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Texas CONCHOLOGIST

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HELMER ODÉ RESIGNS

After ten years as editor of the Texas Conchologist, Helmer Odé has resigned. He will continue to contribute regularly and will continue as a member of the editorial board. The Texas Conchologist has become a periodical with a world-wide circulation and enjoys a fine reputation in its field. We are all grateful for what Helmer has done and Volumes I - X will serve as a lasting memorial to his efforts.

The new editor will be William R. Keeler starting with the September issue. His statement follows:

> "This year we plan to publish quarterly with issues appearing in September, December, March and June. The number of pages will be approximately the same as in Volume X, which was published in nine monthly issues.
>
> I will strive to maintain the standards of past issues and continue the reputation of the publication. At the same time, I would like to establish a broader range of material and publish articles from authors we have not had before. I would accept articles relating to fresh and salt water mollusks subject to approval of the editor and the editorial board. I would like suggestions for articles for publication."

DUES NOTICE

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EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Odé
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double-spaced and should be submitted to the editorial staff.

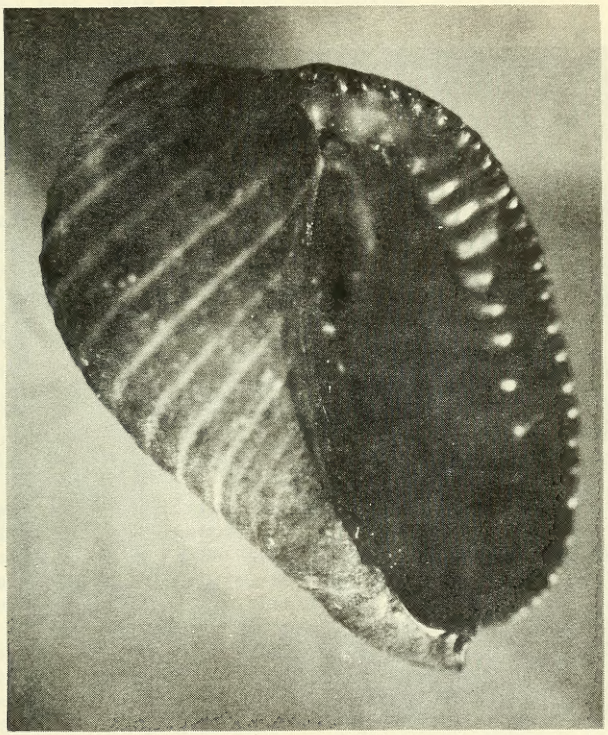
SEARCH AND SEIZURE

by Constance Boone

Collectors who are building worldwide collections have encountered the high prices and the scarceness of good Hawaiian shells. I had been told over and over that I wouldn't be able to find many myself on a first and relatively short visit to the Hawaiian Islands. Frankly, I thought that my husband and I would be too busy anyway being typical tourists on our 10-day-stay on two of the islands--Hawaii and Oahu--for me to do much collecting. However, my first afternoon at Hilo found me at a little park on the bay where I spied some Littorinas and Nerites in the crevices of the lava rocks. I handed the camera to Hollis and forgot the scenery for a half hour so that I could get my first shells in Hawaii.

Most of our time was spent savoring the sights, meeting some of the residents, and visiting the historical and entertainment centers. But I also did a bit of shell collecting, not much to be sure, and certainly not by diving. I just snatched a few hours two days on the Kona coast to collect and visited a beach or so on Oahu. Surprisely enough, I have a nice little collection of live-taken shells and a large number of interesting minute shells from a cup of drift picked up at a park on Oahu.

There were a few shells I collected now for myself that I knew about from my collection, having received them from traders during the years. On a rough, lava-rock boulder area just in front of Hulihee Palace at Kailua, Kona, on the big island, I collected the curious purple echinoderm, Podophora atrata L. Agassiz, on which I knew lived an interesting shell. These echinoderms seem to be found in heavy surf zones. They look like purple center heads of sunflowers, with short petals fringing, on the top. The underneath side is like a small chrysanthemum. They preserve nicely and stay purple. The purplish mollusk associated with them is Vexilla vexillum (Gmelin, 1791), a member of the superfamily MURICACEA, subfamily THAIDINAE. I was able to find five on the urchins. Along with these animals I found Cellana exarata (Reeve, 1854). This is sometimes listed as Patella (Cellana) sandwichensis Pease, 1860 as Dr. Allison Kay supports the division of C. exarata into three species. Powell in Indo-Pacific Mollusca does not.

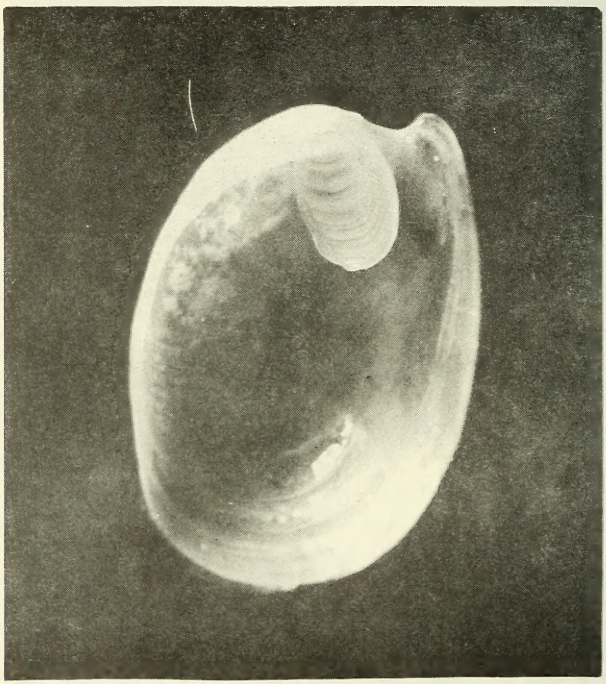


Vexilla vexillum (Gmelin, 1791). Specimen length, 10.7 mm., collected attached to purple echinoderm on boulder at Kailua, Kona, June 9, 1974, by Constance Boone.

The natives picnicking in the area watched me fight each wave to pry off the shells with a knife and thought I was seeking food. The Cellanas are called Opihis by Hawaiians and eaten with relish.

I was also able to get a few Drupa ricina Linnaeus and some Purpura harpa Conrad on these rocks. There were Nerites, two species of Isognomon and some Morula uva Röding.

Of special excitement for me was collecting another oddball mollusk on these boulders. I had the species in my collection, but I had not been told on data slips what the animals looked like "at home". So collecting Smaragdinella viridis Quoy and Gaimard, family BULLIDAE, was fun. The shells, thin green bubble-like scoops, have a "spoon" deck inside at the rolled apex end. They are completely enveloped in a jelly-like greenish blob animal which attaches to the tops of the boulders in the heavy splash zone area where the urchina lived. There seems to be a question on author here. One specimen in my home collection gives Rang. Also, one correspondent thought this might be the same as the Japanese Smaragdinella.



Smaragdinella viridis Quoy and Gaimard. Specimen length, 8.12 mm., collected from boulder at Kailua, Kona, June 9, 1974, by constance Boone. Shell completely enveloped in animal which attaches to splash zone rocks.

Another station on the Kona coast was a beach near the White Sands Motel. There on smaller lava rocks at low tide I found several Cypraea caputserpentis Linn., 1758. Burgess does not recognize the Hawaiian form as different, but Schilder in 1927 separated it into Erosaria (Ocellaria) caputophidii.

I spent two short periods collecting in front of my hotel, Keauhou Beach Hotel, on Keauhou Bay at Kona. There were many lava flow rocks and boulders there, and it was productive for me. I was able to collect four species of Cypraea---caputserpentis, helvola, one mauritiana, and one fimbriata. I also found live Morula uva, Morula granulata (Duclos), Trochus intextus Kiener, Nerita picea Recluz, Nerita polita Linnaeus, Drupa orchrostoma (Blainville), Peristernia chlorostoma (Sowerby), Mitra coronata Lamarck, 1811; two other Mitras, a Ctena, Cerithium, Bulla adamsi Menke, 1851; Siphonaria normalis Gould, Melampus castaneus (Muehlfeldt), Planaxis labiosus A. Adams, Littorina picta Philippi, Littorina pintado Wood, Hipponix pilosus (Deshayes), Latirus nodatus Gmelin, Phenacolepas granocostatus Pease, another Phenacolepas, Acanothochiton viridis Pease, four Nudibranchs, and some drift Odostomias, Turrids, etc. I also found three specimens of Rhyssoplax linsleyi Burghardt, 1973, a newly-named, usually black and white, small Chiton. This could be a range extension.

I also enjoyed seeing the bright red pencil echinoderm, H. mammillatus (Linnaeus), a red starfish, Asterope carinifera (Lamarck), a black short-spined urchin, Tripneustes gratilla (Linn.), which a young lad said he ate in his home.

The above names will have to be more thoroughly checked, I'm afraid. Some were taken from verbal identifications from members of the Hawaiian Malacological Society I met, some are taken from labels on specimens already in my cabinet, some are from current books I have and some from the aquarium displays at Oahu. I notice that all authors do not agree. I may have a mixture of old and new names--and viewpoints.

What I have been trying to do, however, is to emphasize that even the casual visitor shell collector may have a try at getting some of his own shells in Hawaii. You could do much better as a diver with one of the Hawaiian diving groups.

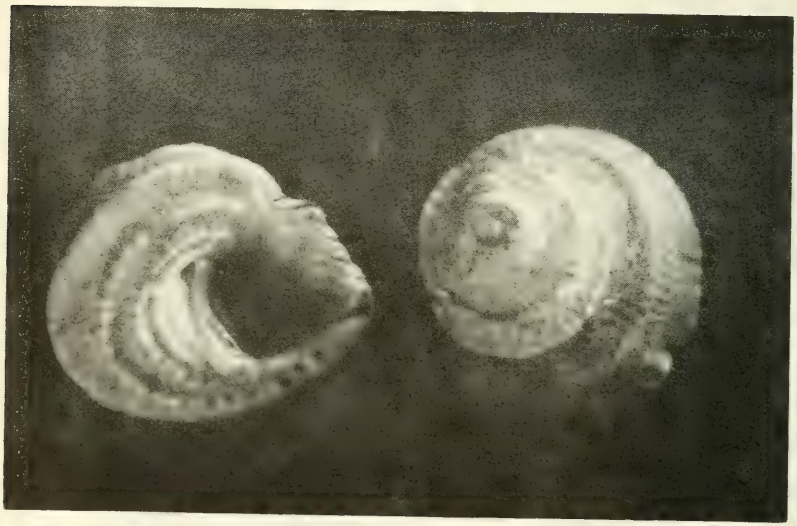
On Oahu I spent most of my time visiting, soaking up what knowledge I could from some very nice people, such as Ruth and Jim Fair, E. R. Cross, Helen and Stu Lillico, and the Henry Asanos. I also visited Andy Butler and saw some fabulous shells live in his aquariums, visited with Lyman Higa, a diver who reports on "Recent Finds" in Hawaiian Shell News, and Joan Grace, shell shop owner, who showed me five five-inch Cypraea tigris from Hawaiian waters. This big, much-sought Cypraea is getting very scarce. Approximately one in a hundred taken will be five inches. The price is getting close to $100.00. Our club members will remember two were auctioned at one of our meetings several years ago, gifts brought back by Dr. W. W. Sutow. Each, one a five incher, sold for under $25.00. Barbara Hudson has the biggie; Fannie Miron the other just a shade smaller.

Ruth Fair is very busy working on a book on Murex. She has some very nice material for it, and I hope she does get to publish it soon. Her husband has made many of the photos, and pictures of type material and museum material are being made available for her use.

My cup of drift shells came from Alii Park beach. Ruth Fair had told me this area was productive for minute shells, so I scooped up a handful of sand from under a rock when we were there on a tour of the island. I have sorted it and am delighted with the Phasianellas, the many Rissoas, the

Triphoras, Odostomias, Caecum, Turrids, and many other species not yet put in families. There, too, I picked up a beach Strombus helli, and a worn Cypraea semiplota. Common in the drift was a pretty, pink striped (horizontally) TURBINIDAE, Leptothyra rubricincta Mighels.

One early morning Ruth Fair and I tried an hour or so of collecting at Makapuu Reef but the scheduled low tide did not develop. The surf was running very high because of high winds. We stopped then at Sandy Beach and got live Conus sponsalis and Conus pennaceus. I also collected some Littorinas, Drupas, Rissoinas, Chitons and Nudibranchs. Here in the crevices of the lava rocks were Peasiella tantilla (Gould, 1849), family LITTORINIDAE, a very different Littorina, Tegula shaped.



Photos by Frank van Morkhoven

Peasiella tantilla (Gould, 1849). Ventral sp. 5.1 mm., dorsal sp. 4.92 mm., collected in crevices, Sandy Beach, Oahu, June 15, 1974, by Constance Boone.

Needless to say, I hope to go back and do more collecting in Hawaii. Hawaiians are very proud of their state, and collectors there value their shells highly. It was great to meet them.

It is true that the divers or dredgers there have the best chance to get the rarer shells that collectors on the mainland seek to obtain, but the reef collecting must be fairly good for me to get as many species as I did on such few occasions to collect. On my continued travels--to Fiji--a companion collector was a Hawaiian college student. He had recently found a live Strombus hawaiiensis in just a few feet of water at Waikiki! Maybe any one of us could.

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REVIEW by H. Odé

B. M. JAMES: SYSTEMATICS AND BIOLOGY OF THE DEEP WATER PALAEOTAXODONTA FROM THE GULF OF MEXICO. Ph. D. Thesis. Texas A and M University. Dec., 1972, 182 pages.

