dig angel wings. After that experience she became an avid self-collector of shells.

Ruby began working with Dr. Helmer Odé in 1973 by typing his notes on the Northwest Gulf Survey. She continued in this capacity until a year ago when she moved to Austin, Texas. Ruby has also served as Field Trip Vice-President, was on the Board of Directors and was Corresponding Secretary for two years.

Ruby mainly collects Murex and Epitoniums and loves going through bushels of shell dredgings. She is married to Tom McConnell who is a Chemical Engineer in research at Jefferson Chemical in Austin. Since moving to Austin, Ruby has also become interested in fresh water clams and in fossils. Tom is interested in photography and fish, and Ruby is sure to get him interested in shells. Read her article on shelling at a Washington oyster farm this issue.

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About seven years ago Rosemary Habermacher was bitten by the "Shell Bug". For years she had picked up shells from Sargent Beach where her parents had a house near by. Then about the same time in 1971 two things occurred which developed a serious interest in shells. A friend of hers, Mary Myers, showed her some shells she had bought. And seeing them, plus the fact that I had recently married her brother Frank whom I had also gotten interested in shells, Rosemary became a serious collector. Shelling has been a family affair for us all ever since.

Rosemary's husband, Steve, is an accomplished musician on accordian, organ and piano, and is a real estate broker. Steve also loves sailing and outdoor activities. They have a son Paul, 13, and a daughter Rosemary who is 7.

Rosemary's special favorites are in the Cypraea, Murex and Cone families and bivalves in general. She enjoys showing her shells at competitive shell shows. Her exhibits have won numerous awards. Among them are Best of Class - Cypraea, Best of Class - Murex, Best of Division Trophy for a display of dredged material, plus two Shell of the Show Trophies and many Blue Ribbons.

Some of Rosemary's other hobbies include painting, needlepoint and reading which she manages to do while she isn't working with her shells. She would also be interested in trading shells with someone who shares her interests in shells.

DID YOU KNOW.....

By Herschel S. Sands

.....in late 19th century London Marcus Samuel owned the "Shell Shop" and also operated an oil transporting business? One of the specialties of his shop was boxes ornately decorated with tropical seashells. these boxes and those interesting shadow box pictures of shell flowers were very popular with the Victorians. He eventually merged his oil transport business with other companies in 1897 to form the oil complex we know today as SHELL. As a reminder of its humble beginnings, the scallop shell was adopted as its trademark.

Strange Stories, Amazing Facts, Reader's Digest Association, Inc., 1978.

.....the word "beachcomer" had its origin in America to denote a long wave rolling in from the Pacific Ocean?

The Seashore and Its Wildlife, Robert Burton, 1977.

.....by legal definition, "flotsom" means strictly floating wreckage, and "jetsom" is goods thrown over board from ships in distress to lighten their loads?

The Seashore and Its Wildlife, Robert Burton, 1977.

.....Sea hares are generally regarded as having relatively few predators due to their effective dye-release mechanisms? This protective device is of little consequence to the bailer shell, however, for it feeds voraciously on large species of sea hares of the genera Aplysia and Dolabella.

Sea Frontiers, Vol. 21, No. 6, 1975.

.....Pleurotomaria (slit shell) is one of the most ancient genera of molluscs, dating back to the Ordovician period, over 500 million years ago?

Color Treasury of Sea Shells, 1973.

Washington state accounts for approximately 10% of total U.S. production in commercial oysters and is the leading producer on the Pacific coast. The primary production method is cultivation of the small native Olympia oyster Ostrea lurida and the Japanese or Pacific oyster Crassostrea gigas, the latter being the more extensively cultivated species.

The majority of production comes from intensive cultivation on intertidal lands, presenting a highly developed aquaculture system paralleling agriculture in that oysters are "seeded", "cultivated" and "harvested".

There are several types of common pests and predators that can damage oysters, one of which is the oyster drill. The Japanese oyster drill, Ceratostoma inornatum (syn. Ocenebra japonica) was imported from Japan with the first planting of Japanese oyster seed in Samish Bay, Washington and has become established in about 18 areas in the state.

The C. inornatum does damage by drilling a small hole in the shell and then eating the oyster. Oysters are usually left on the growing grounds for two to three years and during this time, as we were told by one owner, the drills are capable of eating upwards to 90% of the seed oyster. Needless to say, the owner is anxious to get these pests under control, if not completely eradicated. Farmers have even tried putting them on the food market with some success.

While vacationing in Olympia, Washington, my desire to collect live C. inornatum led me to Ellison Oyster Farm located on Mud Bay, Puget Sound. We were afraid the farm would be closed since it was a Sunday, but we drove by anyway. Luck prevailed. The owner was there preparing oysters for shucking Monday morning. We didn't know just how lucky we actually were until he explained that under normal circumstances the farm is closed on Mondays, too. The pile of oysters which he was loading into a lift to be elevated to the shucking house could not be held over until Tuesday morning because of prolonged exposure to the abnormal heat. The day before it was 99° in Olympia ---- a new record. When we explained our reason for being there, he very kindly gave us a "ground" tour and pointed out areas in which we could collect.

Working against a 19' incoming tide, we found a few live Nucella lamellosa at the base of a normally submerged wire cage that had tiny oysters growing on it. Popping up in the shelly mud were Clinocardium nuttallii and as yet, some unidentified arks. Over at the mound of oysters being readied for shucking, we found live C. inornatum. The only source of protection for them from the hot sun and drying air were the oysters. By turning the oysters over and checking the moist mud below them, the C. inornatum were exposed to our searching eyes. In less than an hour, we found 48 live C. inornatum, 5 Nucella lamellosa, a good many Crepidulas and a few limpets all of which were readily collected.

Time and tide did not permit a satisfyingly thorough search of the farm. Our curiosities were only whetted and some day I'd like to return.

Many of the tidelands and most of the oyster lands are privately owned and are not open to the general public. People wishing to collect

oysters or other shell fish should double check to determine that they are actually on public beach areas. Information regarding the taking of shell fish and a guide to public shell fish sites may be requested from the State of Washington, Dept. of Fisheries, Room 115, General Administration Bldg., Olympia, WA 98504. Be sure to also ask for their recipe book on shell fish.

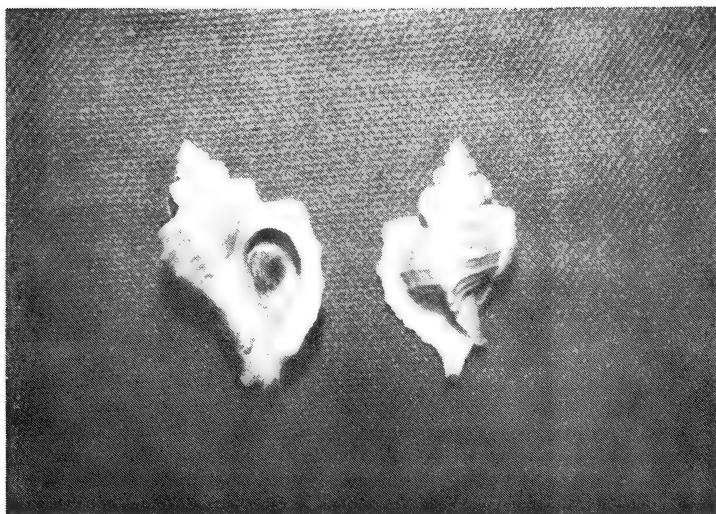


Fig. 1 Ceratostoma inornatum (Recluz, 1851) collected by Ruby McConnell in the mud near oysters at Ellison Oyster Farm, -2.' tide, at Olympia, Washington, July 23, 1978. This species has been introduced to the Puget Sound area together with Japanese oysters. Measurements are 42 mm. length, 25 mm. width, and 37 mm. length and 22 mm. width. (photo by Constance Boone)

## DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN

## THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph)

FAMILY ARCIDAEGenus Anadara continued:265. Anadara (Caloosarca) catasarca Dall, 1898.

Scapharca (Anadara) catasarca Dall, Tr. W. Free Inst. Sci., Vol. 3, pt. 4, p. 654, pl. 32, fig. 20, see also ref. 238. Although there is only a single lot of this strikingly different species present in the collection of the H.M.N.S., there is some evidence that this species may still live in the Western Gulf of Mexico. Our two valves were dredged on Clay Pile Dome, a Miocene shale uplift off the Louisiana coast. One valve is large (54 mm.) the other small (9 mm.) and quite characteristic for Caloosarca. This smaller valve looks fresh and shows color spots especially on the auricle. They remind one strongly of the color pattern on recent Anadara transversa.

About 10 years ago I saw a valve similar to the large one obtained off the Mexican coast (near Vera Cruz). I suspect that more collecting will bring to light more evidence of this interesting species in the Western Gulf of Mexico where it probably survives to this day.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 1 lot, no live material.

Depth Range: 100 feet, on Miocene shale uplift, mud bottom.

Geographical Range: Only known as Plio-Pleistocene fossil from Florida.

Maximum Size: 54 mm.

Eastern Pacific Analogue: None.

Genus Bathyarca Kobelt, 1891.

Small orbicular bivalves with fine radial sculpture.

266. Bathyarca cf. orbiculata (Dall, 1881).

Arca pectunculoides orbiculata Dall, B.M.C.Z. Vol. 9 (2) p. 121; figure B.M.C.Z. Vol. 12 (6), p. 240, pl. 8, fig. 5.

This small arcid is probably widespread on deep mud bottoms in offshore waters off Texas and Louisiana. It is small, 2.5 mm. in size, very inflated and somewhat skew in outline. Its radial sculpture, which near the umbo is rather cancellate, carries in some specimens almost scabrous beads close to the margin.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 13, lots, none alive.

Depth Range: 63-222 fms.

Geographical Range: Large parts of the Atlantic and Pacific Ocean.

Maximum Size: 2.4 mm.

Eastern Pacific Analogue: Also lives in the Panamanian faunal province. Keen reported it as B. nucleata (Dall, 1906) which on page 303 she synonymized with C. orbiculata (Dall, 1881). According to Abbott, 1974, there are many other synonyms.

Genus Bentharca Verrill and Bush, 1898.

Close to Bathyarca, but more elongate. Teeth not separated into two groups.

267. Bentharca spec. indet. A.

Only two lots of this minute species are present in the H.M.N.S. collection. Under the microscope the small valves show a fine cancellate sculpture. In shape these valves resemble somewhat B. culebrensis Smith, 1885, which Abbott, 1974, puts in synonymy with B. asperula (Dall, 1811), but the shape is less skew and the valves are much more inflated. Probably the species is undescribed. I am sure they are not juveniles, but full grown valves.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 2 lots, one of which contains live collected material.

Depth Range: 50-63 fms., alive at 63 fms.

Geographical Range: Unknown.

Eastern Pacific Analogue: None.

268. Bentharca spec. indet. B.

Of this very deep water species only a single juvenile (?) valve is in the H.M.N.S. collection. It is rather flat and practically without any sculpture, but is smooth and shiny, quite unusual for an arc. More material is needed before it can be evaluated properly. Its shape is slightly skew with a shortened anterior.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: One lot, none alive.

Depth Range: 720 fms. off the Mississippi Delta.

Geographical Range: Unknown.

Maximum Size: 3.3 mm.

Eastern Pacific Analogue: None.

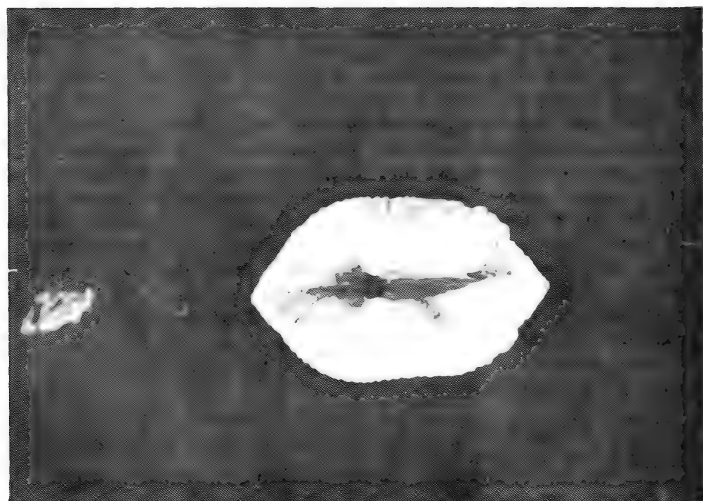
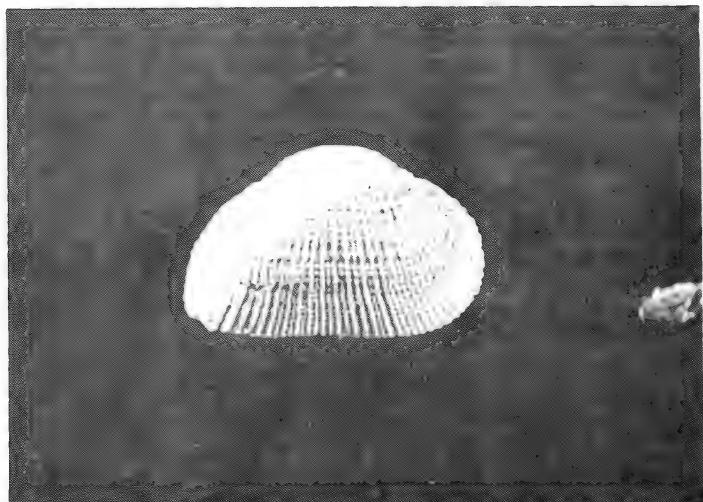
Genus Arcopsis von Koenen, 1885.

Small, rather square and inflated arcids, with strong surface sculpture. Ligament small, beneath the umbo.

269. Arcopsis adamsi (Dall, 1886).

I believe that Newell (1969, treatise) is correct in assigning this species to the Noetiidae, because there are several characters in which A. adamsi is similar to Noetia apart from the striated ligament: 1) the thickened pads for muscular attachment, which are white; 2) the shape of some juveniles which in spite of prosogyrous beaks are reminiscent of Noetia.

This species is enormously variable and A. conradiana Dall is



Figs. 2 and 3 Arcopsis adamsi, a 12 mm. long specimen collected August 22, 1966, by divers Geis and Pierce, from 12 fms. at Buoy #1, Heald' Bank area called Seven Sisters. Taken from debris of rock outcrop at the location 30 miles SE of Galveston, Texas.

merely an elongated form without significance. As is usual, deep water specimens tend to be much coarser in sculpture than specimens from shallow water. The species is rare on the beach mostly carried ashore by whipcoral (St. Joseph Island, South Padre Island), but widespread over the Pleistocene rockridges, Miocene shale uplifts and coral reefs and rough shell bottoms.

Previous records for the Texas faunal province are: 45, Gilbert well No. 10, Bateson, Hardin County, Texas at 323 (?) feet; 137, off East Texas in 70 feet of water, pl. 9, fig. 2; 147, (with A. conradiana Dall, 1886) alive at Baker Bank, dead at Big Southern Bank and alive at West Flower Garden; 156, common on Stetson Bank; 170, transitional shelf assemblage off East Texas; 192, (Yucatan), pl. 9, fig. 8.

Records H.M.N.S.: 52 lots, of which 20 contain live collected material.

Depth Range: 0-70 fms.; alive 5-55 fms.

Maximum Size: 14.0 mm.

Geographical Range: North Carolina, Florida, Texas to Brazil, Bermuda (Abbott, 1974).

Eastern Pacific Analogue: Arcopsis solida (Sowerby, 1833) from the West Coast of Baja California and the Gulf of California to Paita, Peru (Keen, 1971).

#### FAMILY CUCULLAEIDAE Stewart, 1930

See for analysis Newell in Treat. Invert. Pal., Part N. Vol. 1, p. 259-260. It is a surprise to find a representative of this family in deep water off the Texas Coast. A sketch of the minute valve is shown below. Most characteristic is the almost split hinge plate, each part having 3 horizontal teeth. The outer shell is smooth. I am unable to assign the species to a particular genus, and it very well could be placed in

a new genus. Until more material is obtained it seems best only to note its presence in deep water. The size is quite minute, .9 mm., and until more material is obtained it might merely be a juvenile of a larger species. Under favorable light there is the impression that there are faint radial striae.



270. For the time being I shall refer to this species as Cucullaea spec. indet. A.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: One lot of one valve.

Depth Range: 500 fms. off the Texas Coast in mud (27°24'-94°18').

Geographical Range: Unknown.

Maximum Size: .9 mm.

Eastern Pacific Analogue: None.

Most authors regard this family as a subfamily of the Arcidae, but in several respects its members are different especially in the shape of the juvenile shells. Further criteria are the lack of a byssal gulf and the presence of a vertically striated ligament. In the N.W. Gulf of Mexico only a single species. Sources: Keen, 1971, Sea Shells of Tropical West America; N. D. Newell, Treat. Invert. Pal., Vol N, Part I, p. 261; McNeil and Stearns, 1938, U.S.G.S. Prof. Paper 189A.

Genus Noetia Gray, 1857.

It is customary to assign the only species in our region to the subgenus Eontia McNeil, 1938. This subgenus is more inflated and has coarse bifurcating costae, instead of simple costae as in Noetia s.s.

271. Noetia (Eontia) ponderosa (Say, 1822).

I find the taxonomy of this species quite confusing. Whether one wants to consider the Noetiidae as a separate family or lower its rank to a subfamily in the Arcidae is here considered a point of minor importance. What concerns us rather is the relation of the several genera or subgenera. The subgenera listed by Keen for the Panamanian fauna are Noetia s.s., Eontia and Sheldonella - which on paper may seem different enough, are in application of the criteria difficult to separate. Especially Sheldonella (Keen, 1971, fig. 103) is precisely shaped like a juvenile specimen (3-6 mm.) of Noetia ponderosa of which there are hundreds in the H.M.N.S. collection. Unless I am completely mistaken in the shape of juvenile Noetia ponderosa there is no doubt that N. ponderosa goes through a "Sheldonella" stage. This fact alone is sufficient justification for the placement of Noetia in a separate family. Next there is some uncertainty about the criteria which separate Noetia and Eontia. Keen, in her account of the Panamanian fauna presents as Eontia a species which does not appear in the least related to Noetia ponderosa. Finally, there exists a curious correspondence between the two Noetia s.s. species of the Panamanian fauna and two morphs of Noetia ponderosa on Texas beaches. The account of several so called Pleistocene species described by McNeil in a U.S.G.S. professional paper does not clarify the situation.

Noetia ponderosa is one of the most widespread bivalve species along the Texas and Louisiana coasts, often taken alive from beach drift after rough seas. The species also lives in the saline bays (Galveston West Bay, Matagorda Bay, Corpus Christi Bay, Laguna Madre) near the inlets. Off shore it lives to a depth of 25 fms. on mud bottoms and Pleistocene rock ridges (commonly only to 10-15 fms.). Thus the species lives somewhat deeper but goes less far into the bays than Lunarca ovalis, but in general both species often live together.

Full grown Noetia has typically raised platforms for muscular attachment.



Along some beaches (Sargent, Matagorda, South Padre Island) enormously massive and large old specimens are found reaching a size of 72 mm. In contrast the largest live collected material in the H.M.N.S. collection is 55 mm., and are much less massive in structure. These large specimens are undoubtedly Pleistocene in origin and I doubt that the species still reaches this state. It is noteworthy that these Pleistocene (?) shells correspond quite well with the Panamanian Noetia magna McNeil, 1938. The subspecies macneili Olsson and Harbeson, 1953, is apparently a thinner shell and may be still another morph. In contrast in offshore dredgings occasionally a rather small compact morph is found which on first sight could be taken for a different species. It appears to me that also N. palmarae McNeil, 1938, and N. veroensis McNeil, 1938, are merely morphs of Noetia ponderosa (Say, 1822). For the time being and until convincing proof to the contrary is obtained all these different morphs are considered here a single species, Noetia ponderosa (Say, 1822).

Previous records for the Texas faunal province are: 1, Galveston; 7, listed; 15, Corpus Christi and Galveston; 18, Galveston and Corpus Christi; 21, listed; 45, Point au Fer (Louisiana), Galveston, Corpus Christi, var. carolinensis Conrad in Galveston artesian well at 2552-2871 feet; 61, Rockport area and islands; 62, listed for Mustang and Padre Islands; 66, Marine Pleistocene of Texas; 67, Port Isabel; 69, listed in appendix 8, p. 54, a common species; 98, listed for bays, also beach Padre Island; 110, common on all Texas beaches, pl. 6, figs. 9-10; 123, along edge of Sabine Bank; 126, outer sandy beaches and near shore sandy areas of Carolinian Province; 135, alive in Gulf, dead in bays; 136, dead on East Texas beach, alive at 40 feet on Sabine Bank; 145, inlets, shallow shelf, all dead, pl. 5, figs. 14A-B; 146, old shelf, pl. 4, fig. 24; 156, Stetson Bank, appendix 3; 160, Matagorda Bay, dead at several, alive at one location; 164, in Rockport area alive in inlet influenced bays; 170, listed for transitional shelf assemblage; 174, listed; 206, beach records, Tex. Conchol., Vol. 9, p. 176; 225, Galveston; 236, Galveston; 253, rarely found alive in Gulf bottom samples, single valve and pairs uncommon in bottom sediments (off reef near Padre Island); 261, listed for offshore waters, Galveston; 266, Padre Island; 269, figured on page 155.

Records H.M.N.S.: 101 lots, of which 34 contain live collected material

Depth Range: 0-37 fms.; alive 0-26 fms. (Usual 0-12 fms.).

Geographical Range: Virginia to Florida and to Texas (Abbott, 1974).

Maximum Size: 72 mm. (alive 55 mm.).

Eastern Pacific Analogue: Apparently none close but I suspect that both species of Noetia s.s. (i.e., magna and reversa) are much closer to N. ponderosa than is hitherto assumed.

Remarks: References to other species are:

15, Arca indica Gmelin, "several single valves were found at Galveston" (Note: probably misidentified).

170, Anadara hemidesma (sic) Philippi, alive in deep shelf assemblage, plate 9, fig. 3. Probably immature A. baughmani, although A. hemidesmos may be the valid name for that species.

7, Bentharca asperula Dall, 1881, listed for deep water.

170, Bentharca sagrinata Dall, figured on pl. 11, fig. 4 for a specimen obtained off East Texas.

SUPERFAMILY LIMOPSACEA

FAMILY LIMOPSIDAE

Rather small, oblique, often thick shelled bivalves, which, when collected alive, are covered by tufted periostracum.

Sources: Newell, N.D., in Treat. Invert. Pal., Vol. N, p. 264-267, 1969.

Abbott, p. 425-426, 1974.

Genus Limopsis Sassi, 1827.

In the Treat. of Invert. Pal., the genus Limopsis is divided into two subgenera, Limopsis Sassi, without radial sculpture and smooth inner margins, and Pectunculina d'Orbigny, with radial sculpture and crenate inner margins. Both subgenera are present in our material. In addition there is a species which probably should be placed elsewhere (L. antillensis Dall), and, finally, there are some small shells which cannot be placed until more material has been collected.

272. Limopsis antillensis Dall, 1881.

Limopsis antillensis Dall, B.M.C.S., Vol. 9 (2), p. 119.

This small species may not be a Limopsis as suggested by Abbott, but may belong in the Philobryidae (close to Cratis Hedley, 1914). I fail however to see the festoon like ridge around the prodissoconch in juvenile material. It is certain that this species should not be classified as a Limopsis, because the topology of the hinge is different from other species in that genus. Also, a small percentage of valve is colored rose or yellow, and live specimens have a periostracum very much like Limopsis.

Previous records for the Texas faunal province are: 170, deep shelf assemblage off East Texas, pl. 16, fig. 4; 175, listed for upper Continental Slope, 65-600 fms., rare, chiefly west of Delta.

Records H.M.N.S.: 9 lots, of which 2 contain live collected material.

Depth Range: 36-85 fms., alive at 51-55 fms., mostly on mud bottoms.

Geographical Range: Florida to Lesser Antilles (Abbott, 1974).

Maximum Size: 4.0 mm.

Eastern Pacific Analogue: ?

273. Limopsis (Limopsis) sulcata Verrill and Bush, 1898.

Hinge plate is entirely without clear fold or sulcus. Very skewed in shape, when mature, almost circular when juvenile. Occurs in the mudlump fauna off the Mississippi Delta.

Previous records for the Texas faunal provinces are: 145, deep shelf (alive), pl. 7, figs. 10A-B; 170, misidentified as Glycymeris americana (sic), off East Texas, pl. 15, fig. 3, (juvenile specimen); 175, listed for upper Continental Slope, 65-600 fms., common, along whole coast, pl. 6, fig. 10; 206, Texas Conchol., Vol. 9, p. 76; 214, pl. 10, figs. 9-10; 251, listed for Yucatan Shelf.

Records H.M.N.S.: 9 lots, of which two contain live collected material.

Depth Range: 36-110 fms., on mud bottoms; alive at 55 fms.



Figs. 4 and 5 Limopsis sulcata, a 11 mm. wide, 9.5 mm. high specimen taken from 110 fms. mud bottom by a 15 minute dredge by Geis and Stubbs 86 miles SE of Freeport, Texas, July 18, 1967.

Geographical Range: Cape Cod to Florida, Gulf States and the West Indies (Abbott, 1974).

Maximum Size: 15.2 mm.

Easter Pacific Analogue: ?

274. Limopsis sp. indet. A.

Only two lots, one live collected, of juvenile valves of a small species of much more oval shape bivalves were obtained in very deep water.

Previous records for the Texas faunal province are: 206, Texas Conchol., Vol. 9, p. 19.

Records H.M.N.S.: 2 lots, of which one contains live collected material.

Depth Range: 410-450 fms. in mud; alive 420 fms.

Geographical Range: Unknown.

Maximum Size: 2.0 mm.

Eastern Pacific Analogue: ?

275. Limopsis (Pectunculina) sp. indet. B.

This is probably L. minuta Philippi, 1836, as which it was reported before, but I am not certain about this. The cancellate sculpture and coarse tufts, (not dense) differentiate it from L. sulcata, but its shape is not as skewed.

Previous records for the Texas faunal province are: 206 (as L. minuta Philippi, 1836), Texas Conchol., Vol. 9, p. 19.

Records H.M.N.S.: 9 lots, of which 2 contain live collected material.

Depth Range: 63-170 fms., in mud; alive 110-167 fms.

Geographical Range: Unknown.

Maximum Size: 11.0 mm.

Eastern Pacific Analogue: ?

276. Limopsis sp. indet. C.

A very small valve with a straight posterior slope in our only lot. More material is required to evaluate this species.



Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 1 lot, no live material.

Depth Range: 55 fms., in shelly mud, off Louisiana.

Geographical Range: Unknown.

Maximum Size: .9 mm.

Eastern Pacific Analogue: ?

Remarks: Ref. 7 mentions Limopsis cristata Jeffreys, 1876, for very deep water.

FAMILY MANZANELLIDAE Chronic, 1952

Very small bivalves rather nuculid in shape, but with a very peculiar hinge. There are a few taxodont teeth, and below it there is a long groove along the posterior dorsal slope.

277. Genus Nucinella Wood, 1851.

The 5 small valves in the collection of the H.M.N.S. do not resemble the figure Abbott gives of N. serrei Lamy, 1912.

It may be Nucinella adamsi Dall, 1892. Our single fresh valve is dark chestnut brown; the others are bleached.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 3 lots, no live material.

Depth Range: 51-63 fms.; on mud and sandy mud.

Geographical Range: Unknown to me.

Maximum Size: 2.2 mm.

Eastern Pacific Analogue: Nucinella subdola (Strong and Hertlein, 1937), Bahia de los Angeles, Gulf of California to Mazatlan, Mexico, in depths to 22 m.

FAMILY GLYCYMERIDIDAE Newton, 1922

Somewhat circular, thick shelled, equivolume bivalves, mostly with radial sculpture. In the N.W. Gulf of Mexico represented only by a single genus with 3 subgenera: Glycymeris s.s., Glycymerella Woodring, 1925, and Tucetona Tredale, 1931.

Sources: Newell, N.D., in Treat. Invert. Pal., Part N, Vol. 1, p. N267-269.

Abbott, R.T., Am. Seashells 2d Ed., 1974.

278. Glycymeris (Glycymeris) spectralis Nicol, 1952.

In Treat. of Invert. Pal., this is a fairly widespread, rather small species, occasionally obtained from shallow dredgings on sand bottoms. All material in the H.M.N.S. collection is old and worn and no fresh or live material is present. Its centrally located ligament and the outline of the shell, which is rather broad and oval, and lack of discernable color pattern differentiate this species from the next one, which takes the place of G. spectralis Nicol in calcareous environment. G. spectralis has on rare occasions been obtained from beach drift: Sargent, Matagorda, St. Joseph Island and Mustang Island.

Previous records for the Texas faunal province are: 206, Texas Conchol., Vol. 9, p. 76.

Records H.M.N.S.: 13 lots, none alive.

Depth Range: 0-25 fms., on sandy bottoms, never alive.

Geographical Range: Carolinas to East Florida, Texas. (Abbott, 1974)

Maximum Size: 33.5 mm.

Eastern Pacific Analogue: None appears close. Perhaps Glycymeris lintea Olsson, 1961, is related.

279. Glycymeris (Glycymerella) decussata (Linne, 1758).

Common in calcareous environment off Louisiana and Texas, where it lives in coral and algae muds. Live specimens are clearly somewhat cancellate or pitted in sculpture and possess small epidermal hairs in an arrangement identical to the cancellate pattern. The ligament is situated in front of the umbos, which

are opisthogyrate. Juvenile specimens are almost circular in outline and lack the flattened portion of the outline, which is so typical of mature specimens.

Previous records for the Texas faunal province are: 206, Texas Conchol., Vol. 9, p. 76.

Records H.M.N.S.: 12 lots, of which 3 contain live collected material.

Depth Range: 10-40 fms., alive 10-25 fms.

Geographical Range: Southwest Florida and the West Indies and Brazil (Abbott, 1974).

Maximum Size: 49.5 mm.

Eastern Pacific Analogue: None.

280. Glycymeris (Tucetona) pectinata (Gmelin, 1791).

Arca pectinata Gmelin, Syst. Nat. 6, p. 3313.

Only a single valve is in the H.M.N.S. collection, taken from beach drift at San Luis Pass. This area is as far as I know the only spot along the Texas coast from which a few valves of this species have been taken. Once a live specimen was claimed to have been dredged from Galveston Bay (Texas Conchol., Vol. 1 (1), 1961), but since then no other specimens have come to light.

Previous records for the Texas faunal province are: 7, listed; 45, listed; 56, listed; 170, listed for deep shelf assemblage; 192, Alacran reef, off Yucatan, pl. 9, figs. 6a-6b; 251, Yucatan shelf.

Records H.M.N.S.: 1 lot, from beach.

Geographical Range: N. Carolina to both sides of Florida, Texas and to Brazil (Abbott, 1974).

Maximum Size: 24 mm.

Eastern Pacific Analogue: ?

281. Glycymeris (Tucetona) subtilis Nicol, 1956.

Nautilus, Vol. 70, p. 48-53, 1956.

The occurrence of this deeper water species, mainly off the Louisiana coast is a definite surprise. It can be immediately recognized by the small, thin elevated concentric growth ridges in between the radial ribs, which produce imbrications on the ribs. Most of our material is old, but in one lot there are a few live collected specimens. There is a patchy color pattern of randomly distributed rather squarish dots of color. Very small juveniles already possess many closely spaced costae (# 1 mm.).

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 8 lots, one alive.

Depth Range: 51-85 fms., in sandy mud, alive at 55 fms.

Geographical Range: Off East Texas, Louisiana, Bermuda.

Maximum Size: 12.4 mm.

Eastern Pacific Analogue: None. G. (Tucetona) multicostata Sowerby, 1833) resembles it, but is much larger.

282. Glycymeris (Tucetona) sp. indet. A.

A number of small bivalves probably belongs to still another species in the subgenus Tucetona, although finally they may turn out to be juveniles of G. (Tucetona) pectinata (Gmelin, 1791). They are quite coarsely ribbed and skew in outline.

More material is needed for a more definite identification. Previous records for the Texas faunal province are: None. Records H.M.N.S.: 3 lots, none alive in calcareous environment. Depth Range: 50-51 fms. Geographical Range: Unknown. Maximum Size: Not yet measured. Eastern Pacific Analogue: None.

Remarks: Glycymeris americana (DeFrance, 1829) has been twice reported from Texas waters, but I believe that these records are in error. It is listed in Ref. 69 (appendix 8), but this is probably an error for G. spectralis and it is also listed in Ref. 170, but the figure on pl. 15, fig. 3, shows a specimen of Limopsis sulcata (sic!). In all probability Pulley (Ref. 100) is correct when he states "not in Texas waters".