In this thesis a study is made of the palaeotaxodont genera which during the years 1964-1969 have been dredged at ninety-one stations during thirteen cruises of the research vessel "Alaminos" in the Gulf of Mexico. In all ten genera, Brevinucula (1 species), Nucula (6 species), Neilo (3 species), Neilonella (4 species), Nuculana (11 species), Tindaria (3 species), Tindariopsis (2 species), Pristegloma (1 species), Yoldia (1 species), Yoldiella (3 species) and Malletia (1 species) are discussed. I could not find a systematic discussion of the distinctive characters of these genera in this thesis, but the choice of genera appears to be based on the Treatise of Palaeontology.

A number of species appears to be new. Fortunately the author has not attempted to create new taxa for these in his thesis, thus avoiding unnecessary confusion.

An important finding of this thesis is that on the basis of the studied live material the author has reached the conclusion, well illustrated in Fig. 96, page 154, that an important faunal change occurs at a depth of about 2,000 meters and that the Gulf of Mexico harbours in its deepest parts a truly abyssal fauna. Most of the author's material was obtained from depths below 2,000 meters. Only at fourteen (14) stations, material was obtained from depths shallower than 600 meters. Perhaps, as a consequence of the author's main concern, as expressed in the title of this thesis, with the abyssal fauna, the discussion of sublittoral species, which were dredged at the shallower stations is insufficient to evaluate some of the puzzling forms known to live here. Taxonomic problems which exist with respect to these species are not touched upon. For instance, no discussion is presented on Nuculana acuta Conrad, a name applied usually to a great variety of forms and shapes, some of which undoubtedly represent valid but different species. The shell known to Texas beach collectors (see figure in Texas Conchologist Vol. 6, page 49) under that name is almost certainly not that species, but was first described by Gould as N. unca. Dall however has perhaps somewhat hastily synonymized it with N. acuta and ever since this designation has stuck with this common Carolinean species.

It is somewhat puzzling to find mentioned among the references the popular books of Morris and Andrews, while so many other more important studies are omitted, for instance, all references to related neogene species.

The author makes the observation that because of the number of sampling stations, the deep water fauna of the Gulf of Mexico is better known than any other ocean basin. Provided abyssal faunas are uniform over large areas, this may be true, but the small number of stations in the sublittoral and probably also the bathyal zone, make the same conclusion for these depth zones impossible. A number of additional species are known in these zones.

This reviewer is indebted to Dr. James for his identification of some material in the Houston Museum of Natural Science. Nuculana platessa Dall and Nuculana bipennis Dall are two species which prior to the com-

pletion of this thesis were never illustrated.

In summary, it can be stated that this study has contributed important facts to the knowledge of the abyssal fauna of the Gulf of Mexico, but that considerable further study is required for the sublittoral and bathyal zones.

THE PROMENADE OF THE TOP SHELLS

by Cynthia Biasca

Last October when my husband, I and another couple spent four days on the island of Cozumel, Mexico, we enjoyed eating on the open porch of our hotel's dining room. The building, separate from the rest of the hotel, was built on a small promontory about 5 feet above the water and large rocks cascaded steeply down from the level of the porch to the water. Every evening lights were projected onto the water, which attracted flying fish and in turn tarpon. The flashing bodies of the fish made quite a display for the diners.

The second evening we were there, our friends were waiting for us on the porch, leaning over the wall and looking down onto the rocks. They pointed out six Cittarium pica (West Indian Top Shells) that were partly or wholly out of water on the rocks. A bit earlier, as our friends watched, they had climbed almost to the top of the rocks, near one of the lights, and now they were seemingly enjoying the water as it gently washed over them. By the time we had finished dinner, they had disappeared.

Next day there was no sign of the snails but in the evening, at the same time and place, they again took a walk up the rocks, stayed briefly, and then returned close to the water where they remained motionless a few minutes before gliding out of sight.

The final evening we were there, the promenade was repeated and this time, although I really hated to break up this charming group, I climbed over the wall and carefully retrieved just one of the shells.

How does one explain the phenomenon of the Cittariums' walk? Were they attracted by the light being turned on? Do they just like to be out of water a certain time every day? It seemed to be the same shells every night - were they a permanent group? There may be good scientific explanations for their behavior but I'm not sure I really care. It is enough that every time I look at my liberated shell, I recall the mysterious and beautiful promenade of the top shells.

COWRIES AND OVULIDS (Book Reviews) by W. W. Sutow, M.D.

A CATALOGUE OF LIVING AND FOSSIL COWRIES. Taxonomy and Bibliography of Triviacea and Cypraeacea (Gastropoda Prosobranchia). By Maria Schilder and Franz Alfred Schilder. Brussel. Koninklijk Belgisch Instituut voor Natuurwetenschappen. 1971. 246 pages.

Since 1922, Franz A. Schilder, first alone and then after 1929 with Maria Schilder has published numerous scientific articles on the cowries. In recent years the majority of these publications were written in English; many have appeared in familiar American periodicals such as VELIGER and HAWAIIAN SHELL NEWS. The present publication was compiled after 50 years' special research work in the field.

A direct quote from the "General Remarks" section of the monograph succintly summarizes the sustained interest of these well-known malacologists in the marine gastropod familes Triviidae (Eratoidae), Pediculariidae, Cypraeidae, and Ovulidae (Amphiperatidae). "Our studies comprised both the living and fossil taxa, and concerned chiefly the taxonomy of the shells (including variability and evolution), the anatomy of living species (especially the radula), and the distribution (zoogeography, stratigraphy)".

The subject monograph contains "(1) a systematic list of all sufficiently characterized taxa of cowries...(3386 taxa); (2) an alphabetical list of all names proposed for cowries, with exact references (3720 taxa); (3) a bibliography of the books and papers concerning cowries (3650 titles)." The material included goes through December 31, 1968. However, a few later papers which seemed important have been added through December, 1969.

To the non-professional this monumental treatise (and physically large: 10 X 13 inches) is impressive in the massive amount of items comprising each list. If nothing else, the book provides an educational insight into methodology of handling taxonomic material. All validly or invalidly established taxa are listed "if they can be recognized by description, indication or figure". Three digits indicate the subfamily, the tribus and the subgenus or indivisible genus. Other digits and figures identify the habitat of the type specimen of each taxon at the species level. The geological age is indicated and the living taxa are marked. The zoogeographical regions for the type locality of each taxon at the species level is indicated by letters (e.g. small letters for the Western Hemisphere and capital letters for the Eastern Hemisphere). Each name is accompanied by the author and the year of publication.

In the second section of the book, all cowrie names are listed alphabetically with numerical reference to the systematic listing in the first section. Here the origin of each name is identified by author, year and publication source. While the data given would seem to suffice for any literature search, the references are keyed to specific listings in the bibliography. This bibliography comprises the third section of the book where the publications are listed by author in alphabetical order.

This monograph then serves a unique but defined purpose. No descriptions are given. There are no diagrams, drawings or photographs of shells. The book would be of no use in identifying seashells. But like stored data in the computer, information retrieval should be quick and satisfactory if the proper questions are asked.

Franz Alfred Schilder died on August 11, 1970. It is unfortunate that aside from mention of the association of the Schilders with the University of Halle in Germany, no biographic data concerning these scientists are furnished.

A SYSTEMATIC REVISION OF THE RECENT CYPRAEID FAMILY OVULIDAE (MOLLUSCA: GASTROPODA). By Crawford Neill Cate. The Veliger. Volume 15 Supplement. Jan. 31, 1973. 116 pages.

The purpose of this illustrated review is explicitly indicated in the title. This is the first such attempt in 40 years. In the monograph 94 new species, 7 new subspecies, 19 new genera and 7 new subgenera are included. In all, 222 species and subspecies are described; an attempt was made to include all named species.

Every species is photographically documented. In the great majority of cases, two views of the type specimens are shown, magnified when necessary to show the details. In most cases the holotype itself has been photographed. In others the paratype (1), neotype (1), hypotype (2) or lectotype (20) appear. In 14 species the type specimen was not available and a representative specimen was photographed. In 7 cases the original illustrations are reproduced. The photographs are clear and eminently satisfactory. The monograph contains 51 plates (up to 10 species perplate) in black and white and 5 plates in color.

The data presented for each species include reference to the original published description, the description of the holotype, the type locality, measurements of the holotype, actual identification of the type specimen (where located and catalogue number) and comments. Distribution of the species, when known, is indicated.

This monograph constitutes a basic reference for anyone interested in this family. Of particular scientific value are the photographs with which there can be no disagreement irrespective of the taxonomic arguments that may arise over the names.

In a subsequent publication THE OVULIDAE. A KEY TO THE GENERA AND OTHER PERTINENT NOTES (The Veliger, 16-307-313, January, 1974), C. N. Cate suggests "a few other needed changes of taxonomic sequence". The article also provides a dichotomous "key" to the genera Ovulidae based upon "successive dual alternatives". There are bracketed numerical references to the plate numbers in the first publication which best illustrate the morphological character of a particular unit. Separate "keys" are applied to the tribes and subtribes of the family Ovulidae and to the genera and subgenera. In addition the history of the genera of the Ovulidae is also presented.

This publication should be considered as a necessary addendum to Cate's original review (1973) and the two need to be utilized together for any taxonomic purpose in shell identification.

With the appearance of publications of this type, it should be inevitable that there will be a flurry of interest in this family characterized by Schilder at one time as the "forgotten family".

In the last volume of TEXAS CONCHOLOGIST the suggestions for a core library for the serious non-professional conchologist were examined. Almost the entirety of the titles considered were "books" in the sense that they represented definitive unit bound publications.

In constrast, what about the group of publications generally classified in the category of "periodicals" or "journals"? Most of these periodicals are published at variable but regular intervals. They usually contain a number of articles of different subjects. This month a number of such periodicals will be reviewed. No selective classification of the periodicals is intended either as to content or quality. However, only those written in English will be included.

(1) THE VELIGER. A quarterly published by the California Malacozoological Society. Rudolf Stohler, editor-in-chief.

The journal published highly professional articles (rigidly scientific and original) pertaining to any problem concerned with mollusks. Anatomical, cytological, distributional, ecological, histological, morphological, physiological, taxonomic, etc., aspects of marine, freshwater or terrestial mollusks from any region are covered. At intervals, "Supplements" are published; these are monographic in scope and size. For example, some recent Supplements include "A Systematic Revision of the Recent Cypraeid Family Ovulidae" by C. N. Cate and "The Panamic-Galapagan Epitoniidae" by H. DuShane.

THE VELIGER was first published in 1958. Currently, Volume 17 is just starting.

(2) THE NAUTILUS. A quarterly. Editors: R. Tucker Abbott and Charles B. Wurtz.

This is a journal "devoted to malacology and the interests of conchologists. It has long been a major prestige scientific journal in malacology in the United States. The articles that appear almost always represent research reports written by acknowledged professionals.

The journal began publication in 1889. Volume 88 started with the January, 1974 issue.

(3) BULLETIN OF THE AMERICAN MALACOLOGICAL UNION. The official publication of AMU published annually. Editor, Arthur H. Clarke.

Each issue contains a group photograph of the participants at the preceding annual meeting of AMU. The abstracts (of varying lengths) of the scientific papers presented at the meeting as well as the official minutes and reports of officers appear in these papers. There is an alphabetical listing (most recently revised October 27, 1973) of the names and addressed of the AMU members. The area of interest of many of the members is also indicated. The names and addresses of affiliated shell clubs and regional organizations are printed in each issue. In the current issue, Margaret Teskey reviews the history of AMU from 1931 to 1973.

Each issue appears in the spring of the year following the annual meeting. Volume 39 (May, 1974) covers the thirty-ninth annual meeting held June 24-28, 1973 at Greenville, Delaware.

(4) MALACOLOGICAL REVIEW. Quarterly. Editors: J.E. Burch and C.M. Patterson.

The journal is published as a "scientific periodical and may contain review articles on various aspects of malacology, experimental and descriptive papers on mollusks, information on current publications, malacological announcements of special interests, etc." The table of contents of important malacological journals from all over the world are reproduced. Thus, a complete file of the MALACOLOGICAL REVIEW will provide a bibliography of the significant malacological articles appearing in journals. There is about a 2-year lag time between the date of the journal listed and the receipt of the MALACOLOGICAL REVIEW by the subscriber.

The periodicals reviewed in such a way include the following: JOURNAL DE CONCHYLIOLOGIE; ARCHIV FUR MOLLUSKENKUNDE; THE JOURNAL OF CONCHOLOGY; THE NAUTILUS; PROCEEDINGS OF THE MALACOLOGICAL SOCIETY OF LONDON; VENUS; PROCEEDINGS OF THE NATIONAL SHELLFISHERIES ASSOCIATION; THE AMERICAN MALACOLOGICAL UNION ANNUAL REPORTS; BASTERIA; JOURNAL OF THE MALACOLOGICAL SOCIETY OF AUSTRALIA; THE VELIGER; STERKIANA; COMMUNICACIONES DE LA SOCIEDAD MALACOLOGICA DEL URUGUAY; MALACOLOGIA; LAVORI DELLA SOCIETA MALACOLOGIA ITALIANA; CONCHIGLIE; MALACOLOGICAL REVIEW; THE ECHO; ARGAMON; HALIOTIS.

This publication began in 1968. Volume 6 started in April 1973.

(5) MOLLUSCAN DIGEST. Monthly. Editor, Jack W. Brookshire.

This unique periodical provides "current citations" of published articles on malacology. The citation is identified by number and is listed alphabetically by author(s). The bibliographic data include in addition to the author, the title of the article and the journal, volume, date and year of publication. The listing is derived from a wide array of journals of all types, not necessarily those restricted to malacology.

In combination with MALACOLOGICAL REVIEW a current subscription to MOLLUSCAN DIGEST should arm the collector with references to the most significant articles dealing with malacological subjects that appear in periodicals. As the number of articles increase there is a growing need for cross-indexing by subject matter. The editor has indicated that such an index is in preparation but no target date for its appearance has been indicated.

The publication currently is concluding volume 3.