To be continued

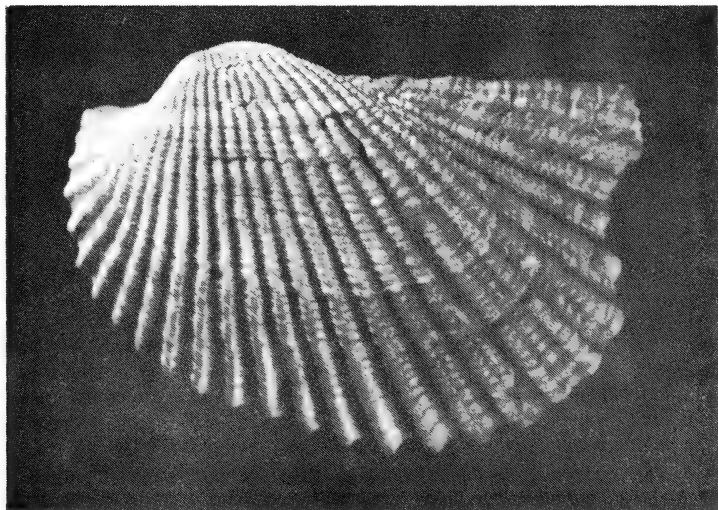
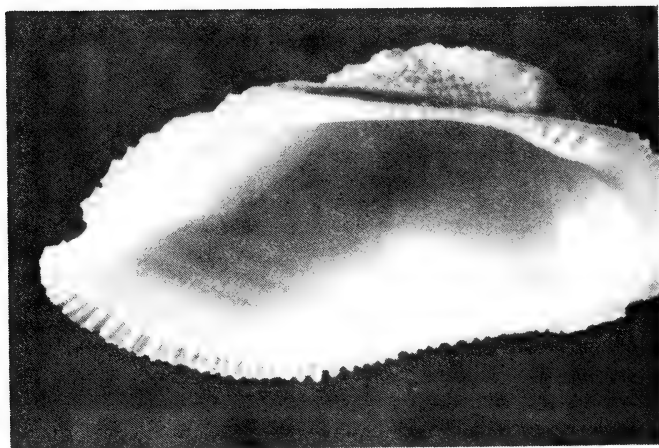
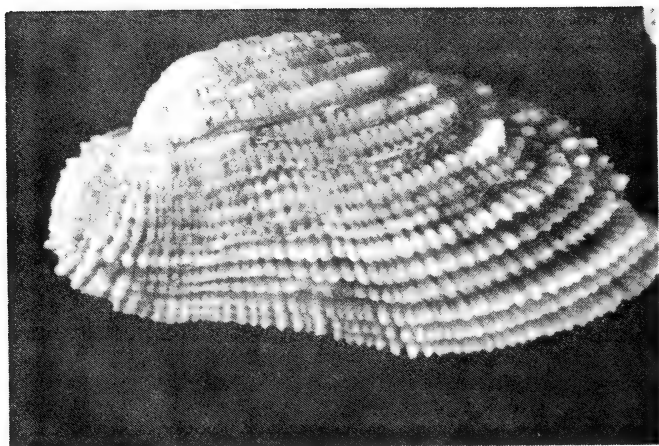
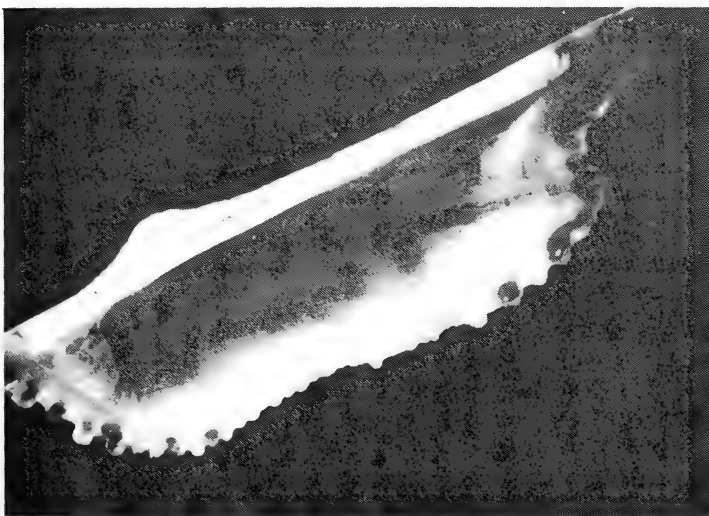


Fig. 6 ? Anadara notabilis, a small specimen with a large auricle which Odé judges to be a Caloosarca but places in the Museum collection under Anadara notabilis at this time. 18 mm. long, 11.5 mm. high, the valve was collected by orange peel grab by the Gus III, Bureau of Commercial Fisheries ship, 54½ miles SSW of Freeport, Texas, April 20, 1966. (See Texas Conchologist, Vol. 14, pg. 104.)



Figs. 7 and 8 Acar domingensis, 21.6 mm. long, 10 mm. high, this specimen was recovered from a sandy limestone lump by diver Harold Geis from 25-50 feet of water about 1½ miles off Padre Island, near South Padre Island, Texas, September 25, 1966. (See Texas Conchologist, Vol. 14, pg. 70, 71.)





Figs. 9 and 10 Arca sp. A, once separated out from Arca zebra by Odé, this 30 mm. long specimen was collected by dredge in 1963 by T.E. Pulley and Paul McGee from Stetson Bank, 74 miles SSE of Galveston, Texas. Odé explains that separation was done so that emphasis on further study of such material could be encouraged. He judged it finally to be simply an aberrant form of A. zebra. (See Texas Conchologist, Vol. 9, p. 77, and Vol. 14, p. 68.)

Photos by Harold Geis in Monograph

## IN MEMORIAM

We regret to announce the loss of two members and two good friends of the Society during recent months.

Ruth Fair, a member of our society for two years, died on June 21, 1978, after months of illness. Immediately on arriving in Houston she offered to present a program and became a member. Some sixteen members will always remember her guidance of a wonderful trip to Fiji in 1977.

The Society voted to add \$50.00 to the memorial fund in Ruth's name which was established by members, and books will be purchased for the library. Anyone still wishing to add to this memorial fund may do so by contributing through treasurer Joanne Hoard, 4525 N. Braeswood, #103THA, Houston, Texas 77096.

\*\*\*\*\*

Word has been received by several Houston Conchology Society members that our friend, Frank Abbottsmith, of Perth, Australia, died on June 18, 1978, after a long illness. He had given his wonderful slide lecture on Australian volutes here in 1974 and then visited here another year. He was on his way to tour the world again when he became very ill.

\*\*\*\*\*

Helen Denny of Sanibel, Florida, died on March 12, 1978, at the age of 72. Many Houston Conchology Society members knew Helen through the years, enjoyed her exquisite shell art, and learned to shell Sanibel and the Keys with her. Mary Sutow, Constance Boone, and Leola Glass visited daily with her during one visit to Sanibel in October, 1966, and then went on to the Keys with a group Helen was leading to the Marathon area. Leola still prizes the gift shells Helen gave her for finding two beach Junonias, a custom Helen established on the island.

\*\*\*\*\*

Our member, Hugo C. Bauer, of Galveston, Texas, died September 10, 1978, en route home from Houston after participating and exhibiting in the Houston Gem and Mineral Society show at the Shamrock Hotel. With his wife, Laura, Hugo has operated the Bauer's Gems, Seashells and Museum shop at 2126 45th Street in Galveston. Hugo had suffered from heart problems for several years, and Laura and Hugo were not often able to attend our meetings. Hugo's interest has always been the rocks and minerals. For years he has given generously of his time to talk to schools and clubs in the area.

HOUSTON CONCHOLOGY SOCIETY, INC.

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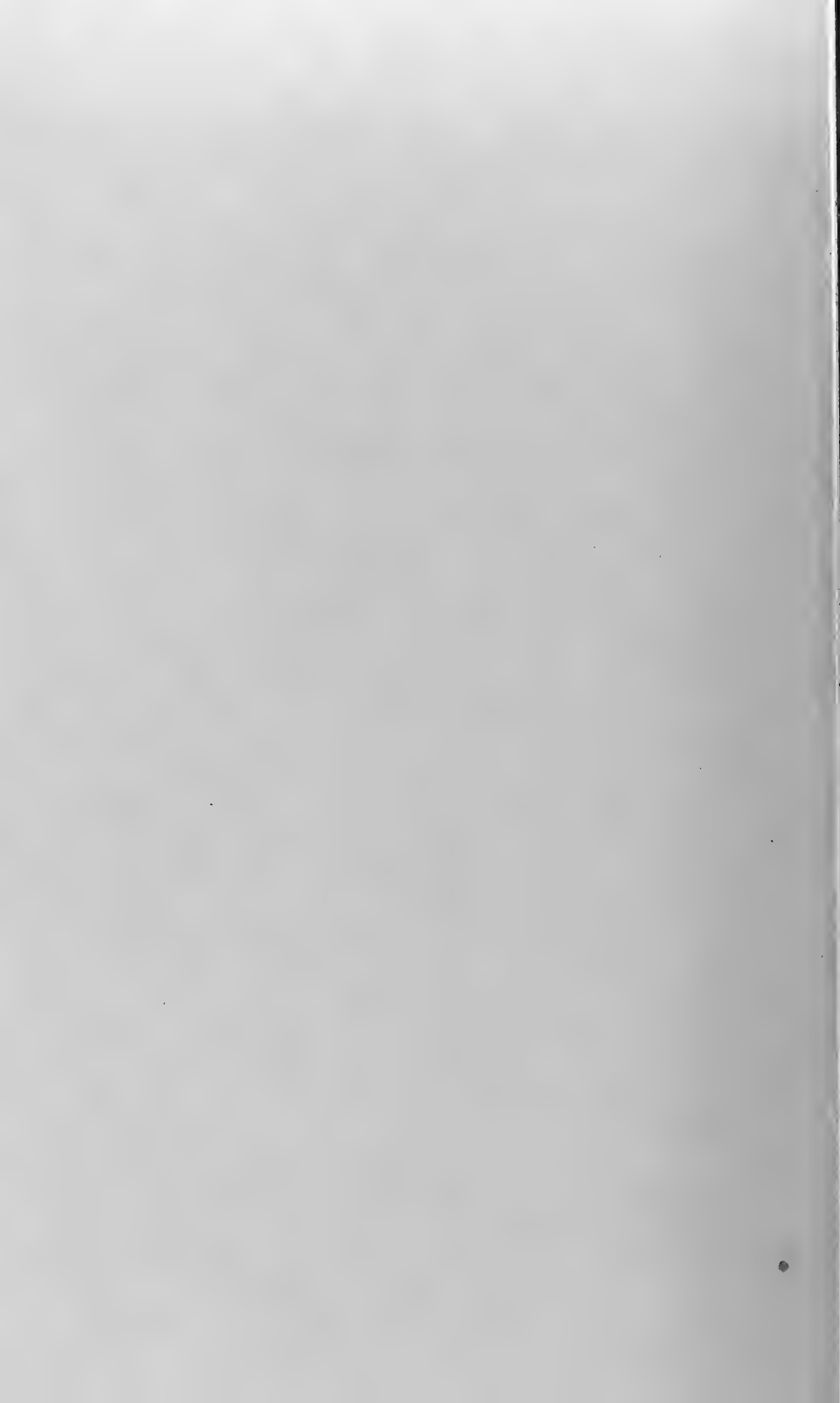
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# Texas CONCHOLOGIST

VOLUME XV NO. 2



JANUARY, 1979

The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas. It is distributed as part of the dues to all members.

The Society holds regular meetings the fourth Wednesdays of the following months: August, September, October, January, February, March, April and May. The meeting is held the third Wednesday in November. Meetings are held at the Houston Museum of Natural Science, Caroline Street in Hermann Park, beginning at 7:30 p.m.

The TEXAS CONCHOLOGIST is published October, January, April and July. It is mailed postpaid to regular members in U.S. postal zones. Overseas members will be charged additional postage. Only one copy will be mailed a family membership.

Dues extend from the beginning of the fiscal year of June 1 through May 31. However, the July issue of the TEXAS CONCHOLOGIST each year is the fourth quarterly due on the regular dues year beginning June 1 of the previous year. Memberships will be accepted throughout the year but will receive the quarterlies of that fiscal year. Members receive meeting Newsletters and have all other privileges provided by the Society's by-laws.

#### RATES AND DUES

Family membership	\$6.00
Single membership	\$5.00
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The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the Editor. Manuscripts should be typed, double spaced and should be in the hands of the Editor the first day of the month preceding publication dates. Photos accompanying such material are welcomed.

## AUCTION DATE IS SET FOR APRIL 25TH

Dave Green has volunteered to be chairman for our shell auction for members and announces that the regular meeting date for April, Wednesday the twenty-fifth, will be the time for this event eagerly awaited by members each year. Dave has received approval from the Houston Audubon Society for our use of the main auditorium at the Museum for that evening which allows us to spread out the shells on more tables and promises that silent auction and sale table shells will be on better view and available to more members.

In order for the auction to continue to be the success it always has been, Dave urges members to search their stock of shells for items to donate for the auctions, sale table and surprise boxes. This year there will be one table emphasizing Texas and Gulf of Mexico specimen shells, so please give generously from your self-collected shells so that other members not as fortunate as you in going to beaches or in finding shells may get to know shells from our area by purchasing shells from this table.

Anyone interested in donating shells or working on the auction is asked to call Dave at home at 493 1179 or to call him at his office at 237 4312. He is anxious to have your ideas and your help.

You may bring your shells to the meetings, or you may take your shells to the homes of Cynthia Biasca, Merle Kleb or Dave Green. Constance Boone would like to have the Texas and Gulf shells. Data as complete as possible is requested for all shells.

Jim Hudson and Lloyd Meister have agreed to pick up shells you may wish to donate if you are unable to deliver them.

This year Dave would like to have some super items for oral auction. He already has some fine shells donated by a dealer. Other dealers will be contacted by members. Contact Dave if you have ideas or relationships with dealers worldwide. Dave intends to itemize each donation from dealers and members. A list will be sent to all members after the auction of such donations. Dealers' addresses will be provided on this list so that members may have it for reference.

The money derived from this club auction helps to keep the club in the business of providing you this quarterly and to continue to support the Houston Museum of Natural Science. We are also better able to purchase more books for our library. Our dues do not cover these activities completely, as you know from the final report from the treasurer last year.

## SHELL SHORT

According to the experts, Vacek Bridge over San Luis Pass between Galveston Island and the peninsula to Surfside will fall to the punishing, swift tides rushing in and out of the Pass and shifting the sands continuously. The recent lack of nourishment of sands to this area has caused even more damage. HCS members on the field trip on December 14, 1978, collected Littorina lineolata from pits in the bridge spans and noted that some of the stands were completely out of the sand and anchored only by steel rods. December meetings were being conducted by authorities bent on saving the bridge. Recommendations included dredging sands from the Gulf of Mexico to replenish sands at the Pass and the erection of jetties.

By T.E. Pulley

In a recent review of the species of Donax living on the Atlantic and Gulf coasts of North America, Morrison (1971) recognized 5 species, one of which he separated into 2 geographic subspecies. A summary of Morrison's interpretation is presented in Table 1. It has been determined that the name Donax is masculine, and the endings of some species names have been appropriately changed.

	<u>D. roemeri</u> <u>protractus</u>	<u>D. roemeri</u> <u>roemeri</u>	<u>Donax</u> <u>fossor</u>	<u>Donax</u> <u>parvulus</u>	<u>Donax</u> <u>dorotheae</u>	<u>Donax</u> <u>texasianus</u>
New York			!			
New Jersey			**			
Virginia	-		*			
Cape Hatteras	*			*		
Carolinas	*			**		
East Florida	*			*		
West Florida	*				*	
Alabama	*				*	
Mississippi	*				*	
Louisiana		*			*	
La.-Tex. Border		*			*	*
Texas		*				*
Mexico		*				*

- Sometimes present

\* Always present

Table 1.

Morrison was the first to call attention to the fact that the familiar name Donax variabilis Say, 1822 is preoccupied, and Donax roemeri Philippi, 1849 is the next available name. Abbott (1974), however, continues to use Donax variabilis with the comment that the name will surely be conserved by the International Congress of Zoological Nomenclature. So far as I know, however, no attempt has been made to present the case to the ICZN, and there is no assurance as to what action that group would take. Until the case has been decided, strict observance of the Rule of Priority requires the use of the name Donax roemeri.

Morrison stated that both subspecies of Donax roemeri are highly variable, and some populations from Texas resemble populations from the Atlantic coast. I have critically examined several thousand specimens from the entire range of this species, and I do not think that the variability is sufficiently correlated with geographic locality to warrant the use of subspecies names. Donax roemeri (formerly known as Donax variabilis) is thus the ubiquitous species that is most often seen on sandy beaches from Cape Hatteras to Mexico. Like many other Carolinian species, however, it is not found in south Florida between Cape Canaveral and Sanibel.



Of the remaining 4 species considered by Morrison, a review of Table 1 indicates a remarkable pattern of distribution. Collectively, the 4 species have a range that almost exactly duplicates the range of Donax roemeri, and in only one small area do the ranges of any of these 4 species overlap. Morrison stated that both Donax texasianus and Donax dorotheae are found in Jefferson County, Texas and Cameron Parish, Louisiana, on opposite sides of the Texas-Louisiana border.

By analogy with the known distribution of other species and subspecies groups, it seems likely to me that the 4 species (other than D. roemeri) recognized by Morrison might represent only 1 or 2 species with geographic separation into subspecies. All four share certain structural and behavioral characteristics as outlined in Table 2.

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Donax roemeri

Other Donax: (texasianus, dorotheae  
parvulus and fossor)

Tend to concentrate in shallower water (intertidal).

Tend to concentrate in deeper water.

The ridge which separates the sides of the shell from the posterior slope is sharp and clearly defined.

The ridge which separates the sides of the shell from the posterior slope is rounded.

Radial ribbing is uniformly sharp and distinct over the entire posterior slope.

Ribbing is variable on the posterior slope, but never like that described for D. roemeri.

Radial ribbing is distinct on sides of the shell near the posterior end.

Radial ribbing is obscured on the sides of the shell. It can often be seen but not felt.

Maximum size is about 28 mm.

Maximum size is about 18 mm.

Colors often bright, and rayed forms are not unusual.

Colors are usually drab, and there are no rayed forms.

Left and right valves meet symmetrically in the mid-ventral line.

The left valve slightly overlaps the right in the mid-ventral line.

Table 2

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The four species compared with Donax roemeri in Table 2 are almost certainly more closely related to each other than any one is to Donax roemeri. The principal distinguishing features of all five species can be explained by reference to the illustrations and brief descriptions.

- Donax roemeri: Compare the illustrations in Fig. 1 and the description in Table 2.
- Donax dorotheae: Refer to Fig. 2. Note the rounded ridge separating the sides of the shell from the posterior slope. Note also the secondary ridge not far from the posterior border in the side view. This ridge shows more plainly in the rear view. Between this ridge and the posterior mid-line there are numerous closely spaced radial ribs that can be seen with magnification, but which cannot be felt. Forward of the secondary ridge there may be additional radial ribs, which extend over the whole shell but they are somewhat more widely spaced. These, too, can be seen only with some magnification and cannot be felt. The entire surface of the shell feels smooth, even when scraped with a pin or fingernail.
- Donax texasianus: Refer to Fig 3. This species is very similar to Donax dorotheae except on the posterior slope where the radial ribbing is crossed by wavy concentric ribbing to create a crenulate pattern of sculpture. This sculpture is usually quite distinct when seen under magnification, and it can be felt with the thumb nail.
- Donax parvulus: This species is more elongate than Donax dorotheae, and the hinge is nearer the center of the shell. There are no radial ribs between the secondary ridge and the posterior mid-line. Faint radial ribs can be seen elsewhere on the shell, but they lie within the shell and cannot be felt.
- Donax fossor: Say's type locality for this species was the "coasts of New Jersey and Maryland". A single lot of shells in the collection of the Houston Museum of Natural Science is from New Jersey. Since only Donax fossor is supposed to be found that far north, it is assumed that this lot does represent that species.

The specimens (about 40) are all small; the largest is only 7 mm. long. They are not distinguishable, however, from young Donax parvulus, which is fairly well represented in the Houston Museum of Natural Science collections from several localities between Virginia Beach, Virginia and Ormond Beach, Florida. If there is only a single species (in addition to Donax roemeri) which is found from New Jersey to Florida, the earliest name for it is Donax fossor, and Donax parvulus is a junior synonym. Refer to Fig. 4.

Fig. 1 Donax roemeri

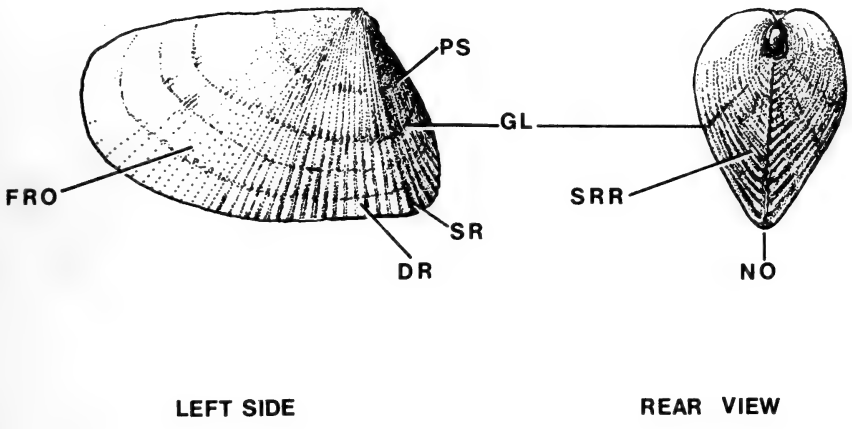


Figure 1

Donax roemeri

- GL - Growth line
- FRO - Faint ribs or none
- DR - Distinct ribs that can be felt
- SR - Sharp ridge
- PS - Posterior slope
- SRR - Sharp radial ribs
- NO - No overlap

Fig. 2 Donax dorotheae

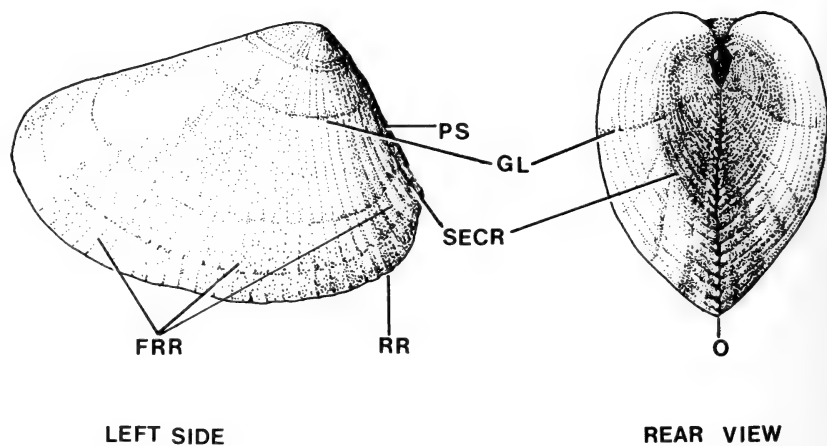


Figure 2

Donax dorotheae

- GL - Growth line
- FRR - Faint radial ribs that can be seen but not felt
- RR - Rounded ridge
- PS - Posterior slope
- SECR - Secondary ridge
- O - Overlap

Fig. 3 Donax texasianus

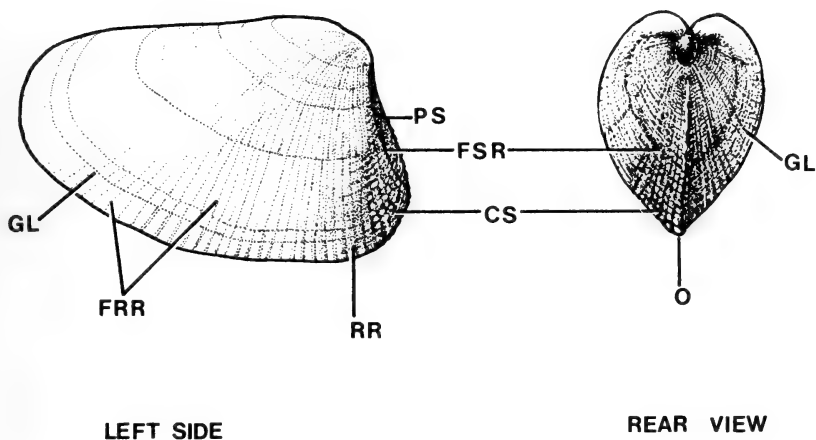


Figure 3

Donax texasianus

- GL - Growth line
- FRR - Faint radial ribs that can be seen but not felt
- RR - Rounded ridge
- CS - Crenulate sculpture
- FSR - Faint secondary ridge
- PS - Posterior slope
- O - Overlap

Fig. 4 Donax fossor

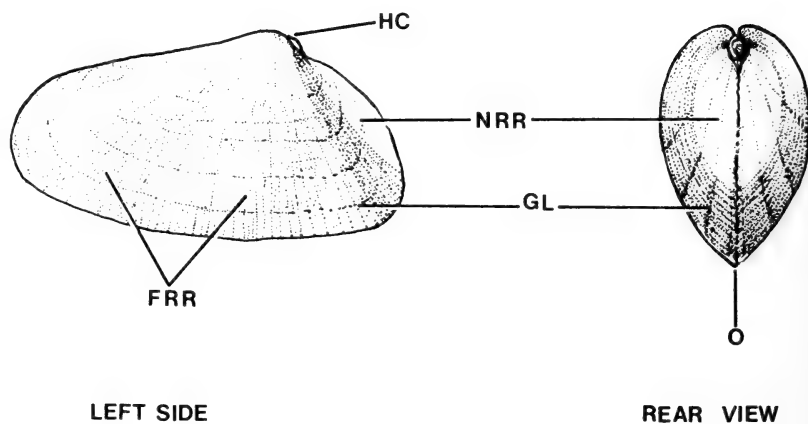


Figure 4

Donax fossor

- HC - Hinge nearer center of shell
- NRR - No radial ribs from secondary ridge to posterior mid-line
- GL - Growth line
- FRR - Faint radial ribs that can be seen but not felt
- O - Overlap

The best test to confirm the distinctness of species is to find them living together without evidence of interbreeding or intergradation of characters. It was with this in mind that I accompanied a field trip of the Houston Conchology Society on November 4, 1978 to Sea Rim Park, the most easterly Texas beach, and to Holly Beach (near Cameron) in western Louisiana. According to Morrison, Donax roemeri, Donax texasianus, and Donax dorotheae all occur in this area.

The beach at Sea Rim Park is poorly developed. A thin layer of sand overlies a stiff Pleistocene clay base. At the east end of the Park, the sand beach disappears entirely. Surf and tidal action are weak.

Holly Beach is an isolated, very poorly developed beach where the only sand is a thin layer in the intertidal zone. Beyond the low tide line the bottom is soft mud. Surf and tidal action are usually very weak. There are no sand beaches between Holly Beach and Sea Rim Park, and to the east of Holly Beach there are only small patches of sandy beach all the way to the Mississippi River.

Neither of the two beaches visited on this field trip seems particularly favorable for Donax, and, as the following tabulation of the results of collecting indicates, the shells were not present in the abundance usually seen on most Texas beaches.

#### Donax collected at Sea Rim Park

1. About 30 specimens of Donax roemeri; size range 14-22 mm.
2. About 70 specimens of Donax texasianus; size range 6-10 mm. for all specimens taken alive. A few dead shells up to 13 mm. were found. Most of the shells were bluish gray, but some were unusually colored with shades of yellow, pink, and orange.

It should be noted that some of the larger shells did not begin to show the crenulate sculpture on the posterior slope that is characteristic of Donax texasianus until they reached a length of 4 or 5 mm. As young shells they would not be distinguishable from Donax dorotheae.

3. Five small specimens (5-7 mm.) taken alive which are almost smooth on the posterior slope (like Donax dorotheae) but which have faint evidence of the crenulate sculpture of Donax texasianus.

There were also 12 larger single valves (9-13 mm.) which also seem intermediate between Donax texasianus and Donax dorotheae in the sculpture of the posterior slope.

#### Donax collected at Holly Beach

1. Two live specimens of Donax roemeri about 23 mm. long were found by Dianna Ballard. A single valve about the same size was also found, as well as a smaller (13 mm.) live specimen.
2. About 70 live specimens of Donax texasianus; size range 7-12 mm. Several dead shells up to 15 mm. were also found. A few shells exhibited the same shades of yellow, pink, and orange seen on shells taken at Sea Rim Park.

On several of these shells, particularly the larger ones, the crenulate sculpture of Donax texasianus was begun only after the shell was 5-6 mm. long, or it was only slightly visible.

3. About 35 live specimens which appear close to Donax dorotheae; size range 4-9 mm. Also one single valve 12 mm. long. Many of these specimens show some evidence of the crenulate sculpture of Donax texasianus. They also exhibit the same range of colors (mostly blue or gray, but some with yellow or orange) as in the more typical Donax texasianus with which they were found.

The large single valve is indistinguishable from Donax dorotheae taken at Grand Isle, Louisiana.

It seems apparent that Donax populations at Sea Rim Park and Holly Beach are genetically intermediate between typical Donax texasianus to the west and Donax dorotheae to the east. If these 2 species are capable of interbreeding, and apparently they are, then they must be regarded as geographic subspecies of a single species.

#### Conclusions:

1. A single, highly variable species, Donax roemeri Philippi, 1849 is found from Cape Hatteras to Cape Canaveral and from Sanibel to Mexico. Subspecific designations are probably not warranted.
2. Donax texasianus texasianus Philippi, 1847 is found along the Texas coast at least as far south as Mustang Island.
3. Donax texasianus dorotheae Morrison, 1971 is found in Louisiana and an unknown distance eastward in the northern Gulf. Morrison reports it from as far east as Franklin County, Florida. Intergrades with Donax texasianus texasianus are found near the Texas-Louisiana border.
4. Donax fossor Say, 1822 and Donax parvulus Philippi, 1849 do not appear to be separable on the basis of limited collections in the Houston Museum of Natural Science. If they do prove to be conspecific, Donax fossor is the earlier name and Donax parvulus is a junior synonym for a species whose range extends from New Jersey (occasionally Long Island) to the east coast of Florida. There are specimens in the collection at the Houston Museum of Natural Science from Ormond Beach, Florida, and Morrison reports it from St. Lucie County Park, Florida.

#### Recommendations:

Additional collections are needed from the entire northern Gulf to clarify the status of Donax texasianus and Donax dorotheae. More material from western Louisiana is particularly important, if the present conclusion that they are geographic subspecies of a single species is to be confirmed.

Collections from the Atlantic coast, particularly from localities north of the Cape Hatteras, should also be examined critically. If there is only one other species in addition to Donax roemeri, the correct name for it is Donax fossor.



References:

- Abbott, R. T., 1974, American Seashells. Van Nostrand Reinhold.  
New York. pp. 1-663.
- Morrison, J. P. E., 1971. Western Atlantic Donax. Proc. Biol. Soc.  
Wash., vol. 83, no. 48, pp. 545-568.

Illustrations by James Jeffries



HCS member Dianna Ballard spent several hours digging and screening sands at high tide line on the field trip to Holly Beach, La., Nov. 4, 1978, when the main object was to assist in the collection of Donax. Dianna was lucky enough to find several of the few specimens of Donax roemeri collected that day. Her specimens have been added to the collection at the Houston Museum of Natural Science.

Photo by Constance E. Boone

Heeding Dr. T.E. Pulley's call for more Donax from the coasts of the Gulf of Mexico and from up the East Coast of the United States, I began to look for specimens on a visit to Port Aransas, Texas, in October, 1978.

My sister, May, and her son, Ronald Shank, and I joined the Outdoor Nature group on a shelling and birding trip to Rockport, Texas, October 11th and 12th. We walked the shores of Goose Island and found a few mussels.

The next day we went to Port Aransas to walk the beach. It was crowded with campers. I noticed a few dead Donax and picked them up. Recalling a remark by Cynthia Biasca on the trip to Holly Beach that "where there are dead Donax there are sure to be a few live ones", I looked closer and found a school just a fraction of an inch under the sand. I uncovered a few as the waves rolled in and out, approximately a cupful.

At the cabin that evening I made a sieve by heating a large fork and making holes in a plastic bucket.

On Sunday morning, October 12th, we returned to the beach, omitting a trip to St. Joseph Island. A few individuals were taking their morning walk, a few bathers were in the warm water, and one lady was busy gathering Donax and said she planned on making soup and gave me the recipe. She said the soup tasted like oyster soup.

The Donax were coming in with the waves, staying on top of the sand a few seconds before they disappeared beneath it. In those seconds we scooped them up by the handfuls. As we looked down the beach we could see another school riding the waves in. We spent two hours on the beach watching the Donax come in. Approximately every thirty feet schools of Donax floated in. This was located on the Port Aransas beach on both sides of the fishing pier.

(Ed. Note: A gallon of frozen Donax was delivered for use in Dr. Pulley's study. This first resided in the Boone freezer, and since the Donax were delivered in a Bluebell ice cream carton, Hollis Boone promptly opened that carton the first evening to get some of his favorite ice cream, exclaiming in dismay as Donax spilled out and commenting that he thought that in his refrigerator freezer he at least shouldn't have to encounter more shells. The bad part of this was that there wasn't any ice cream there to soothe the spirits.)

#### NEW SCIENTIFIC JOURNAL

A new scientific journal, Monographs of Marine Mollusca, devoted to the systematics, biology, zoogeography and taxonomy of marine mollusks, both living and fossil, has been announced available by subscription through American Malacologists, P.O. Box 4208, Greenville, Delaware 19807. Dr. R. Tucker Abbott will serve as Editor-in-chief. Number 1 is "The Family Cerithiidae in the Indo-Pacific" by R.S. Houbbrick of the Smithsonian Institution. Numbers in preparation include the Mitridae by W.O. Cernohorsky, Babylonia by Altana and Gittenberger, and others. Numbers are issued irregularly as research is completed. They will be issued with color plates and in a convenient looseleaf form compatible with the former Indo-Pacific Mollusca.

Price for Number 1 only is \$17.50. Price for this number and the special looseleaf binder is \$26.00.

The journal will be placed in the library of our society.

Melba Drake, Mildred Elkins and Helen Eberspacher, all members of the Houston Conchology Society, and Helen's sister, Roberta Campbell, left Houston on June 17, 1978, for a delightful week at Harbour Island in the Bahamas. For those who have not been to Harbour Island, it is a very small island (one mile wide by three miles long) that lies just off North Eleuthera about a 20-minute plane ride from Nassau. In truth, the plane goes only as far as North Eleuthera and from there the rest of the journey is made by a 20-minute boat ride, on board the African Queen (no fooling, that's the name of the little boat), operated by a huge, bearded black man named Anthony.

When we began to make plans to go to Harbour Island, we decided to stay at the Coral Sands Hotel which we had heard about from others who had stayed there. We had a brochure on the hotel which showed that the Bahamas Hotel Reservation Service handled reservations for this hotel. We called their toll free number (800) 327-0787 and asked them to try to reserve for us the one 2-room, 2-bath cottage/kitchen listed available on the hotel grounds. A few days later they advised they were successful in getting the cottage for us for the week we wanted. The hotel has many rooms but none with cooking facilities.

Our next step was to make plane reservations and since three of our party are members of AAA, we asked them to work out the best schedule for flying there from Houston. As a result we left here on National Airlines, transferred in Miami to Bahamasair, and transferred again in Nassau to another Bahamasair plane which took us to North Eleuthera Island. There we had to take a little boat to Harbour Island which is accessible only by boat. We later learned that we could have taken a direct flight from Miami to North Eleuthera on the Shawnee Airlines, thus avoiding one plane transfer. Anyone interested in making this trip might also check on Mackey Airlines out of Miami and Fort Lauderdale. Reservations for these are usually easier to make through a Miami or Fort Lauderdale travel service or directly with the airlines.

The natives of this beautiful little tropical island, which used to be the capitol of the Bahamas, are black and speak English. They are a friendly lot, especially the children who loved to help us collect shells. The only way to get around here is on foot or by taxi, there being very few automobiles. However, there is really not much use for them since the place is so small. Dunmore Town is the only town on the island and is about 350 years old, very quaint with all its houses painted in bright colors (pink, green, blue, yellow and even orange). The island's terrain is hilly and covered with lush tropical growth - date and coconut palms, bananas, Royal Poinciana trees (in bloom while we were there), bougainvillea, hibiscus, and many other flowers.

We shelled in two places on the island - the mud flats in Girl's Bay and The Narrows with its rocky shore and volcanic cliffs. Both places produced many beautiful shells, many of them firsts for us or, as the birders would say, lifers. Shells we brought home were milk conchs, angular tritons, dog-head tritons, speckled tellins, black lace Murex, amber pens, king helmets, strawberry cockles, West Indian chanks, eared arks, West Indian top shells, and one retriculated cowrie helmet. Other familiar shells were tiger lucines, prickly cockles, queen conchs, mussels, Pennsylvania lucines, apple Murex, true tulips, as well as other sea life such as sea biscuits and huge star fish. One day we were taken to

Pidgeon Island nearby and dug for the beautiful gaudy Asaphis, assisted by several black boys who knew how to look for them. This was an interesting experience because there was absolutely no evidence of these clams on the rocky beach, yet these boys knew where to dig for these pink, purple, yellow and white lovelies. Another day, Uncle Sam, the singer-guitar player from the hotel, took us out in his boat and he used his many-pronged anchor to snag for each of us a huge star fish, king helmet and queen conch, in water about 8-10 feet deep. It was fun helping to spot these creatures as we slowly circled around over crystal clear water. Incidentally, all shelling is done here as described above or by wading. In other words, there is no beach-combing here as the beaches have no debris shells. However, we did pick West Indian top shells, beaded and prickly periwinkles, bleeding teeth, and other nerites off the volcanic rocks at The Narrows.

Our separate cottage had two bedrooms and two bathrooms and a kitchen. I don't know how we could have managed without the kitchen when it came time to clean our shells. The hotel fronts on the ocean and has its own pink sand beach, and I do mean pink sand. It was a marvelous trip and all of us want to go back again some day.

#### MORE ON MUSSELS

The December 11, 1978, issue of Newsweek had a science report on the use of marine mussels in measuring contaminants in coastal waters. According to the report, the common Eastern Mytilus had already helped find a hot spot of plutonium, the radioactive garbage of nuclear fission, off Plymouth, Mass. Other toxic PCBs were being found nearby, and tests with mussels determined that the waters off southern California are still full of DDT. Since the mussels stay put, so to speak, scientists are able to use them from the same clusters for fairly cheap methods of monitoring coastal waters. "Mussel Watch" is the brainchild of Edward Goldberg of the Scripps Institution of Oceanography in La Jolla, California, according to the article. "U.S. Mussel Watch" is going International, with 70 scientists meeting in Barcelona, Spain, in December, 1978, to create a global monitoring network using the mussel. It seems appropriate to report this in this issue as you note Dr. Odé's discussion on mussels - they aren't just 'ugly shells', as some collectors seem to think. They are important food sources in many parts of the world; now they seem to be very important in our war against pollutants.

On Saturday, October 19, 1978, about 15 members of The Outdoor Nature Club joined me in an outing to the seashore - of about 65 million years ago - to collect fossil seashells. This outing was to the Stone City Fossil Bed on the Brazos River. Last year the Houston Conchology Society had a successful field trip to this site which is an easy one to reach and a pleasant place for profitable collecting of ancient shells. From Houston we drove north on Highway 6 to Bryan, then turned west on Highway 21 for about 11 miles to the Brazos River. Stopping on the west side of the river, we parked our cars along the side of the highway and descended the river bank on the south side of the bridge.

At the water's edge, the group assembled with the proper equipment for looking for fossils at this location which included instruments for digging (knife, knitting needles, screw driver, or anything with a sharp point), containers padded with cotton to prevent breakage for holding the "finds", something for protection against the sun (both a hat and suntan lotion if you go during the heat of summer), drinking water and a lunch. All these items of necessary equipment should be carried in your well-used collecting bucket. For the more fastidious collector, you may also want to take along extra water for hand-washing. Since you will be spending about 95% of the time on your knees, you may want to take along something to be used for padding. But, at any rate, be sure and wear long pants.

The Stone City Fossil Bed is a well known fossil-collecting location which was first discovered by Ferdinand Roemer in 1846. This fossil bed is a geological formation about 60 feet in thickness, which is exposed for a distance of about 500 yards along the west bank of the Brazos River. This was the coast line during the middle of the Eocene Age, with the materials being deposited in a lagoon and a submerged mud flat environment.

With the river at an extremely low stage, there were many new zones exposed and ready to be searched for goodies. Naturally, most of those present were looking for the large shells and hoping to find cones - and find cones we did! Most everyone was lucky enough to find at least one cone, some found several and one person even found a cone with the full lip intact. Of the large shells, the more numerous were Athleta, Cochlespira, Distorsio, Pseudoliva and Venericardia. We picture some of these shells. My most interesting find in the large shell category was two perfect examples of Ancilla.

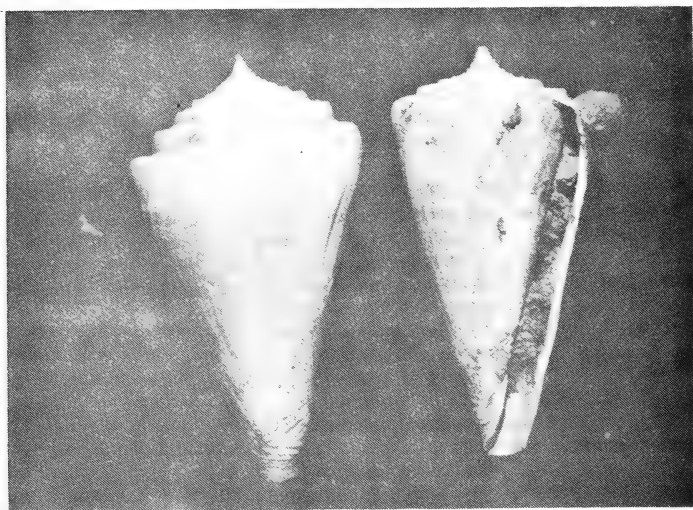
Another way to collect at the fossil bed is to get chunks of dirt to take home to search for the miniature shells. The procedure I follow is to take the chunks home and first get them completely dry by placing them in the oven at the lowest possible setting for several hours. I might point out a word of caution - it is advisable to get the approval of your wife or husband before trying this for the first time. Needless to say, without permission to "cook" your fossil lump there would be several pages of harsh words here. After the chunks are dry and cooled down, put them in a container and cover with a solution of agricultural gypsum (available at a nursery or farm supply store) and warm water. The application of this solution will turn the chunks of hard dirt into mud. Wash the mud through a sieve (40 mesh) and place the retained material on a flat surface to dry. After drying, look for the small bivalves, such as Calornadia, Notocorbula, Glycymeris, Tellina, and Vokesula. Also, look for juveniles of the larger fossils mentioned above. I found a juvenile cone in my first batch. Many

minute Gastropods are in the clay chunks - Pyramidellas, Architectonica, etc. Although we did not find any shark teeth or crab claws on this trip, these are much-sought-for fossils at this site.

The following publications are helpful in identifying the fossils:

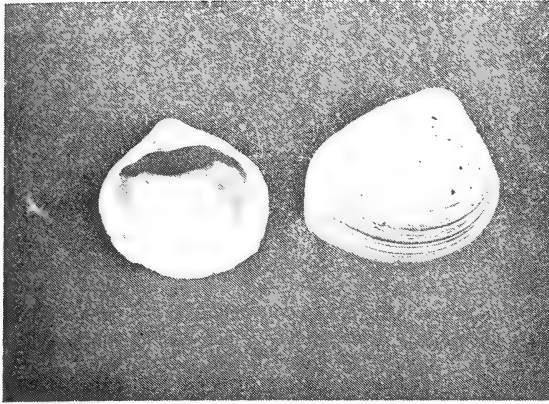
- \*1. "Fossils and Localities of the Claiborne Group (Eocene) of Texas", James E. Knight, Irene D. Offeman and Ruth M. Landry, publication of the Houston Gem and Mineral Society, (Paleontology Section).
2. "Fossils, An introduction to Prehistoric Life", William H. Matthews (Everyday Handbooks No. 280).
3. "Pelecypods From the Type Locality of the Stone City Beds (Middle Eocene) of Texas", H. B. Stenzel (University of Texas Publication S704).
4. "Texas Fossils, and Amateur Collectors Handbook" W. H. Matthews (University of Texas Guide Book No. 2).

\*Publication in the library of The Houston Conchology Society. (All other publications in the author's library).

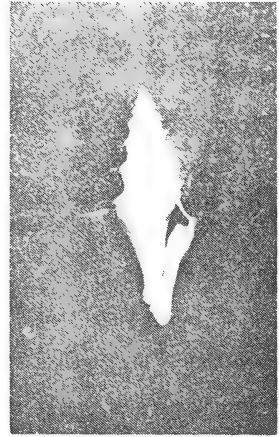


Conus sauridens (Conrad)

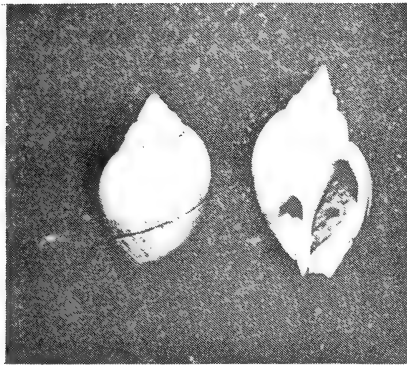
Photos by Constance E. Boone



Crassatella antestriata Gabb



Cochlespira engonata Conrad



Pseudoliva vetusta carinata

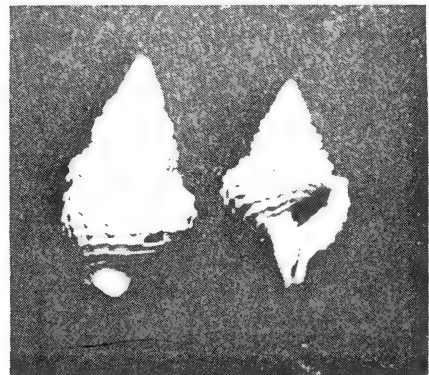
Conrad in Gabb



Athleta petrosus (Conrad)



Pitar petropolitana Stenzel & Krause



Distorsio septemdentata Gabb

## SEARCH AND SEIZURE

By Constance E. Boone

A paper by Dr. Robert Robertson of the Department of Malacology, The Academy of Natural Sciences of Philadelphia, published in The Biological Bulletin, 155: 360-382 (October, 1978) gives the results of a study of some east North American odostomioid pyramidellids and provides new light on systematic placement of Texas species also.

Titled "Spermatophores of Six Eastern North American Pyramidellid Gastropods and Their Systematic Significance (With the new Genus Boonea)", the paper presents the new assignment of six odostomioid species to the new genus and to the Genus Fargoa for the first time in pyramidellid systematics on non-conchological characters (except for shell size and protoconchs).

The new Genus Boonea Robertson, 1978 is named for Constance (Mrs. Hollis Q.) Boone. For a number of years material of living and preserved mollusks has been sent to Dr. Robertson for his studies, and I am deeply honored at his thoughtfulness in naming the new genus for me.

Type of Boonea is seminuda (C.B. Adams, 1839), a species occurring in Texas. Included in this genus also are Boonea bisuturalis (Say, 1822), reported from this area but not confirmed by the author, and Boonea impressa (Say, 1822), a common shallow-water odostomioid in the Texas area.

Type of the Genus Fargoa Bartsch (1955, p. 80) is Fargoa calesi Bartsch, 1955 ("Pliocene" or Pleistocene) = "Odostomia" bushiana Bartsch, 1909. The genus is used by Dr. Robertson for Fargoa dianthophila (Wells and Wells, 1961), occurring also in Texas; Fargoa bushiana Bartsch, 1909, reported for Texas; and Fargoa bartschi (Winkley, 1909), also in Texas. All three of these are scarce. Your Search and Seizure author has collected F. bushiana dead only and a few of F. dianthophila and bartschi alive. Dr. Robertson predicts that "Odostomia" gibbosa, which lives in Texas in sands near shore apparently, will be placed in Fargoa.

The placement of the six species in the two genera was done on the studies of spermatophores which Dr. Robertson says are species-specific in structure and position.

The Biological Bulletin is published by the Marine Biological Laboratory of Woods Hole, Mass. 02543. The price per volume is \$22.00 for three issues. The most recent issues, the 12 issues in 4 volumes published during the last 2 years, are available by order from the above address. The journal is issued six times a year; therefore, the price for one year's subscription is \$44.00. Single numbers are available at \$8.00. This information has been sent me from the library at Woods Hole.

A reprint of the discussed paper, provided by Dr. Robertson, will be placed in our library.

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An interesting proposal for standardizing some common names for mollusks has been made by the American Malacological Union. Dr. Carol Stein, president of AMU in 1977-78, initiated discussion of the feasibility and desirability of preparing a list of common names for mollusks.



The thought behind having an AMU list of common names for mollusks was brought forth by the need envisioned when countries and governmental agencies discuss endangered species or valuable mollusks for medical research or food. Common names are being used by countries and agencies and often are not the same in different areas and often are unusual, to say the least.

A year ago when I was helping to prepare the permanent exhibit of Texas mollusks at the Houston Museum of Natural Science, the problem of common names for land snails and fresh water mussels could not be solved successfully. Many marine shells have no adequate common names. Common names were left off the labels when they weren't widely known. We did not want to manufacture common names.

Some of the common names being used for some fresh water mussels include "pink pigtoe pearly mussel", "painted snake coiled forest snail", "turgid rifle shell", "Higgins' eye pearly mussel", "mudpuppy mussel", and "rough rabbit's foot pearly mussel".

Many of us who are amateurs have struggled to learn Latin names for shells because we are told these names are universal. Some of us do not wish to use the Latin names because we are afraid to pronounce them. Some of us are collectors who do not intend to seriously work with the shells we collect and do not intend to catalog them with Latin names.

However, I have thought so many times of the statement in Myra Keen's Sea-shells of Tropical West America where she notes that the common name, wentletrap, for Epitonium is longer than the Latin name but is readily adopted by amateurs who insist they cannot remember scientific names. I think they are equal in pronunciation ease. It is also true that many books give the common name in the text but not in the index.

Some reference books devise common names but don't agree. For instance, we note that Epitonium albidum is listed as "bladed wentletrap" in one book and as "white wentletrap" in another.

The general meeting of AMU in 1978 approved a motion for establishing a committee to prepare a list of common names for mollusks of medical importance, commercial importance, of major food supply and selected mollusks as determined by the committee. We will hear more of this next year. Such an AMU list would eventually be available for public use.

#### AMU-WSM TO MEET IN TEXAS THIS YEAR

The American Malacological Union will host a joint annual session with the Western Society of Malacologists August 5-11, 1979 at Corpus Christi, Texas. The Coastal Bend Shell Club will be the local host club for the meeting which will be headquartered at the La Quinta Royal Motor Inn.

William E. Old, Jr., will be presiding as president. He extends an invitation to all society members to attend the meeting. The Houston Conchology Society is an affiliate club member of AMU. Members of the society who are not individual members of the union are eligible to attend the sessions and participate in all social and field trip events by registering and paying special event fees for the meeting. Plans and fees will be announced in the spring. Information may be obtained at that time from Constance E. Boone, Recording Secretary, AMU., 3706 Rice Blvd., Houston, Texas 77005.

The Western Society of Malacologists plans to hold a symposium on "The Life Histories of Mollusks", and AMU will have a symposium on "The Mollusks of the Gulf of Mexico", chaired by Dr. T.E. Pulley.

LIBRARY ADDITIONS

General Library Fund

- Brazilian Marine Iconography
- British Bivalve Seashells
- British Shells
- Animals With Shells
- \* Exploring for Seashells on Martha's Vineyard
- Hamlyn Guide to Shells of the World
- \* How to Know the Eastern Land Snail
- Illustrated Guide to Fossil Collecting
- Seashells of the West Indies
- Seashore Life of Florida and the Caribbean
- Shelling in the Sea of Cortez
- \* Shells of the Caribbean
- Shells of the Pacific
- Starfish
- Wonders of Barnacles
- Wonders of Starfish

Hugo Bauer Memorial Fund

- \* 1001 Questions Answered About the Seashore
- \* A Day in the Life of a Sandy Beach
- \* Baja (Travel Guide)
- \* Crabs
- Fascinating World of the Sea
- Questions and Answers About Seashore Life
- \* Shell Craft
- Shell Life and Shell Collecting
- \* When the Tide Goes Way Out
- \* Wonders of Sponges
- \* Yucatan Peninsula (Travel Guide)

Ruth Fair Memorial Fund

- Australian Seashores in Colour
- Coquillages de Polynesie
- Field Guide to Shells of the World
- Florida Fossil Explorations
- Guide to Australian Shells
- \* Guide to Shells of Papua, New Guinea
- \* Marine Shells of the Pacific, Volume III
- \* Seashells of Dar-es-Salaam - Gastropods
- \* Seashells of Dar-es-Salaam - Pelecypods
- Seashells of Sri Lanka
- Seashells of Hawaii
- Shell Collecting in Australia
- Shells of New Zealand
- The Coral Seas
- The Story of Pearls

\* - Books due in at time article submitted.

DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN  
THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph)

SUPERFAMILY MYTILACEA

Family MYTILIDAE

The family Mytilidae in the N.W. Gulf of Mexico is remarkable for the presence of two genera so far not yet known from the tropical Western Atlantic. Solamen and Adula are components of the Panamanic Province and their occurrence on the Texas coast is one more indication of the close ties between the offshore Texas fauna and the more southerly part of the Panamanic faunal province. Also, Dacrydium off Texas appears to be more closely related to a species of the Galapagos Islands than to Atlantic species. It further may be noted here that the identification of several widespread species in our area presents serious difficulties.

Mytilids are equivalve, in general somewhat elongate bivalves, either attached by byssus to hard substrate or nestlers or borers and live from shallow to deep water. Their size varies from small to large. Four subfamilies are recognized which all live in the N.W. Gulf of Mexico: Mytilinae with genera Brachidontes and Ischadium; Crenellinae, with genera Crenella, Solamen, Musculus, Gregariella and Lioberus; Modiolinae with genera Modiolus, Geukensia, Amygdalum and Botula; Lithophaginae with Lithophaga and Adula. Soot-Ryen remarks that of these subfamilies the Crenellinae are probably polyphyletic. It is somewhat unlikely that Crenella and Solamen are in any way close to Musculus or Gregariella. Juveniles of Crenella are not mytiloid in appearance and the genus Crenella together with Solamen probably ought to be split off in a separate family.

Sources: T. Soot-Ryen in Treat. Invert. Pal., Vol. N, part 1, p. 271-281.

M. Keen, Sea Shells of Trop. West. America, p. 58, 1971.

R. Turner and K. J. Boss, Johnsonia, Vol. 4, (41), p. 81-116, 1962.

Genus Amygdalum Muhlfeld, 1811.

Very thin, often light colored shells of modiolid shape. Mostly deep water. The animals are nestlers.

283. Amygdalum papyrium (Conrad, 1846).

Modiola papyria Conrad, Proc. Acad. Nat. Sci., Phila, 3 (1), p. 24, 1846.

This is one of the few species of the genus that live in shallow

water. A. papyrium has entered the coastal bays and although it does not go as far up into the bays as some other mytilids, it still can live in water less saline than seawater. It also lives in the hypersaline bays, but is missing in offshore waters. Texas material (no material from Louisiana is present in the H.M.N.S. collection) is obtained along most bay margins (Galveston Bay, Matagorda Bay, Corpus Christi Bay, South Padre Island) and is mostly juvenile; good sized mature specimens are less common but can occasionally be found nestling in root masses at the bay margins. The color pattern is mostly a uniform glistening muddy greenish brown seldom with appreciable flames and patterns of lines as in other species. The species has also been reported as A. arborescens Dillwyn 1817, and A. dentriticum Muhlfeld 1811.

Previous records for the Texas faunal province are: 7, listed; 15, abundant on Peat Island, Laguna Madre; 19, living in Carancahua Bay, Keller Bay and Matagorda Bay; dead specimens in Espiritu Santo Bay, and Corpus Christi Bay; 21, listed; 45, Corpus Christi and Laguna Madre; 50, listed for Texas; 69, listed in appendix 8; 110, found in Lavaca Bay; 136, listed "alive" in final list, not in text; 164, in Rockport area and in Laguna Madre; 174, listed; 175, listed for "open shallow hypersaline near inlet" assemblage, pl. 3, fig. 6; 178, upper end of Southern Laguna Madre and shallow barrier flats; 194, listed as Lithophaga papreca (sic!) mentioned as food item for Black Drum fish; 206, beach record in Tex. Conchol., Vol. 6, p. 58; 208, listed for grass flats; 225, Galveston; 236, Galveston; 269, figured on page 158.

Records H.M.N.S.: 12 lots of which 9 contain live collected material.

Depth Range: 0-1 fms., mostly at bay margins.

Geographical Range: Texas and Maryland to Florida (Abbott, 1974).

Maximum Size: 25.5 mm.

Eastern Pacific Analogue: None of the 2 Panamanian species appear to be close.

284. Amygdalum sagittatum Rehder, 1934.

Modiolus (Amygdalum) sagittatus Rehder, Nautilus, Vol. 48 (4), p. 127-128, pl. 7, figs. 11-12.

This is a much blunter, flatter and thinner species from offshore waters. It is a nestler in its own byssus in a depth range of 20-30 fms. It is diagonally divided into two color regions, the posterior end being the darker. Inside the umbo there is a small riblet.

Previous records for the Texas faunal province are: 144, reported from location 163.

Records H.M.N.S.: 5 lots of which 3 contain live material.

Depth Range: 23-30 fms., alive 23-38 fms., nestling in sandy mud.

Geographical Range: Off Florida and Mississippi (Abbott, 1974).

Maximum Size: 33 mm.

Eastern Pacific Analogue: Amygdalum pallidulum (Dall, 1916)

"----to 380m depth from northern California to Columbia" Keen, 1971.

285. Amygdalum politum (Verrill and Smith, 1880).

Modiola polita Verrill and Smith, Am. Journ. Sci., 20, p. 390-400.

We have only a single lot of fragmental material of this much

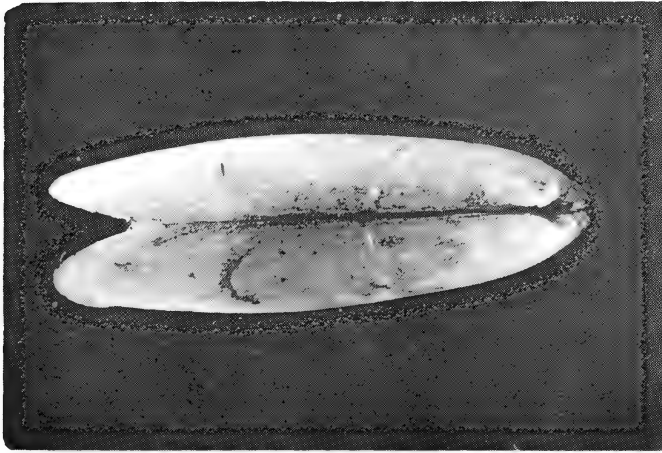
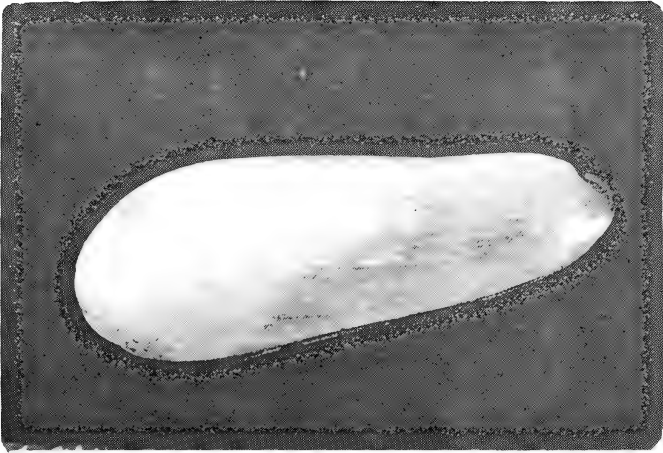


Fig. 1 Amygdalum papyrium (Conrad, 1846), a 24 mm. wide specimen collected at Hoecker's Point, Galveston West Bay, by Harold Geis on Feb. 27, 1968.

larger Amygdalum, which has been dredged occasionally from much deeper waters in the Gulf of Mexico. These fragments indicate a size of over 2 inches. They were obtained off the Mississippi delta.

Previous records for the Texas faunal province are: 144, reported from locations 542, 548.

Records H.M.N.S.: One lot, no live material

Depth Range: 228 fms., on mud.

Geographical Range: North Atlantic to West Indies, Gulf of Mexico.

Maximum Size: Probably in excess of 2 inches.

Eastern Pacific Analogue: None.

Genus Geukensia Poel, 1959.

A radially ribbed modiolid, which is surprisingly like the mytilids of the genus Brachidontes. Lives in brackish water.

286. Geukensia demissa granosissima (Sowerby, 1914).

Modiolus demissus granosissimus, Sowerby, Proc. Mal. Soc. London, Vol. 11, p. 9, 1914.

This large brackish water modiolid can be collected together with Tagelus in root masses along bay margins of Galveston and Matagorda Bay systems. Further south in Texas it is rare, and apparently south of Corpus Christi it is missing in Texas, but appears again in Mexico. It is restricted to bay margin environment. Rare beach specimens have been transported to the beach by gulls, who eat them. I have observed this twice on Galveston West Beach where I surprised gulls during their meal, of this for humans almost inedible mollusk. G. demissa lives along the eastern seaboard and is not as finely ribbed as the southern granosissima (Florida-Texas-Yucatan). In spite of careful collection I have not succeeded in obtaining juvenile material smaller than 12 mm. These are very similar to the much smaller juveniles of Ischadium. G. demissa will finally be classified close to Ischadium. It has 3 muscular impressions like Brachidontes and Modiolus.

Previous records for the Texas faunal province are: 1, (as Modiola plicatula Lamarck) Galveston; 7, (as M. plicatula Lamarck, var. semicostata Conrad) listed; 15, (as M. plicatula Lamarck) Galveston Bay; 18, (as M. plicatula semicostata Conrad), Galveston Bay; 19, along the reedy shore of Carancahua Bay, Lavaca Bay, Matagorda Bay. "They are not good eating"; 21, listed as M. plicatula Lamarck; 26, recent from Nova Scotia to Georgia, West Florida and Texas. Locally restricted towards the extremes of its distribution; 45, Lavaca, Matagorda and Galveston Bays, Texas; 126, listed for bays and lagoons, moderate to high salinity, sandy or muddy bottom, Carolinian province; 145, shallow shelf, dead; 206, beach records in Tex. Conchol., Vol. 6, p. 58, 1970; 225, Galveston; 236, Galveston; 269, figured on page 66, Marine Pleistocene of Texas; 110, found living in peaty mud above high tide mark in Galveston Bay, pl. 6, fig. 16.

Records H.M.N.S.: 7 lots of which 4 contain live collected material.

Depth Range: 0-1 fms., alive 0-1 fms.

Geographical Range: Florida, Louisiana, Texas, Mexico.

Maximum Size: 107 mm.

Eastern Pacific Analogue: Not in Panamanian province but introduced into San Francisco Bay.

Anterior part of the shell extending in front of the umbo. Two species are reported to live in the N.W. Gulf of Mexico, but here only one species can be identified with certainty.

287. Modiolus americanus (Leach, 1815).

This well known tulip mussel can be usually collected along Padre Island where it washes to shore attached by byssus to seawhip. At numerous offshore localities fragmental material is dredged. Abbott, 1974, cites for the N.W. Gulf of Mexico only another species of the genus: M. modiolus squamosus Beuperthuy, 1967, and fails to mention M. americanus for the area. This is an error since M. squamosus as far as I know has never been collected in Texas. However, most specimens in the H.M.N.S. collection came from seawhip to which the animals are attached by byssus. On Heald Bank a living specimen of a Modiolus americanus (36 mm.) was dredged which in coloration is somewhat different, although not in shape. It was a nestler, which was dredged as a "mud ball". Its color hardly shows any pink, but the shell is drab brown olive and totally covered by periostracum. (Usually M. americanus is obtained from seawhip only partially covered.) There is only an indication of white radial band and also the internal hue of the white is dark. The hairs of the periostracum, however, are long and slender. Juveniles of Modiolus are quite triangular in shape with a flaring posterior end and a small snout like anterior part in front of the umbo. (See sketch). By these criteria they can be distinguished from juveniles of Lioberus which live often together with Modiolus in the same environment. Juveniles of both species are quite compressed. It may be noted here that juveniles of almost all mytilids of which I have seen juvenile material (1-2½ mm.) are somewhat elongate and quite compressed. The only exceptions are true crenellids (Crenella and Solamen) which probably would be more properly placed in a separate family. Musculus and Gregariella are true mytilids.



Modiolus



Lioberus

Previous records for the Texas faunal province are: 21, listed; 45, listed; 61, listed for Corpus Christi Bay; 69, listed in appendix 8; 98, listed for South Texas bays and Padre Island; 110, broken shells are rare on all Texas beaches, pl. 6, fig. 15; 135, dead in the Gulf; 156, common on Stetson Bank, may not live there; 170, listed for shallow shelf assemblage; 174, listed; 192, figured on pl. 7, figs. 8A-B; 206, beach records Tex. Conchol., Vol. 6, p. 58; 269, figured on p. 156.

Records H.M.N.S.: 37 lots, of which 11 contain live collected material.

Depth Range: 0-55 fms., alive 0-55 fms., either on seawhip or sandy

shelly bottoms.

Geographical Range: South Carolina to Florida to Brazil, Bermuda; Gulf of California to Peru. (Abbott, 1974).

Maximum Size: 73 mm., but fragments indicate a much larger size  $\neq$  4".

Eastern Pacific Analogue: Modiolus pseudotulipus Olsson, 1961, is considered by several experts to be identical with M. americanus Leach. "Bahia Magdalena, Baja California, to Peru" (Keen, 1971).

288. Modiolus spec. indet. A.

A single juvenile shell of very small dimensions ( $\neq$  1 mm.) is so different from other material that we have classified it separately. Until further material is found little can be said about it. Its generic assignation may be in error.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 1 lot.

Depth Range: 11 fms., in shelly mud off Galveston.

Geographical Range: Unknown.

Maximum Size: .9 mm.

Eastern Pacific Analogue: None?

Genus Botula, Morch, 1853.

Rather inflated with coiled umbo and dark brown to olive brown periostracum.