(6) HAWAIIAN SHELL NEWS. Monthly. Editor, E.R. Cross.

Identified as "an educational publication of the Hawaiian Malacological Society" this widely read publication has been extremely popular with the amateur shell collectors. Each issue is well illustrated. The articles are written by a variety of people and the subject matter varies from highly scientific presentations to anecdotal reporting of shelling activities of the members. There appears to be the expected emphasis on material dealing with Indo-Pacific province.

The periodical is now in its 22nd volume. Commercial advertising appears.

(to be continued)

Texas CONCHOLOGIST

VOLUME XI, NO. 2 DECEMBER, 1974

SHELL AUCTION REPORT

by Merle Kleb, Chairman
Shell Auction Committee

The Houston Conchology Society Shell Auction Committee is happy to announce that a net profit of $551.18 was made at the auction held at our last meeting on September 25, 1974. There was a very fine attendance and it appeared that everyone enjoyed the event. The proceeds from the auction will be used for the continued publication of the Texas Conchologist as well as other Houston Conchology Society publications.

Mrs. Clarice Van Erp did a fine job with the oral auction and all the shells prepared for that part of the auction were sold, as well as the shells on the silent auction table.

Particular appreciation and thanks is extended to the following:

Mrs. Clarice Van Erp - Auctioneer

Mr. Bob Morrison, of The Morrison Galleries, 5101 Ocean Blvd., Siesta Key, Sarasota, Florida for his donation of a Murex acanthropterus, Lamarck.

Mrs. Frank Biasca, Mrs. Ruby Ray, Mr. & Mrs. Frank Petway, Mrs. Carol Cortade, Mrs. Jerry Clampit, Mrs. Rosemary Habermacher, Miss Mary Myers, Mrs. Leola Glass, Mr. & Mrs. Sam Miron, Admiral & Mrs. Cordeza, Mrs. Ruth Goodson, Mr. Wilson Ward, Dr. Watt Sutow, Dr. Helmer Odé, Mr. Lloyd Miester, Mr. Frank van Morkhoven, Mrs. Clarice Van Erp, Mr. Charlie Doh, Mr. & Mrs. P. H. Loughmiller, Mrs. Barbara Hudson, Mrs. Constance Boone and Mrs. Merle Kleb for shell donations.

Mr. Fritz Lang - who made and donated a beautiful shell case.

All members of the Houston Conchology Society - who really made the auction a success by your attendance and purchases.

Mr. Jim Hudson and Mr. Frank Petway for acting as cashiers.

I want to add my personal appreciation to Mrs. Constance Boone and Mrs. Barbara Hudson, Shell Auction Committee Members, and Mrs. Tina Petway for their assistance in packaging, pricing and labeling the shells for the auction. A special thanks to Mrs. Constance Boone for donating the shells awarded for door prizes.

Thank you very much, one and all.

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EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Ode
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double-spaced and should be submitted to the editorial staff.

AMERICAN MALACOLOGISTS - 1975 SUPPLEMENT

A supplement to "American Malacologists" is in preparation for spring distribution. Club members who would be included should contact Fritz Lang or write directly to the address below. The supplement will be available for $1.00. A special discount is offered on the hard bound 1974 edition of "American Malacologists" to those who write in for a free application form.

The managing editorship and main office of the National Register of Amateur and Professional Malacologists have been transferred to Dr. R. Tucker Abbott, P. O. Box 4208, Greenville, Delaware, 19807. All correspondence, listings and orders should be sent to the new address.

DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA
IN THE NORTHWEST GULF OF MEXICO
PART I: CRASSATELLACEA - POROMYACEA

by H. Odé

INTRODUCTION

From a look at the map of the coastline of the tropical western Atlantic, it is apparent that the Gulf of Mexico is placed in a position of great faunistic interest. Not only is it the most westerly and most secluded basin of the Caribbean area, it is also the place where the essentially southeast - northwest trending coastline of South America and Middle America swings to the northeast and continues along the North American continent. Its margins offer essentially three types of faunistic areas: in the South extends the large calcareous self area of the Yucatan platform, its western and northern coasts are formed by sandy beaches, muddy coastal bays and an extensive shelf area on which the Rio Grande used to, and the Mississippi still deposits large amounts of silt and clay, and finally along Alabama and Florida a clean sandy province grades into the calcareous province of the Keys extending into the Bahamas. In its deep water portions lives an abyssal faunal. No systematic attempt has yet been made to compile all malacological information about the Gulf of Mexico.

It is noteworthy that Abbott and Warmke, in a map on page 319 of their popular book "Caribbean Seashells", excluded the Texas and Louisiana coast from the Caribbean faunal area. In doing so, they were undoubtedly influenced by the widespread, but in my opinion erroneous belief, that the Texas-Louisiana fauna is Carolinian in composition. In contrast to the fauna of western Florida, the fauna of the Texas-Louisiana coast is not well known. A number of species of common beachdrift mollusks is also found on the beaches of the Carolinas, a fact which at an early date suggested (Römer 1848) the idea of Carolinian relationship. A more systematic investigation of the fauna however, discloses numerous species endemic to the Texas-Louisiana coast. While the fauna of Florida has been studied intensively and that of Yucatan (See Refs. 178, 215) has, on the basis of meager evidence, been inferred to be similar to faunas of adjacent areas (Caymans, Jamaica) which are known to a fair degree - but not well -, the fauna of the Texas-Louisiana coast remained practically unknown to this day. It is this particular fauna, remarkable because it is totally enclosed by areas of calcareous environment, that will be reported here.

Faunal lists are some of the most difficult of all reports on taxonomic matters to prepare and it requires some optimism on the part of the author to try. Particular attention has to be paid to the composition of adjacent faunas and taxonomic matters cannot be lightly glossed over. It is often not so much of importance to attach some label or other to a species, the essential difficulty and often neglected aspect of the work is to show what every species discussed is <u>not</u> equal to. The problem which faces the author of such a list is in <u>a sense</u> comparable to providing a uniqueness proof in mathematics, proofs which are in general more difficult than those which deal with a specific and direct proposition.

Many years of intensive collecting along the Texas-Louisiana coast have provided both the material for the collection and experience to report it. This report pretends to be more than an up-to-date version of the tabulation which has appeared in coauthorship with A. Speers continuously since 1964 in volumes 1-9 of the "Texas Conchologist" under the heading "Notes on Texas Beach Shells". In that series of notes the bay and

beach fauna obtainable by simple beach collecting was enumerated but no attention was given to the offshore fauna. In addition to beach collecting a large amount of offshore material (± 22,000 lots) was assembled for the Houston Museum of Natural Science (abbreviated H.M.N.S. in the following) obtained by dredging, diving and conventional collecting methods. A note about the historical background of this collection has appeared in the "Texas Conchologist" (Vol. 5, p. 63-68), in which also several diving expeditions and collecting trips (Tex. Conchol. Vol. 4, p. 46-48, Vol. 6, p. 8, 15-16; 29-31) were reported.

A preliminary list of the results, reflecting the status of the collection in 1971 has been published (Tex. Conchol., Vol. 9, p. 46-48; 60-70; 73-83). Since that time much new material came to light and it is now time to report the results of all investigations in a proper manner. This report intends to discuss systematically and in regular installments, groups of related mollusks from the H.M.N.S. collection, collected along the Texas-Louisiana coast.

In the introductory article for the "Beach Notes" (Tex. Conch. Vol. 1 (1), 1964) the estimate was made that the Texas bays and beaches would eventually yield over 400 species of mollusks. In the completed series of "Beach Notes", this number has already exceeded 500 and about double that number is known from offshore waters, so that the total number of mollusks known from the N.W. Gulf of Mexico is more than double that reported by T. E. Pulley in 1950.

Although in the last 25 years our knowledge of the mollusk fauna has increased substantially, it is apparent that much intensive work remains to be done. Taxonomic difficulties are many, new species must be described and relationships with other faunas clarified. Of many of the smaller bivalves and gastropods, nothing is known except the fact that they live along the Texas-Louisiana coast. Their mode of life, habits, breeding, etc., remain a fasinating subject for study and observation. Notes and short articles in the ten volumes of the "Texas Conchologist" will for a few species, furnish some information on this subject.

The Texas beachcomber handles shells which derive from a limited range of ecological conditions. Relatively few species live in the upper portions of the coastal bays, many more live in the high salinity bays seldom flushed by large amounts of fresh water, but most species live close to the inlets or "passes" as they are called in Texas. Not too many species are inhabitants of the sandy beaches and the narrow surf zone in front of them. The majority of collectors items comes from the offshore shelf and reach the beach only rarely. Some have been transported by shrimpers or are adventitious by other means. Dredging of deep channels has in some instances uncovered Pleistocene fossils accounting for a number of species on our beaches which so far have never been found alive in the immediate vicinity of the shore. Jetties and pilings harbor a community of species which to a large extend is artificial for Texas. Pelagies are common in beachdrift but few in species.

The major part of the N.W. Gulf of Mexico fauna lives in water too deep for the waves to transport the shells to the beach. It is these species which are incompletely known and although this report will add a large number of species to the published record, it undoubtedly will remain fragmentary. A particular source of confusion in the interpretation of the results is the change in sea level since the Pleistocene. Many bay species, living exclusively in water shallower than 3 fathoms are regularly dredged dead in offshore waters below 10 fathoms and as deep as 40 fathoms. These should be considered fossils. Large accumulations

of fossil shell material are found at certain locations (Heald Bank, Sabine Bank), locations which now sustain a somewhat specialized fauna, different from that on the surrounding muddy or sandy bottoms. At present, schemes to classify molluscan assemblages in offshore waters in the N.W. Gulf of Mexico are almost exclusively based on water depth (Parker, A.A.P.G. Bull. 40, p. 295-376, 1956; 43, p. 2100-2166). It is probable that the type of substrate rather than water depth is the controlling factor.

The reader not familiar with the Texas littoral fauna may wish to consult some previously published information. The works of Parker (cited above) and a few shorter notes by myself in the "Texas Conchologist" in which a somewhat different interpretation is given, are suitable for this purpose. A brief sketch of the history of various molluscan investigations along the Texas-Louisiana coast can be found in the "Texas Conchologist", Vol. 3 (4); Vol. 4, p. 13-14; 31-32; Vol. 5, p. 29-32; 41-42.

Now that slowly, a picture of the composition of the in-and-offshore fauna in the N.W. Gulf of Mexico begins to emerge, several important questions can be raised in connection with the composition of this fauna and its relation to faunas in adjacent parts of the Gulf of Mexico and Caribbean region. A comparison with adjacent faunas is not significant because these will be different for purely ecological reasons. A more significant comparison should be made, however, with areas of similar environments such as the coastline of the Carolinas, the bay sketches of the coastline of Middle America, Costa Rice-Panama and the coastline of South America, the Guyana shelf. I have made some attempt to do this and came to the conclusion that the Mexico-Texas-Louisiana coast constitutes a faunal province in its own rights. The reason that it took so long to come to this conclusion is twofold.

Prior to 1950, practically no systematic collecting has been undertaken in the Texas-Louisiana area and most of the information about it was derived from specimens collected by Mitchell and sent by him to Dall. Mitchell was not yet aware of the richness of the Texas coastal fauna so that his list is quite fragmentary, but as far as his data go, they are quite reliable and carefully assembled, in contrast to many data compiled later which show many erroneous identifications. The listings of Mitchell show of course, a preponderance of easily collected shallow water species, most of which have been collected in the Carolinas, although already a number of endemic species were discovered (Macoma mitchelli). About this time the technology of deep sea dredging was perfected and the interest of the biologists became focussed on deep sea basins so that the shallow shelf area off Texas remained neglected. A second factor contributing to the persistence of the idea that the Texas fauna is Carolinian is the nature of the sediment on the shelf, which still today is the greatest obstacle to a reliable assessment of the mollusk fauna. Over large areas of the shelf, clays are deposited which compact readily into a tough and coherent mass. Dredges drawn over bottoms have a tendency to slip and jump or, if they bite, fill up quickly with mud so that the "fetch" of the dredge is drastically shortened. The result is that those species which prefer loose sandy bottoms as habitat are preferentially collected whereas species living in dense clay bottoms seldom come up alive. As example, we may cite two quite widespread components of the offshore Texas fauna: Laevicardium fiski Richards and Pitar (Agriopoma) texasiana Dall, for both of which until recently hardly any live specimens were known, although both are common as dead shells. Both of these species live in clay bottoms.

Another example is Panopea bitruncata, a large clam living deep in clay bottoms. Until several years ago when a trawl accidentally bit too deep in a clay mound and brought up a live specimen (Ref. 198) it was surmised that the species was extinct. The erection of oil platforms by the oil industry in deep offshore waters disturbs the bottom deeply enough so that hundreds of valves are washed out. The offshore Texas-Louisiana fauna is rich in species, either rare in adjacent areas or unknown elsewhere: of all species covered in Part I about 1 in 6 proves to be endemic to the area. For this reason, I believe that one justifiably can speak about a Texas faunal province. In the small section of mollusks treated in Park I of this report, the following are abundant in the Texas provinces but according to the literature, rare elsewhere: Pitar cordata, Vesicomya pilula, Spheniopsis sp., Jouannetia, Rangianella, Microcardium, etc. Whether their scarcity elsewhere is caused by poor collecting techniques or not remains to be proved. It must be noted that the so-called Carolinian faunal elements (f.i. Dosinia discus, Dinocardium robustum) are all easily collected sandy beach and inlet species. Recently van Regteren Altena has published comprehensive data on the fauna of the Guyanan shelf (Zool. Meded. No. 119, Leiden 1971). Along the coast of Surinan, one finds similarly as along the Texas coast a broad shallow shelf area where rivers deposit clastic material. It is not surprising that a number of faunal elements known from Texas are also in Alten's list but I would hesitate to call our fauna Surinamian.

A second element in the Texas fauna is the fauna on a number of rocky outcrops (Stetson Bank) and coral reefs fringing the outer shelf where the fauna is Caribbean. Under favorable circumstances there areas may serve as a source of veligers, which sustain population of Caribbean species closer to shore. In this manner one is able to explain that several of these species can be collected from beachdrift or the jetties over a period of several years after which they disappear only to emerge again some years later (Sphenia antillensis, Cantharus tinctus).

Of even greater interest is the remarkable correspondence between certain groups of bivalves in the Gulf of Mexico and the Eastern Pacific. It is a puzzle to me that such an interesting fact has not been studied in greater detail than the few passing references in some of the literature I have seen. But this is perhaps to be explained by pointing out that only recently a reliable and up-to-date review of the Panamanic fauna has appeared (Keen: Sea Shells of Tropical West America) and that, although a similar compendium for the Caribbean fauna still has to be written this fauna in many respects is known from available but very scattered works. In the Texas fauna too many South American species (t.i. Strigilla gabbi, Macoma tageliformis) and too many Panamanic species (Uperotus and some small Pitars) occur to classify it as Carolinian. Rather it has a character all of its own because it is located where South American elements are gradually replaced by cooler fringe fauna of the northern Caribbean (i.e. Carolinian). Only when this report has been completed will it be possible to write a more definitive discussion of the Texas-Louisiana marine mollusk fauna.

Apart from the problems in connection with faunal relationships, some other problems can be formulated on the basis of our results. If one looks at several groups of related bivalves it is seen that the Cardiidae, Mactridae and Tellinidae have produced many endemic forms whereas some other families: Semelidae, Solecurtidae and Pholadidae (Myoidea in general) are much less rich in those. In the Veneridae the number of endemics is large only in certain groups: Chioninae and Pitarinae, and in the Donacidae, the genus Donax has produced local forms all over the western Atlantic.

A quite surprising result to me so far is, the serious difficulty in identification I experienced with many socalled common and "well known" species as Crassinella lunulata, Dinocardium robustum, Mulinia lateralis, Gastrochaena hians, etc. It became painfully obvious that in the professional literature hardly any data are given on the earliest stages of shell morphology of bivalves. Much of the material in the H.M.N.S. collection is immature and hence was quite difficult to identify. Right from the beginning, a conscious effort was made to pick all samples in their entirety under the microscope discarding nothing. I believe that this policy has paid off so that the H.M.N.S. collection possesses possibly more juvenile forms than most other regional collections. The pertinent data are discussed in the main section of this report.

In this section, all marine species known to us and present in the H.M.N.S. collection are listed and discussed. A large number of dredge samples from various coastal bays was obtained from the Texas Parks and Wildlife Service whose kindness in providing these samples is hereby gratefully acknowledged. A few species have been added to our list from the literature but only if the source is considered reliable and properly documented in print.

There is considerable change in format from the "Notes". No effort was made to give descriptions of well known species - there are enough sources for that and it would have been unnecessarily repetitive - nor to provide keys for identification purposes, but the emphasis is placed entirely on reporting reliable depth and distribution data and to point out uncertainties and taxonomic difficulties. The latter cannot be treated in any detail here and I have restricted myself to point out some of the difficulties that exist with regard to many species. Until expert work based on world wide collections and especially a study of the type specimens is made, a definitive opinion has to be postponed. In some instances I have expressed my own views concerning certain taxonomic problems by elevating certain subgenera to full genera, or vice versa and given reasons for doing so. In more than one instance where extensive Museum work in comparing types would be necessary (f.i. family Corbulidae) I have rather arbitrarily chosen a name, but stated this in the text. The amount of categorical detail has been considerably increased by inclusion of subfamilies and subgenera so that a better comparison can be made with related faunas of the eastern Pacific, South America and West Africa.

Complete information about synonymy of species cannot be given in a report as this. Some information however is provided in order to avoid confusion. In the arrangement of species, I have sometimes deviated from the conventional one (f.i. Abbott: American Sea Shells) and have preferred to follow a different one (Treat. Invert. Paleont, Vol. N), fully realizing that not everybody will agree with that arrangement. For many species, it is not necessary to give figures; they are often well known and are usually well figured in the literature. A number of figures will be published, mainly of the lesser known species or those which are usually confused with others or juveniles. Some attention is given to previous reports for all species. Here some effort was made to be reasonably complete. Species reported in the literature but which were not collected by us, have been listed with a few comments under the heading "Remarks". Because unfortunately erroneous identifications abound all cited records are open to doubt. Because it is of interest to correct these as far as is possible, we have in many instances given our opinion about the proper designation.

In the course of this study a number of apparently undescribed species has been discovered, many of them fairly common throughout the area.

For the sake of completeness it is advisable to include them in a properly described and documented manner.

As can be expected, this somewhat detailed discussion of about 1500 species will be a lengthy one and can be expected to be a continued effort over many years. Completed so far is a section of bivalves - Crassatellacea to Poromyacea - which will appear as Part I of the report.

A list of publications pertaining to the Texas marine mollusk fauna has already been published (Texas Conchologist, Vol. 11, p. 7-18). It contains well over 250 references, numbered more or less in chronological order. This was preferred to alphabetical ordering of author's names to facilitate the use of numbers for the purpose of conserving space and chronological order in the heading "Previous records", in the main body of the report. Besides few publications pertaining to the Atlantic coast of Mexico, the reader may find among these titles most of the important studies on the Texas mollusk fauna.

These papers reflect the lack of interest by malacologists in this fauna during the first half of this century. Only during the Fifties the number of papers in various publications began to increase substantially so that during the last 15 years a steady flow of new information has become available.

Special acknowledgement must be made to those studies which were extensively used and quoted in the present report. These are: all issues of the publication "Johnsonia" and Keen's book, The Sea Shells of Tropical West America, without which I could not have written this study. Also the "Treatise of Invert. Paleontology" proved to be invaluable and Altena's work on the fauna of Surinam was quite helpful. Many authors contributed their share in papers concerning more specialistic detail. Many of them have been acknowledged under the heading "Sources".

In conclusion, I want to express my sincere thanks to all persons who contributed information and material or helped us in other ways to compile this list. One person in particular deserves mention here. The H.M.N.S. collection would never have been assembled were it not for the efforts of Mr. Harold Geis, now of Paige, Texas, who took the initiative to bring it together, coordinated the efforts of the various agencies and organized collecting and diving expeditions. After becoming an accomplished diver, he spent many hours washing and sieving the samples, and hundreds of hours picking them and to top it off, prepared a series of color slides of many of the collected shells. During all his work, he not only extended the hospitality of his home to the dedicated group of twice-a-week workers cataloguing the 22,000 lots of the H.M.N.S. collection, but demonstrated his abilities as cook by feeding them gourmet meals and particularly delicious cheese stick of his own receipe as "in-between" snacks. Without his dedication, foresight and encouragement this report never would have been written.

The help and advise of Dr. H. Rehder who assisted greatly in making available type material from the Natural Museum for comparative purposes is thankfully acknowledged. To Mrs. Constance Boone, who over many years has collected new and unusual species alive in their natural habitat along the Texas coast and who has thus contributed much to the knowledge of the Texas marine mollusk fauna the list owes many new and interesting pieces of information. Special thanks are due to Mrs. Ruby Ray who has undertaken to type the manuscript. In ending, I express the hope that this report may assist those who are interested in shells either professionally or as a hobby and afford the user as much pleasure as the author has in compiling it.

A MICROMOLLUSK FROM THE NORTHWEST GULF OF MEXICO

by H. Ode'

From a sample taken at a depth of 450 fathoms at the coordinate location 27 38 - 94 07 W in the northwestern Gulf of Mexico an extremely small taxodont bivalve was obtained, which under conventional magnification looked unlike anything known to me. Details of the hinge remained fairly unclear and were difficult to make out precisely. This is no wonder because the maximum diameter of this small bivalve is about one half millimeter (0.02 inch). In order to study this bivalve in more detail Mr. F. van Morkhoven prepared a series of photographs ranging in magnification from 100 times to 6000 times by means of the electron microscope at the Shell Research Laboratories in Houston, Texas.

There can be hardly any doubt that the specimen shown is full grown and thus must be one of the smallest bivalves known to science. So far, I have made no effort to find out whether this small species has described or not; in all probability it is new, but I shall make here no effort to describe it and will merely present our readers with a series of interesting pictures of the species, which, so far as I can judge, belongs in the Family Nuculanidae.

The original specimen, now goldplated in order to obtain the pictures by means of the electron microscope, has been deposited in the collection of the Houston Museum of Natural Science. The species has also been found in the Florida Straights at a depth of 558 fathoms (collection V. Morkhoven).

Figure 1 shows at a magnification of 100 times the entire valve, looking down into the shell cavity. The maximum (horizontal) dimension is .5mm. Characteristic of the species are the triangular shape and the snoutlike umbo, which protrudes forward above the hingeline. The hinge is clearly taxodont and consists of two sequences of teeth separated in the middle by an irregular wavy area. This is shown in Figure 2 at a magnification of 600 times. Quite remarkable is the somewhat hooked shape structure on the umbo, a structure which is visible in all pictures taken. Its function is unknown to me. The small circular region with a white halo around it is merely a small pinhole in the shell. Another view of the umbo with its hook like structure is presented, at a magnification of 600 times, in Figure 3. To obtain it the shell was tilted at an angle of 60 degrees. Figure 4 shows the same view at a lesser magnification (300 times), but gives details of the marginal grooves surrounding the entire valve.

Figure 5 taken at a magnification of 6000 times and tilted at 60 degrees shows the outer two teeth of the sequence to the left of the viewer of Figure 1. Finally, Figure 6 shows at 4000 times magnification a close-up of the wavy area between the two rows of teeth in the hinge. No impressions of the muscles can be seen in any of these photographs.

FIGURE I

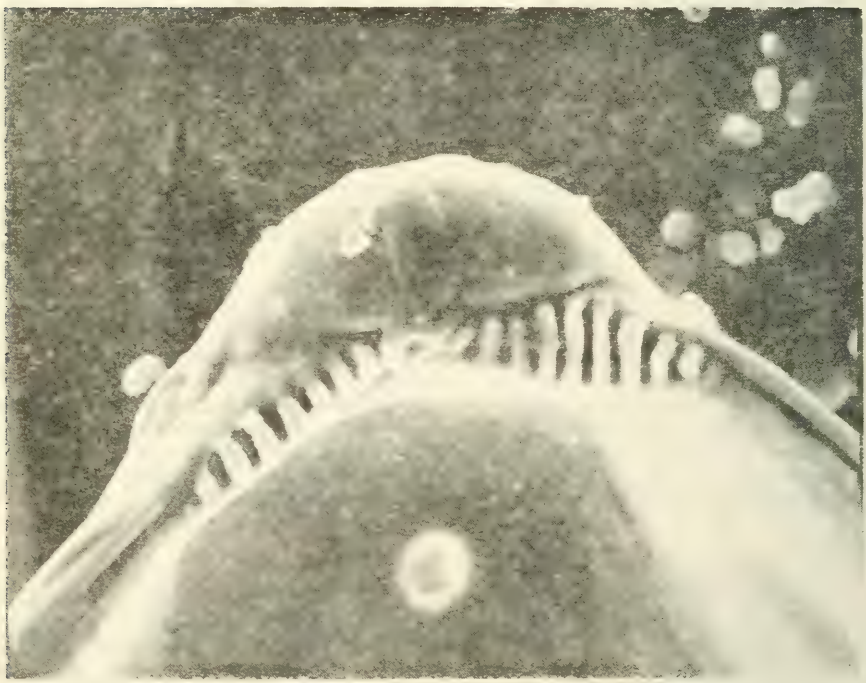

FIGURE 2

FIGURE 3

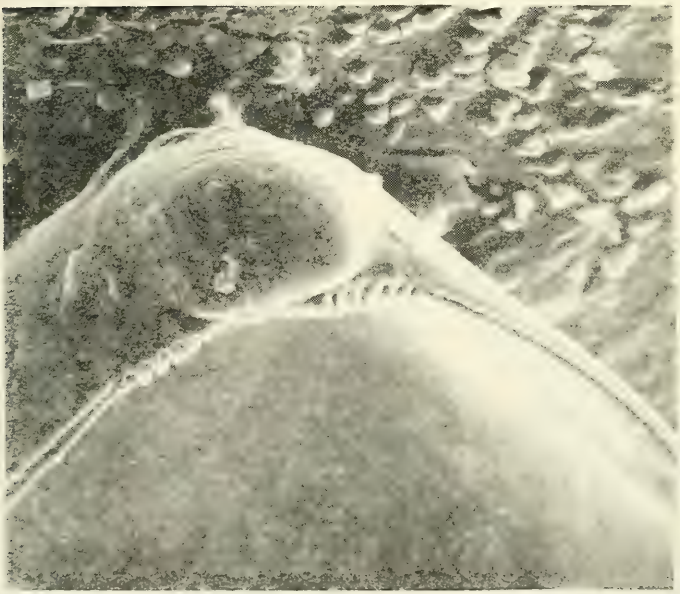

FIGURE 4

FIGURE 5

FIGURE 6

According to cold statistical estimates by the American Cancer Society, 655,000 new cancer cases will be diagnosed in America in 1974 (1). About 355,000 persons will die of cancer this year - "975 persons a day, one every one and one half minutes". It is obvious, then, that a significant portion of medical research activity will be concentrated in the search for drugs that will cure, control or alleviate cancer.

The impetus for this type of research is provided by the periodic discovery of effective agents from various sources, such as the isolation of the alkaloid vincristine from the periwinkle plant and the progress that resulted from the availability of such agents (2). For example, the use of vincristine with other treatments now provides a better than 95% chance for survival to children with Wilms" Tumor, a cancer that involves the kidneys (3). (Parenthetically, it should be noted here that Cernohorsky in his fine books on marine shells of the Pacific erroneously attributes, in both editions, the source of vincristine to the molluscan periwinkle instead of the periwinkle plant).