289. Botula fusca (Gmelin, 1791).

This very different bivalve is only taken in calcareous environment (Flower Gardens and off Louisiana). The valves possess a number of fine serrations posterior to the ligament. Uncommon in the Northwest Gulf of Mexico. Most specimens are rather light brown rather than chestnut brown in coloration, but the colors vary considerably in a population. Juveniles are elongate in shape and rather flat.

It may be noted that some of our material is considerably in excess over the 3/4 inch size given by Abbott (1974).

Previous records for the Texas faunal province are: 147, alive from East and West Flower Gardens; 174, listed.

Records H.M.N.S.: 8 lots, of which two contain live collected material.

Depth Range: 10-51 fms., alive 10-28 fms., in calcareous environment.

Geographical Range: North Carolina to Florida, West Indies, Bermuda, Brazil (Abbott, 1974).

Maximum Size: 28.5 mm.

Eastern Pacific Analogue: Botula cyclista Berry, 1959. Probably identical with the Atlantic B. fusca! "Mazatlan, Mexico to Manta, Ecuador (rare)" (Keen, 1971).

Genus Ischadium Jukes-Brown, 1905.

Superficially close to Brachidontes and Geukensia, but umbo not as far in front as in Brachidontes and arrangement of teeth and muscular impressions different.

290. Ischadium recurvum (Rafinesque, 1820).

It is not always a simple matter to separate Ischadium from Brachidontes (Hormomya). For quite small juveniles,



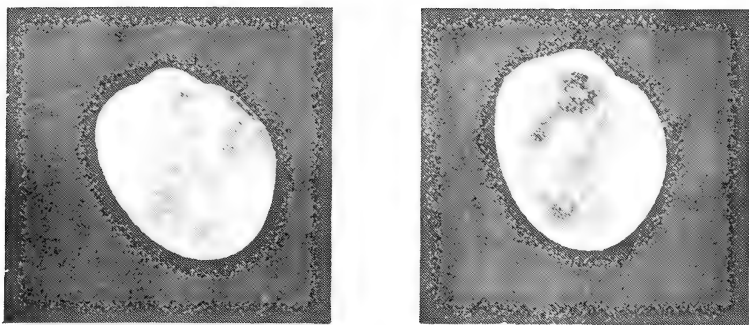


Fig. 2 Modiolus spec. indet A, a 1.1 mm. wide specimen taken from the 24 fm. lump 113 miles SE of Galveston, Texas, from algae debris and shells brought up by divers on board the USS Haynsworth DD 700 on Oct. 7, 1967, from 25-28 fms.

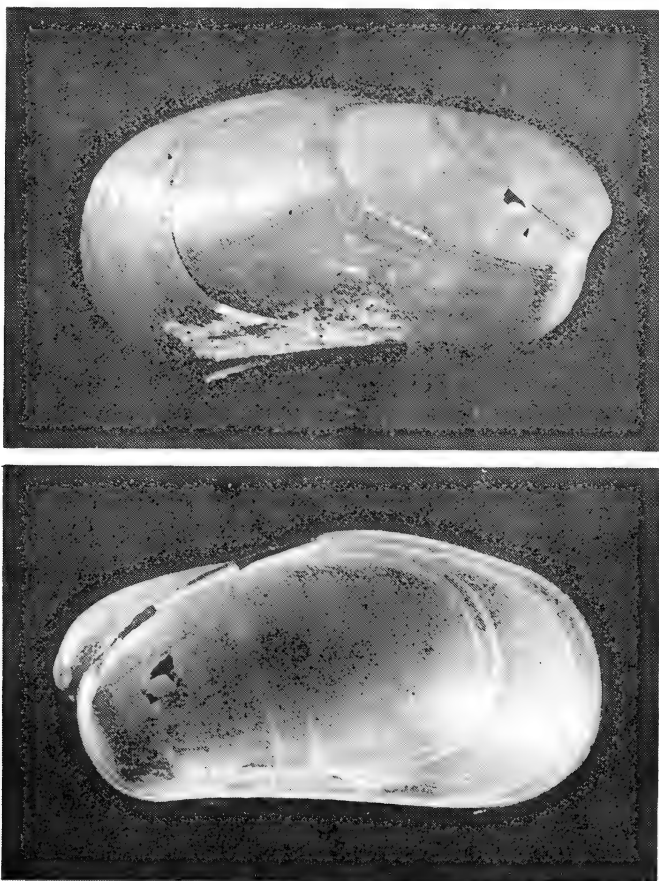


Fig. 3 Botula fusca (Gmelin, 1791), a specimen 18.5 mm. wide, 8.9 mm. high, collected from coral bottom, 65-85 ft., by divers on the USS Haynsworth DD 700, from the East Flower Gardens, 103 miles SE of Galveston, Texas.

178, upper extremity of northern Laguna Madre; 202, listed for Mexico, Laguna de Terminos, plate 1, fig. 5; 206, beach records in Tex. Conchol., Vol. 6, p. 47; 208, listed for oyster reef; 225, Galveston; 236, Galveston; 269, figured on page 157.  
Records H.M.N.S.: 30 lots, of which 19 contain live collected material.  
Depth Range: 0-1 fms., alive 0-1 fms.  
Geographical Range: Cape Cod to the West Indies (Abbott, 1974).  
Maximum Size: 63.5 mm.  
Eastern Pacific Analogue: None.

Genus Brachidontes Swainson, 1840.

According to Keen (1971) the subdivision of this genus into two subgenera Brachidontes and Hormomya is difficult to defend. Here a conservative course is followed and one of the 2 Texas species, which can hardly be considered part of the fauna (adventitious?) is classified in Brachidontes, the other in Hormomya.

291. Brachidontes (Brachidontes) modiolus (Linne, 1758).

Only rarely some valves have been taken at the Port Isabel jetty. It is a more elongate and yellower species than the next one; probably the few specimens known from the South Padre Island jetty are adventitious and the species cannot maintain itself so far north. A single dead specimen was dredged in 55 fms. off Louisiana. This species used to be known as B. citrinus (Roding, 1798).

Previous records for the Texas faunal province are: (Note: I suspect that most, if not all, of these records pertain to incorrectly identified Hormomya). 147, listed for reefs; 161, listed for Laguna Madre; 160, dead at several locations in Matagorda Bay; 164, alive in Rockport area, alive in Laguna Madre; 174, listed; 178, Baffin Bay; 192, plate 8, fig. 3, Alacran Reef, Yucatan; 206, beach records Tex. Conchol., Vol. 6, p. 47; 208, serpulid worm tubes, barnacles and B. citrinus are the most common potential fossils of these reefs (serpulid reefs in Baffin and Alacran Bays); 225, Galveston; 236, Galveston.

Records H.M.N.S.: 1 lot.

Depth Range: 0-55 fms.

Geographical Range: Southern Florida and West Indies. (Abbott, 1974)

Maximum Size: 8 mm.

Eastern Pacific Analogue: ?

292. Brachidontes (Hormomya) c.f. exustus (Linne, 1758).

The identification of the N.W. Gulf of Mexico species of Hormomya is beset by uncertainties. According to Abbott (1974), there are two closely similar species in the Western Atlantic, mainly differing in degree of inflation, thickness, number of riblets, color and habitat. The finer ribbed species is figured by Abbott as B. exustus Linne, which is lighter colored than B. domingensis Lamarck and which prefers slightly brackish water habitat. B. exustus Linne is also said to be less arched than B. domingensis. The Texas representative of Hormomya has the ribbing of B. domingensis (far less marginal crenulations than 90), lives for a few exceptions mainly in brackish water bays, and on the whole is extremely variable in shape, inflation and shell thickness. Its color is a peculiar "burned yellow", which gave B. exustus Linne

less than 1-2 mm., there is little trouble because Ischadium has a juvenile which is much more elongate than that of Hormomya. However for shells in the range of 4-8 mm., distinction is sometime quite difficult. Due to the unequal growth rate along the margin - this precisely causes the hooked nature of I. recurvum - Ischadium reaches a stage during which it to a surprising degree resembles Brachidontes. At this relatively early stage the shell is still light colored, much like Hormomya. There are however a number of characters which allow one to separate both species without a direct look at the hinge. Ischadium is much the flatter of the two and the contour of the highest elevation on a flat lying valve (convex side up) is much closer to the dorsal margin than in Hormomya. Also the valve is more rounded and less winglike.

Once Ischadium reaches a size of 5-8 mm. internal solid coloring starts which during the life of the shell gradually intensifies. Large specimens become outwardly a dark gray blue. Juvenile material is never, as in Hormomya, outwardly blotched by purple streaks. A most telling difference between Ischadium and Hormomya is the margin posterior to the ligament. In Ischadium the margin is smooth, in Hormomya there are 5 to 6 small teeth. Finally Ischadium carries 2 muscular impressions, Hormomya 3 (see sketch).

According to Soot-Ryen Ischadium misses the anterior retractor muscle.



Ischadium

Hormomya

Of all bivalves Ischadium lives farthest up into the brackish water bays (except for Dreissena), but can tolerate also fairly high salinities so that on occasion it can be collected with Hormomya. It is found alive in all coastal bays of Texas and Louisiana and dead valves are often found on the beaches.

Previous records for the Texas faunal province are: 1, (as Mytilus hamatus Say), listed for Galveston, common; 7, listed as Mytilus hamatus Say; 15, as Mytilus hamatus Say, common all along the coast; 18, as Mytilus hamatus Say, Galveston and Corpus Christi, very abundant on oyster reefs; 19, as Mytilus hamatus Say, very common on oysters, sometimes so numerous as to render oysters unfit for market; 21, listed as Mytilus hamatus Say; 45, Galveston, Corpus Christi; 56, listed; 61, as Mytilus hamatus listed for Corpus Christi area; 68, listed for Mustang and Padre Islands; 67, listed for Point Isabel; 69, oyster reefs, listed in appendix 8; 91, on all jetties; especially in East Texas; 98, dead in many bays, alive on reefs, Laguna Madre; 110, commonly found growing on oysters on pilings in all the bays, plate 6, figs. 17-18; 126, listed for jetties and oyster reefs in bays of Carolinian Province; 134, on oysters in East Galveston Bay; 139, listed for low salinity oyster reef, pl. 38, fig. 6; 145, lower sound, upper sound, inlets of Mississippi delta, pl. 2, figs. 14A-B; 146, oyster reef, plate 4, fig. 43; 156, Stetson Bank, fossil; 160, dead in Matagorda Bay; 164, alive in Rockport area in several types of environment, dead in Laguna Madre; 174, listed; 175, listed for low salinity oyster reef assemblage, plate 1, fig. 9;

its name. However some few specimens appear to be darkly colored but these are specimens with an unusually dense pattern of purple streaks. In shape some Texas material is on the whole slightly hooked like Ischadium. The situation is somewhat more confused than represented here because at two occasions live specimens were taken offshore in water 36-45 feet deep; these specimens are indistinguishable from bay specimens. The N.W. Gulf of Mexico species may turn out to be a subspecies of one of the two cited species, and for the time being I will label it as everybody in the past has done. It lives in profusion in all Texas coastal bays and although the H.M.N.S. collection lacks material from Louisiana I expect it to live also there.

Previous records for the Texas faunal province are: 7, listed; 15, Corpus Christi, on oysters; as Mytilus cubitus Say, Corpus Christi common on oysters; 19, fresh shells in Lavaca Bay, none alive; 21, listed; 45, Corpus Christi and Lavaca Bay; 55, listed; 110, abundant on the Rockport jetty, also found at Port Isabel, pl. 6, figs. 11-12; 114, commonly found on oyster shells, Aransas Bay, San Antonio Bay, Copano Bay, pl. 56, fig. 10; 135, alive in bays; 139, listed for high salinity oyster reef, pl. 38, fig. 9; 143, listed for Matagorda Bay; 145, upper sound, Mississippi delta, pl. 2, figs. 13A-B; 160, dead at several locations in Matagorda Bay; 164, alive in Rockport area, dead in Laguna Madre; 174, listed; 175, listed for high salinity oyster reef, commonly attaches to oyster valves, pl. 2, fig. 21; 193, common on oyster clumps in Port Isabel area; 194, food items for black drum fish; 206, beach records in Tex. Conchol., Vol. 6, p. 47; 225, Galveston; 236, Galveston; 269, figured on page 157 (very typical).

Records H.M.N.S.: 35 lots, of which 20 contain live collected material

Depth Range: 0-25 fms; alive: 0-1 fms. and 36-45 feet (offshore).

Geographical Range: North Carolina to Texas and the West Indies. Brazil to Uruguay. (Abbott, 1974).

Maximum Size: 20.7 mm.

Eastern Pacific Analogue: None of the Panamanian species appears close.

Genus Dacrydium Torell, 1859.

Dacrydium is known from the North Atlantic, but the species described from cold water does not fit the material in the H.M.N.S. collection. Practically indistinguishable from our material appears to be Dacrydium elegantulum Soot-Ryen, described from the Galapagos Islands. This species belongs in the subgenus Quendreda Iredale, 1924.

293. Dacrydium (Quendreda) elegantulum Soot-Ryen, 1955.

The hinge of this bivalve has a resilium bordered by two small teeth. The surface of the shell is strikingly colored by broad somewhat radial oily streaks. Widespread off the Louisiana coast but rarer off Texas.

Previous records of the Texas faunal province are: Mentioned in Tex. Conchol., Vol. 9, p. 94, as Mytilid.

Records H.M.N.S.: 10 lots, of which 1 contains live collected material.

Depth Range: 24-170 fms. in calcareous environment (shallow) and mud bottom (deeper). Alive at 55 fms. on sandy mud.

Geographical Range: Recently described from Galapagos (1955; ("A report on the family Mytilidae...Allan Hancock Pacific Exp., Vol. 20, No. 1).

Maximum Size: 3.1 mm.

Eastern Pacific Analogue: On Galapagos Islands.

Genus Lioberus Dall, 1898.

Smooth, without teeth, somewhat inflated, elongate.

294. Lioberus castaneus (Say, 1822).

Modiola castanea Say, Journ. Acad. Nat. Sci., Phila., 2, p. 266.

This fairly common nestler is widespread over the shallow sandy portions of the offshore Texas shelf. As Modiolus americanus it is also commonly found attached to seawhip rafted in ashore along South Padre Island and a single fragment comes from the Flower Gardens. Most dredged material is juvenile and can be easily distinguished from other mytilids. Although reported for the bay I have not seen material from the bays.

Previous records of the Texas faunal province are: 21, (as Modiolus ligneus Reeve) listed; 110, (as Botula castanea Say, 1822) a few shells in Aransas Bay; 136, not in text, but in final list, off East Texas; 160, alive in Matagorda Bay; 206, beach records Tex. Conchol., Vol. 6, p. 58; 253, on reef offshore Padre Island, 2 fresh valves; 269, figured on page 159.

Records H.M.N.S.: 14 lots of which 11 contain live collected material.

Depth Range: 0-25 fms., alive 0-25 fms., in sandy shelly bottoms.

Geographical Range: Both sides of Florida and the West Indies. Brazil. (Abbott, 1974).

Maximum Size: 22.8 mm.

Eastern Pacific Analogue: Lioberus salvadoricus (Hertlein and Strong, 1946). Keen, 1971, gives Sonoran coast of Mexico to Costa Rica as range.



Fig. 4 Lioberus castaneus (Say, 1822), specimen 16.6 mm. wide, 10.2 mm. high, taken in 25 fms. by dredge on Gus III, Bureau of Commercial Fisheries ship, 55 miles SE of Freeport, Texas, December 7, 1966.

Photos by Harold Geis

Genus Solamen Iredale, 1924.

Of this thin shelled genus a single species is taken in the N.W. Gulf of Mexico. Soot-Ryen considers Rhomboidella a subgenus of Solamen, but Abbott inverts the relationship by considering Rhomboidella Monterosato, 1884, as the genus and Solamen the subgenus. Finally Keen (1971) seems to imply that Solamen Iredale, 1924, is used improperly and calls the genus Megacrenella Habe, 1965 (Abbott states as authors Habe and Ito, 1965). It is probable that our species is closely related if not the same as Solamen columbiana Dall, 1897 (? Solamen megas Dall, 1902) of the Panamanic fauna.

295. Solamen (Rhomboidella) spec. indet. A.

This paper thin bivalve is not particularly rare in the 20-50 fms. range, but complete material is quite rare due to its extreme fragility. There are very many radials (probably about 100, I did not count). The prodissoconch is relatively large and orbicular, smooth, white and ending abruptly against the glassy shell. Hinge with thickened anterior part bearing several "teeth". There is a long groove for the ligament.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 12 lots, none alive.

Depth Range: 13½-70 fms., in sandy mud.

Geographical Range: Unknown.

Maximum Size: Unknown, but probably in excess of ½ inch.

Eastern Pacific Analogue: Megacrenella columbiana (Dall, 1897) may be identical. "It has been dredged in 29-530 m. depth from the Aleutian Islands to southern Mexico - or to Panama, if C. megas is, as suspected, a synonym" (Keen, 1971).

Genus Crenella Brown, 1827.

Rather inflated and thick shelled for such a minute bivalve. Surface sculpture of irregular radials. Margin dentate and hinge thickened and striated.

296. Crenella c.f. divaricata (d'Orbigny, 1845).

It is with some doubt that I assign most of the Crenellas to d'Orbigny's species. It is definitely not Crenella abbotti described by Altena from Surinam. The inflation of the valves is considerable, its shape is ovate and overall it resembles the figures of the species given by Keen (1971) closely.

Previous records for the Texas faunal province are: 147, alive on East Flower Garden.

Records H.M.N.S.: 12 lots, of which 1 contains live collected material.

Depth Range: 27-170 fms., in calcareous environment and on mud bottoms; alive: 40 fms.

Geographical Range: North Carolina to Florida and the West Indies. (Abbott, 1974).

Maximum Size: 4.0 mm.

Eastern Pacific Analogue: The same species lives in the Eastern Pacific "...from Southern California through the Gulf of California and south to Peru, mainly offshore in depths of 4-450 meters" (Keen, 1971).

To be continued

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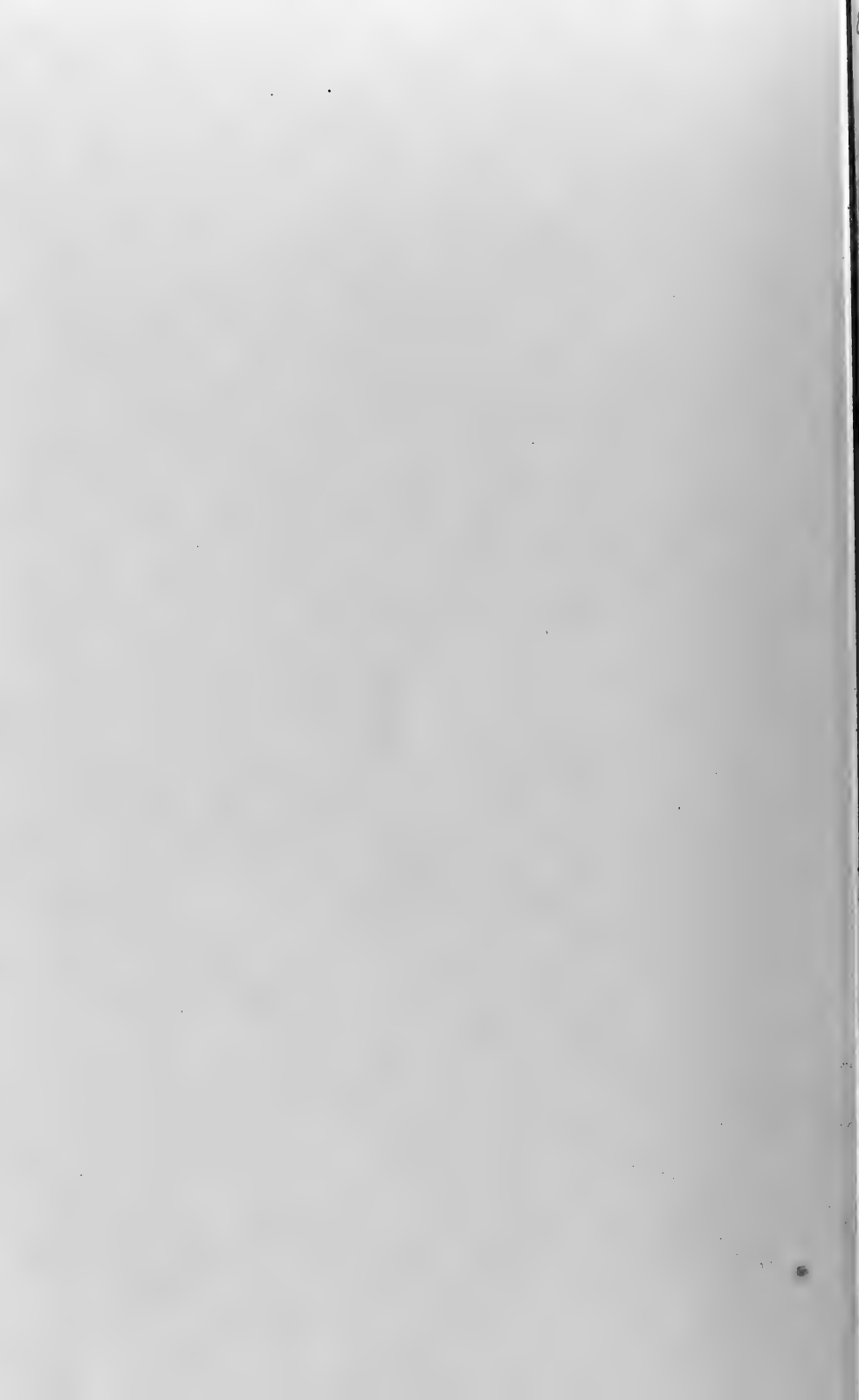
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# CONCHOLOGIST

VOLUME XV NO. 3



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The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas. It is distributed as part of the dues to all members.

The Society holds regular meetings the fourth Wednesdays of the following months: August, September, October, January, February, March, April and May. The meeting is held the third Wednesday in November. Meetings are held at the Houston Museum of Natural Science, Caroline Street in Hermann Park, beginning at 7:30 p.m.

The TEXAS CONCHOLOGIST is published October, January, April and July. It is mailed postpaid to regular members in U.S. postal zones. Overseas members will be charged additional postage. Only one copy will be mailed a family membership.

Dues extend from the beginning of the fiscal year of June 1 through May 31. However, the July issue of the TEXAS CONCHOLOGIST each year is the fourth quarterly due on the regular dues year beginning June 1 of the previous year. Memberships will be accepted throughout the year but will receive the quarterlies of that fiscal year. Members receive meeting Newsletters and have all other privileges provided by the Society's by-laws.

#### RATES AND DUES

Family membership	\$6.00
Single membership	\$5.00
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The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the Editor. Manuscripts should be typed, double spaced and should be in the hands of the Editor the first day of the month preceding publication dates. Photos accompanying such material are welcomed.

## SEARCH AND SEIZURE

By Constance E. Boone

After talking about Amaea Mitchelli (Dall, 1896) at the February meeting, it became apparent that many members had not seen a specimen of this uncommon to rare Epitonium. The natural question from some members was how could they get a specimen. Could a specimen be bought?

The prompt response from me was that the shell was seldom offered on lists these days. Five to ten years ago it could be occasionally seen on a list. Most recently (last two years) Betty Allen of Shop of the Seven Seas of Port Isabel, Texas, listed it. Most of the shells offered were beach shells. You seldom saw a live-taken specimen offered at any time. Once in a while somebody could buy one from a shrimper. It is a species that lives offshore in the Gulf of Mexico and now known down to Panama. Trawlers could net the shell when they worked for shrimp on the bottom. They no longer do this so sources for the shell have dried up.

Yet every year someone you know does find the shell on the beach, broken perhaps, yet prized. Our members the Lonnie Hobbs' from Alvin, found one at San Luis Pass, Galveston Island, in February of this year, and our member Sam Mundorff from Freeport found one the same month at Bryan Beach.

As reported to members at the February meeting, I only know of a few live-taken specimens from the beach. A former principal, Dorothy Sorrells, found one once at San Jose Island (St. Joseph's) near Port Aransas, and Betty Allen found a couple after a storm at South Padre Island.

Members were informed that even pieces were prized. Mildred Tate of Lake Jackson still has the specimen she pieced together from fragments to make a whole shell which she entered in the county fair once and won Shell of the Show. It was, of course, entered as a fake, but the idea was intriguing to shell collectors and the judges. Maybe this will be an antique some day.

Named for J.D. Mitchell of Victoria, Texas, an early collector of sea life and amateur conchologist in the Matagorda area, this shell has long been a favorite of Texas shellers. Every year a request is received for purchase or trade of this shell. There was a time when I had a few specimens I could spare in trade or gift. It has been so scarce in recent years that collections are being kept. Pieces can be found on many of our beaches, especially at Matagorda Beach. Once seen in fair numbers at Sargent, this area no longer produces many specimens. In addition to haunting the drift line at water's edge, collectors learn to check out shell deposits thrown up higher on the beach.

So, if you are asked what shell is rare in Texas, name this one. It is a beautiful shell, brown and white and commanding in appearance among Epitoniids.

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Now thinking of "rare" Texas shells leads me to talk of other shells hard to add to your collection, some rare anywhere and most very hard to find on lists of sale shells.

Some of these were offered at our auction for members--begged from lucky members so that you could add them to your specialized Texas collection.

Rangianella flexuosa (Conrad, 1839) is an ugly small clam found in muddy river inlets and in lakes like Clear Lake near Kemah, Texas. Some bayous should be checked in the Galveston Bay area also.

It took me a long time to distinguish this species from the more common one, Rangia cuneata. You have to look at the position of the umbones (rarely mentioned in discussion of flexuosa), the laterals and the pallial line. (See drawings) Rangianella flexuosa is called a "rare and elusive species from marsh areas" in Dr. Tucker Abbott's Second Edition of American Seashells. Called the "Brown Rangia" and described as a species with a brown interior (from original description), this species in my experience in Texas is not brown inside at all but is of the same bluish-white color as cuneata. It is a smaller shell usually than cuneata, and the two species can be found together. The shapes are variable, but flexuosa usually is more elongate. Don't count on this for identification.

Specimens were dug once at Clear Lake in front of Leola and Berkeley Glass's home, but the lake has so much muddy muck in it now in that area that Leola is no longer sure it exists there. At extreme low tides recently she has not seen specimens exposed. Specimens have been taken by this writer and others in the Palacios Bay area, never in abundance.

This shell certainly isn't much to look at and doesn't have the appeal of colorful univalves, but you should work on shells "in your own backyard" and count this one as a rarity in your collection when you add it there. No, I can't tell you how to purchase one. I've never seen it on a list. Leola has about exhausted her spare specimens. You may have to go digging in the mud!



Rangianella flexuosa



Rangia cuneata

Another Texas species, one that you really should be able to add to your collection, is one seldom seen in collections. By sieving in the bays around Corpus Christi, Texas, and South Padre Island, Texas, you may collect a small tellin, Tellina texana Dall, 1900. For many years it was mixed up with the more common Macoma mitchelli Dall, 1895. We get Macoma mitchelli fairly regularly in East Galveston Bay areas. Both species are iridescent but shaped differently and are, of course, in different genera.

Tellina texana is not rare. Macoma mitchelli is not rare. Collectors just do not dig in the mud in bays often enough to add it to their collections. You do not find them offered on lists. Both are one inch sized bivalves and certainly not too small to be overlooked if you are sloshing around in the mud and examining trails on mud flats at low tide.

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I am sure you'll never see Agriopoma texasiana on lists. (Oh, boy, I know better than to say "never". Many a researcher has had to eat this word as time goes on!) It seems to be rare everywhere in the Gulf of Mexico. It must live just offshore in the sand but must live deeply enough to avoid being tossed up on shore very often. It gets to be two inches, but I counted myself very, very lucky to find four medium and small specimens one day this winter at Jamaica Beach area. There have been more whole and live specimens found the last couple of years than many years before that. This is the shell we represented only by valves in our Texas buckets in 1977. Many members called it the "ugly" because the valves tossed up on the beach certainly aren't beautiful and though large are usually gray and worn. We felt collectors should learn to know the shell. The fresh or live specimen is delicately cream and thin and usually much smaller than the big ugly valves. The only two large live-taken specimens I have came from St. Joseph's State Park, tossed up on the West Florida Gulf beach, collected by our member Carl Young of Corpus Christi, Texas. I have big fossil pairs tossed up on our shores and a few smaller pairs, some live-taken. Specimens recently collected were usually found at 16-Mile Road, Galveston Island, Texas, Surfside Beach and Matagorda Beach.

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One could list other hard-to-acquire shells from Texas beaches, of course, but some have already been discussed in earlier columns. The point, I think, is that you should pick up any shell or valve that seems different to you and check it out to learn about it. There are so many times you won't have any idea what you have. Even broken specimens need to be kept if they are the first of the species you have collected. The hunt will be on to find live ones throughout your life.

Try adding the following shells to your collection from Texas: 1) Meritina reclivata (Say, 1822), uncommon in Texas but certainly not from the Northern Gulf Coast around Alabama, etc., so don't cheat and count that area; 2) Has-tula maryleeae R.D. Burch, 1965, a fairly newly-named Terebra with type locality as Freeport, Texas, but not often appearing there now and more common farther south in the surf zones; 3) Recluzia rollaniana Petit, 1853, a brown Janthina found associated with Minyas sea anemones that wash in on the beaches, usually in the Spring; 4) Solen viridis Say, 1822, a small bivalve resembling

Ensis minor that can be dug at San Luis Pass bay flats, as well as Bolivar and farther south; 5) Epitonium sericifilum (Dall, 1889), a lovely tiny and unusual Epitoniid that can be picked from drift at South Padre Island. Live ones? I only know of one report of a live-taken specimen in all the years I have been collecting and I haven't seen that one.

So you see, you can find uncommon shells in Texas. You can be as proud of them as the gorgeous Cassia you bring home from the Caribbean or the lovely Lambis from the Pacific.

Let me hear from you when you add some of the named shells to your collection.

SHELL CRAZY

By Herschel S. Sands

If you are like most shell collectors, collecting doesn't stop with the real thing, but extends into many decorative items for the home and wearing apparel.

Many of our friends think my wife Kaye and I have literally gone "shell crazy", and they are right! Not only do we display shells in every room but we have gone further. One bathroom has shell wallpaper, a shell mirror, towels with appliqued shells and a hanging plant in a white pot with shells as well as being hung by a shell and sea urchin holder. The den contains watercolors, paintings, lithographs of shells, as well as framed shells and shell stamps, a sofa covered in a large shell design with a matching table cover across the room, and a mobile from the Philippines made of Capiz shells, with the ornaments in the shape of shells. Even the kitchen is not without shells - a set of canisters with a group of shells on top of each lid and a shell night light. The breakfast room houses a gift from Kaye on my last birthday - a beautiful wreath made of brass and bronze colored shells. Yes, we are "shell crazy".

Here are a few sources of decorative items which can be purchased thru specialty type gift catalogues which I am sure many of you may not receive. They are available just by writing and asking to be put on their mailing list.

The Paragon, 35 High Street, Westerly, Rhode Island 02891 - One catalogue showed a sea urchin lamp, shell night light and shell napkin rings.

Trifles, P.O. Box 44432, Dallas, Texas 75234 - Listed in a recent catalogue was a 10 inch tall brass stemmed lamp with a peach colored shell for the shade, a 14 inch canvas pillow handpainted with a sand dollar, bookends with real Nautilus shells mounted on clear acrylic bases, and elegant fold over notes with a superb Nautilus shell embossed on them.

The Horchow Collection, P.O. Box 34257, Dallas, Texas 75234 - I couldn't believe my eyes when I opened one catalogue and saw a sterling silver ladle with the handle as a Tibia fusus (only \$350), and beautiful luncheon plates in the shape of a shell from France. At \$22.50 each, the description read "makes a perfect first course or luncheon plate".

Once you get on the mailing list of these catalogues, others will most probably be sent from other such companies, but what fun when they arrive.

## MOLLUSCANA

By W.W. Sutow

The first issue of the journal, now TEXAS CONCHOLOGIST, appeared in September, 1964. As we enter the 15th consecutive year of publication, under a new editor, it seems appropriate to review the early history of this club organ.

What is now the HOUSTON CONCHOLOGY SOCIETY was at one time a part of the Conchology Group of the Outdoor Nature Club. At the August, 1964 meeting, the club members unanimously voted to start an official club publication for the club. Fortunately, Liz Eubanks had just moved from the Jacksonville (Florida) area to Pasadena. She was an active shell collector and had edited the publication of the Jacksonville Shell Club, "SHELL-O-GRAM". Liz was elected editor and Helmer Odé was named associate editor. Dr. T.E. Pulley assented to become the professional consultant.

Volume 1 Number 1 made its debut as a mimeographed sheet. The embryo publication did not yet have a name. But with the very first issue there appeared a feature section entitled "Notes Concerning Texas Beach Shells" by Helmer Odé and Mrs. A. Speers. Helmer and Anne were to continue this feature through Volume IX, No. 3, March, 1973.