The magnitude of the search, world-wide, is indicated by a report describing tests of the anticancer effects of extracts of plants indigenous to Taiwan and its nearby islets. Special interest was focused on plants mentioned as possessing some anticancer properties in the ancient Chinese Materia Medica (Pen-Tzao-Kang-Mu, 1973). These plants were collected from 30-40 meters under sea water to 3000 meters above sea level. The report concerns the first 500 species that failed to show sufficient antitumor activity in experimental tumor systems to warrant further investigation (4).

The sea appears to be another vast reservoir where probes for effective anticancer drugs have been directed. Several recent reviews summarize the results of these studies (5, 6, 7). Of particular interest to conchologists might be the potentials of mollusks as sources for anticancer drugs.

While provocative activity has been seen with some agents developed from the sea, only cytosine arabinoside has been clinically useful up to this time. Cytosine arabinoside resulted from studies of antitumor substances in the sponge (see Texas Conchologist, 8:5, 1971). Schmeer first demonstrated that extracts of Mercenaria mercenaria has growth inhibiting properties (10). Li and his colleagues, earlier, found that extracts from such molluscan sources as Ostra virginica, (Mercenaria) mercenaria and Haliotis rufescens showed marked inhibitive effects (antimicrobial effect) against experimental infections with Staphylococcus aureus, one of the widespread "pus germs" (8). In addition, a moderate protective action against experimental poliomyelitis was noted (9). The antibacterial and antiviral substances were called "paolins" a Chinese derivation meaning "abalone juice". Later, Li and colleagues expanded their research to investigate the effect of paolins on experimental cancer. The antitumor activity of paolins was demonstrated (5). Schmeer applied the name of "mercenene" to the antitumor substance extracted from the well-known clam.

What might be the nature of these antitumor substances? Li and coworkers have delved into this problem. They have some evidence that the antineoplastic activity is concentrated in the clam liver. The extract of clam minus the liver had no effect on the growth of experimental tumor.

The extract of the whole clam had only moderate activity. The liver extract showed the greatest activity. Although considerable data regarding the physical and biological nature of the antitumor substances have been accumulated, the exact mechanism by which the substances act remains unknown.

While the findings briefly reviewed here are scientifically quite important, neither the paolins nor mercenene have been developed to the stage of clinical usefulness in the cancer patient. It is hoped, however, that the studies of anticancer agents from the sea in general, and possibly from mollusks in particular may provide leads to the isolation or synthesis of more active compounds. To some degree, paolins and mercenene have shown many of the properties considered to be the prerequisites of a truly effective anticancer agent. It may be of some interest to see that other mollusks such as Busycon canaliculatum, Helix sp., Loligo sp., Strombus gigas, Mya arenaria and Spisula solidissima also contain some of these substances with antitumor properties.

It has been reported that those whose diets contained a substantial helping of the conch (Strombus gigas) prepared in various ways were protected from a poliomyelitis epidemic. The possibility of a high abalone diet being protective against cancer seems fanciful, however attractive that may seem. Incidentally the lobster has been found wanting as a potential source of antigrowth material.

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SEARCH AND SEIZURE by Constance Boone

My trips to South Padre Island, Texas, are so infrequent that I cannot claim that area to be a familiar "hunting ground" for shells, yet each time I go I learn a little more about it and find something new for me. In October I made two visits there. Tides were fairly low for the one week but high for the second time. Nevertheless, I came home with finds from each journey.

From the rocks under the pilot station at the Coast Guard Station, I collected a six millimeter "yellowish-orange" animal that I did not know was a Lamellaria until I got home and put it under a microscope. Fortunately I had kept it in a gallon of water along with two Nudibranchs I had collected during the week.

The Lamellaria looks like a Nudibranch but differs anatomically. The specimen I collected had a creamy yellow background to the translucent umbrella-like mantle spread over and engulfing the transparent shell. The animal inside the Sinum-like (ear-shaped) shell was rosy pink and showed through the mantle, making the dorsum look orangish in the center. The outline of the shell could be determined from the bulge on the dorsum. I observed a pattern of opaque rings of whitish spots around nucleus of orangish spots on the dorsum. Underneath there was a cream foot protruding from the shell and two dark tentaciles which were withdrawn into the animal by the time I got to see it under the scope. I did not get to see much movement in my animal as it was beginning to die.

The shell itself measured three millimeters. I have not taken the animal out and have preserved the whole mollusk, so I have not examined the shell completely. It seems to be very flat, transparent whitish and very thin. In references (American Opisthobranch Mollusks by Marcus and Marcus, 1967, page 11-12; Sea Shells of Tropical West America by Keen, 1971, pages 483-484, and The Invertebrates: Volume VI Mollusca I by Hyman) it seems probable to me that the species I collected could be the worldwide Lamellaria perspicua (Linnaeus, 1758) or a form of this species. The illustrations in Marcus and Keen are very close to what my tiny specimen looked like. Keen says the male has a pinkish hue.

This species has been found in Florida, in South America, Eastern Atlantic and Mediterranean, Indo-West Pacific Ocean and Eastern Pacific. Perhaps this, at least, may be extension of range.

This prosobranch is of the Order MESOGASTROPODA, Superfamily LAMELLARIACEA, Family LAMELLARIIDEA.

Other mollusks I might mention finding include Nerita fulgurans, in greater number than I have ever found them on the jetty rocks; an orange wee Dorid I have not seen before; three Littorina meleagris, low on the jetty rocks; Hastula salleana in the surf zone, and a number of Ischnochiton papillosus on old oyster shells and slabs of concrete in the channel and bay areas. Also I collected one fine, ruffled, reddish Pseudochama radians live on a flat building slab near the pilot station.

One day we went over to Washington Beach on the Mexican side of the Rio Grande River. There was not too much on the beach, but we were able to collect a large series of Hastula in the surf zone. In so doing, observations were made that may prove of interest.

Hastula salleana (Deshayes, 1859) has been recognized as the Gulf of Mexico version of the gray auger, Hastula cinerea Born, found on the

Eastern Atlantic coast, especially common from Cape Hatteras to Florida. We also have another species, a gray-white (or albino) and brown form named Hastula maryleeae R.D. Burch, 1965, with Surfside, Texas, as type locality.

Dr. J.P.E. Morrison reviewed the differences of these three Hastulas in the Texas Conchologist of May, 1968, and photos exhibit differences in punctations and radulas. My observations from the Washington Beach material mostly concern the coloration of the animals we saw in the three forms (not species) we collected. From what I understand, we collected Hastula salleana and both albino and brown forms of Hastula maryleeae. However, the three animals had different colors. Standing in the surf, snatching the mollusks from the sand as they were uncovered by the waves, I began to notice that the animals looked different. The few albino Hastulas were creamy white and the operculums seemed light orange. The many, many Hastula salleana were all gray with hardly visible operculums. The albinos (Hastula maryleeae) differed from the wine-brown Hastula maryleeae (three specimens) in animal coloration. The latter three specimens collected by Lucille Taylor of San Antonio and by me all seemed to have very white animals with dark orange operculums.

On returning home, I checked out the original description of Hastula maryleeae in The Veliger, Vol. 7, #4, page 242. The species were described by Burch as dark brown with obscure white band at the periphery of the body whorl. The sculpture was said to consist of low thin axial ribs on the posterior one-third of each whorl; the anterior portion unsculptured. The body whorl had a series of low, thin, weak seminodules at the periphery, not connecting with the crenules on the posterior portion and not extending to the base of the shell; the protoconch of two glassy whorls. Of the specimens examined by Burch, 40% had the peripheral crenules on the body whorl entirely obsolete and replaced with a continuous swelling that forms a wide convex belt and gives the outline of whorls a concave appearance. Burch said that this species often produces colorless or albino varieties.

The holotype described from the dark brown form is like wine-brown specimens collected by Mrs. Taylor and me. The white specimens resembled Burch's hypotype which was solid opaque white Hastula which he said possessed a row of small crenules, occasionally coalescing into a broad belt at the periphery of the body whorl. My white specimens had transparent and clear nuclear whorls, were very slender and had the effect of the ribbing flowing up and down and shell and with sutures very weak. The brown shells I have are fatter and with distinct ridges or nodules in the peripheral zone. The nuclear whorls are light brown and glassy.

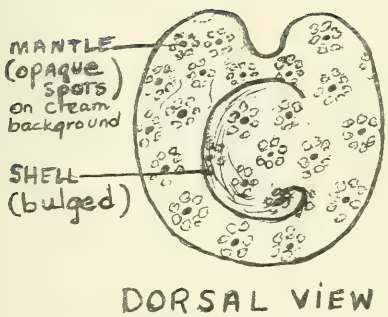
The gray-animal, H. salleana, had more nuclear whorls and these were dark amber. The operculum was a pale yellow color but looked gray because the animal showed through. The thin edge of the mantle was white and the feathered rolled tip of the siphon is white also.

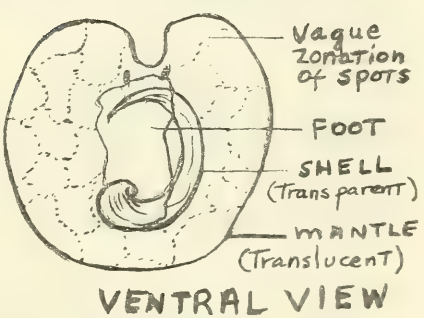
These observations of shells differences do not mean new discoveries; populations of mollusks vary in both great and subtle ways from different areas and even from one area. However, animal colorations are frequently not mentioned. It may be worthy of note to others.

Most of the specimens from Washington Beach (and those from Padre) were small, up to 20 millimeters. We collect much larger specimens of H. salleana in the Galveston area, and they seem more like H. cinerea. The Galveston specimens reach 40 mm.

I returned to South Padre with Dr. T.E. Pulley's continuing education class on "Biology of the Sea" and found tides high and bays muddy. However, a goodly number of animals were found. This second trip was a good example of determination to collect. Seines were used to retrieve fish and other animals such as Bursatella leachi plei (Rang, 1828), the ragged sea hare that is not too common. We sloshed out to the grasses on the mud flat near the mangroves on the old causeway. There we seined for sea horses and pipe fish and gathered shovelfuls of mud and grass to sieve. It was thus we recovered a few live Phacoides pectinatus, not seen alive too often; Neritina virginae, Tellina texana, Bulla, etc.

Lamellaria sp. drawn from live specimen collected at South Padre Island, Texas, October 14, 1974, by Constance Boone. Mantle spread 6 mm., shell 3 mm. Compared to worldwide Lamellaria perspicua (Linnaeus, 1758). Drawing by C. Boone.





This issue continues the comments on periodicals that relate to mollusks. (The numerical order in which the publications are discussed has absolutely no significance). Many of these publications are available in our own Houston Conchological Society library. Some might be examined in the library of the Houston Museum of Natural Science or in the libraries of Rice University or the University of Houston. It has been suggested before that it would be useful if at some future date the accessibility of these books and periodicals might be ascertained and listed for our Society members.

(7) OCCASIONAL PAPERS ON MOLLUSKS. Occasionally. Published by the Department of Mollusks, Museum of Comparative Zoology, Harvard University. William J. Clench, editor.

In the preface to Volume I, Dr. Clench indicated that the periodical will publish studies which are limited entirely to mollusks. "Each number is an entity and may deal with any phase of malacology whether bio-bibliographic or monographic or it may consist of catalogues of families or genera. A convenient number of pages will be grouped to form volumes, the numbers to run consecutively."

Volume I (Nos. 1 to 18) was printed from February 27, 1945 to August 14, 1954. Volume II (Nos. 19 to 34) was published from August 13, 1955 to November 8, 1965. The current Volume III started February 8, 1967 (No. 35); the last number (47) was issued November 29, 1973.

In general, the subject matters that have appeared can be categorized as follows: Biographical Sketches, Catalogue of Families and Genera, Monographic Studies, Faunistic Studies and Book Reviews. The Bio-bibliographic Sketches "are part of a long range plan to build up a historic background in our field of mollusks". The material is prepared by top professionals.

(8) MALACALOGIA. Quarterly. Published by the Institute of Malacology, Museum of Zoology at The University of Michigan. Editor-in-chief: J. B. Burch.

The first issue published October, 1962 put the journal on an international base and dedicated its pages to the publication of long articles or monographs devoted primarily or exclusively to the study of mollusks. The first article to appear in this journal was "An Outline of Gastropod Classification" by D. W. Taylor and N. F. Sohl.

The current issue is No. 1-2, Volume 13, 1973.

(9) STERKIANA. Semiannual. Editor: Aurela La Rocque.

The journal was named after Dr. Victor Sterki (1846-1933) who lived and worked in the midwest. He maintained a lifelong interest in non-marine mollusca. Consequently, the periodical originally limited itself to articles concerned with non-marine living and fossil mollusca of both Americas. Since 1973, however, the editorial policy was changed. Now articles on marine mollusca will be considered for publication. In particular, there has been an emphatic call for ecological data.

This publication was begun in 1959. The latest issue, No. 54, is dated 1974.

(10) THE ZOOLOGICAL RECORD. Annual. Published by The Zoological Society of London. Section 9, Mollusca, is published as a separate volume.

This mammoth undertaking lists "current" references on the broad subject of Mollusca. The material is cross-indexed under a number of categories including Author Index, Subject Index, Geographical Distribution, Palaeontological Distribution and Systematic Index. Except for the publication lag of some four years these pages should provide the key references (world-wide) for any bibliographic search concerning molluscan subjects.

The current Volume 107 published in 1974 includes publications for 1970.

(11) BIOLOGICAL ABSTRACTS. Semi-monthly. Published by Bio-Science Information Service, with the cooperation of individual biologists, biological industries and biological journals.

One section of each issue of the Biological Abstracts is headed Invertebrate, Comparative and Experimental Morphology, Physiology and Pathology. Under this heading one subsection deals with the Phylum Mollusca. The abstracts of references relating to mollusks appear here. These items are concise, running from 10 to 30 lines of fine print, and are professionally prepared. Each issue contains from 24 to 40 of these abstracts.

The journal sources are international in scope. The subject matter of the selected material appears to relate, for the most part, to basic research. References are current, having appeared one year or so earlier. Almost no private library will have a need for periodicals of this size. Nearly all university libraries and many departmental libraries will provide easy access to this publication.

(12) OF SEA AND SHORE. Quarterly. Editor: Tom Rice.

For five years now, the affable Tom Rice of Poulsbo, Washington, has put together almost singlehandedly the contents of this most readable quarterly which is slanted deliberately toward the shell-collecting hobbyist. Most of the articles are written in popular and entertaining styles by a variety of contributors.

The publication offers a varied menu and lots of illustrations, many in color. For many readers, this is frequently a welcomed change from the weighty and too often stereotyped discourse on basic science subjects.

(13) LA CONCHIGLIA (THE SHELL). Monthly. International Edition in English. Editor: Kety Nicolay (Italy).

This large, profusely and beautifully illustrated publication supplies the continental point of view to conchology. For example, in late issues, F. Nordsieck discussed in depth the genus Thericium in the European seas. E. Romagna-Manoja writes part one of Superfamilia Strombacea. Material dealing with Mediterranean mollusks has been published.

Publication began in 1969. The International Edition begins with Issue No. 15 (Volume II, May 1970). The issues prior to that were printed in Italian. The back issues, however, contain a mimeographed insert with English translations. This periodical must not be confused with another Italian journal, Conchiglie, or the publication, Journal de Conchyliologie.

JOHN Q. BURCH, CONCHOLOGIST by W. W. Sutow, M.D.

John Quincy Burch died on August 6, 1974. Thus another giant in the field of conchology passes on.

The biographical data on John Q. Burch are conveniently summarized in the recently published American Malacologists (page 220). In his own words, John was an "editor ... book and shell dealer (retired) and an amateur malacologist". He was born on June 20, 1894. He spent a good portion of his early years around El Paso, Texas, and attended the University of Texas in Austin. From 1944 to 1966 he was a book and specimen shell dealer for which he is best known. He edited the famous Minutes of the Conchological Club of Southern California (Nos. 1-200). He contributed to many publications. He was a member of many malacological organizations.

These cold facts, however, are inadequate to describe John Q. Burch as a human being. He was a respected and treasured friend of generations of conchologists, amateurs and professionals alike. He was elected president of the prestigious American Malacological Union in 1964. During the time he ran his shell business, his so-called lists were priceless items of carefully researched information.

And in our fledgling days, John Q. Burch supported the TEXAS CONCHOLOGIST with his usual enthusiasm. The August, 1966, issue of the TEXAS CONCHOLOGIST (Vol. 3) carries his comments about basic literature for the amateur conchologist. Later, he contributed "Notes on the Family Pectinidae" in the September, 1967 issue (4:15). In 1966 he and Rose Burch became subscribing members of the Houston Conchology Society.

A very personal description of this man's life and activities has been published in THE TABULATA, 4:7-12 (January) 1971. His bibliography is also appended. Two genera and four species of mollusks honor taxonomically the name of Burch.

LIBRARY NOTES

Some early issues (now out of print) of two paleontological journals have been catalogued and added to the library of the Houston Conchological Society. These included: Bulletin of American Paleontology, complete volumes I, V, VI, VII, VIII, XIII, XIV, XVI, XVII, XVIII, XIX and XX. Incomplete volumes II (Numbers 6, 7, 8, 9, 10); III (No. 11); IV (No. 16); XII (No. 47); XV (Nos. 56, 57, 57A, 57B); XXII (No. 74); XXIII (No. 78); XXIV (Nos. 80, 84, 85, 86); XXV (No. 94B); XXVII (Nos. 104, 106); XXVIII (Nos. 112, 113); XXXI (No. 126). Paleontographica Americana, Volume I (complete), II (No. 8); III (No. 15).

These journals were donated to the library of the Houston Conchological Society by Sidney Stubbs.

The "Minutes of the Conchological Club of Southern California" mentioned above is an oft-quoted reference in articles dealing with mollusks of the American west coast. The Minutes have long been out of print and second-hand copies are practically unobtainable. Fortunately, the malacological section of the library of the Houston Museum of Natural Science has one set.

SOME REMARKS ON THE OCCURRENCE AND COLLECTING OF SHELLS IN THE FAMILY TEREDINIDAE ALONG THE TEXAS COAST

by H. Ode

Until recently it was rather difficult to identify material of the family Teredinidae found boring in wood along the Texas coast. The world wide review of the Teredinidae by Turner (1966) has made this task not only much lighter but for the first time possible. Before her review was published, the innumerable species, which she has shown to be for a major part synonymous of only a relatively small number of species, precluded even a superficial discussion of this group in the Texas fauna.

In contrast to almost all other groups of bivalves, the Teredinidae possess practically indistinguishable hard shells which can hardly be called characteristic of the species and specific distinction must be made on the basis of the structure and shape of the pallets. These are calcareous-chitinous structures forming a pair of small appendages placed at the base of the siphons, serving the purpose of closing the tube in which the animal lives, when the siphons are retracted. The pallets are characteristic for the Teredinidae and are assumed to be highly specific, i.e. each species can be recognized by the shape and structure of the pallets. Thus, the collection of the pallets together with the shell is a necessity, because otherwise it remains virtually impossible to identify material.

All Teredinid material must be collected from the calcareous tubes the animals secrete to line their tunnels bored in wooden objects. Not rarely one finds logs, roots, nuts or boards washed upon the beach, which have been attacked by Teredinids. In most instances the animals have died so that only empty shells can be obtained from the end of the tubes. Usually but not always some pallets have remained behind. For reliable identification of this material, it is absolutely required to obtain as many pallets as possible. If, as happens quite often, two different species have infested the same log, it is seldom possible to separate the shells according to species and it is only possible to note from examination of the pallets that two different species lived in it. The rare material picked from beachdrift is useless and except for perhaps a single species, can never be identified.

In this short note I will report upon the several species of Teredinids, which according to my information, have been collected along the Texas coast. All material has been found along the beaches or was in rare instances dredged in comparatively shallow water on the offshore shelf near Galveston and Freeport in completely waterlogged wood. Only in a few cases live material was obtained. It remains difficult to say whether these animals, even when collected alive in Texas waters, belong to the fauna of the Northwest Gulf of Mexico. Many species of shipworms are practically world wide because of their dispersal in floating timbers and animals may survive in certain locations but may not breed or propagate. To my knowledge no test board experiments have been made in Texas waters and until such experiments have been made it is possible that most of the species reported here below are merely adventitious. I am inclined to believe that only Bankia gouldi is truly a part of our coastal fauna.

Unfortunately the number of useful lots in the collection of the Houston Museum of Natural Science is severely restricted because in many cases pallets are missing either because collectors were not aware of their importance for systematics or as happens once in a while, no pallets

could be retrieved with the shells. When a piece of wood floats for a long time in the water and the animals die before the wood is totally consumed the tubes get washed out completely, the pallets disappear, and only the shells remain because they have grown too large to escape.

If the animals consume more than a critical amount of wood the weight of the calcareous material in the tubes finally makes the log sink. Such submerged logs riddled with tubes are occasionally dredged in mid ocean, and may have drifted there from long distances away.

Collecting must be done carefully. Because live fresh material is relatively uncommon or sometimes impossible to obtain one must gather what one can. Once I found an enormous tree trunk on the Freeport beach, moderately attacked by still living Teredinids. Watersoaked wood of tropical trees can be extremely tough and not having an axe with me and after breaking a pocketknife, I was completely stymied in my efforts to collect even a single specimen and all I got was a sliver of wood in my hand. Fortunately one finds usually smaller pieces of wood or removable parts of trees in which a sufficient number of specimens are crowded together to obtain an idea of the species. These pieces of wood can be explored at home and be picked apart above paper spread out in a draft free room. When doing such exploration in the backyard it is a good idea to anchor the paper securely, otherwise paper, pallets and shells are blown away by slight gusts of wind. With these precautions, usually a number of pallets can be obtained to serve as indicators of the species which have infested the wood. But one can never be sure unless one collects live material. Frequently more than one species infest the same log and although the pallets may be quite different, the shells are surprisingly similar. There are probably some minor differences in sculpture, which long experience might enable one to recognize, but I have not studied them sufficiently to make statements about such characters and all identifications in the following are made on the basis of pallets only.

The state of preservation of the pallets is important. Older ones have the tendency to exfoliate and to corrode, so that it is not always simple to identify them. Usually the genus can be assigned without too much trouble, but within the genus the choice is not always easy. Moreover, there exists a certain amount of variability in these objects and it is not inconceivable that the number of species within certain groups will be still further reduced when more detailed studies are made (f.i. the genus Teredo).

In the literature pertaining to the Northwest Gulf of Mexico a number of taxa have been reported which we cite here under the name considered correct by Turner. They are:

1. Bankia gouldi Bartsch
2. Bankia carinata Gray (as Bankia caribbea Clench and Turner)
3. Bankia fimbriata Jeffreys
4. Teredo navalis Linne
5. Teredo bartschi Clapp
6. Teredora malleolus Turton (as Teredo thomsoni Tryon)
7. Lyrodus pedicellatus quatrefages (cited in Andrews but no records are given)

Of these numbers, 1, 2, 5 and 7 are present in the collection of the Houston Museum of Natural Science. Numbers 3, 4 and 6 could occur in this area. Teredo navalis has been reported by many investigators, but I suspect that this is due to the fact that it is a well known

species of the Atlantic, often citied in literature available to those who report on local faunas. In view of the diversity of species in our limited material, I suspect that systematic collecting will uncover more species than mentioned in the listing below which enumerate all species identified in the Houston Museum of Natural Science collection. As stated before about 50% of our material unfortunately cannot be identified. Of the material identified the name is based on pallets only and the shells are merely assumed to go with the pallets.

Two of the three accepted subfamilies are represented in our fauna: Teredininae and Bankiinae, which differ in anatomical details apart from differences in structure of the pallets (see Turner, 1966). The following species are present:

Teredininae	1.	?Lyrodus pedicellatus
	2.	Teredo c.f. bartschi
	3.	Teredothyra dominicensis
	4.	Uperotus panamensis
Bankiinae	5.	Nausitora fusticola
	6.	Bankia gouldi
	7.	Bankia carinata

A discussion of the material follows:

Lyrodus pedicellatus Quatrefages, 1849. A single lot from Bryan Beach, Freeport. The identification is based on a single pallet of typical shape, but which has lost its chitinous material. The shells obtained with it may or may not be this species.
Teredo bartschi Clapp, 1923. A single lot of many pallets mixed with an equal abundance of Bankia gouldi. There are slight differences in shell appearance, but whether these reflect specific differences between Teredo and Bankia must be further investigated. All pallets are old and many are badly exfoliating.
Teredothyra dominicensis Bartsch, 1921. We have 3 lots of these very characteristic pallets with its inserted extra cup, obtained from dredgings between 11 fathoms and 25 fathoms off Galveston. In this case there is no doubt about the identification.
Uperotus panamensis Bartsch, 1922. A single lot from Mustang Island Beach, about which there can be no doubt. Two large pallets are beautifully preserved and show the typical structure of this genus. The shells are different in shape and sculpture from Teredo and Bankia and can be considered almost certainly to belong with the pallets. The occurrence of this species in the Gulf of Mexico is quite interesting because Uperotus is an eastern Pacific species from the Panamanic Province.
?Nausitora fusticola Jeffreys, 1860. A single lot dredged from 40 fathoms. Most specimens are quite juvenile and were alive at the time of collecting. Unfortunately the pallets as far as they were preserved are now loose from the shells. They are quite small and show the following characters:

1. The blade is translucent, opaque and the stalk can be discerned in it.
2. The distal part shows the close arrangement of septa crowded together in a single mass. The small size of these pallets makes this identification somewhat uncertain.

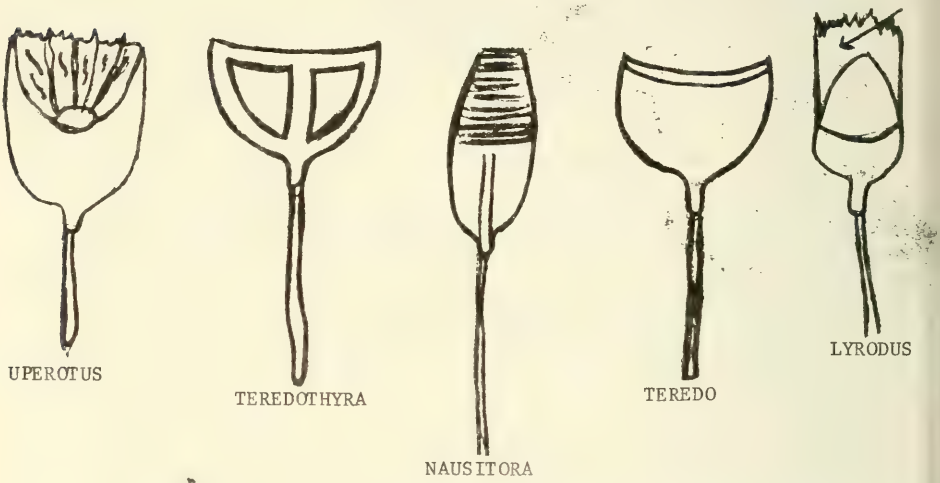
Bankia gouldi Bartsch, 1908. We have about 8 identifiable lots of

pallets. In one case the log contained a mixed population of B. gouldi and B. carinata, since 2 pallets of the latter species also were obtained. B. gouldi is probably the most widespread of the Teredininae along the Texas coast and may be the only species which truly belongs to the coastal fauna living in the muddy waters of the Northwestern Gulf.