The initial issue had no masthead but the second (October, 1964) came out with the name CONCHOLOGIST suggested by this writer. The masthead was laboriously put together by Ernie Libby. Ernie went further. He talked Ken Weaver into running the material off the printing press at M.D. Anderson Hospital. The format and size were agreed upon - those of a folded typewriter sheet. With the second number, a new feature section was added, entitled "Mollusks in the Journals" which subsequently (August, 1965) became "Molluscana".

After the third number was printed, a major crisis developed. The publication by that time had begun to expand its circulation. Dr. Clench saw a copy and informed the editor that the name CONCHOLOGIST had been used by a short-lived and now defunct journal in England. At the November, 1964 meeting, the name of this publication was officially changed to "TEXAS CONCHOLOGIST".

The new masthead? Once again, resourceful Ernie Libby came to the rescue. He shifted the "CONCHOLOGIST" slightly to the right of midline and added in script the word "TEXAS". The masthead he prepared at that time has been retained even though the format was changed recently. (Ernie was officially recognized as Art Editor of TEXAS CONCHOLOGIST beginning May, 1965.) Behind the scenes, the laborious typing for the early volumes was handled by Dorothy Kister who appropriated Tom Kister's office machine for the job.

During the summer of 1965 Liz and family moved away from Houston. Beginning with Volume II, No. 1 (August, 1965) Helmer Odé undertook "the editorial duties on a pro tem basis". One of the things that went with Liz was the series of informative articles that she had initiated under the title of "For the Beginners". (Liz has since earned her doctorate in microbiology and resides in Arizona).

In the early issues of the TEXAS CONCHOLOGIST (Jan., Feb. and March, 1965) there appeared the first listing of members and subscribers: there were 43 names. A comparison of that list with the membership listing for 1978-1979 shows overlap of 8 names (Barnette, Cardeza, Dexter, Glass, Kister, Odé, Sutow and Young).

And that's how it all began.

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My "R & R" was squeezed out of a tight schedule of 10 lectures at various medical schools and cancer centers in Japan. We left for Okinawa one rainy day in November, 1978, from Fukuoka City airport (formerly the Itazuke Air Force Base).

Okinawa is an island prefecture of Japan, situated south of Amami Islands at the far end of a chain of islands that extends 700 miles southward from Kyushu to Taiwan. The southernmost isles of Okinawa lie just a few miles east of the northern end of Taiwan. Okinawa itself is the largest of 60 islands that comprise the prefecture and has an area of 1220 sq km and a population of slightly more than one million. Military occupation by U.S. armed forces ended in 1972 and the islands were returned to Japan. Although regional dialects exist, the official spoken and written language is Japanese. Okinawans refer to the principal Japanese islands as "mainland". We landed at Naha, the principal city of Okinawa. This is a reconstructed post-war international metropolis of 306,000, a tourist center with modern facilities.

Geographically, Okinawa is in the latitudes comparable to the Florida Keys. The main "kuroshio" (Japan current) flows between Okinawa and Taiwan into the East China Sea making these islands subtropical in climate, a good environment for a vast array of Indo-Pacific seashells.

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Our hosts were Dr. and Mrs. Nakamine, both native Okinawans with long, established family backgrounds. This couple had built a shell museum on their mountain property overlooking the Pacific Ocean. They had raised the funds for the impressive building and even for construction of a road to the museum. There was adequate space for parking cars - an exceptional luxury that cannot be enjoyed in most parts of Japan. The only concession to Japanese tradition was the request that visitors take off their shoes and use slippers (which are provided) while in the building. The museum is situated just outside the village of Kushi.

The museum exhibits were divided into four sections occupying three large rooms. One room contained shells from the Okinawan waters, mostly self-collected. The second room was filled with world-wide shells. The third section consisted of rarities (truly breath-taking rare beauties). In the fourth section were land snails of Okinawa. A fourth room in the back was used for storage and work area.

There was no fancy background artwork. The identifications were hand-written, neatly. But the information was succinct and complete, including the scientific name (Latin), the Japanese name, and the collection data. The Okinawan section was particularly appealing to me. The number of species displayed suggested that the molluscan fauna of these islands was well represented.

Most of the well-known professional malacologists in Japan as well as a host of amateurs have visited the museum and have enjoyed the Nakamine hospitality. The home is close by on the Pacific side of the island. But it is only a matter of a few kilometers to drive across the west (China Sea) side. Outer reefs on both sides provide fabulous shelling.

I sensed that here was a museum, conceived and built by ardent shell collectors. Everywhere there was evidence of the care and dedication with



which every specimen was prepared. For scientific data and for the number of true conchological rarities, the contents of this museum were equal to any that I have seen in Japan. The specimens were in superb condition and each (large or small) was effectively shown in individual transparent cases.

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Because of the tide conditions, my active shelling on Okinawa was limited to the inner reef along a small bay. A wide variety of the common reef fauna was collected. But here again, there was mute evidence of the conflict between nature and the activities of man. The reefs near the shore were coated with a thin layer of reddish silt. Apparently, the arable land on the foothills and the flats had been cultivated to grow pineapples. Periodically whole farms were plowed for replanting of the pineapples. Some of the loosened soil subsequently drained into the bay. The silt coating effectively interfered with growth of algae and thus depleted the number of reef denizens. Once abundant, such species as the abalones and the turbos were now scarce close to shore. The Okinawans said a good typhoon would clean off the silt from the reefs, and repopulation could occur. (There had been no recent typhoons).

My visit to Okinawa, however, was spectacularly productive, conchologically speaking. Mrs. Nakamine saw to that. She provided me with Okinawan goodies such as Pecten speciosa, Pecten superba and Murex aculeatus. Then she gave me specimens of the many species of Spondylus from the area. To top things off, she handed me two live-collected specimens (color variants) of Cypraea guttata to keep (!!). These two specimens of C. guttata were brought up recently on different occasions by the fishermen who netted for precious coral. They dredged some 240 meters below the ocean surface. According to my information, the shells were incidentally caught in the nets in the Southeast China Seas somewhere between the southern isles of Okinawa and Taiwan. It seems that a small number of this rare cowry has become available since 1970. The uncertainties of any meaningful "catch" of the precious coral at any one time and the long time that the ships must remain at sea along with the seeming dwindling of coral beds appear to be discouraging the fishermen from continuing in this hazardous occupation.

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I have often read passages that ponder the strange interactions of human events. The chain of circumstances that culminated in this trip to Okinawa was almost unbelievable. During the war, Mrs. Nakamine (then unmarried) was a nurse in the Japanese army. Her tour of duty included the Philippines and Palau. She did a lot of shell collecting whenever she could. But she could not bring home any shells with her. She barely survived the war and immediately pitched in to help transport the sick and wounded Okinawa people to Japan for medical care. Many crowded into the Kyushu University Medical School facilities. She was particularly grateful for the tremendous kindness and care provided on numerous occasions by a young pediatrician, Dr. Kanemitsu. This young pediatrician, a few years later (1948), became the first Japanese physician to join me in the Atomic Bomb Casualty Commission studies in Japan. We worked together for several years. Dr. Kanemitsu subsequently started a busy practice in Fukuoka City.

The nurse mentioned above eventually married a physician in Okinawa and soon resumed her shell collecting activities with great enthusiasm. The Nakamines had a son who was born with a heart anomaly. They sought medical aid in

Fukuoka and were referred to Dr. Kanemitsu. She immediately recognized him as the young pediatrician who years ago had helped her and the Okinawans. In the meantime, the Kanemitsus had been contaminated by the Sutows and had become ardent shell collectors. When Mrs. Nakamine learned of the conchological interests of the Kanemitsus, she immediately began to help with the Okinawan species. She extended a standing invitation for the Kanemitsus to visit Okinawa. Because of my medical background in addition to being a shell collector, we were included in the invitation.

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We departed Okinawa at 11:40 a.m. via All Nippon Airways (A.N.A.). Somewhere above the Amami Islands, lunch was served. This was a typical Japanese cold box lunch served with hot green tea. Inside were tidbits of individually prepared Oriental delicacies. They included 3 rice balls, a small piece of ham, pickled egg-plant, a chunk of salted salmon, seaweed wafers, sour-pickled plum, a slab of fish cake, crab-meat, a bite of roast beef, bamboo shoots and canned peach with cherry. We landed in bright sunshine at Fukuoka, one and a half hours after we took off.

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#### ACCORDING TO GUINNESS

The largest starfish in terms of total diameter was a specimen collected in the Gulf of Mexico in 1968. It measured 54.33 inches from tip to tip but the diameter of its disc was only 1.02 inches. Its dry weight was only 2.46 ounces.

#### CLAIMING CLAMS

A recent news story discussed the development of a method of marking young oysters and clams so that their cultivators could prove ownership in offering them for sale after they matured.

The New York Times News Service story said that Ellis T. Bolton, professor of marine science, and Noel D. Dey, a graduate student, had developed this process for the University of Delaware in Newark. The young bivalves are placed in a tank and tetracycline is added to the water. After a day or two, the water is drained from the tank. Marks on the shells made by the tetracycline are made visible in a vivid yellow-orange color when exposed to ultraviolet light. Shellfish poaching has been serious, according to Bolton.

#### SECOND EDITION AMERICAN MALACOLOGISTS PLANNED

Editor-in-chief R. Tucker Abbott has announced that a second edition of American Malacologist is planned. This book contains biographic facts about America's leading mollusk workers, shellfishery experts, paleoconchologists and advanced shell collectors. Biographies of 500 American malacologists of the past will be included.

Applications for listing were available at recent meetings of HCS. If you missed getting yours and wish to be included, please contact Constance Boone for applications. There is no charge for being listed. Members listed in the first edition have already received new applications from Dr. Abbott.

Last May-June, my husband, Frank, and I spent 4 weeks sightseeing in the British Isles. Our daughter Marie and her husband live in London; Marie is a shell collector, too. Although this vacation was to be purely for seeing the country, somehow, along with castles, stately homes, Roman ruins, and beautiful scenery, we happened upon beaches. And when a shell collector - or two - happens on a beach, you know what follows.

Frank, Marie and I were driving south from Poole, in Dorset, to a car ferry which would take us across a bay to the southern coast of Dorset. As we neared the ferry slip that morning, we came to a huge sand flat out of water; a young man with a pail was gathering something. Almost before Frank could stop the car, Marie and I were out and dashing onto the sand. The young man had a pail full of cockles and cheerfully showed us how to use our spoon in wide sweeps to remove the top half inch of sand, thus exposing the cockles, Cerastoderma edule. We quickly collected a bag full, and before we left, our new friend brought us 3 large Mya arenaria clams.

The next time we happened on a beach was in Ireland, where Frank and I rented a car. We were driving the scenic southern route from Cork to Killarney when we saw a small cove at the approach to Bantry. Since I was driving, I just pulled in off the road. In that small cove we found whole Anomia ephippium attached to seaweed, some pairs of Venerupis decussata and rhomboides, dead but together, and lovely valves of dark brown Chlamys varia. The next day we drove the beautiful Ring of Kerry. My guide book indicated a fine beach only two miles off the main road at a place called Rossbeigh. We found it easily, a sandy crescent with a rocky area to the left. I hurried to the rocks--they were covered with shells: 3 kinds of Littorina, white Nucella lapillus, Gibbula umbilicus, and beautiful limpets. Caught among the rocks and partially buried in sand were numerous broken pieces of Ensis siliqua. A careful search produced 4 complete pairs, the largest 10 inches long!

Since we were traveling light, my sole shelling equipment consisted of 2 Ziplock bags and a sewing kit. Unless we cleaned the shells somehow, I could imagine the aroma after 2 more days in Ireland and 12 in Scotland and England before we returned to London. But luck was with us. In Wexford, the water literally came out of the tap as steam in our hotel room. So I filled the sink and, working with a few shells at a time, soon removed the bodies with a safety pin. It took a long time and then I had to get up early next morning to put the opercs in the shells and wrap each one in toilet paper. Three sea urchins I had found whole, went into cigarette boxes someone had discarded, a perfect protection.

In Scotland, we joined a coach tour and I could only hope we would stop near a beach at some point. Sure enough, at Thurso, on the extreme north coast, one of our tour group members came back from an evening walk to say we were only a few blocks from the North Sea. Well, I was up at dawn next morning and off to the beach alone. It was quite rocky and I soon found that algae on the rocks made them terribly slippery. After one spectacular fall, though no one saw my acrobatics, I noticed a long cement dike leading out through the rocks. I slipped and slid over to it and was relieved to find it was free of algae. When I walked almost to the end, I was able to step off carefully onto the rocks and collect more large limpets, Littorina, Nucella and Monodonta lineata.

Our schedule had called for only a lunch stop at Dornoch, on the east coast of Scotland, but a snafu in arrangements made it necessary to spend the afternoon and night there. Since our hotel was only a short distance from a beautiful beach, this was scarcely a hardship. We explored the town in the afternoon and beachcombed in the evening; being so far north, it was light enough to pick up shells until ten o'clock. We found many pairs of Donax vittatus, some tellins, a few sea biscuits (which did not make it back to London, unfortunately), and picked up some color forms of Nucella on some rocks. It took us until midnight to clean and wrap the shells, again thanks to very hot water.

After our Scotland tour, we met Marie and her husband in the Lake District of Cumbria, where we spent 3 gorgeous days. Somehow we managed to visit 2 or 3 beaches during that time. There was a huge sand flat at one place where we found hundreds of tellins (probably Tellina tenuis) just below the surface and then at a deeper level of 4 to 5 inches, scores of delicate Scrobicularia plana, a member of the Telliniacea. In order not to break them, I used the angel wing approach of coming up under them with my hand. At another beach, dozens of people were collecting cockles for food; they were popping up here in great quantities, but we already had enough specimens. At still another place we found a beach which was a mass of mussels, almost all Mytilus edulis it turned out, and some chitons, still unidentified.

In all I found some 16 live species and a dozen more beach ones. For a non-shelling vacation in a region not noted for a variety of shells on its beaches, this wasn't bad at all.

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#### A RARE FIND

A recent Associated Press release told of a Kay Creasey of Torquay, England who was strolling along the beach last October looking for shells when she spotted an object covered in seaweed.

"I ignored it twice," she said, "then returned a third time to pick it up. Even then I didn't think much of it. To me it looked like something a kid had made and painted at school."

The object was a gold Viking bracelet dating from the 10th or early 11th century. City officials decided it belongs to Mrs. Creasey, and she said the British Museum is interested in buying it.

So shell collectors keep a sharp eye out, you never know when you may make a "rare" find.

#### BEATING THE GROCERY STORE PRICES

Paul McGee, long time friend of many of HCS members, has started cultivating his own land snails for food. At his home he has been raising Helix aspersa and Otala lactea, both species imported to our area and common as garden pests. He promises to write a note about the methods he uses and also to tell us about his recipes. At first he mentioned he might bring us some of his snails to eat. When he found out we are having up to 75 attend the meetings he reluctantly declined.



## 'SCOPING THE MEMBERS

By Tina Petway

Collecting sea shells has been a favorite hobby for many years for Max and Ruth Finer. They have been collecting our local shells for so many years they don't remember when they began. They have been members of H.C.S. for about five years now, and have been very active in supporting and working for the club. Max is currently serving his second term as a member of our Board of Directors. They are usually to be found on our field trips where they seem to have good luck and lots of fun. Ruth's favorites are the tiny and microscopic shells, while Max doesn't have a favorite group or area of shells because he likes them all. The Finers would also be interested in exchanging shells with another collector from some other area who wants to trade local shells.

In November of this year they will celebrate their 47th wedding anniversary. They must have been meant for each other all along because of the amazing similarities in their early lives. They were both born in St. Louis, Missouri although they didn't meet until years later in Memphis, Tennessee. They were born on the same day, three years apart and were delivered by the same doctor.

Max moved to Houston in 1927 and after corresponding from Louisiana for several years Ruth joined Max here in 1932 and they were married. Max is a retired druggist. He and Ruth opened the first Drug Store in Bellaire, Texas those many years ago and they still reside in Bellaire. They have 2 grown sons. Both Ruth and Max share a special interest in flowers and plants as evidenced by an apartment full of living greenery everywhere.

They also used to pick up rocks from trips they took but had to give them up when they moved into their apartment as happens to many of us.

Ruth and Max have carefully cleaned, dated and added localities to their field trip shells. They recently shared a big bag of such shells for use by the club for auction or educational purposes.

For about 6 years now the Baldwins, Margaret and Lisle, have been active and enthusiastic members of our club. Their interest in shelling began after a trip to the Baja Peninsula about 7 years ago. On that trip they picked up about 200 shells from the beaches. These they brought home and wanted to know more about them. Margaret had met Cynthia Biasca, a member of H.C.S., who suggested joining the club, which they did.

Since that first trip to Baja, Lisle and Margaret have been back to Baja again to collect shells as well as having been to Florida 3 times; Culebra Island, Puerto Rico; and they were among that lucky group of H.C.S. members who went shelling to the Fiji Islands not too long ago. Now they are planning an extended trip to Australia for about a year after Lisle retires soon from Shell Oil Company. Lisle has been with Shell as a chemical engineer and they have been to many parts of the country and to Holland in that capacity. Margaret is a librarian but has not worked as such since coming to Houston in 1972. Margaret has done a beautiful job of cataloging our club's books and periodicals for your use.

Margaret's interest in shells is not surprising since she learned technical classifications in other areas as a youngster from her missionary father who was also a professor of Botany and Agriculture. Her childhood till age 18 was spent in China where her father was engaged teaching Botany and Agriculture at the University of Nanking. At 18, she returned to the United States for her college education in California. Here she met Lisle who was attending the University of California at Berkeley; where he graduated *summa cum laude* incidently.

Since being transferred to Houston by Shell Oil in 1972 Lisle and Margaret have added shelling to their varied outside interest. Some of Lisle's other favorite things include camping, hiking, fishing, boating, photography, carpentry, hunting and reading. Margaret is very interested in Public Affairs, is a member of the League of Women Voters, likes to read, play the piano and she shares with Lisle a love of the outdoors. Both of them enjoy bird watching and Margaret likes flowers. She learned much about them from her father. When asked if their 3 sons had any interest in shell collecting the answer was "no". But who knows; the "bug" can bite one at any time.

The H.C.S. has been fortunate to have Margaret and Lisle as very active members. Margaret served as corresponding secretary and field trip chairman. They have helped give programs and helped with shell exhibits and our club auctions. We envy them the chance to retire and travel. We will miss them.

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#### COA TO HELP WITH STOLEN SHELLS

The Conchologists of America, an organization of shellers and dealers that holds an annual session to discuss shells and shelling, has established a central clearing agency to assist in the recovery of stolen shells.

COA plans to distribute information on stolen shells so that dealers or individuals approached to purchase rare shells may be able to contact COA committee chairman Sally Jo Gray, 3943 Cornell Way, Eugene, Oregon 94705, telephone 503 342 2281, to check about such shells offered when there is suspicious thought about the deal offered you.

A formula for simple measures collectors may take to avoid loss of shells has been devised. Write Miss Gray if you are interested.

## DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN

## THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph)

Family MYTILIDAEGenus Crenella continued:297. Crenella sp. indet. A.

A very much smaller species has been taken in much deeper water. It is quite regularly oval, but differs from equal sized C. divaricata in being much narrower and compacter. Only two lots. Previous records for the Texas faunal Province are: None.  
 Records H.M.N.S.: 2 lots, none alive.  
 Depth Range: 450-720 fms.  
 Geographical Range: Unknown.  
 Maximum Size: 1.3 mm.  
 Eastern Pacific Analogue: None.

It is quite regularly oval, but differs from equal sized C. devaricata in being much narrower and compacter. Only two lots. Previous records for the Texas faunal Province are: None.  
 Records H.M.N.S.: 2 lots, none alive.  
 Depth Range: 450-720 fms.  
 Geographical Range: Unknown.  
 Maximum Size: 1.3 mm.  
 Eastern Pacific Analogue: None.

298. Crenella (?) sp. indet. B.

We have 4 lots of an enormously inflated small Crenellid (?). There is absolutely no trace of any radial sculpture and at this moment its classification under Crenella is merely a matter of avoiding a decision where the species belongs. I would guess that it belongs to a new to name genus.  
 Previous records for the Texas faunal Province are: None.  
 Records H.M.N.S.: 4 lots, none alive.  
 Depth Range: 25-55 fms., in calcareous environment.  
 Maximum Size: 1.4 mm.  
 Eastern Pacific Analogue: None.

Genus Gregariella Monterosata, 1883.

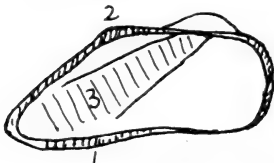
Elongate, with umbonal keel, marginal crenulations, radial striations somewhat subdued in median part near margin, hairy and tangled periostracum. In the N.W. Gulf of Mexico two different forms, here considered different species, but which may be only a single species.

299. Gregariella opifex (Say, 1825).

Although at first glance there would seem to be hardly any doubt that two different species live in the N.W. Gulf of Mexico, closer study of a sufficient number of lots and inspection of the total record raises grave doubts about their distinctness. For the time being I will consider the two forms as specifically different.

As I see it the facts are these: In the N.W. Gulf of Mexico live two species which differ both in habitat and in shell morphology. The difference in habitat is very outspoken. The most common form lives in small populations in abandoned bore holes in oyster shells, Mercenaria's, etc., mostly offshore, but it has also been taken (rarely) on the beaches. The other species constructs its own rocky environment by gluing together sandgrains and lives in this artificial rock.

The differences in shell morphology are mostly outspoken: (see sketch).



A. coralliophaga



B. "opifex"

- |  |  |
|--|--|
| <p>A. 1) Along the inner margins the crenulations are fine and extremely fine along the ventral margin. Correspondingly the outer ribbing is finer.</p> <p>2) The posterior dorsal margin shows a definite angle.</p> <p>3) The periostracum is relatively light and covers mostly the umbonal keel region.</p> <p>4) The color of living specimens varies from dark yellow to dark greenish brown; the interior seldom with a slight purple dorsal stain.</p> <p>5) Hardly ever iridescent on the inside.</p> <p>6) Outline somewhat rectangular.</p> | <p>B. 1) Along the inner margin the crenulations are quite coarse and thus less in number. Coarse outer ribbing.</p> <p>2) The upper dorsal margin is rounded.</p> <p>3) The periostracum is heavy and tangled and often covers more than half the shell surface.</p> <p>4) The color of living shell is dark brown to almost black, and the interior often completely stained purple.</p> <p>5) Almost always iridescent on the inside.</p> <p>6) Outline more modiolid in shape.</p> |
|--|--|



Both species can vary considerably in shape due to environmental stress. G. coralliophaga occurs in rather small populations. The valves in each of which are all similarly shaped, but vary from population to population. G. opifex Say is somewhat more uniform in morphology.

Abbott (1974) denies the existence of two species of Gregariella in the Western Atlantic. Before this point of view can be safely accepted several aspects of the biology of both morphs ought to be investigated, such as reproduction cycles, time of spawning and soft anatomy.

There are however some facts which are in favor of Abbott's interpretation: 1) I am unable to separate juvenile material into two different species; 2) their total depth ranges are quite similar, but on the whole G. opifex lives much shallower than G. coralliophaga. At the few locations where both species have been dredged together, there is no difficulty in separating full grown material.

It should be noted that I have attached quite arbitrarily the trivial names coralliophaga Gmelin and opifex Say to these species and have been led mainly by the significance of the "latin". Further it may be noted that almost all full grown material of G. coralliophaga Gmelin is indistinguishable from G. coarctata Carpenter as figured by Keen, 1971, from the Eastern Pacific. G. opifex Say might be the same as G. chenui Recluz (figured by Keen quite indistinct), but in some features (pearly interior) it starts approaching G. denticulata Dall, 1871. The latter lacks the heavy and tangled periostracum and is figured by Keen as having a thick and hairless periostracum (?). The species lives close to shore often on Pleistocene rocky ridges (beaches) from Sabine all along the Texas coast. Presumably also in Louisiana.

Previous records for the Texas faunal province are: 7, listed; 110, found in 20-30 fms. off Port Isabel (Note: may be C. coralliophaga Gmelin); 136, off East Texas, occurred in its typical habitat, partially embedded in mounds of cemented sands and mud which they apparently build; 147, alive from Baker Bank, dead from Big Southern Bank (note: almost certainly G. coralliophaga Gmelin); 174, listed, as M. barbata Linne; 206, beach records in Tex. Conchol., Vol. 6, p. 47 (exparte); 269, listed on page 159, figure probably opifex.

Records H.M.N.S.: 14 lots, of which 10 contain live collected material.

Depth Range: 0-32 fms., in sandy mud, alive 0-20 fms. Optimum shallower than 10 fms.

Geographical Range: Not determined.

Maximum Size:  $\neq$  20 mm. (due to periostracum difficult to measure).

Eastern Pacific Analogue: Same species probably in Panamanian Province, but reported as G. chenui Recluz.

300. Gregariella coralliophaga (Gmelin, 1791).

We have already discussed the points of difference with G. opifex Say. This species is one of the most widespread and common mytilids in offshore waters along the Louisiana and Texas coasts. It lives in many environments but appears to avoid mud bottoms. Whether it is a boring species is uncertain; probably it lives merely in abandoned boring holes (Lithophaga). A few times the species was found in oyster shells on the beach (Matagorda). Previous records for the Texas faunal province are: 56, listed; 69 listed in appendix 8; 110, found on coral banks 100 miles off Galveston; 147, alive on East Flower Garden; 206, beach records Tex. Conchol. Vol. 6, p 47; 253, on the reef off Padre Island, uncommon to abundant, buried in a fibrous substance mixed with sand. (Possibly G. opifex Say?). Records H.M.N.S.: 59 lots, of which 20 contain live collected material. Depth Range: 0-55 fms.; alive 7-55 fms., but mostly in 20 fms. range. On coral, algal reefs, miocene shell uplifts and shelly bottoms. Geographical Range: N. Carolina, Texas; West Indies, Bermuda, Brazil, Monterey, Calif., to Peru. (Abbott, 1974). Maximum Size: 19.5 mm. Eastern Pacific Analogue: Gregariella coarctata (Carpenter, 1857) "Scammon's Lagoon, Baja California to Ecuador and the Galapagos Islands in 4 to 6 m. depth" (Keen, 1971).

Genus Musculus Roding, 1798.

Shell clearly divided into 3 parts: anteriorly and posteriorly there are radial riblets, in between concentric sculpture. The only Texas species belongs in the subgenus Ryenella Fleming, 1959..

301. Musculus (Ryenella) lateralis (Say, 1822).

A quite widespread small mytilid attached by byssus to shell fragments, hard objects, etc., mostly on muddy bottoms. The animals also are nestlers, but usually are not entirely enclosed in the fibrous mass. Their usual color is olive green with brown purple spots. Occasionally dark colored shells are collected. The species lives from the Mississippi delta to the Rio Grande in shallow water offshore.

Previous records for the Texas faunal province are: 159, live specimens embedded in the tunic of a tunicate washed upon the beach, Port Aransas, March 1955; 174, listed; 206, beach records Tex. Conchol., Vol. 6, p. 59; 285, Galveston, 236, Galveston; 269, figured on page 158. Records H.M.N.S.: 37 lots of which 16 contain live material. Depth Range: 0-32 fms.; alive 0-30 fms., mostly in muddy environment. Geographical Range: North Carolina to Florida, Texas, and the West Indies, Brazil. (Abbott, 1974). Maximum Size: 11.5 mm. Eastern Pacific Analogue: Not in the Panamanian Province.

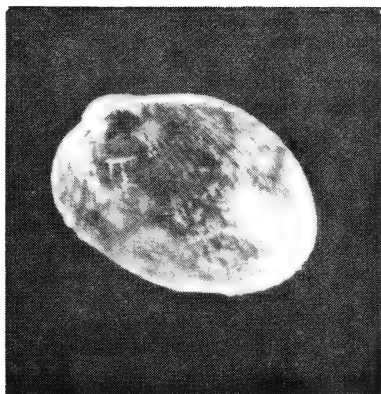
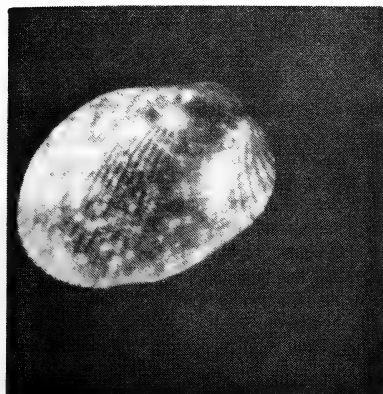


Fig. 1 Musculus lateralis (Say, 1822), taken by trynet by Capt. Allen Kight from 22 fms. off Freeport, Texas, Nov. 22, 1967. Specimen 1.5 mm. in length.

Genus Lithophaga Roding, 1798.

Truly boring mollusks, of elongate shape. For a discussion see Turner and Boss. Four species in the N.W. Gulf of Mexico.

302. Lithophaga antillarum (d'Orbigny, 1842).

Lithophaga antillarum d'Orbigny, 1842, Hist. Nat. de l'Isle de Cuba Atlas, p. 18, figs. 12-13.

Of this very large species only a single broken valve was dredged in 37 fms. water depth. It is straw yellow, smooth and shiny and unmistakably this species. Because with it a fragmental very fresh hinge part, with parts of both valves, was dredged I surmise that it lives at that location.

Previous records for the Texas faunal province are: 206, Tex. Conchol., Vol. 9, p. 76, as Lithophaga sp. A.

Records H.M.N.S.: 1 lot of rather juvenile valve and fresh hinge.

Depth Range: 37 fms., on sandy very shelly bottom.

Geographical Range: Southeast Florida and the West Indies, Brazil. (Abbott, 1974).

Maximum Size: When completed our valve would measure 1 inch.  
Eastern Pacific Analogue:

303. Lithophaga (Lithophaga) nigra (d'Orbigny, 1842).

Lithodomus niger d'Orbigny 1842, Hist. Nat. de l'Isle de Cuba Atlas, pl. 28, figs. 10-11.

This is a very large blackish colored Lithophaga also without encrustation, rarely found alive in the coral reefs. Both this and the previous species are because of their deep holes in rock probably difficult to collect on the Texas coast, thus accounting for their relatively rarity. Remarkable is one lot

from Louisiana dredged at 55 fms. These could be fossil shells living originally much shallower in coral, and now drowned because of the past Pleistocene rise of sea level.

Previous records for the Texas faunal province are: 170, listed for deep shelf assemblage; 69, listed in appendix 8, and mentioned on page 34 (note: probably error for L. bisulcata); 180, Alacran reef, pl. 7, figs. 8A-B (Mexico).

Records H.M.N.S.: 3 lots, of which one contains live collected material (Flower Gardens).

Depth Range: 10-55 fms.; alive at 15 fms.

Geographical Range: Southeast Florida to Brazil, Bermuda (Abbott, 1974).

Maximum Size: 46.5 mm.

Eastern Pacific Analogue: ?

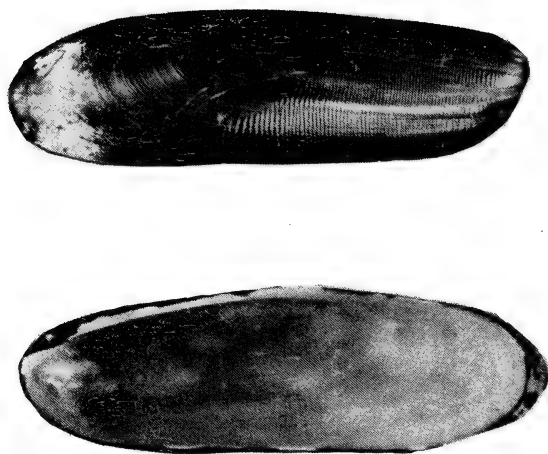


Fig. 2 Lithophaga nigra (d'Orbigny, 1842),  $1\frac{1}{2}$  inch specimen, collected by divers from coral bottom from 65-85 feet at East Flower Gardens, 103 miles SE of Galveston, Texas. Aboard USS Haynsworth dd 700, October 6, 1967.

Photo by Harold Geis

304. Lithophaga (Myoforceps) aristata (Dillwyn, 1817).

Mytilus aristatus "Solander" Dillwyn, Deser. Cat. Rec.  
Sh. 1, 303.

This species is characterized by the scissor like crossing encrustation at the posterior end of the shell. Uncommon in the N.W. Gulf of Mexico, and only 6 lots have been collected in our survey.

Previous records for the Texas faunal province are: 147, alive on West Flower Garden; 195, 107 miles S.E. of Galveston in 10 fathoms (note: these are the Flower Gardens), Port Isabel; 206, Tex. Conchol., Vol. 6, p. 59, beach records; 253, rarely taken in rocks on reef off South Padre Island; 269, figured on page 160.

Records H.M.N.S.: 6 lots of which 5 contain live collected material.

Depth Range: 0-36 fms.; alive 0-15 fms.

Geographical Range: North Carolina to Texas, Florida and the West Indies. La Jolla, California to Peru. (Abbott, 1974).

Maximum Size: 45 mm.

Eastern Pacific Analogue: ?

305. Lithophaga (Diberus) bisulcata (d'Orbigny, 1842).

Lithodomus bisulcatus d'Orbigny, 1841, Hist. Nat. de l'Isle de Cuba Atlas, pl. 28, figs. 14-16.