Bankia carinata Gray, 1827. Two lots of pallets. Both in mixed populations, one with B. gouldi and another one with Teredothyra dominicensis, in a large log.

From this brief ennumeration it is clear that much more work and systematic collecting of live material is necessary before the Teredinid fauna of the Northwestern Gulf is understood. Test board experiments should be undertaken.

CHITINOUS MISSIN



Schematic figures of Teredinid mallets X 20

A most interesting fact emerges when we compare this list with a listing of Teredinina in Keen's book of the Panamanic Province. Except for Lyrodus and Teredothyra all other species cited here have been collected in the eastern Pacific. Uperotus panamensis is confined to this province and its occurrence on the Texas coast is still another indication that the Northwestern Gulf of Mexico has retained many traces of an original fauna drived from the Pacific before the Isthmus of Panama was formed.

Texas CONCHOLOGIST

VOLUME XI, NO. 3 MARCH, 1975

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We have not been overwhelmed with a deluge of requests for copies of the December issue, Volume XI, Number 2 of the TEXAS CONCHOLOGIST.

This is rather surprising and somewhat disappointing because the December issue carried the first of a series of articles on the mollusks living in the N.W. Gulf of Mexico. The second in this series is carried in this issue.

We believe that this is an important work, the culmination of years of activity by a number of dedicated people and the results are significant.

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The editor regrets that Volume XI, Number 2, was printed without page numbers. It should have been numbered 25 - 48. For purposes of reference it would be well to number the pages of your copy by hand.

The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas and is included in the membership dues.

The society holds meetings the fourth Wednesday of each month except June, July and December at 8:00 p.m. in the Houston Museum of Natural Science.

The TEXAS CONCHOLOGIST is mailed, postpaid, to regular members of the society, with the exception that only one copy is mailed to a family. Overseas members will be charged the additional postage required at the beginning of each fiscal year (June).

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EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Odé
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double-spaced and should be submitted to the editorial staff.

CHANGES IN RATE

Inflation is catching up with the TEXAS CONCHOLOGIST and we are forced to make the following changes effective with the fiscal year 1975-76 starting in June:

1. We are eliminating the subscriber classification urging all subscribers to become members with all the benefits and privileges of membership.

2. We will pass on the additional cost of the postage for overseas members.

Hopefully, these will be the only changes required for the next year.

SHELLS OF THE WORLD
ABOUT OUR 1975 SHELL SHOW

Lloyd Meister

It has been this writer's privilege to have been involved in all but the first of our shell shows one way or another. It has been this writer's honor to have been chairman of three out of the ten shows, including this year's, that we have put on. You will notice I said ten. This year will be our ninth show at Sharpstown Center, so why ten?

In April of 1969 our club put on a display in Joske's Post Oak store. This was my first experience at doing anything of this nature and had it not been for the wonderful backing of all who were involved it could not, like any show, have been accomplished. This show was followed in May by our Sharpstown affair.

In 1970 along came Mary Sutow who not only filled the entire mall from one end to the other but several of the side malls as well. This was far and away our best show.

It fell on me as Chairman of the 1971 show to follow Mary's. It was needless to say, considerably smaller in scope, but was as successful as far as sales from the store.

Now, once again, I have been asked to chair another, my third. With the selection of the following people and the help of all our members this too will be a successful show.

CHAIRMAN	Lloyd Meister	926-3812 or 926-4047
SHELL SHOP	Carole Courtade	668-2541
TABLE FOR THE BLIND	Fanny Miron	723-3628
TABLE FOR THE CHILDREN	Margaret Rogers	524-0052
SCOUTS AND SCHOOLS	Janet Christie	723-8852
PUBLICITY	Wilson Ward	645-9938
EXHIBITS	Mary Myers	774-2914

Do not be afraid to exhibit your shells. Sharpstown has 24 hour security guards and we will have someone there from early morning until the Mall closes at 10:00PM.

The dates for the show will be May 8-9-10, with setup to begin on the afternoon of the 7th.

We are limited as to the number of cases we have to use and if you are not lucky enough to get the use of one, a cardboard box painted flat black and covered with one of the plastic wraps will serve very well. Tables will be available in the quantity needed and will be 2ft. by 6ft., so make your plans and let us know your needs as soon as possible.

The theme of this year's show will be "SHELLS OF THE WORLD". If you have enough shells of a genus to make a display of them, then please do so; if you do not, then mix them up.

If you have any shells, either beach or specimen, to donate to the store, bring them to the meetings or to Carole Courtade or call and we will make arrangements to have them picked up.

Your help is needed and requested. Let us hear from you.

SUPERFAMILY CARDITACEA

FAMILY CARDITIDAE

Represented in the NW Gulf of Mexico by five species, one of which is endemic. Most species in this family have rather thick shells, radial ribbing and ventral crenulations. We shall here recognize the genera: Carditamera, Cyclocardia, Pteromeris and Pleuromeris.

Sources: A. Chavan in Treat. of Invert. Pal., Vol. N, Part 2, p. 548-558, 1969.
M. Keen, Seashells of Trop. West America, p. 106-111, 2nd Ed., 1971.

Genus Carditamera Conrad, 1838.

Somewhat elongate and rectangular. Chavan considers most subgenera in Keen, 1971, as full genera.

1. Carditamera (Carditamera) floridana Conrad, 1838.

Carditamera floridana Conrad, Foss. Med. Tert., p. 12, 1838.

Although we have a fair number of lots, mostly from the beaches and hypersaline bays, the live occurrence of this species in the Texas faunal province has not yet been documented. Dead shells are fairly common in beachdrift from Matagorda to St. Joseph Island, but become abundant on Mustang and Padre Islands. Rare worn shells have been found on Galveston Island, and occasionally dead material of worn appearance has been dredged off Galveston and Freeport. A single rather fresh valve was obtained by diving on the coral reefs. Numerous juvenile valves can be collected from the Mississippi mudlump fauna. In the recent past, this species must have lived in abundance along the Texas coast. Very small juveniles are quite symmetric with the umbo placed in the middle of the valve. By the time the shell reaches 2-3mm it has developed considerable asymmetry.

Previous records for the Texas faunal province are:* 15, worn beach valves at Corpus Christi; 19, beach-worn shells in Matagorda and Espiritu Santo Bay; 21, listed; 45, repeats previous locations; 56, listed for Texas; 61, Corpus Christi region; 62, Harbor Island and Padre Island; 65, common in Corpus Christi area; 66, Marine Pleistocene of Texas; 69, listed; 98, bays, also dead on beach of Padre Island; 110, beach worn shells rare at Galveston, fresh shells on St. Joseph Island, Mustang and Padre Islands, plate 9, fig. 1; 135, dead in Gulf and in the bays; 160, dead at three locations in Matagorda Bay; 161, dead in Rockport area, dead in Laguna Madre, 170, as Cerastoderma pinnulatum, pl. 16, fig. 6; 175, listed; 202, figured; 206, Beach Notes, Tex. Conch., Vol. 1, (8); 208, listed for "bay margins and grass flats" environments; 253, one fossil (?) valve on offshore reef, Padre Island; 269, figured on p. 179.

Records H.M.N.S.: 21 lots, none alive.

Depth Range: 0-67 fms. The depth range is puzzling. A fresh valve from 13-16 fms. There are two ranges in our material, one from 0-25 fms. and another from 50-67 fms. mostly in sandy mud. Some of these have a somewhat different shape than those from shallow water.

* (The numbers of references refer to those of the bibliography published in Texas Conchologist, Vol. 11, p. 7-18. Figures of some of the lesser known species are in preparation.)

Geographical Range: Southern Florida, along Gulf Coast to Yucatan.
Maximum Size: 30.5mm.
Eastern Pacific Analogue: There is only one Panamanic Carditamera, which is not close.

Genus Pleuromeris Conrad, 1867.
Small, triangular shells, with lunule only in left valve.

2. Pleuromeris tridentata (Say, 1826).
Venericardia tridentata Say, Jour, Acad. Nat. Sci., Phila., 1st series, Vol. 5, p. 216, 1826.
This small species apparently reaches its western range extremity off the Louisiana Coast. We have only two small lots of worn shells and do not know whether the species still lives in the area.
Previous records for the Texas faunal province are: None. This species can hardly be considered part of the Texas faunal province.
Records H.M.N.S.: 2 lots, none alive.
Depth Range: 12-40 fms.
Geographical Range: North Carolina, Florida.
Maximum Size: 3.5mm.
Eastern Pacific Analogue: None.

Genus Cyclocardia Conrad, 1867.
Rather rounded small shells, with somewhat curved radial ribs. In Texas, two species.

3. Cyclocardia armilla (Dall, 1903).
Venericardia (Cyclocardia) armilla Dall, Proc. Acad. Nat. Sci., Vol. 54, (4), p. 704, 713.
This widespread and common species is characteristic for the Texas faunal province. It can be collected in great numbers in depths between 50-167 fms. One record from 8 fms. probably represents a shell adventitious at that location. Often this species is called rare (ref. 105), so that I believe it is endemic to the Texas faunal province, where it lives in the sandier portions of the coastal shaft all along the Louisiana-Texas coast. Very small juveniles are already exact replicas of mature specimens. Fresh specimens are covered by dense radial rows of epidermal hairs and in large specimens the radial ribs flatten out considerably toward the ventral margin.
Previous records for the Texas faunal province are: 144,listed for offshore locations; 147, dead on Big Southern Bank; 175, upper continental slope, 65-100 fms., common especially from 60-120 fms., plate 6, fig. 4; 206, Tex. Conch., Vol. 9, p. 78.
Records H.M.N.S.: 20 lots, of which 4 contain live collected material.
Depth Range: 50-167 fms., alive; 60-95 fms. in sandy mud.
Geographical Range: largely restricted to the Texas faunal province; off West Florida.
Maximum Size: 11.6mm.
Eastern Pacific Analogue: None.

4. Cyclocardia sp. indet. (A)
In our area a second species has been collected (a single lot), which has ribs of a square cross section, colored by brown flecks, and which is somewhat broader. The ribs are not as nodulose as those of C. armilla but carry somewhat spinelike protuberances. In many aspects this quite different species is much closer to Carditamera floridana (color, ribs and spines), but its shape and hinge are clearly those of Cyclocardia; only taken off the Louisiana coast.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 1 lot, none alive.
Depth Range: 60 fms.

Geographical Range: unknown.
Maximum Size: 4.5mm.
Eastern Pacific Analogue: None.

Genus Pteromeris Conrad, 1862.
Small, obliquely rounded, somewhat compressed shells. One species in the Texas faunal province.

5. Pteromeris perplana (Conrad, 1841).
The distribution of this small species is the same as that of Pleuromeris tridentata and it reaches also the western extremity of its range off Louisiana. We have only two lots, one containing eight recent-looking valves with fresh color patterns, the other of two small bleached juvenile valves.
Previous Records for the Texas faunal province are: None.
Records H.M.N.S.: 2 lots, none alive.
Depth Range: 13-40 fms.
Geographical Range: North Carolina, Florida. This species can hardly be considered part of the Texas faunal province.
Maximum Size: 6.2mm.
Eastern Pacific Analogue: None.

Remarks: In the literature, the following species have been mentioned:
Ref. 74: Carditamera arata Conrad, 1832. This species close to C. floridana has been figured in the reprint of the papers by T.A. Conrad by the Pal. Res. Inst. (1963) (Cypricardia arata Conrad, Plate 5, fig. 1.).
Ref. 170: Milneria c.f. kelseyi Dall, 1916. Listed for deep shelf assemblage off East Texas. Plate 15, fig. 4. Until a few years ago I would have been inclined to dismiss the occurrence of this Pacific genus in the Atlantic as a mix-up of material but since then the number of species derived from the Panamanic province has become so numerous that I rather reserve judgment and prefer to await the discovery of more material.

FAMILY CONDYLOCARDIIDAE

In the NW Gulf of Mexico represented by two species, one in the subfamily Condylocardiinae and the other in the Cuninae. In this family the small shells are characterized by a concentric ridge which separates the nepionic part of the shell from the later part. Some species possess concentric ribbing, e.g. Goniocuna dalli Vanatta of the Alabama coast - (and just in the Texas faunal province), - others such as Condylocardia are strongly radially ribbed.
Sources: A. Chavan in Treat. of Invert. Pal., Vol. N, Part 2, p. 558-561, 1969.
M. Keen, Seashells of Trop. West America, p. 111, 2nd Ed., 1971.
Genus Condylocardia Bernard, 1896.
Small bivalves, with radial ribs.

6. Condylocardia c.f. bernardi (Dall, 1903).
Erycinella (Carditopsis) bernardi Dall, Tr. Wagner. F. Inst. Sci., Vol. 3, Pl. 6, p. 1438, Pl. 53, fig. 10 (USNM 135637).
Originally described from the Pliocene of Costa Rica, this species was later reported by Olsson and McGinty from the Atlantic coast of Panama (1958, Bull. 177, Am. Pal. p. 20, 52, Pl. 5, fig. 6). It is not rare on the Texas offshore coral reefs, also lives on the Miocene shale outcrops and has been taken in sandy mud at 51 fms. We have not yet compared our material with authenticated material or with Carditella smithii Dall, 1886, from Bermuda and Florida

(=Condylocardia floridensis Pilsbry and Olsson, 1946).
Previous records for the Texas faunal province are: 206, Texas Conch. Vol. 9, p. 78.
Records H.M.N.S.: 11 lots of which 1 contains live collected material.
Depth Range: 12-51 fms.; alive: 12-15 fms. on coral and algal reefs, Miocene shale outcrop and sandy mud (51 fms.).
Geographical Range: NW Gulf of Mexico, Panama, to South America.
Maximum Size: 1.5mm.
Eastern Pacific Analogue: Condylocardia hippopus Mörch, 1861. "Puntarenas, Costa Rica, to Panama" (Keen, 1971).