By far the most common species along the Texas-Louisiana coast, sometimes reaching large size (43 mm.). Its encrustation is often quite 'foamy' and porous. As plate 62, fig. 1 in Turner's and Boss' paper show juveniles are pustulose. Remarkable is the heavy encrustation over a tough, dark periostracum, which in old shells tends to come off. Shallow water specimens collected from oyster shells tend to have a dark almost black periostracum, and the shells are quite pearly inside. Offshore material is lighter brown and the periostracum is much less developed. If this is a trend in mytilids then probably Gregariella opifex and G. coralliophaga which we discussed as separate species may be merely ecological variants. The wide dispersal of this mollusk shows its adaptability to many environments: muddy bays, inlets, offshore shrimp grounds, coral reefs and miocene shale uplifts.

Previous records for the Texas faunal province are: 69, listed in appendix 8; 91, in sandstone and calcareous rock, but not in granite blocks of the jetties; 110, found boring in oyster shell in Aransas Bay; 136, alive, boring in slabs of rocks in 70 feet of water off East Texas; 147, alive on East Flower Garden; 159, numerous and large in rocks at Aransas Bay during 1955; 174, listed; 195, several references for Texas; 206, beach records Tex. Conchol., Vol. 6, p. 59; 269, figured on page 160.

Records H.M.N.S.: 48 lots of which 29 contain live collected material, almost always boring in rock or shell and hardly ever loose in dredgings or drift.

Depth Range: 0-228 fms.; the valve taken at latter location is probably adventitious, alive: 0-30 fms.

Geographical Range: North Carolina to Texas, Florida and to Brazil, Bermuda (Abbott, 1974).

Maximum Size: 42.6 mm.

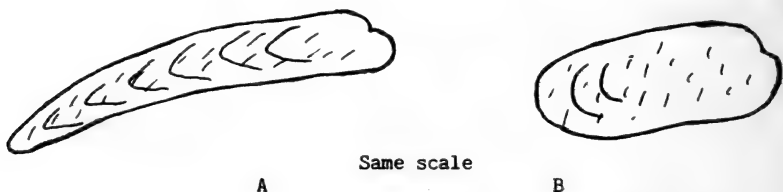
Eastern Pacific Analogue: ?

Genus Adula Adams and Adams, 1857.

This genus is since several years known to live in the N.W. Gulf of Mexico, where to my knowledge it was first discovered by Mrs. A. Speers. During our investigation it became clear that the Atlantic species is widespread. Adula comprises a number of elongate somewhat curved bivalves with small dysodont teeth.

306. Adula sp. indet. A.

This undescribed species lives between 0-40 fms. in abandoned bore holes of teredinids, hence mostly in wood. It has floated ashore in that manner at Galveston (San Luis Pass, alive, collector Ode), Matagorda, Port Aransas and South Padre Island. Due to this peculiar mode of life the shape of the valves is quite variable. In fact they are so different in shape that one may speculate about two different species, but since they are almost always found together this seems unlikely. One form is very elongate and drawn out into a long tapering point (see sketch); the other is much more inflated, rounder and blunter. Both forms are covered by a sparse coat of epillermal hairs. It appears most likely to attribute the tapered



form to the narrow open space available for growth. The blunter more inflated form may have developed in wider spaces.

Concerning their relationship with Panamanian species it appears sure that the Atlantic form is not closely related to any of the species Keen mentions. "Form" B resembles probably somewhat A. diegensis Dall, 1911 and "Form" A is in shape closer to A. soleniformis soleniformis d'Orbigny, 1842. The latter however can be ruled out as close relative because it is a true rockborer and the Atlantic species definitely is not. In size the Atlantic species is much smaller than any of the Panamanian ones.

In dredged submerged wooden logs and other debris, which finally sank due to replacement of wood by calcareous material during Teredinid infestation, the species can be found (many together with Teredothyra in a large log), often in huge numbers.

Previous records for the Texas faunal province are: 206, Tex. Conchol., Vol. 6, p. 59.

Records H.M.N.S.: 16 lots, of which 11 contain live collected material mostly in wooden logs, seldom loose in dredgings.

Depth Range: 0-40 fms., which is also the live range.

Geographical Range: Unknown.

Maximum Size: 16.8 mm.

Eastern Pacific Analogue: Is not closely related to any Panamanian species.

SUPERFAMILY PTERIACEA

Family PTERIIDAE

Hinge line straight, interior shiny and valve margin flexible. Attached by byssus to whipcoral.

Sources: L.G. Hertlein and L.R. Cox in: Treat. Inv. Pal., Vol. N, p. 302-306, 1969.

Genus Pteria Scopoli, 1777.

Obliquely elongate bivalves with large wing formed by posterior elongation of the hinge line.

307. Pteria colymbus (Roding, 1798).

Pinctada colymbus Roding, Mus. Bolten 2, p. 106.

The winged oyster is a fairly common bivalve along the entire coastline of the N.W. Gulf of Mexico where it lives attached by byssus to whipcoral. There are two color phases, the usual dark brown or slatey grey one with radial color bands and a uniform brownish yellow form, which is somewhat uncommon. The length of the "wing" is variable. Most live collected specimens have the flatter valve somewhat concave at the outer margin and almost all specimens possess strong prickly imbrications along the margin, which wear off in dead material. In earlier references reported as Avicula atlantica Lamarck.

The single live collected specimen obtained at 67 fms. depth off Louisiana may be another species.

Previous records for the Texas faunal province are: 7, listed; 21, listed; 45, listed for Texas coast; 61, listed for Rockport area (Nueces Basin); 62, listed for Mustang Island; 69, listed in appendix 8, figured in text; 110, dead shells rare on St. Joseph, Mustang and Padre Islands, found living on a buoy off Port Aransas, pl. 7, figs. 1-2; 123, one live specimen taken in 17 fms. off Padre Island, and often found attached to the octocoral Eugorgia virgularia along the jetties at Port Isabel and Port Aransas; 144, reported offshore from locations 536, 537, 539; 147, dead from Baker Bank; 156, Stetson Bank; 164, dead in inlet influence and shallow hypersaline in Rockport area; 170, dead shelf assemblage off East Texas; 174, listed; 206, beach records Tex. Conchol., Vol. II, #5; 251, Yucatan shelf; 253, abundant on yellow seawhip Leptogorgia virgulata and the red seawhip L. hebes Verrill; 269, figured on page 162.

Records H.M.N.S.: 25 lots, of which 12 contain live collected material, many of which - but not all - were collected on seawhip. Depth Range: 0-67 fms.; alive 0-67 fms. If the specimen collected at 67 fms. proves to be different the ranges are 0-55 fms., and alive: 0-40 fms.

Geographical Range: North Carolina to Florida, Texas and the West Indies and to Brazil, Bermuda. (Abbott, 1974).

Maximum Size: 98 mm.

Eastern Pacific Analogue: ?

Genus Pinctada Roding, 1798.

Less oblique and more rounded than Pteria and hardly any wing.

308. Pinctada imbricata Roding, 1798.

Only 2 lots of this smaller pteriid are in the H.M.N.S. collection.

They consist of fresh but dead shells taken from beachdrift on St. Joseph and Padre Islands. In size they are far below the mature size of this species. Other collectors have collected larger and live material on South Texas beaches, but so far no live material has been obtained by dredging off Louisiana and Texas. Usually reported as Pinctada radiata Leach, 1814 or Margaritiphora radiata Leach.

Previous records for the Texas faunal province are: 19, plentiful, attached to floating seaweed in Pass Caballo; 45, repeats reference 19; 110, occasionally found on Mustang and Padre Islands, pl. 7, figs. 3-4; 174, listed; 192, pl. 6, figs. 6A-B; 206, beach records Tex. Conchol., Vol. II, #5; 269, figured on page 162.

Records H.M.N.S.: 2 lots, no live material, from beach, probably floated in on seaweed.

Depth Range: Unknown.

Geographical Range: South Carolina to Florida, Texas and the West Indies to Brazil, Bermuda. (Abbott, 1974).

Maximum Size: Reaches up to 3 inches, but our material well below 20 mm.

Eastern Pacific Analogue: ?

#### Family ISOGNOMONIDAE

Pteriids with small anterior umbonal wing and multiple ligamental grooves.

Sources: L.R. Cox in Treat. Invert. Pal., Vol. N. p. 322, 1969.

Genus Isognomon Lightfoot, 1786.

Characters as above. Shape rounded or elongate. In the N.W. Gulf of Mexico 3 species which are easily differentiated.

309. Isognomon alatus (Gmelin, 1791).

Ostrea alata Gmelin, Syst. Nat., p. 339.

The flattest and thinnest of the 3 western Atlantic species and the rarest on the Texas coast. Only a single lot of live specimens from the rocks at the Coast Guard Station of South Padre Island is in the H.M.N.S. collection. It also live at Port Aransas, but is rarer. In offshore waters it is missing. According to Abbott (1974) it reaches up to 3 inches, but the largest Texas material is about 2 inches. In shape it is fairly rounded, but its most distinctive character consists in the flattened "spines" of the growth incrementals on the shell surface (see sketch). These spines line up in a radial pattern. Even quite immature specimens of several mm. size show such "spines", which are often somewhat lighter in color than the brown background of the main area of the disc.



Previous records for the Texas faunal province are: 159, rocks along jetty at Port Aransas, 1955; 174, listed; 192, plate 9, figs. 11A-B; 206, Tex. Conchol., Vol. 2 (5), 1965; 269, figured on page 163.

Records H.M.N.S.: 1 lot of live collected specimens at South Padre Island.

Depth Range: 0-1 fms. (tidal zone).

Geographical Range: Bermuda, Florida, West Indies, Brazil (Abbott, 1974).

Maximum Size: 49.2 mm.

Eastern Pacific Analogue: None.



310. Isognomon bicolor (C.B. Adams, 1845).

Perna bicolor C.B. Adams, Proc. Bost. Soc. Nat. Hist., 5, p. 9. This is the common coastal species of the genus along the Texas-Louisiana coast. Although no live material is known from Galveston, dead valves are occasionally picked from beachdrift at Freeport, (San Luis Pass), Matagorda and live in profusion locally at Port Aransas and South Padre Island. Not known from offshore water. In shape it is far more irregular and more lamellose than I. alatus and it misses the flattened spines of the latter. In many specimens - but not all - the pallial line forms a raised ledge so that the central (umbonal) part of the shell cavity appears to form a cup. On the inside this part is often colored somewhat differently so that the entire shell gives the impression to be formed of two differently shaded areas, whence the name. Overall color is brown, but is sometimes stained by purple streaks. Previous records for the Texas faunal province are: 7 (as Perna obliqua Lamarck), listed; 45, (as Melina obliqua Lamarck), "Texas"; 192, plate 9, figs. 10A-B; 206, Tex. Conchol., Vol. 2 (5), 1965; 269, figured on page 163. Records H.M.N.S.: 10 lots of which 4 contain live collected material. Depth Range: 0-2 fms. on rocks. Geographical Range: Florida Keys, Texas, Bermuda and the Caribbean. (Abbott, 1974).

Maximum Size: 33 mm.

Eastern Pacific Analogue: Isognomon recognitus (Mabille, 1895)

This may be the same as I. bicolor. "Baja California to Chile" (Keen, 1971).

311. Isognomon radiatus (Anton, 1839).

Perna radiata Anton, Verreichn. d. Conchilien, p. 17.

On the Texas-Louisiana coast this is the largest Isognomon species which lives in offshore waters in calcareous environment, where it is widespread, and the Miocene shale uplifts. Its color is mostly white but often it has a number of purple radial streaks. In this species the vertical ligamental grooves are widest apart. Large specimens can become thick shelled and mostly are elongate in shape. Juveniles especially can be very elongate and irregular in shape. Previous records of this species (Pedalion listeri Hanley, 1846) for the Rockport jetty and Port Isabel have not been confirmed by collecting over the last 15 years. However, 2 small live pairs were collected from beachdrift on Mustang Island so that it is likely that the species may live on the jetties.

Remarkable is the pitted sculpture on juvenile specimens, a sculpture not seen in the two other species.

Previous records for the Texas faunal province are: 110 (as Pedalion listeri Hanley, 1846), Rockport jetty, Port Isabel; 174, listed; 253, rare on reef offshore Padre Island.

Records H.M.N.S.: 11 lots, of which 8 contain live collected material.

Depth Range: 0-55 fms.; alive 0-31 fms.

Geographical Range: Bermuda, Florida, West Indies, Brazil.

Maximum Size: 72 mm.

Eastern Pacific Analogue: ?

Family MALLEIDAE

Hinge line with a central ligamental pit.

Genus Malleus Lamarck, 1799.

The only western Atlantic species is elongate with rather short hingeline and reduced auricles. After an initial development of clear pterioid shape the valves grow to quite elongate size in an oblique direction.

312. Malleus (Malvufundus) candeanus (d'Obigny, 1847).

This interesting species only lives at a few localities in the N.W. Gulf of Mexico, the Flower Garden complex and Stetson Bank. Highly irregular in shape each valve can be considered to exist of two parts, the umbonal "cup" with the auricles and the elongate elongation beyond the cup. Characteristic is the internal ledge running along this elongation beyond the cup. It is also clearly reflected in the outside, rather lamellose sculpture, which is most pronounced on the early stages of the shell.

The color is dark purple to brownish with yellowish areas, but Texas specimens are mostly quite dark and elongate. Our largest unbroken specimen, live collected, reaches 48 mm., but a broken specimen indicates sizes up to at least 2½ inches. This broken specimen has a huge posterior auricle.

Previous records for the Texas faunal province are: 206, Tex. Conchol., Vol. 5, page 25, 1968.

Records H.M.N.S.: 6 lots of which 5 contain live collected material. Depth Range: 10-16 fms.; alive 10-16 fms.

Geographical Range: South Florida, Bermuda, West Indies (Abbott, 1974). Maximum Size: 48 mm., but reaching up to 2½ inches.

Eastern Pacific Analogue: Malleus (Malvufundus) rufipunctatus (Reeve, 1858) is considered by many identical with M. candeanus (d'Obigny). "Mazatlan, Mexico to Panama, attached to other shells such as Ostrea, or commensal with sponges" (Keen, 1971).

To be continued

SUBSCRIPTION RATE ESTABLISHED BY HCS

The new By-Laws adopted this year provide for a subscription rate to Texas Conchologist. Members have established this rate as \$6.00 a year for the quarterly, published now in October, January, April and July. The new fiscal year begins June 1. The first quarterly due to new subscribers the next fiscal year will be the October, 1979, issue. The July issue is part of the present fiscal year.

The subscription rate has been set to apply to institutions, museums, corporations and even individuals wishing only to be mailed the quarterly. Full members receive the monthly newsletters on meetings, minutes, notices. Postage rates continue to rise, and we feel that some individuals will wish to enter subscriptions when they do not need the meeting notices.

Members everywhere will still receive all mail. Rates remain the same as listed on the inside cover.

Postage for mailing subscriptions outside U.S. postal zones has been established to be \$2.00 for seamail or regular mail, \$3.00 for airmail.

HOUSTON CONCHOLOGY SOCIETY, INC.

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# CONCHOLOGIST

VOLUME XV NO. 4



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The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas. It is distributed as part of the dues to all members.

The Society holds regular meetings the fourth Wednesdays of the following months: August, September, October, January, February, March, April and May. The meeting is held the third Wednesday in November. Meetings are held at the Houston Museum of Natural Science, Caroline Street in Hermann Park, beginning at 7:30 p.m.

The TEXAS CONCHOLOGIST is published October, January, April and July. It is mailed postpaid to regular members in U.S. postal zones. Overseas members will be charged additional postage. Only one copy will be mailed a family membership.

Dues extend from the beginning of the fiscal year of June 1 through May 31. However, the July issue of the TEXAS CONCHOLOGIST each year is the fourth quarterly due on the regular dues year beginning June 1 of the previous year. Memberships will be accepted throughout the year but will receive the quarterlies of that fiscal year. Members receive meeting Newsletters and have all other privileges provided by the Society's by-laws.

#### RATES AND DUES

Family membership	\$6.00
Single membership	\$5.00
Student membership	\$2.00
Single Issues	\$1.50
Extra sets mailed members	\$5.00
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The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the Editor. Manuscripts should be typed, double spaced and should be in the hands of the Editor the first day of the month preceding publication dates. Photos accompanying such material are welcomed.

Donax variabilis Say, 1822 is the correct name for the common coquina of the Atlantic and Gulf coasts. The International Commission on Zoological Nomenclature has voted to suppress the earlier name, Donax variabilis Schumacher, 1817, which was for another species.

Under its plenary powers, the Commission voted to conserve the familiar name of Donax variabilis Say, 1822, and the decision was published in the Bulletin of the International Commission on Zoological Nomenclature on 26 June, 1976.

(Ed. Note: See "The Species of Donax on the Atlantic and Gulf Coasts of North America," by T.E. Pulley, Texas Conchologist, Vol. XV, No. 2, January, 1979, pages 26-34.)

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#### MORE ON SINISTRAL BUSYCONS

Our member Mrs. C.W. Hanks shares some more information on sinistral Busycons she has received from Robert J.L. Wagner, senior editor of Wagner and Abbott's Standard Catalog of Shells.

Since the publication of her collection of a left-handed Busycon spiratum plagosum (Conrad, 1863) at Port O'Connor, Texas, in August, 1976 (reported with photos in Texas Conchologist, Vol. XIII, No. 2, Dec., 1976), Mrs. Hanks has heard from several collectors seeking to purchase the shell. She has sought to find out more about the rarity of her shell.

Bob Wagner wrote that his only study concerning sinistral whelks was one that he made many years ago when he was interested in ascertaining whether or not there could be any sinistral Busycon canaliculatum.

He informed Mrs. Hanks that he knew of no sinistral B. plagosum except the one she has.

Mr. Wagner studied egg cases of B. canaliculatum. He found that the results showed that each string of capsules averaged about 78 capsules per string. There were well over 2,000 (actually 2,168) baby shells in these capsules. The greatest number in any one capsule was 43 and the least was 19. The average number of young per capsule was 29. Out of the thousands, there averaged about 6 sinistral shells per string. There was no 'lefty' in the first 56 capsules--all sinistrals were lodged in the last 20 capsules.

He went on to say that the mortality rate of the young is tremendous and that the odds of getting one of the six out of the over 2,000 to reach maturity is astronomical.

He suggested that a similar study of the capsules of B. plagosum might prove to be very revealing.

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#### OFFICERS, DIRECTORS FOR NEXT YEAR ANNOUNCED

The results of the election were announced at the May meeting. New Officers and Directors of the Houston Conchology Society, Inc., are listed for 1979-1980 on the inside cover of this issue of the quarterly.

## SEARCH AND SEIZURE

This column serves to alert you to changes in nomenclature and the reasons for such changes as well as reporting collecting news.

Having recently reviewed the synonymy of Epitonium angulatum, adopted as our club's logo, the recent report in The Veliger (Vol. 21, No. 3, Jan. 1, 1979) on Epitoniums caught my eye. Helen DuShane established a new name for a previously misidentified species of Epitonium. The opening paragraph explained that Epitonium barbarinum Dall, 1919, had been long considered a species common intertidally along the northern shores of the Gulf of California, Mexico, but that this species was in need of a new name since she had determined that Dall's holotype of E. barbarinum (USNM 46229), type locality San Diego, California, is a specimen of Epitonium angulatum (Say, 1830) from the Atlantic and Gulf of Mexico. She has named the Gulf of California species Epitonium (Nitidiscala) arcanum.

A table sets out comparison of the characters of the new species with E. tinctum and E. angulatum.

I was left with questions in my mind about this turn of events involving E. angulatum. How was this determined?

Helen DuShane has been kind enough to write some answers to my questions asking how she decided the type of E. barbarinum was E. angulatum.

"The holotype of Epitonium (Nitodoscala) (sic) barbarinum Dall, 1919 (USNM 46229) from the Stearns collection, a not too reliable source, type locality, San Diego, California, is a specimen of Epitonium angulatum (Say, 1830), with a range on the Atlantic seaboard and in the Gulf of Mexico, from Long Island, New York south to Florida (excluding the Florida Keyes) and west to Texas. Dall (1921:116) gave the range for E. barbarinum from San Diego to Panama. Moreover, Dall's original measurements (length 19 mm; width 6.5 mm) are in error. The type of E. Barbarinum has been measured several times by Joseph Rosewater and DuShane; length 13.9 mm; width 6 mm, within the size range for E. angulatum. Thus E. barbarinum, as a name is eliminated from the Eastern Pacific fauna, and was renamed as a previously misidentified species from the upper Gulf of California, Mexico above 30° (DuShane, 1979:379)."

She further stated that she has discarded "barbarinum" as a specific name because Dall was in error in everything regarding the shell as a species. No specimens of the species Dall described have been taken from the San Diego or Panamic province.

The type of E. barbarinum still is in place at USNM and my final question is the one I have posed to professionals concerning whether E. barbarinum then becomes a synonym of E. angulatum. That is the understanding I have of this at this time. I started this because of my interest in studying E. angulatum and other Epitoniums in our area. I'm not positive I know what happens when it is determined that the type deposited in a museum is not the same shell as described and is determined to be another species.

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Earlier issues of Texas Conchologist carried the progressive story of the



discovery of a small gastropod in Galveston Bay and the first determination that this was J.P.E. Morrison's Odostomia barretti (Proc. Biol. Soc. of Wash., 1965, No. 78, 220). Later after examinations of live animals collected in 1968, Dr. Morrison placed the animals in the genus Hydrobia and also changed the specific name to H. booneae because he said he had been informed that his O. barretti was preoccupied. TC has reported all this to you and needs now to bring explanation to you of the latest change concerning this species. (Andrews, 1977, Shells and Shores of Texas, page 82)

Helmer Ode had told me several years ago after the change to Hydrobia booneae that the two spellings of barretti and barreti for the two Odostomias should have meant that it was unnecessary to change the specific name of Morrison's shell and that the two "barret-ts" were different people!

It has been hanging incompletely answered in my mind.

The author of the material in Andrews' book concerning this species was Dr. Dwight W. Taylor of Tiburon Center for Environmental Studies. He has been kind enough to answer my questions for the return to the first Morrison specific name in changing the genus and family for the little gastropod we find near the Houston Yacht Club in Galveston Bay. He states that the explanation of the name change was in the text submitted to Jean Andrews but that it was deleted in the final revision of the book, probably in the interest of saving space. However, since this was the only place this new information has appeared, I am happy to report the explanation. Dr. Taylor's opinion was that the first Odostomia barretti Morrison, 1965, was not preoccupied by the earlier Odostomia barreti because the names are of different spelling and derivation. (As Helmer and I have suspected was the reason.)

The little brackish water mollusk has become Texadina barretti (Morrison, 1965) placed in the Family Littorinidae, as stated in the Andrews' book, after studies of the animals by Dr. Taylor.

Odostomia barreti was a fossil described by L. Morlet in the Journal de Conchyl, 33: 314, 1885. Odostomia barretti was the small snail found in Louisiana and described by Dr. Morrison and named for Ronny Barrett in 1965. It is now found in Texas and is Texadina barretti.

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Cone Shells, A Synopsis of the Living Conidae, (T.F.H. Publications, Inc., received 1979) by Jerry G. Walls, has finally arrived, with a lot of name changes.

Not by any means a cone "expert", I simply remark to you some of the name changes concerning some of the familiar Gulf of Mexico cones, if you accept the material as presented in this book.

Conus austini Rehder and Abbott, 1951, is listed as a subspecies and becomes C. atractus austini. True Conus atractus atractus occurs off Brazil.

Conus clarki Rehder and Abbott, 1951, becomes a synonym of Conus armiger Crosse, 1858. C. clarki is not recognized as a subspecies in this edition although the author states that C. armiger is poorly known, although often not uncommon, and the southern populations are especially not understood.

Changes in names of cones have been common in the literature as it is deter-

mined that earlier descriptions are the cones described later. We have seen already that Conus juliae is now a synonym of the accepted name Conus amphurgus and Conus sozoni is now C. delessertii. You will note that Abbott solved that in his second edition of American Seashells by making popular names of the names we had used for so long for these last two species of cones, so we can call them Julia's cone and Zozon's cone.

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#### PLEASE NOTE SUBSCRIPTION RATE ESTABLISHED

A subscription rate of \$6.00 has been added to the masthead information. This has been established to provide a fee for institutions, museums, corporations, etc., wishing to receive the quarterly only. It may also be used by residents outside U.S. postal zones who want to receive the quarterly and who do not wish to receive the monthly meeting notices and the ballot each year. A postal fee of \$2.00 seairmail and \$3.00 airmail delivery overseas has been established for these subscribers.

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#### REMEMBER THE AMU-WSM MEETING IN CORPUS CHRISTI

You still have time to register and attend the meeting August 5-11, 1979, at Corpus Christi, Texas, of the American Malacological Union, hosting also the members of the Western Society of Malacologists. You may register at the door (La Quinta Royale Hotel on Water Street) starting on August 6th.

Special events of interest to our members are the Symposium on the Gulf of Mexico, chaired by Dr. T.E. Pulley, and Shell Night, chaired by Constance Boone. The symposium is slated for Wednesday afternoon at the hotel. Participating on this program will be Dr. Helmer Odé talking on the Northwest Gulf Mollusk Survey. Our member Dr. W.W. Sutow will talk on finding Strombus taurus in the Pacific, and our members Audrey and Wayne Holiman will talk on finding shells on Baja on the Shell Night program Tuesday at 7:30 p.m. at the Corpus Christi Museum auditorium.

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#### DONATION TO THE HOUSTON MUSEUM OF NATURAL SCIENCE

Houston Conchology Society members voted at the May meeting to give \$500.00 this year again to the Houston Museum of Natural Science. The club is very appreciative of the services provided for our members. We house our library on shelves on the first floor at the information office, and we meet at least nine times a year in the classrooms or auditorium at no cost to the society.

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#### AMAEA MITCHELLI IN THE NEWS AGAIN

Most of you saw the TV coverage and news stories in local papers concerning the new restaurant, The Wentletrap, established by Cynthia and George Mitchell in the historic T. Jeff League Building on the corner of Strand and Tremont on "The Strand" in Galveston, Texas. Built around a three-story atrium, the restaurant got its name from Amaea mitchelli seen in a shell book and labelled a rare Texas shell. The name coincidence hit the spot with the Mitchells.

SUMMER LIBRARY ANNOUNCEMENT

Because of the display of Peruvian gold artifacts at the Houston Museum of Natural Science this summer, our general library, housed at the Museum's Information Office, is closed until after September 3.

Some of the new books that have arrived and some of the most-sought books from the library will be kept at the home of Library Chairman Cynthia Biasca until we can use the general library again. Please call Cynthia to arrange to get any of the books listed below.

Australian Shells

Joyce Allan

Sea Shells of the West Indies

Michael Humfrey

Sea Shells of Tropical West America

A. Myra Keen

Shells and Shores of Texas

Jean Andrews

Sea Shells of North America (A Guide to Field Identification)

R. Tucker Abbott

Caribbean Seashells

Warmke and Abbott

The Collector's Encyclopedia of Shells

S. Peter Dance

The Coral Seas

Andrew C. Campbell

1001 Questions Answered About the Seashore

N. J. Berrill

Cone Shells

Jerry G. Walls

Exploring for Sea Shells on Martha's Vineyard

Richard J. Heuer, Jr.

The Sea Shells of Dar es Salaam - Part II Pelecypoda (Bivalves)

J. F. Spry

Shell Craft

Virginie Fowler Elbert

Yucatan Peninsula (Mexico-British Honduras-Guatemala and Islands)

Cliff Cross

Wonders of Sponges

Morris K. Jacobson

How to Know the Eastern Land Snails

John B. Burch

## SHELL AUCTION

The 1979 shell auction for the Houston Conchology Society was the most profitable ever held. The club made \$1905.19, less \$200.00 for expenses, for a net profit of \$1705.19. I hope next year's auction will be even more profitable for the club.

A successful auction takes a great deal of effort to collect, label, package and price the many, many shells. A very special thanks goes to all who gave so generously of their time and shells, and above all, to my wife, Lucille, who really deserves all the credit for the organization and preparation for the auction.

The Gulf of Mexico table was a big success thanks to the hard work of Connie Boone. Many interesting shells were made available at very low prices. All members and collectors should know the shells in their own backyard, including the auction chairman. Thank you, Connie, for such a splendid job on the table.

Thanks go to Barbara Hudson for cleaning and packaging the large box of Phillip-pine mix, as many hours of hard work were devoted to this task. You did a beautiful job.

Without Cynthia Biasca, my job as auctioneer would have been harder than it was. Special "thanks", Cynthia, for your help, support, and the excellent ideas you contributed to the auction.

Lloyd Meister, Frank Petway, Jim Sartor, Jerry Clampit, and Herschel Sands should open their own bank. They did a super job of collecting money and speeding up your check-out process and departure. Thank you all for your help.

The fifty gift boxes were a real success, as they were gone within minutes. Thanks for the packaging and wrapping go to Lucy Clampit and Maria Carpenter for their time and work in preparing these boxes. Due to popular demand, I hope to double the number of gift boxes available for next year's auction.

A very "Special Thanks" go to the following club members for their generous donation of shells and shell-related items: Betty and Larry Allen, Lisle and Margaret Baldwin, Cynthia Biasca, Lynn Blair, Connie Boone, Admiral and Mrs. Carlos M. Cardeza, Maria Carpenter, Jerry and Lucy Clampit, Jim and Sandra Clark, Eugene and Carol Courtade, Charles and Helen Doh, Max and Ruth Finer, Ruth Finer and Frank Van Norkhovan, Robert and Betty Genusa, Leola Glass, Ruth Goodson, Rosemary Habermacher, Bill and Joanne Hoard, Wayne and Audrey Holiman, James and Barbara Hudson, Merle Kleb, Ruby McConnell, Lloyd Meister, Sam and Fanny Miron, Laura Montgomery, Gale Orem, Frank and Tina Petway, Herschel and Kaye Sands, Jim Sartor, Linda and Richard Serrill, Wataru and Mary Sutow, Marguerite Thomas, Wilson Ward, and Margie and Wilbur Woods. Thank you all.

To two loyal friends of the Houston Conchology Society, Mildred Tate and Thelma Crow, a sincere thank you for your support, donations, and friendships.

Gale Orem and her refreshment committee went out of their way to provide all types of "goodies" for the members. Thank you so much. All the refreshments were great. In fact, it was one of the most popular tables of the evening.

Without the large response of dealer donations, our auction would not have been near as profitable and fun. A "Super Thanks" to the following dealers who so generously contributed to the 1979 auction: Kirk Ander's Shells of the Seas,

Inc.; The Beachcomer, Fish City; A Gift for All Seasons; Green's; Ed Hanley's Coral and Shells; Jim's Shell Shop; Richard M. Kurz, Inc., Specimen Shells; Elsie Malone Specimen Shells; The Morrison's Galleries, Inc.; Of Sea and Shore; One Foot in the Sea; Sea Atlanta; Sea Castles; Sea Shell Sales; Sea Shell Shoppe; Seashell Treasures; The Shell Cabinet; Shells and Accessories; Shop of the Seven Seas; Bob and Fay Stewart; and Tradewinds Wholesale Sea Shells. Thank you all so very much. Show them how much you appreciate their generosity by giving them your business, and when you contact them be sure to mention the Houston Conchology Society and the annual auction.

Several donations of shell-related items and auction supplies were presented to the club. These dealers and firms included: Adam's World of Hobbies; Arrangements by Betsy; MacIntosh Bookshop; McDonald's Corporation; Musabelle's Books; Randall's Supermarkets; Turrentine's (Needlepoint); and the Shell Cabinet. Many thanks to all.

As auction chairman and assistant auctioneer, I would like to express my personal appreciation to all the members of the Houston Conchology Society for their attendance and participation in this year's auction. It presented me the opportunity to meet many dealers around the country and more important, the opportunity to meet and develop friendships with other club members. Lucille and I really enjoyed putting together this event.

Plans are already under way for the 1980 shell auction and your early ideas are needed. When shelling this summer on your trips, bring extra shells home for donations to next year's auction. Let's make 1980 even bigger and better than 1979. Thank you ALL.....Best of wishes for the summer months and HAPPY SHELLING.

Dave Green  
1979 Auction Chairman

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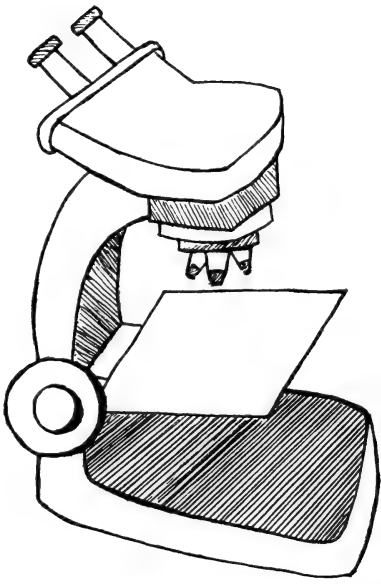
#### PERU'S GOLDEN TREASURES HAS SHELLS

The fascinating display of gold artifacts from five pre-Columbian civilizations, called Peru's Golden Treasures, includes the beautiful gold spindle (Fusinus) shell and contains several necklaces, masks and other artifacts that have shell inlays or worked pieces of shells with jewels and metals. It will be interesting to shell collectors.

The special event is being held at the Houston Museum of Natural Science through September 3. It is open daily, including weekends, from 10 to 5 p.m. Tickets are \$2.00 at the door.

## 'SCOPING THE MEMBERS

BY MERLE KLEB



Tina and Frank Petway

Frank Petway was hardly recognizable in his duck hunting garb plus about four days growth of beard. He had just returned from hunting with friends and they all sat on benches in front of Caney Creek Store rehashing their hunt. Tina Kleb and her friends came in from a fishing trip up the creek. Though it was a cold and windy Thanksgiving weekend in 1970, Tina wore "cut-offs" and was barefoot, but clad in a warm coat and heavy wool cap. The perfect time for a couple to meet--looking their absolute worst. Deana Mock, whose parents owned Caney Creek Store at that time, introduced Tina to Frank. Tina had been fishing with Deana and Frank had been hunting with Cris, Deana's brother.

Someone suggested that they go to the beach for a weiner roast. It was cold and windy and getting dark but that was no problem. There was plenty of driftwood on Sargent Beach to build a fire for warmth, roast weiners, and provide light, and the rest of the needed supplies were handy in the store. All agreed and so began the Petway-Kleb relationship.

Tina became interested in shells in 1964 when we, as a family, would be invited to go to Caney Creek for a weekend with my sister, Laura Montgomery (a fellow shell club member), and her husband. They had a weekend place there and they went down every Friday evening after work. We were invited often and eagerly accepted. Soon we found our way to Sargent Beach across the intracoastal canal. We parked the car and if we walked to the west it was toward Brown Cedar Cut. To the east was the San Bernard River about ten miles away. Either way on foot didn't get us very far but we soon discovered pretty shells, lovely colors and interesting shapes. We began to wonder what they were called.

One weekend when we arrived at Laura's she told us she had bought a paperback

book about shells. It was Abbott's "Sea Shells of the World" and it really whetted our appetite for shells. We recognized some of the shells in the book as some that we had collected such as olives, whelks, sun dials, augers, rock shells, moon snails, bonnets, tulips and even wentletraps (Amaea mitchelli). It took several years for us to learn the correct scientific names for our shells. Some of us STILL can't remember them. The shell book also told about such things as RARE shells. Friends told us there were SHELL SHOPS in Rockport, Texas, so off we went one Saturday. What a discovery! And now we were truly "hooked". We even BOUGHT shells!

After a couple of years Laura and Chuck decided to move to Caney Creek permanently. Chuck knew how we enjoyed the trips to the beach so when he was offered the opportunity to buy a much-used but still usable ex-Army jeep, he grabbed it. Laura could drive this four wheel drive vehicle and the four of us, Laura (Tina's aunt), Vicki (Tina's sister), Tina and me (Tina's mother), piled into the Jeep and took off for Sargent Beach. We called ourselves The Rat Patrol and would whoop and "holler" all the way to the San Bernard River or to Brown Cedar Cut. NOW we could get to either destination in that Jeep, stopping here and there along the way when we saw something interesting. We collected bucketsful. We decided that perhaps we were among some of the first people to shell these areas since Hurricane Carla had thrust many shells onto this beach. The beach shells were abundant and in fairly good condition. We still hadn't learned about LIVE collecting. We did find live Thais haemastoma but we left them because they had animals in them.

Once Tina said that if and when she got married, the man she married would have to like Caney Creek and shell collecting. Well, Frank loved Caney Creek and spent a great deal of time there as his parents had owned a weekend house there for many years. Frank's father was a doctor and loved to go there for a few days relaxation. But for Frank, collecting shells was an idea that had to grow on him. Tina told him about her hobby and that it was the hobby of several of her relatives. It was a dumb hobby, he thought. Why spend good money on something you couldn't use?

Well, one weekend we were going to Rockport again and we invited Frank to go along. He began to show a little interest seeing some of the beauties in the shell shop.

There was a tropical fish shop in Town and Country Village that used to have a few shells for sale. Tina had seen a slit shell there that she was interested in buying. Frank couldn't believe the price so he went along out of curiosity. The slit shell had been reduced in price, as the shop was no longer going to sell shells, so Tina bought it. Also marked down was a lovely Voluta ebraea and that became Frank's first shell and resulted in his decision to specialize in collecting the Family Volutidae. By this time Frank's sister, Rosemary Habermacher (also a fellow shell club member), had become interested in the SHELL GAME and Rosemary loved Cypraea and Pectens. Tina had chosen Cones, Laura - Strombus, and I had settled on Murex long ago. Frank had also heard that the Volute Family was called the aristocrat of shells - very nice but also very expensive, as Frank was soon to learn.

On June 25, 1971, Tina Kleb became Mrs. Frank Petway. That was also Tina's parents' 27th wedding anniversary so it was quite a celebration. Now where would you guess Tina and Frank would go for their honeymoon? Caney Creek, of course, to Frank's folks' place. But just for a few days at that time. Frank's mother, Rosie Petway, had told the couple that she would pay for their honey-

moon as her wedding gift to them. Where did they want to go? Frank said, "Let's all go to Guaymas, Mexico." The Petway family had been there several times before and Frank thought it would be fun and shelling was good there, or so he had heard.

The rest of us said no way would we go along on their honeymoon. Then they came up with an idea. If they waited a couple of months after they were married, would we all go THEN? So on August 25, 1971, Merle and Mel Kleb, Rosie Petway, and Laura Montgomery left by car (Rosie's) for Tucson, Arizona. Tina and Frank were flying over to Tucson to meet us in two days. From Tucson, the six of us, plus luggage, drove south to Guaymas, Mexico.

We arrived in Guaymas about 4 p.m. on Saturday, August 28th. We shelled, shopped, fished and went sightseeing till the following Saturday, September 4, 1971. We drove back to Tucson with every available space in that car packed with shells. We dreaded arriving at the border for fear of having to unload all of those stinking shells. But when we got to the border they asked us what we were bringing back and we told them shells. They got a good whiff and told us to go on. Didn't even OPEN the trunk. What a relief!

In April of 1972 Tina and Frank went to the Solomon Islands with the Ernests of San Antonio, Texas. It was a two-week trip with a stop over in Honolulu, Hawaii on the return trip. While shelling in the Solomons Tina was stung on the hand by a Conus marmoreus, a potentially very poisonous cone. Fortunately she lived to tell about it. They had taken an antihistamine along and that helped. If you would like more information about this, ask Tina. The Petways returned from the Solomons with a huge suitcase full of self-collected shells and an air travel bag full of shells, which in November of 1972 won them the DuPont Trophy for a four case display of self-collected Solomon Island shells at the Coastal Bend Gem and Mineral and Shell Show in Bay City, Texas.

Florida was their next shelling trip in July, 1973. Frank's mother and sister went along on this trip. Tina was expecting their first child in late October, 1973, but Matthew Timothy waited till Frank was away on another duck hunting trip to arrive. Laura's voice coming over the CB radio calling Frank awakened him to tell him that Tina had gone to the hospital at 5 a.m., November 10, 1973. Frank and Mel arrived in Houston and the hospital before Matt entered this world.

It was another trip to Florida in July, 1974, and 8-month-old Matt went on his first shelling trip. This time Granny Merle went along.

Bay City had it's annual Gem and Mineral and Shell Show in November, 1974, and Tina entered a beautiful display of Cones for which she won the DuPont Trophy.

Melanie Michelle Petway entered the family scene April 28, 1976. This one is a red head and says her name is Melanie, "The Shell". Well, why shouldn't a three-year-old misunderstand "The Shell" for Michelle when the home conversation is about shells so often. Matt and Melanie both have their own shell collections and they enjoy them very much.

There was a shell show in Corpus Christi, Texas, in October, 1976. Frank decided he might have enough Volutes to enter. His four cases of Volutes did prove to be sufficient because Frank received the DuPont Trophy for his efforts. Now the Petways have three DuPont Trophies. They also have numerous other trophies for best of class, shell of the show and many blue ribbons for displays entered in Bay City, Galveston and San Marcos, Texas. Competitive shell shows



have lost their popularity in Texas in recent years. Too bad. They were very exciting.

The Petways were seriously thinking about making a return trip to the Solomon Islands when they discovered Baby #3 was on the way. So on Good Friday, May 13, 1979, Miss Tracey Lee Petway joined the Petway Clan and she is as adorable as kids #1 and #2.

Frank became President of the Houston Conchology Society in May, 1978, and was re-elected for a second year in May, 1979. He has also served as Vice President-Program Chairman and on the Board of Directors in recent years. Frank joined the club in the Fall of 1971. He is a graduate of the University of Houston and is employed by Shell Oil Company.

Tina joined the Houston Conchology Society in May, 1969, and has served as Vice President-Program Chairman and Hospitality Chairman. Tina has her degree in interior design from Sam Houston State College. Most recently Tina has been the writer of this column, Scoping the Members. At present, Tina is on leave of absence for a few months due to her duties as a new MOMMY. Please folks, encourage her to return to her writing duties SOON.

Only subbing in,

Merle Kleb

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#### MAY NOT BE MANY OYSTERS FROM GALVESTON THIS YEAR

A report in the Houston Chronicle (May 27, 1979) indicated that biologists of the Texas Parks and Wildlife Department were worried over the spring floods and heavy rains sending too much fresh water into Galveston and Trinity bays, threatening to devastate the state's prime oyster beds.

Hot weather would add to the problems to seriously imperil the oysters, the biologists stated. Bob Hofstetter of the department's Seabrook office said that the oysters in Trinity Bay would probably be the most affected because of the runoff from Trinity River.

In Carlos Byars' science story Hofstetter was quoted as follows: "They can't stand fresh water at high temperatures," .. "During bad conditions they close up. But during hot weather they can stay closed for only a short time. They can stay closed for weeks during cool weather." He said that fresh water also keeps oysters from reproducing. May is the most important spawning season for oysters, although there is a secondary spawn during the fall.

The good news reported by Hofstetter was that the oyster drills (our Thais haemastoma floridana forms) had already been killed by the fresh water. He blamed the drill for the heavy loss of oysters last year on Dollar Reef in Galveston Bay.

The Oyster season in Galveston and Trinity Bays was closed last fall to allow the reefs to recover from several years of poor reproduction. No decision will be made on an oyster season this fall until September. The minimum size for oysters to be collected is 3 inches. An excellent spawn took place last year, according to C.E. Bryan, shellfish program director of the coastal fisheries branch of TPW.

## DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN

## THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph)

SUPERFAMILY PECTINACEAFamily Pectinidae

In view of the large number of fossil and recent species the Pectinidae present serious difficulties to the specialist. In his article in the Treat. of Invert. Pal., Vol. N, part 1, L. G. Hertlein ordered the family into a number of "groups", without taxonomic status in which similar species were grouped together; no firm commitment was made. To avoid such a loose arrangement, even though prudent at this time, I shall follow here the arrangement used by Abbott (1974), who for the recent North American material distinguishes three subfamilies, here cited only with some genera of our region:

- 1) Pectinidae with Pecten and Amusium.
- 2) Chlamydinæ with Chlamys, Aequipecten, Argopecten, Nodipecten, Cyclopecten, Delectopecten, Palliolium.
- 3) Propeamussiinae with Propeamussium.

It is unfortunate that so little appears to be known about the morphology of pectinid valves in their early stages. It is my firm conviction that much information about their relationships can be derived from the prodissoconch which are amazingly different. As an example consider the prodissoconchs of the small pectinids grouped by Hertlein in the "Eburneola" group. Their prodissoconchs are so different that I believe that their arrangement together in the Chlamydinæ is rather a matter of convenience than of understanding. Some may be chlamyd in affinity. A typical chlamyd prodissoconch is that of Argopecten where both valves are rather flat and the radial riblets start in a somewhat hesitating manner. Although about equally inflated at first, unequal inflation becomes accentuated in Argopecten, but not in Aequipecten or Chlamys. In those very juvenile valves I have seen of chlamyd material there are teeth in the byssal notch (ctenolium), but whether all Chlamys have those at that early stage I do not know. In contrast the prodissoconch of Pecten raveneli, at least I believe it to be that species - is quite different. The valve which later will grow into the inflated one is already quite inflated when about 1 mm. in size, is reddish in color and in the umbonal area covered by a dense net of small pustules. There are no teeth in the byssal notch. Comparing the small pectinids such as Cyclopecten or Delectopecten with the Argopecten and Pecten (Euvola) we note that Cyclopecten to some extent resembles Pecten, and not Argopecten. Both valves of Cyclopecten spec. indet. B (close of C. nanus) when under 1 mm. in size are quite dissimilar. The radially streaked valve is much inflated with a smooth swollen umbo and carries a few fence like concentric ridges, and the other valve is much flatter. There are no teeth in the byssal notch. The difference of umbonal inflation can still be seen in older valves. (See figure on next page)



Sketch of inflated and flat valve of Cyclopecten

Compared with Cyclopecten, Delectopecten is quite different, in fact so different that I think it highly unlikely that it can be placed in the same subfamily. The prodissoconch is somewhat unsymmetrical and densely lamellose with concentric ridges. It looks the more different because it is clearly set off rather abruptly from the nepionic shell.

In view of this diversity it is no wonder that the small pectinids cannot be treated here with the literature at my disposal. It is striking again that both generic distribution and species distribution in these genera seems to follow the Panamanian Province more closely than the Atlantic (6 species of Cyclopecten, 1 Delectopecten, and perhaps Palliolum). Unfortunately I do not understand at present the precise differences between Cyclopecten and Palliolum but will come back to some of my own observations when these genera are discussed.



Sketch of inflated valve of Cyclopecten nanus

Genus Pecten Muller, 1776.

Large shells with one inflated (lower or right valve) and a flat upper valve. In the N.W. Gulf of Mexico only a single species in the subgenus Euvola Dall, 1897.

313. Pecten (Euvola) raveneli Dall, 1898.

Pecten (Pecten) raveneli Dall, T.W.F.I.S., Vol. 3, pt. 4, p. 721, pl. 29, fig. 10, 1898.

Sometimes reported as Pecten medius, of authors, not Gmelin.

Often dredged alive and apparently widespread over the Texas-Louisiana shelf in a depth range of 10-30 fms. In most specimens the valves are discrepant in color, the inflated valve being almost pure white, but with some pink towards the umbo, the flat valve being a uniform purplish red, which is lighter near the umbo. However, especially in younger specimens the inflated valve can be colored by reddish spots and rarely - as in a large live specimen from Heald Bank - can be a uniform light pink. There are also some flat valves of uniform orange color in the H.M.N.S. collection. There is no ctenolium. The genus Amusium is only superficially close to Euvola, as juvenile material appears somewhat similar. One difference is that the flat valve of Pecten raveneli starts growing with a negative radius of curvature after it reaches about 2-3 mm. in size.

The species has been found rarely in beachdrift from Galveston to St. Joseph Island (Galveston, Sargent, Matagorda), but south of Corpus Christi it becomes more common in drift. It lives in many types of bottoms, but appears to prefer hard substrate of shell rich bottoms

and shale uplifts (Stetson Claypile); on the algal reefs it is rare. Also taken in the mudlump fauna.

Previous records for the Texas faunal province are: 144, listed for offshore location 1088; 145, deep shelf, Mississippi Delta; 156, Stetson Bank; 174, listed; 175, Intermediate Shelf, 12-35 fms., sand bottom, few, pl. 4, fig. 30; 206, records Tex. Conchol., Vol. IV p. 2; 225, Galveston; 236, Galveston; 253, rare on reef off South Padre Island; 269, figured on p. 164.

Records H.M.N.S.: 52 lots, of which 15 contain live collected material. Depth Range: 0-55 fms; alive 6-30 fms.

Geographical Range: North Carolina-Florida, Texas-Louisiana shelf, West Indies.

Maximum Size: 58 mm.

Eastern Pacific Analogue: None.

Genus Amusium Roding, 1798.

Very thin, but large shells; both valves are inflated. Juveniles show a very small ctenolium, which disappears in larger shells (up to about 1½ cm.). In the N.W. Gulf of Mexico only a single species.

314. Amusium papyraceum (Gabb, 1873).

Pleuonectia papyracea Gabb, Geol. Santo Domingo, p. 257.

This well known large (up to 3 inches) Pecten is widespread over the Texas-Louisiana Shelf on shelly and muddy bottoms. The valves are different in color, internally ribbed and quite thin, but strong. Juveniles of about 1 cm. size show 5 small teeth in the ctenolium (white to dark), but in specimens of about 2 cm. they have disappeared because of shell thickening. Remarkable is the fact that a relatively large proportion of our valves show irregularities in the internal shell surface which look as if sand grains are incorporated in the shell structure. Only a few times this species has been taken on Texas beaches; in all instances known to me such finds were made on Padre Island. (See ref. 206).

Previous records for the Texas faunal province are: 123, not uncommon in the 30 to 40 fathom zone offshore; one valve in 24 fms. off Corpus Christi Pass, also in 17 fms. south east of Freeport, and in 25-26 fms. off Mustang Island; 139, open shelf, pl. 39, fig. 39; 144, at many offshore locations; 145, deep shelf, pl. 7, figs. 11A-B; 147, dead from Baker Bank, and Big Southern Bank; 156, Stetson Bank; 174, listed; 175, outer shelf 40-65 fms., abundant, whole coast, mud bottom, pl. 5, fig. 11; 201, listed for mudlump fauna; 206, beach records in Tex. Conchol., Vol. 4, p. 2, 1967.

Records H.M.N.S.: 64 lots, of which 25 contain live collected material.

Depth Range: 10-75 fms.; alive 10-70 fms. on sand and mud bottoms.

Geographical Range: Gulf of Mexico to Brazil.

Maximum Size: 76 fms.

Eastern Pacific Analogue: None.

Genus Lyropecten Conrad, 1862.

In the N.W. Gulf of Mexico only the subgenus Nodipecten Dall, 1898, with a single large species.

315. Lyropecten (Nodipecten) nodosus (Linne, 1758).

Ostrea nodosa Linne, Syt. Nat., 10th Ed., No. 164, p. 697, 1758.

This large Pecten is locally common on the shale uplifts and coral reefs, but is rarely dredged from sandier shell bottoms. On rare occasions valves have been found on Texas beaches from Matagorda to

South Padre Island. At the latter location valves are more common than anywhere else. I have not seen juvenile material smaller than 16 mm. These small shells are already coarsely ribbed with a lower rib between two more elevated ones. The nodules which become hollow are formed by a sudden upward flaring of the valve margin.

In the smallest material available the early shell is quite flat, often yellowish in color, and somewhat concentrically ribbed. Unfortunately it is the valve without denticles in the byssal gap. Sometimes in juvenile specimens there are coarse concentric lamellae between the ribs.

The color of fullgrown Texas material is usually a dark maroon red but some specimens (rarely) tend to orange red and one specimen is brick-red with white flames.

Previous records for the Texas faunal province: 21, listed; 69, listed in Appendix 8, Port Isabel, page 54; 110, one dead shell taken from St. Joseph Island and fragments occasionally found at Port Isabel, pl. 8, fig. 10; 156, Stetson Bank; 175, listed for outer shelf, 40-65 fms., few, Texas to Mexico, sand bottom. Note: Pl. 5, fig. 12, shows Aequipecten glyptus, hence probably a misidentification; 206, Tex. Conchol., Vol. IV, p. 2, beach records; 253, rare on reef off South Padre Island; 269, figured on p. 166.

Records H.M.N.S.: 11 lots, of which 3 contain live collected material. Depth Range: 9-55 fms.; alive 12-31 fms.

Geographical Range: North Carolina, Bermuda, Florida, Texas and mid Atlantic (Abbott (1974)).

Maximum Size: 161 mm. (width) X 145 mm. (height) (dead valve).  
146 mm. (width) X 141 mm. (height) (live specimen).

Eastern Pacific Analogue: Lyropecten (Nodipecten) subnodosus (Sowerby, 1835) "Scammon's Lagoon", Baja California to Peru (Keen, 1971).

Genus Chlamys Roding, 1798.

Somewhat elongate, strongly ribbed bivalves with unequal ears. In the N.W. Gulf of Mexico only two species.

316. Chlamys multisquamata (Dunker, 1864).

Unfortunately I reported this species previously as Chlamys sentis, which is quite different. The species is rare and lives off the Texas-Louisiana coast only in calcareous environment. The early shell shows under the microscope a quite characteristic sagriate posterior of small radial grooves. Its ears are very different in size. The color is yellow orange or blotched, while large specimens tend to become more purplish. The color of the valves can be discrepant in some specimens (lemon yellow and orange purple). There are strong teeth in the byssal gap in the material studied by me. Very finely ribbed with numerous ribs of equal size, which become minutely scaled towards the margin. These scales are located on top of the ribs and are triangular in shape.

Previous records for the Texas faunal province are: 206, (as C. sentis, Tex. Conchol., Vol. 9, p. 77.

Records H.M.N.S.: 4 lots, of which 3 contain live collected material. Depth Range: 13-31 fms., only in calcareous environment; alive 13-31 fms.

Geographical Range: Florida, West Indies to Brazil (Abbott, 1974).

Maximum Size: 61 mm.

Eastern Pacific Analogue: None.

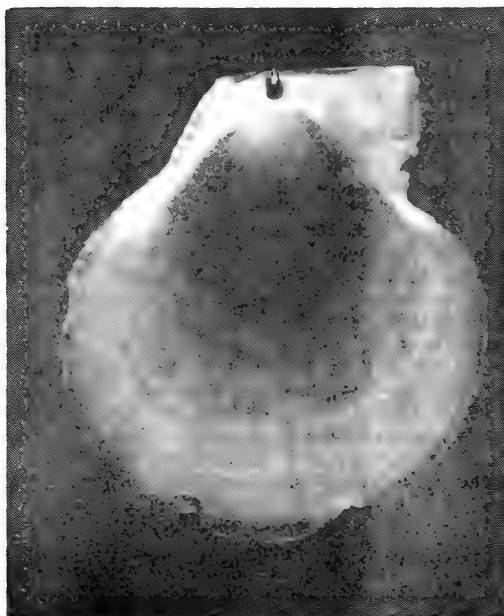
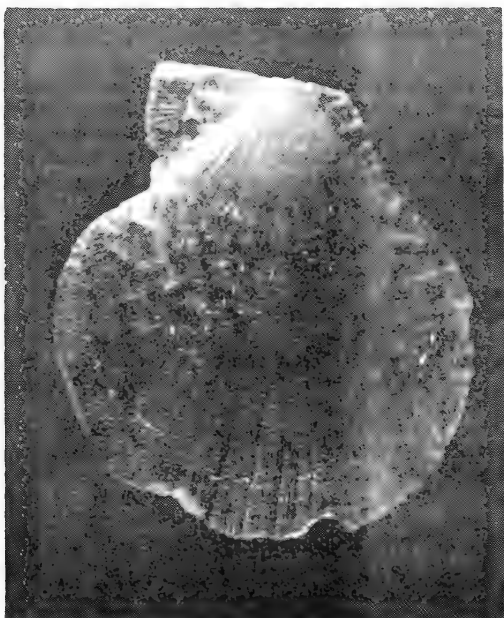


Fig. 1 Chlamys multisquamata (Dunker, 1864), brought up by divers from 13-16 fms., East Flower Gardens, coral reef 90 miles off Galveston, Texas, aboard the USS Haynsworth, October 8, 1967. 41-38 mm.

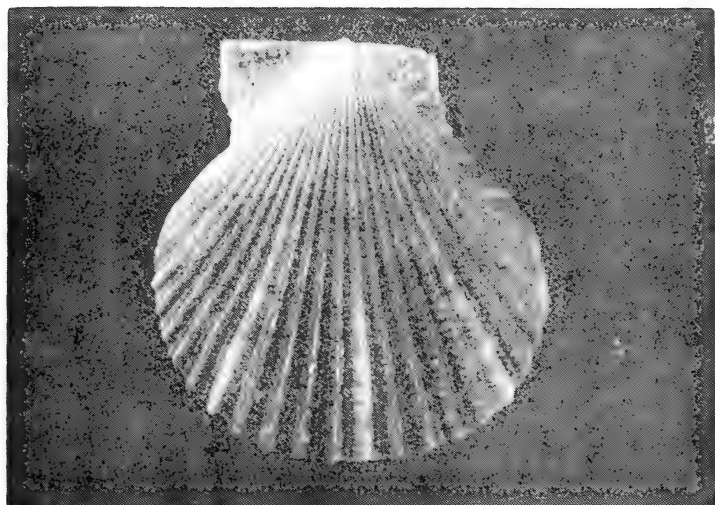


Fig. 2 Chlamys benedicti (Verrill and Bush, 1897), trawled by Capt. Allen Kight, shrimper, 60 miles SSE of Galveston, Texas, 25 fms., Nov. 22, 1967. 17.2-16.5 mm.

317. Chlamys benedicti (Verrill and Bush, 1897).

Over the Texas-Louisiana shelf this is a fairly widespread species in many types of environment and in an extended depth range. It is rare on the beaches, only a small single valve known from Mustang Island beach. In offshore waters it is often dredged on shelly sand or mud bottoms and it lives also on the shale domes and in calcareous environment. In shape it is quite variable and in color pattern it is unexcelled among pectinids in the N.W. Gulf of Mexico. Spectacular specimens are vividly and contrastingly colored by half circular patterns of color (see sketch). Most common are irregular blotches of color. Also completely uniform colors occur (yellow, orange, red, purple) but rare are radial patterns of color. The intensity of spinosity is so variable that I first believed that the H.M.N.S. material possibly could be interpreted as a mixture of two different species. (It must be noted that juvenile Aequipecten muscosus is quite different and far more spinose with larger spines.) However, the differences are not consistent and are probably caused by the large depth range and adaptation to various ecologies (shale, coral, sand bottoms). Strong teeth are present in the byssal gap. Large specimens rarely reach up to 19-20 mm., but most specimens stay well below 15 mm.



Previous records for the Texas faunal province are: 144, reported from loc. 538; 145, deep shelf, dead; 147, dead on Baker Bank, dead on Big Southern Bank; 156, Stetson Bank; 170, deep shelf, pl. 13, fig. 4; 174, listed; 206, Tex. Conchol., Vol. 9, p. 77; 214, pl. 11, figs. 3 and 4.

Records H.M.N.S.: 34 lots, of which 8 contain live collected material. Depth Range: 6-60 fms., and one lot from the beach; alive 17-40 fms. Geographical Range: Southern half of Florida to Texas (Abbott, 1974). Maximum Size: 19.9 mm., but a broken specimen indicates sizes of over 20 mm.

Eastern Pacific Analogue: Probably close to Chlamys lowei (Hertlein, 1935). "Catalina Island, California to Ecuador and the Galapagos Islands in depths to 146 m." (Keen, 1971).

Genus Argopecten Monterosato, 1889.

Valves of unequal convexity, growing to fairly large size and discrepant in color. Ctenolium present but reduced in large valves. Juveniles of Argopecten are much thicker than those of Chlamys or Aequipecten. Formerly the 3 N.W. Gulf of Mexico species were considered as Aequipecten but there seem to be many points of difference. (See a study by T.R. Waller, 1969, Journ. Pal., Vol. 43, suppl. 5).

318. Argopecten irradians amplicostatus (Dall, 1898).

Pecten gibbus amplicostatus Dall, 1898. T.W.F.L.S., Vol. 3 (4), p. 745, 747.

The common bay scallop of the Texas Coast is in danger of extinction due to man made changes in environment in the bays. I have not seen live material in several years near Galveston, where it used to be common. Dead valves are still washed ashore in large numbers all along Texas beaches from Sabine to the south west. In Louisiana it is apparently replaced by the subspecies A. irradians concentricus (Say, 1822), but unfortunately only a single lot of Argopecten from Louisiana



is in the H.M.N.S. collection so that no definite statement can be made.

Beach valves are often colored a reddish orange, but this is an unnatural color caused by bleaching in sunlight. Live shells are discrepant in color: the right or inflated valve is almost pure white but often with some small brownish discolorations close to the umbo; the left or less inflated valve is a dark grayish brown on the ribs, but often white in the intercostal areas. Juveniles are often darker colored.

In Louisiana apparently replaced by A. irradians concentricus Say, 1822, which has more ribs, and is darker and looks more regular in consequence. However, the difference is hardly sufficient to justify its subspecific status.

Previous records for the Texas faunal province are: 1, (as Pecten concentricus Say), Galveston; 7, listed as P. irradians Lamarck, and P. irradians amplicostatus Say); 15, Corpus Christi and Galveston, abundant; 18, beach worn valves are common at Galveston and Corpus Christi; 21, listed; 26, chiefly west of the Mississippi on the Texas Coast and south to Carthage, p. 747, also as P. gibbus irradians Lamarck, stated by Dall to live in deeper water than gibbus and to be less colorful. This is completely in error for Texas material and Dall must have been confused; 45, Galveston, Corpus Christi; 56, listed; as Aequipecten irradians dislocatus Say, living in Aransas Bay; 61, reported under four labels for Port Aransas area; 62, Mustang Island, Padre Island, Corpus Christi Bay; 65, sandy beaches; 67, Point Isabel; 69, listed; 97, Red Fish Bay, beach Padre Island; 110, dead shells common on all Texas beaches, alive in Aransas Bay and Laguna Madre at Port Isabel, pl. 8, figs. 6-7; 126, listed for bays and lagoons, moderate to high salinity of of Carolinian Province (note this includes apparently the subspecies concentricus); 131, dead from the Gulf, alive from the bays; 135, alive from the bays; 139, beach and surfzone, near shore Gulf, pl. 39, fig. 35 (note: very peculiar reference for a bay species); 145, upper sound, inlets, shallow shelf (all dead), pl. 2, figs. 10A-B; 146, Islands, sound, shore, pl. 4, fig. 31; 160, dead in Matagorda Bay; 164, alive near Rockport in various types of environment and alive in Laguna Madre in inlet environment; 174, listed; 175, listed for open sound or open lagoon assemblage, abundant in inlet end of lagoon, pl. 2, fig. 4; 191, listed for Pleistocene of Texas; 193, alive in Laguna Madre at Port Isabel in spring months, apparently migratory; 194, listed as food item for black drum (fish); 206, beach records in Tex. Conchol., Vol. IV, p. 3; 208, listed for several environments; 225, Galveston; 235, Galveston; 251, listed for Yucatan shelf; 269, figured on page 165.

Records H.M.N.S.: 27 lots, of which 3 contain live collected material.

Depth Range: 0-7½ fms.; alive in 0-1 fms. in sheltered bays.

Geographical Range: Galveston - South to Columbia (see Abbott, 1974).

Maximum Size: 73 mm. (width) X 68 mm., alive in West Galveston Bay.

Eastern Pacific Analogue: None close.

319. Argopecten irradians concentricus (Say, 1822).

Only a single lot of this slightly different subspecies from the most easterly of the Isles Dernieres (Louisiana) is present in the H.M.N.S. collection. Previous references to it from Texas may prove to be all

untrustworthy and probably are based on either inflated or flat valves. Pulley (Ref. 110), reports and illustrates a few dead shells from Galveston; we have never seen it there, and probably the subspecies reaches its most westerly locality on the Louisiana coast. Previous records for the Texas faunal province are: 110, Galveston, pl. 8, fig. 1.2.

Records H.M.N.S.: A single lot from Isles Dernieres, (Louisiana).  
No live material.

Depth Range: Beach material only.

Geographical Range: Maryland to Georgia and Tampa, Florida to Louisiana (Abbott, 1974).

Maximum Size: 38 mm.

Eastern Pacific Analogue: None

320. Argopecten gibbus (Linne, 1758).

Ostrea gibba.

This more colorful species is widespread over the shallow sandy shelf area of the Texas-Louisiana coast, but except in South Texas it hardly ever reaches the coast. Beach valves become not uncommon south of Port Aransas but at Galveston, Freeport and Matagorda they are quite rare. A. gibbus is more irregular in shape than A. irradians, has more ribs than amplicostatus but differs mainly by its totally different color pattern. Both valves are colored, often with distinctive flames and blotches of vivid and contrasting colors; although the bottom valve is less strongly colored. Both valves are about equally inflated. It is noteworthy that although often dredged dead in large numbers live material is fairly uncommon. In the literature I find that its maximum size is given about 2 inches. Off the Texas coast however dead specimens of almost 3 inches in maximum width and slightly less in height are not particularly rare although the bulk of the material stays below two inches. Older valves without color are sometimes difficult to separate from A. nucleus. We have some material (mudlumps) which resembles that species.

Between the costae many specimens show concentrically arranged lamellations and often there appears to be a lighter colored rib in the middle of the shell. Juvenile material is typical for Argopecten. After the prodissoconch stage the valve starts to thicken dramatically and specimens of 1-2 mm. in size are already different from Chlamys. A ctenolium is present but much less developed than in the genus Aequipecten.

Previous records for the Texas faunal province are: 15, (as Pecten irradians dislocatus), living shells rare; 17 (as P. irradians dislocatus), living in Corpus Christi Bay (Note references 15 and 16 are puzzling); 19, living in Matagorda and Espiritu Santo Bay, (also probably A. irradians); 21, listed as P. dislocatus; 45, Matagorda, Corpus Christi; 61, Port Aransas area; 62, Mustang Island, Padre Island and Corpus Bay; 65, sandy beaches; 66, Marine Pleistocene of Texas; 67, Point Isabel; 69, listed in Appendix 8; 110, dead shells are sometimes found on the south end of Padre Island; 123, a few isolated valves, tentatively identified as this species were taken from 11 fathoms east of Freeport, Texas; 137, in final list, not in text; 144, listed for offshore station 1088; 145, deep shelf, (alive), plate 7. figs. A-B; 146, reworked delta deposits, pl. 4, fig. 28; 156, Stetson Bank, common; 170, listed for transitional shelf assemblage; 174, listed; 175, intermediate shelf, 12 to 35 fathoms on sand bottom; 201, mudlump fauna; 206,

beach records Tex. Conchol., Vol. IV, p. 3; 214, pl. 11, figs. 7-8; 225, Galveston; 236, Galveston; 269, figured on page 164.

Records H.M.N.S.: 101 lots, of which 11 contain live collected material.

Depth Range: 0-82 fms.; alive 7½ fms.-55 fms. (one beach specimen alive at South Padre Island). Almost always dredged on sandy shelly bottoms. Rare on miocene shale uplifts and calcareous environments.

Geographical Range: Off Maryland to Florida and south Texas to Brazil. Bermuda. (Abbott, 1974).

Maximum Size: 74.7 mm. (width) X 68 mm. (height) (dead). 56 X 52 (alive) at 55 fms.

Eastern Pacific Analogue: Argopecten circularis (Sowerby, 1835).

"Cedros Island, Baja California, south to Paita, Peru in depth of 1 to 135 m." (Keen, 1971).

Genus Aequipecten P. Fischer, 1886.

Different from Argopecten but close to Chlamys, but heavier. However the 3 species here grouped together under Aequipecten seem so different that I am not sure that their arrangement in a single genus makes sense. A. glyptus is a pectinid close to Amusium and not an Aequipecten.

321. Aequipecten muscosus (Wood, 1828).

Pecten muscosus Gray, Woods, Ind. Test. Suppl., pl. 2, fig. 2.

Over the Texas-Louisiana shelf this species is often dredged alive. Although large size older specimens sometimes appear thinner and have auricles of the shape resembling those of A. acanthodes (Dall, 1925), this latter species does not live in the N.W. Gulf of Mexico. All material inspected by me has the typical muscosus pattern of imbrications on the ribs. A large somewhat concave spine on top of the rib, flanked by a row on each side of thorny somewhat curved spines. In between the ribs rows of scales can develop, especially in mature specimens near the margins. In juvenile material the spinosity is emphasized and especially the hinge line can be wildly spinose. Very variable in color usually reddish brown, blotched, but also yellow or bright orange.

Previous records for the Texas faunal province are: 56, "North Carolina to Florida and Texas"; 110, dead shells on St. Joseph Island and at Port Isabel; 136, off East Texas at 54 feet; 44, offshore at locations 537, 538, 1087, 1088; 145, deep shelf, dead; 147, dead on Baker Bank; 156, Stetson Bank; 170, transitional shelf assemblage; 174, listed; 175, intermediate shelf 12-35 fms. sand bottom, pl. 4, fig. 28; 191, marine pleistocene of Texas; 201, mudlump fauna; 214, pl. 11, figs. 9-10; 206, Tex. Conchol., Vol. IV, p. 3; 251, Yucatan Shelf; 269, figured on p. 165.

Records H.M.N.S.: 56 lots, of which 10 contain live collected material. Depth Range: 0-55 fms.; alive 9-55 fms.

Geographical Range: North Carolina to Florida and Texas to Brazil. Bermuda (Abbott, 1974).

Maximum Size: 47 mm. (width) X 45 mm. (height).

Eastern Pacific Analogue: None.

322. Aequipecten phrygium (Dall, 1886).

Pecten phrygium Dall, B.M.C.Z., Vol. 12, No. 6, p. 217, 1886.

Only 4 lots of this quite different Aequipecten are in the H.M.N.S. collection all from off Louisiana. Kennedy (Ref. 170) was the first to report this species from this area (off East Texas). The normal color is creme with large blood red spots of irregular shape. A single incomplete specimen is uniformly lemon yellow in color. To be noted

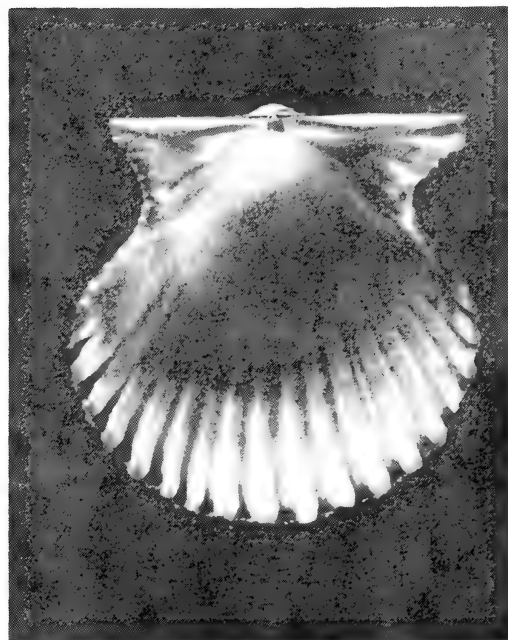
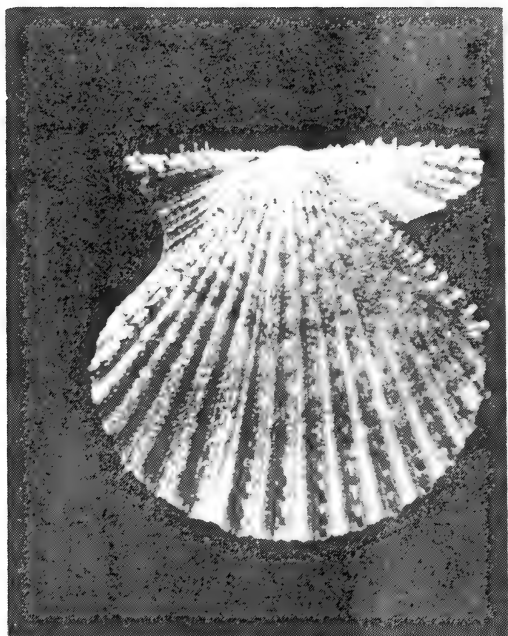


Fig. 3 Aequipecten muscosus (Wood, 1828), trawled by Capt. Allen Kight, shrimper, 96 miles SE of Freeport, Texas, in 55 fms., June, 1965. 36-35 mm.

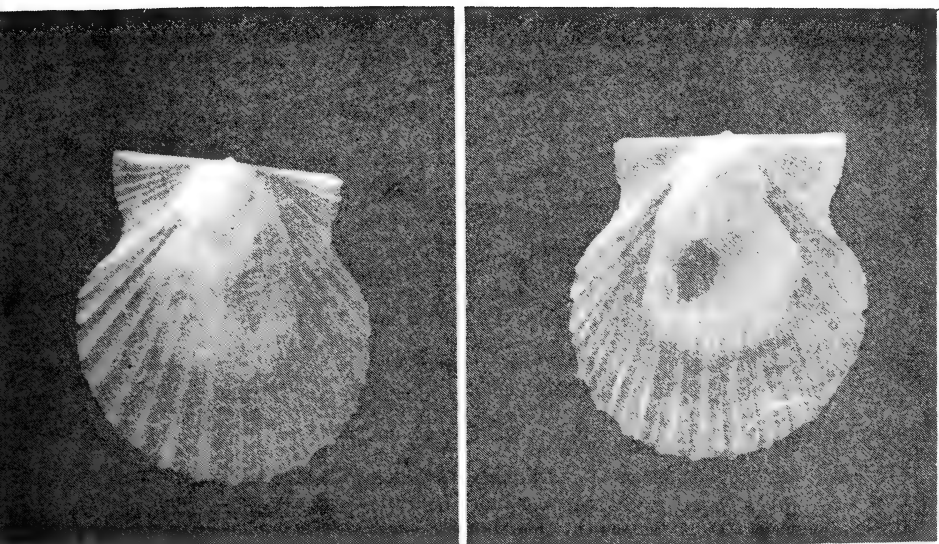


Fig. 4 Aequipecten sp. indet. A., dredged by Stubbs and Geis 110 miles SE of Freeport, Texas, from mud, 75 fms., July 18, 1967. 7.25 mm. length, 7 mm. width.

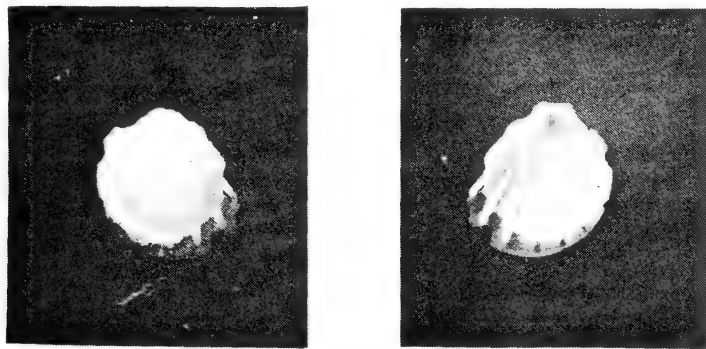


Fig. 5 Propeamussium pourtalesianum (Dall, 1886), Van Veen grab from 450 fms. 99 miles SSE of Freeport, Texas, by Stubbs and Geis June 18, 1967. 2.6 mm.

is that the trivial name is not an adjective but genitive plural, so that it can not be changed (phrygius is in error).  
Previous records for the Texas faunal province are: 170, off East Texas, pl. 10, fig. 3. (Deep water).  
Records H.M.N.S.: 4 lots, no live material.  
Depth Range: 51-85 fms.  
Geographical Range: Cape Cod to Florida and West Indies (Abbott, 1974).  
Maximum Size: 42.5 mm. X 38 mm.  
Eastern Pacific Analogue: None.

323. Aequipecten glyptus (Verrill, 1882).

Pecten glyptus Verrill, Trans. Conn. Acad. Sci., 5, p. 580.  
The assignment of this species to the genus Aequipecten is very strange. The species is so completely different from both previous species that I am convinced it belongs somewhere else. Since a proper assignment can only be made by an expert here I shall not attempt to propose one of the genera enumerated in the Treatise of Invert. Paleontology. A. glyptus is a large species, from deeper water, with fairly thin, moderately inflated valves, no ctenolium, and small auricles.

The sculpture of the valves is strongly discrepant. The red colored valve has a microscopic scabrous sculpture somewhat reminiscent of A. phrygium, but the white valve is fairly smooth. Unfortunately there is no juvenile material in the H.M.N.S. collection.  
Previous records for the Texas faunal province are: 144, listed for offshore location 540; 174, listed; 175, upper continental slope, few mostly deeper than 100 fms., plate 5, fig. 12 (mislabelled).  
Records H.M.N.S.: 6 lots, two of which contain live collected material.  
Depth Range: 70-110 fms.; alive at 70-95 fms.; also in mudlump fauna.  
Geographical Range: South of Cape Cod to Florida to off Texas (Abbott 1974).  
Maximum Size: 76 mm. X 78 mm. (Alive).  
Eastern Pacific Analogue: None.

324. Aequipecten sp. indet. A.

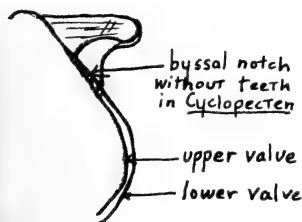
These few small valves could be the juveniles of A. glyptus, but look considerably different upon comparison. However much older valves often assume a different appearance near the umbo. There are only 3 small valves of this "species", which are noteworthy for their flat appearance with clearcut triangular ribs.  
Previous records for the Texas faunal province are: 206, Tex. Conchol. Vol. IX, p. 77 (as Aequipecten sp. B.).  
Records H.M.N.S.: 3 lots, none alive.  
Depth Range: 70-85 fms.  
Geographical Range: Unknown.  
Maximum Size: 7.3 mm.  
Eastern Pacific Analogue: Unknown.

Genus Cyclopecten Verrill, 1897.

Identification of species in this genus is extremely difficult because the smaller right valves are often quite similar, but the left valves may be considerably different. Also it is not easy to state what are specific characters and what are not.

Small mainly circular, thin, with discrepant sculpture: the small right valve has concentric sculpture, the larger left valve has radial and/or

reticulate sculpture. Abbott (1974) mentions equally sized auricles but this varies in left and right valve (see sketch) and the difference constitutes the opening for the byssus. There are no teeth in the byssal notch.



The distinction of Cyclopecten and Palliolium is unclear to me and I will restrict myself to some disjoint remarks. We have a few valves, which are rather smooth and one specimen resembling a very small Amusium papyraceum, which are smooth on the valve and have a few teeth in the byssal gap.

These are here reported later as Palliolium (?), where the question mark is a huge size.

325. Cyclopecten nanus Verrill and Bush, 1897.

Trans. Conn. Acad. Sci., p. 85, 92, pl. 16, figs. 12-12C.

After careful inspection of our material, I have come to the conclusion that this is a rare species off the Louisiana coast, that it hardly reaches Texas, but that the bulk of the Texas shells of Cyclopecten are so different as to be called at least subspecifically different or entirely different. Its larger valve becomes below a rather smooth umbo reticulately sculptured, and towards the margin densely striated by somewhat undulatory closely crowded radial grooves. The color is soft brown or creme often with dark blotches in irregular patterns.

Previous records for the Texas faunal province are: (All these records need reidentification). 139, listed for "outer shelf", pl. 39, fig. 50; 145, deep shelf, dead, pl. 7, figs. 13A-B, text figure 24A; 175, listed for upper continental slope; 65-600 fms., common east of Mississippi Delta, rare west of Delta, pl. 6, fig. 11; 206, Tex. Conchol., Vol. IX, p. 77; 214, pl. 11, figs. 5-6; 251, Yucatan shelf.

Records H.M.N.S.: 6 lots, of which 2 contain live collected material. Depth Range: 25-55 fms., in mud and over algal reef; alive 40-55 fms.

Geographical Range: Virginia to Gulf of Mexico to Brazil (Abbott, 1974).

Maximum Size: 5.6 mm.

Eastern Pacific Analogue: ?

326. Cyclopecten sp. indet. A.

This species is shaped differently from C. nanus and allied species. It is very symmetrical with the umbo almost exactly in the middle. Its lower margin is an almost perfect circular arch subtending about 200 degrees suddenly changing into two straight lines toward the umbo, giving the impression of angularity at the sides.

The concentrically ribbed valve is quite regular, the concentric ribs being slightly elevated. The other valve shows clear cancellate sculpture below the umbo which disappears toward the margin. Both valves appear quite discrepant. Some specimens have formed large external

"teeth" above the upper margin of the auricles (see sketch). I have not seen colored material of this species.

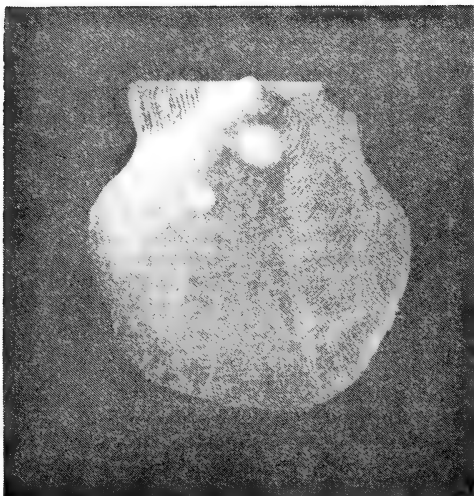


Fig. 6 Cyclopecten sp. indet. B, dredged from 110 fms. 86 miles SE of Freeport, Texas, by Geis and Stubbs, July 18, 1967. 5.5-5.3 mm.

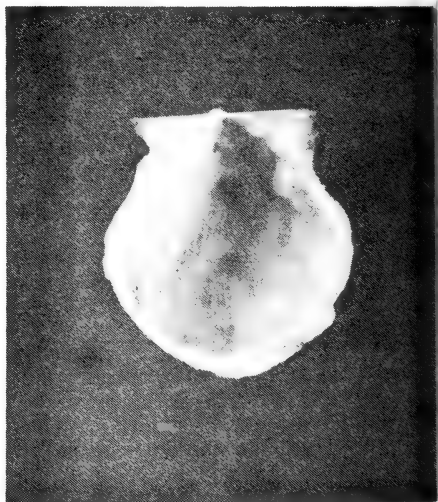
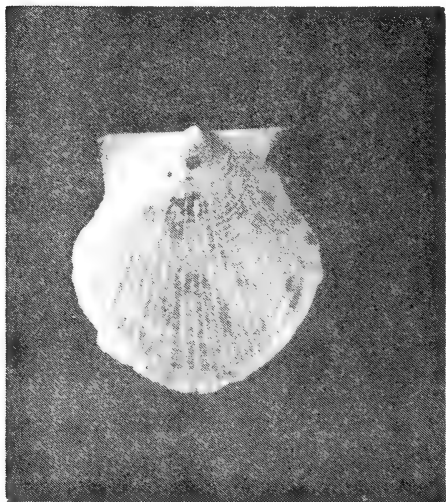


Fig. 7 Cyclopecten sp. indet. A, Van Veen grab by Geis and Stubbs, 66 miles SSE of Freeport, Texas, 67 fms., June 4, 1967. 4.4-4.2 mm.



Previous records for the Texas faunal province are: 206, Tex. Conchol., Vol. IX, p. 77.

Records H.M.N.S.: 10 lots, none alive in mud bottoms.

Depth Range: 63-167 fms.

Geographical Range: Unknown.

Maximum Size: 5.8 mm.

Eastern Pacific Analogue: ?

327. Cyclopecten sp. indet. B.

The bulk of the N.W. Gulf of Mexico Cyclopectens belongs to a species which finally may be decided to be only a race or subspecies of C. nanus. It is however so different from the latter, that I am forced to set it specifically apart. An excellent figure has been given by Kennedy (Ref. 170, pl. 16, fig. 3), who identified it as Cyclopecten nanus (sic!). The larger left valve is practically completely smooth, but under appropriate light indications of radial sculpture can be seen. The smaller valve is inflated, and covered by silky and fine growth incrementals. Its color is never that of C. nanus, but more subdued. Dead right valves are often blotched by vitreous blotches sometimes in checkerboard pattern. In the H.M.N.S. collection is a single right valve which has small evenly spaced denticles all along the outer side of the auricles. Usually bleached but some live material seems of a different color pattern than C. nanus Verrill and Bush. Sometimes present in great profusion in dredgings.

Previous records for the Texas faunal province are: 206, Tex. Conchol., (exparte).

Records H.M.N.S.: 44 lots, of which 4 contain live collected material.

Depth Range: 13½ fms.-75 fms. on mud bottoms; rare on algal reefs (6 valves at 36 fms.). Alive: 30-50 fms. One lot was obtained from the entrance to Timbalier Bay in 8 feet of water, (old mud-lump?) and another almost unidentifiable fragmental valve from 450 fms., which is better left out the depth range record.

Geographical Range: Unknown.

Maximum Size: 5.6 mm.

Eastern Pacific Analogue: ?

328. Cyclopecten sp. indet. C.

Only two lots of this quite different and heavily sculptured species are available. One lot comes from the mudlump fauna off the Mississippi Delta (South Pass) the other from 85 fms. on mud from off Louisiana. Kennedy (Ref. 170) has figured the species on pl. 15, fig. 1A-B and labeled it Cyclopecten thalassinum (sic), a species Abbott (1974) orders with Propeamussium. On the inside of one valve some radial grooves can be seen, but they correspond with external sculpture of the valve and are in no way analogous to the internal radials of Propeamussium. Apparently rare from East Texas to off Louisiana.

Previous records for the Texas faunal province are: Ref. 170, (as C. thalassinum Dall, 1886). Off East Texas in 60 fms.

Records H.M.N.S.: 2 lots, no live material, in mud.

Depth Range: 85 fms.

Geographical Range: Unknown.

Maximum Size: 5.4 mm.

Eastern Pacific Analogue: Cyclopecten exquisitus Grau, 1959, seems very close. Angelde la Guarda Island, Gulf of California to Galapagos Islands and Callao, Peru, in depth of 22 to 274 m. (Keen, 1971).

329. Cyclopecten spec. indet. D.

In coloration this species resembles true C. nanus very much but its shape and sculpture set apart even small fragments. Its margin is angular by reason of 4 slightly inflated radial undulations, so that the shell assumes the superficial likeness to a very minute Nodipecten (see sketch). The surface of the larger valve is densely cancellate but the pits are not as heavy as those in spec. indet. C. Only 3 lots off Louisiana.



Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 3 lots, not alive, but some fresh.

Depth Range: 51-85 fms. on sandy mud.

Geographical Range: Unknown.

Maximum Size: 3.6 mm.

Eastern Pacific Analogue: This might be related to Cyclopecten cocosensis (Dall, 1908). Locos Island, Costa Rica and Gulf of Panama, 95 to 113 mm. (Keen, 1971).

330. Cyclopecten spec. indet. E.

A single valve in rather poor condition is the only evidence for still another species. It is an unsymmetrical rather roundly and coarsely lined valve. Obtained at 750 fms. off the Mississippi Delta. More material is required to evaluate this "species".

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 1 single lot, none alive.

Depth Range: 750 fms., in mud.

Geographical Range: Unknown.

Maximum Size: In excess of 4 mm.

Eastern Pacific Analogue: ?

Genus Delectopecten Stewart, 1930.

Small, round valves, closely resembling Cyclopecten, but prodissoconch different. According to Abbott (1974) both valves with reticulate sculpturing.

331. Delectopecten spec. indet. A.

Our only two valves are surprisingly close to Cyclopecten but differ in a number of important details: 1) valves are partially cancellate; 2) prodissoconch strongly and densely lamellose; 3) posterior auricle less clearly set off from valve; 4) there are a few minute teeth in the byssal notch. For the time being these valves remain a puzzle to me. They do not resemble any Delectopecten I have seen figured or described.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 1 lot, none alive.

Depth Range: 110 fms., in mud.

Geographical Range: Unknown.

Maximum Size: 5.5 mm.

Eastern Pacific Analogue: None of the Pacific species resembles our material.

Genus Palliolum Monterosato 1884.

These very small pectinids resemble Cyclopecten closely and differ from it by

characters which are difficult to ascertain from the literature. Here I will classify a few meagre lots to the genus, realizing that I may be mistaken in this assignment.

332. Palliolum sp. indet. A.

3 lots of a rather oily smooth species with a streaky color pattern are available. The specimens have a few very minute teeth in the byssal gap. More material is needed for evaluation.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 3 lots, one of which contains live collected material.

Depth Range: 23-32 fms., in mud; alive at 23 fms.

Geographical Range: Unknown.

Maximum Size: 4.7 mm.

Eastern Pacific Analogue: None.

333. Palliolum sp. indet. B.

Similarly vague I must be about some fragments of a differently shape valve showing byssal teeth in the byssal gap. Color of the fragments is rose, with a color pattern of irregular streaks of white.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 2 lots, none alive.

Depth Range: 37-40 fms., in mud.

Geographical Range: Unknown.

Maximum Size: Only incomplete material available, + 4-5 mm.

Eastern Pacific Analogue: None.

Genus Propeamusium Gregorio, 1884.

Small, slightly inflated, thin shelled pecten with internal ribs.

334. Propeamusium pourtalesianum (Dall, 1886).

Amusium (Propeamusium) pourtalesianum Dall, B.M.C.Z., Vol. 12 (6), p. 211, pl. 5, fig. 12.

Probably widespread in deeper water, but so far only collected in 5 lots mostly from off Louisiana. The species is immediately recognized by the internal ribs which in many specimens do not extend to the margin of the shell. The color is an indefinite pattern of brown orange on a creme background with countless white dots. The sculpture of both valves is discrepant and there are no teeth in the byssal notch. Previous records for the Texas faunal province are: 206, Tex. Conchol.,

Vol. IX, p. 77.

Records H.M.N.S.: 5 lots, of which one contains live collected material.

Depth Range: 67-450 fms.;; alive at 222 fms.

Geographical Range: Southeast Florida and the West Indies. (Abbott, 1974).

Maximum Size: 12.8 mm.

Eastern Pacific Analogue: None.

Remarks:

Reported from off Texas is also

Propeamusium dalli (E.A. Smith, 1886), in very deep water, 860 fms.

(Abbott, 1974), also Refs. 144 and 175, 65-600 fms., rare.

Ref. 145 lists Chlamys sentis for the Mississippi Delta.

Ref. 170 lists Pecten laurenti Gmelin, which probably is in error for

Amusium papyraceum Gabb.

Ref. 192 (Yucatan Shelf) list Lyropecten antillarum Recluz and Chlamys imbricata Gmelin, 1791. (Plate 8, figs. 2, 5 and figs. 7A-B.

#### Family Spondylidae

Spondylids are modified pectens which early in life attach themselves to hard substrate. They grow into giant bivalves, often (not in Texas) covered by lengthy spines. Because of their varying color and bizarre appearance they are highly prized by collectors. Recent forms are all classified in the single genus Spondylus.

Genus Spondylus Linne, 1758.

Of the three described Western Atlantic living species two are known from the N.W. Gulf of Mexico, but only one is fairly common in calcareous environment. The 3rd species, here also reported, could be misidentified.

335. Spondylus americanus Hermann, 1781.

Spondylus americanus Hermann, Der Naturforscher, Vol. 19, p. 51, Halle, 1781.

Until I have inspected authentic material of all species in the Caribbean and Panamanian Province it will be impossible for me to name with certainty most of the H.M.N.S. material. The extremely terse treatment in Abbott (1974) of the 3 species in the Western Atlantic is not explicit enough to understand our material. Apparently the differences between S. americanus and S. ictericus are the following: 1) color, 2) size, 3) spines. S. americanus according to Abbott (1974) is white with yellow umbones, red or purple, sometimes all rose, all cream or all pink. S. ictericus is brickred or dull red purple with white mottlings at the umbones. Rarely peach to dark purple or with shades of yellow and orange.

Spines of S. americanus are not digitate, those of S. ictericus are often so. Finally S. americanus reaches about twice as large a size as S. ictericus. It is true that among our material there are indeed two forms, one small, inflated and dark colored, and another much lighter colored, huge and massive. Hence I believe that both species occur in the N.W. Gulf of Mexico. There are however certain difficulties. S. americanus in the Gulf of Mexico off Texas grows to enormous, massive shells in excess of 9 inches in size and a weight of many pounds. It may be an as yet unrecognized subspecies of S. americanus. Usually it is light colored.

The spinosity of our material is extremely variable, and the specimens with long slender spines are quite rare. Usually even in live collected shells, the spines are broken and completely encrusted by algae or a crust of fire coral. Juvenile material is almost uniformly of an orange color. In some large specimens the spines are somewhat digitate because they almost become fronds. Seldom are they long.

Among the material here reported as S. americanus are essentially two forms. One fairly round, and one somewhat more elongate corresponding closely with figures given by Keen (1971) of Spondylus princeps Broderip, 1833, and Spondylus ursipes Berry, 1959, respectively. Except for size several of our specimens resemble the figure of S. ursipes Berry, closely. (Usually the Texas specimens are 6-9 inches).

In summary for our material it can be said that it neither resembles Florida shells nor fits Pacific material. In general it is huge and massive. It probably should be labelled as a subspecies of S. americanus.

Previous records for the Texas faunal province are: 7, listed as S. spathuliferus Sowerby; 21, listed as S. spathuliferus Reeve; 45, listed; 56, listed as S. echinatus echinatus Martyn, 1784; listed as S. echinatus americanus Lamarck, 1818; 58, listed as S. spathuliferus Reeve for Matagorda Peninsula; 67, Port Isabel (note is probably S. ictericus Reeve); 69, listed in Appendix 8; 91, a single battered specimen from Sabine jetty; 110, two large live specimens were taken from the coral banks 100 miles off Galveston; 144, listed for offshore location 297; 147, alive from East Texas Flower Garden Banks; 156, Stetson Bank; 170, deep shelf assemblage; 192, pl. 8, figs. 9A-B; 206, beach records Tex. Conchol., Vol. II, p. 3 (Note: probably misidentification of S. ictericus Reeve); 253, uncommon on reef off Padre Island; 269, figured on page 167.

Records H.M.N.S.: 12 lots, of which 8 contain live collected material.

Depth Range: 8-31 fms., alive 8-31 fms.

Geographical Range: North Carolina, Florida, Texas to Brazil (Abbott, 1974).

Maximum Size: 23.5 cm., very massive.

Eastern Pacific Analogue: ?

336. Spondylus ictericus Reeve, 1856.

This smaller species is in offshore waters considerably more rare than the previous species. Although beach material is on the whole, due to its worn state, difficult to identify. I believe that most if not all Spondylus material from the Texas beach is S. ictericus Reeve and not S. americanus as previously reported.

The most important difference with S. americanus is the surface sculpture. Between widely spaced radials which form small spines there are closely crowded rows of finer radials formed by minute spines, which completely wear off in beach material. Also the amount of inflation of the valves is different: the attached valve is considerably more inflated than the free valve, although this is sometimes also the case in very large S. americanus.

Previous records for the Texas faunal province are: None.

Records H.M.N.S.: 7 lots, of which 2 contain live collected material.

Depth Range: 0-28 fms., alive 12 fms.

Geographical Range: Florida, Caribbean, Bermuda, Brazil (Abbott, 1974).

Maximum Size: 85 mm.

Eastern Pacific Analogue: Our material has close affinity with both S. princeps princeps Broderip, 1833 (Panama to north western Peru (Keen, 1971) and Spondylus ursipes Berry, 1959 (Angel de la Guarda Island, Gulf of California in 18 meters (Keen, 1971).

337. Spondylus gussoni O.G. Costa, 1829.

Spondylus gussoni O.G. Costa, Cat. Syst., 42, 1829.

Two lots of this "species" were obtained, one from somewhat deeper water, the other from the coral reefs off Galveston. The latter resembles closely the figure given by Bayer (1971). This elongate box like shell is remarkable for the color discrepancy of the valves. The inflated attached valve is almost without spines, is yellowish white in color, the almost flat free valve is on the outside dark purplish red. In external sculpture the flat valve resembles S. ictericus closely,

and probably S. gussoni Costa is merely a form of S. iceticus Reeve. Previous Records for the Texas faunal province are: 7, listed. Records H.M.N.S.: 2 lots, one of which contains live collected material.

Depth Range: 13-55 fms.; alive 13 fms.

Geographical Range: Greater and Lesser Antilles in deep water.

Maximum Size: (not yet measured) +2 inches.

Eastern Pacific Analogue? ?

To be continued

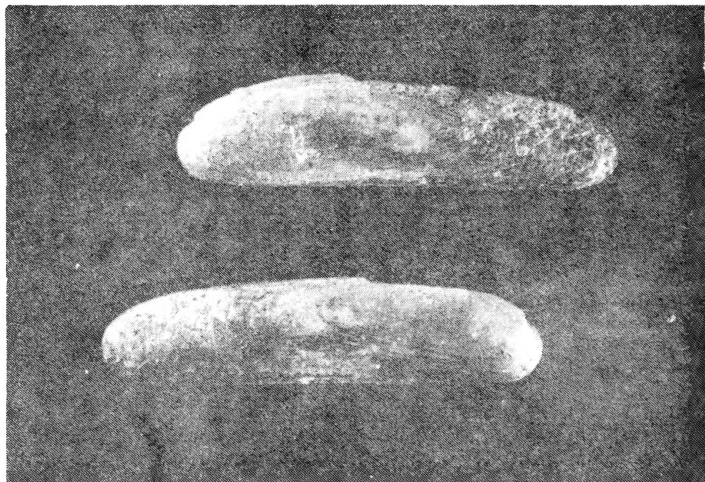


Fig. 8 Adula sp. indet. A., dredged by Bureau of Commerical Fisheries, Gus III, in 11 fms. at 30 miles S. Rigs off Galveston, Texas, Feb. 15, 1966. 14.1-3.8 m (See Texas Conchologist, Vol. XV, No. 3, April, 1979, p. 76.)

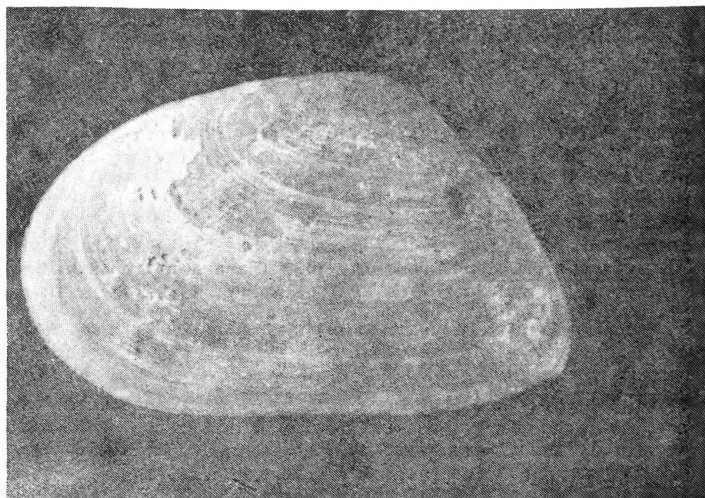


Fig. 9 Angulus (Angulus) texanus Dall, 1900, collected by Harold Geis at Hoecker's Point, Galveston West Bay, Texas, on silt flats, Feb. 27, 1968. 12 mm. (See Texas Conchologist, Vol. XII, No. 2, Dec., 1975, p. 41.

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