Genus Goniocuna Klappenbach, 1963.
Small, inequilateral, with concentric ribbing and very strong hinge.

7. Goniocuna dalli (Vanatta, 1903).
A single valve of this rare species, living at present in the Northeast Gulf of Mexico (Mississippi-Florida) in shallow water, was dredged in 50 fms off Louisiana near the Mississippi Delta. It compares perfectly with material from the Alabama coast. Superficially, the species resemble a somewhat skewed Gemma purpurea, but the hinge is different. Whether the species still lives off Louisiana is unknown; our specimen could be a Pleistocene fossil.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: One lot, none alive.
Geographical Range: N.E. Gulf of Mexico (hence our locality is merely a slight extension of the known range).
Maximum Size: 2.6mm.
Eastern Pacific Analogue: None.

SUPERFAMILY CRASSATELLACEA
FAMILY ASTARTIDAE

In the N. W. Gulf of Mexico represented by two species in fairly deep water. Recent species are mainly distributed in the north Atlantic, but a few small ones are known from the Gulf of Mexico. These shells are somewhat rounded, trigonal in shape, with strong concentric sculpture.

Genus Astarte J. Sowerby, 1816.
Rounded, trigonal in shape, with strong undulating concentric sculpture.

8. Astarte (Astarte) nana Dall, 1886.
Astarte nana "Jeffreys" Dall, B.M.C.Z., 12, No. 6, p. 261, Pl. 7, Figs. 6a, b.
This rather small, somewhat ovate, especially in the juveniles, species is probably common in the N.W. Gulf of Mexico in the depth range of 100-170 fms. At least it is found in a large proportion of the samples taken at that depth. One of the remarkable facts about this species is the crenulation of the ventral margin, which is present only in part of the valves, never in juvenile specimens. Abbott (Am. Seashells, p. 480, 1974) states that it is very abundant off eastern Florida in moderately shallow water, and Dall cites also the Carolina coast as its area (B.M.C.Z., Vol. 12, p. 261, 1886).
Previous records for the Texas faunal province are: 175, listed for upper continental slope, 65-600 fms., common, 50-100 fms; 206, Tex. Conch., Vol. 9, p. 78; 214, Plate 12, figs. 1, 2. A reference to this species in 164 for the Rockport Area: "alive in open bay margin and inlet influence", and the Laguna Madre: "dead in inlet influence", must be in error for Crassinella sp.
Records H.M.N.S.: 5 lots, none alive, but two contain some fresh fragments with brown periostracum and ligaments.
Depth Range: 110-170 fms.; no live material.

Geographical Range: Texas faunal province, West Florida and off coast of Carolinas.
Eastern Pacific Analogue: Astartidae do not live in the Panamanic province.

9. Astarte (Astarte) spec. indet. (A)
One lot of another somewhat smaller species was taken at a location off Louisiana. It is more triangular in shape with higher umbo, heavier hinge line and a discernable color pattern of radial brown color bands. The juveniles are much more rounded with a prominent umbo, and the concentric ribs are coarser. Possibly this is A. liogona Dall, 1903, which was reported from the Mississippi Delta.
Previous references for the Texas faunal province are: None.
Records H.M.N.S.: One lot, off Louisiana, none alive.
Depth Range: 40 fms.
Geographical Range: Unknown. If this is A. liogona Dall, 1903 P.U.S.N.M., 26, No. 1342, pp. 940, 948, pl. 62, Fig. 9, it is only known from the Mississippi Delta.
Maximum Size: 6.5mm.
Eastern Pacific Analogue: Astartidae do not live in the Panamanic province.

FAMILY CRASSATELLIDAE

In the N.W. Gulf of Mexico represented by two subfamilies: Crassatellinae with the genus Eucrassatella and the Scambulinae with four species in the genus Crassinella.
Sources: A. Chavan in Treat. of Invert. Pal., Vol. N, Part 2, P. 573-578, 1969.
M. Keen: Seashells of Trop. West America, P. 103-106, 1971.
H.W. Harry: Inst. Mar. Science, Texas, Vol. 11, P. 65-89, 1966.

Genus Crassinella Guppy, 1874.
Small bivalves, up to 10 mm in size, concentrically sculptured, brownish white, or with radial brown bands of color, opisthogyrate beaks and quite variable in form. Although specimens of this genus are widespread over the continental shelf, it remains very difficult to make a reasonable interpretation of the various species. In a recent, very detailed and extensive study,(ref. 222), Harry studies two of the species Crassinella in the N.W. Gulf of Mexico. Our extensive material definitely shows the presence of four species, only one of which is uncommon and which may be new, although Altena (1971) reported a very similar form from Surinam.

10. Crassinella lunulata (Conrad, 1834).
Astarte lunulata Conrad, 1834, Journ. Acad. Nat. Sci., Phila. 7, (1), p. 133.
(Syn. Thetis parva, C.B. Adams, 1845; Astarte mactracea, Linsley, 1845;
Eriphyla galvestonensis, Harris, 1895).
Recently Harry has studied this species in great detail and came to the conclusion that it is also the same as C. guadelupensis Orb., 1846. This is possible in view of the great variability of this species, but it leaves the identity of another common Texas species uncertain. Inspection of the type of C. guadelupensis if still existent is required to solve this problem.
C. lunulata Conrad is by far the largest of the Texas species (up to 9.2mm). Fully grown specimens show considerable variation in color and shape. Fresh specimens show a texture of the shell surface, illustrated by Harry, which under the microscope, gives the shell surface a reticulated appearance. Juveniles of this species

can be distinguished from other species by their rounded shape (fig. 16, page 73 of Harry's paper) and differ substantially from the other three minute species. The most variable aspect of C. lunulata is the intensity of the concentric sculpture. This varies from practically non-existent (C. galvestonensis Harris), over moderately intense undulations to (rarely) lamellar ridges as in some Venerids.

C. lunulata is most easily identified by its size. No other species reaches a size in excess of 5mm. Its juveniles are different in shape from any of the other species. It may be noted here that full grown specimens of an as yet unidentified species resemble full grown C. lunulata in shape, but differ considerably from juvenile C. lunulata, especially in strength of development of the hinge lines. This is in juvenile C. lunulata considerable coarser than in any of the other forms. C. lunulata Conrad is a very common species along the Louisiana-Texas coast, where it lives both in the bays and in shallow offshore waters. Often old valves are found together with the other three species, making identification of the material difficult. Most of these deeper-water valves however, are old and worn and probably fossil. The species is common in beachdrift all along the Texas-Louisiana coast.

Previous references for the Texas faunal province are: 15, (Eriphyla lunulata Conrad), single valve at Galveston; 21, listed; 32, artesian well Galveston at depth 444-458 feet (C. galvestonensis), pl. 49, fig. 14; 45, Galveston, recent and in well; 66, listed for marine Pleistocene of Texas; 98, (Crassinella sp.), listed for bays; 110, (C. mactracea Linsley, 1845), dead shells at Galveston and Port Aransas, living in Aransas Bay; 137, reported for almost all stations sampled off East Texas, in depth of 10 fms, plate 6, fig. 8; 140,(C. martinicensis) listed for inlets, pl. 39, fig. 23; 152, in about 60 fms. off Mississippi Delta; 164, dead in open bay center at Rockport, alive in open bay margin and inlet influence , dead in Laguna Madre; 170, alive in transitional shelf assemblage; 174, listed; 175, listed for inlet and deep channel assemblage, common on shelly bottom, pl. 3, fig. 18; 201, listed in appendix; 206, beach records in Tex. Conch., Vol. 5, p. 71; 208, in tidal inlet influence and open bay center; 222, extensive discussion; 225, Galveston; 236, Galveston; 253, several pairs on Padre Island reef; 269, figured on page 180.

Records H.M.N.S.: 61 lots, of which 20 contain live collected material.

Depth Range: 0-55 fms.; alive: 0-12 fms., and if a doubtful specimen proves to be this species, 0-26 fms.

Geographical Range: Massachusetts, Florida, Puerto Rico, Mexico to Brazil.

Maximum Size: 9.2mm.

Eastern Pacific Analogue: C. pacifica C.B. Adams, 1852, "Cape San Lucas and through the Gulf of California, south to Peru" (Keen, 1971).

11. Crassinella spec. indet. (A).

A second species, living in deeper water than C. lunulata, is common over the Texas- Louisiana shelf, where it has been dredged in a depth range of 8-70 fms. In many respects it is close to C. lunulata but is is much smaller. In the list of mollusks of the N.W. Gulf of Mexico published earlier (Tex. Conch., Vol. 9, p. 78), I lumped it together with C. lunulata, but now I believe that it represents a distinct species. The reasons for this are: 1) Specimens of equal size of both species show considerable differences in shape. Those of C. lunulata are quite rounded with a strongly curved umbo (see fig. 16 of Harry's paper); at the same size (2-3mm) specimens of C. spec. indet. (A) are full grown and exhibit a form closer to the form of mature C. lunulata. Thus they are quite

triangular and quite flat; 2) The differences in development of the hinge line are distinctive. Although topologically quite similar, the hinge line of C. lunulata is much more strongly developed than that of species C. spec. indet. (A); 3) In general the shape of species C. spec. indet. (A) is quite skewed and resembles to some extent a straight sided Pteromeris perplana.

I became aware of the specific differences through the fact that in the water depths of 25-40 fms. large Crassinellas (i.e. C. lunulata) are rarely obtained and that many samples yielded only abundant fresh looking "juveniles" of some species. The fact that shells of true C. lunulata are obtained - but rarely - at such depths confused the issue. Closer inspection however showed that most, if not all, of these specimens are "drowned" shells, derived from shallow-living animals, when the sea level was below the present level of the Gulf. In consequence, they look dull, brownish, eroded, whereas most of the so-called juveniles are fresh and often alive.

The color pattern of species C. spec. indet. (A) is essentially that of C. lunulata, there are fine radial striae of brown color.

Whether this is the species that ought to be designated as C. guadelupensis Orbigny, 1846,cannot be determined here. For that, an inspection of the type - if it still exists - is necessary. If Harry is correct C. guadelupensis is a synonym of C. lunulata and species C. spec. indet. (A) must receive another name. As Altena (1971) remarks,it would be premature to name this and still another species C. spec. indet. (B) until all Neogene and recent material can be critically compared.

The species lives all along the Texas-Louisiana coast in sandy bottoms. It does not enter the bays, nor is it found on the beaches. It is also abundant in the mudlump fauna off the Mississippi Delta. Its optimum depth range is far below that of C. lunulata (20-40 fms. as compared to 0-12 fms. for C. lunulata).

Previous references for the Texas faunal province are: In the past either reported as C. lunulata or C. guadalupensis, Orbigny.

Records H.M.N.S.: 49 lots, of which 9 contain live collected material.

Depth Range: 0 (mudlumps)-50 fms; alive: 9-32 fms.

Geographical Range: Unknown.

Maximum Size: 4.2mm.

Eastern Pacific Analogue: ?

12. Crassinella martinicensis (Orbigny, 1846)

Crassatella martinicensis d'orbigny, in Sagra, Hist. Cuba, Moll., 2, p. 288-289, pl. 27, fig. 21-23, 1846.

This minute species is often collected with C. spec. indet. (A) in water depths between 20-50 fms. In fact, the three species: C. martinicensis, C. spec. indet. (A) and Vesicomya pilula, together form the majority of dredged bivalves at many locations off the Texas-Louisiana coast.

This species is regularly triangular, is seldom skewed, and is more inflated than any of the other species. Its surface sculpture varies in intensity from rather sharp ridges to only slight indications of their presence. It has been well figured in Harry's paper of 1966. Although we have extensive material, live shells are apparently uncommon in spite of the fact that paired valves are common in dredgings. This species is seldom colored, but sometimes specimens with a brownish hue are seen. I agree with Harry that the specific separation of above three species remains occasionally tenuous. C. martinicensis sometimes is difficult to separate from either C. lunulata or species C. spec. indet. (A). In one lot from Heald Bank, all three species seem to merge but at all other locations the separation is easily made; especially at deep-water locations, C. spec. indet. (A) is quite different from C. martinicensis.

For the present we recognize here above three forms as different species. About the distinctness of the fourth species, there is no doubt.

Previous references for the Texas faunal province are: 147, dead on Baker Bank, dead on Big Southern Bank; 174, listed; 206, listed in Tex. Conch., Vol. 9, p. 78; 222, extensive discussion. The following references are probably all misidentifications of C. lunulata: 136, dead in Gulf, alive in bay; 143, Matagorda Bay; 145, upper sound, Mississippi delta, pl. 2, fig, 12, A, B; 160, alive at several locations in Matagorda Bay.

Records H.M.N.S.: 59 lots, of which 14 contain live collected material.

Depth Range: 8-70 fms. (one sample however from 1.3 fms near Tambalier Island, La.); alive: 9-50 fms. in sandy and muddy bottoms, often in large numbers (dead).

Geographical Range: Gulf of Mexico, Caribbean, Panama.

Maximum Size: 3.2mm.

Eastern Pacific Analogue: Crassinella varians Carpenter, 1957, "La Paz and Guaymas, Gulf of California to Ecuador", Keen, 1971.

13. Crassinella spec. indet. (B).

A quite different species, also minute, has been collected in only a few lots of a few shells each. There can be no doubt that this is a completely different species because both surface sculpture and shape are different in many respects from the characters of the other three species. It is probable that Altena was dealing with the same form from Surinam (figs. 17 a-d in his 1971 paper). Our specimens are closest to his figures c and d. In many characters this species (B) seems comparable to the Panamanic C. adamsi Olsson, 1961, which is, as in species (B), the least triangular of the Crassinella's of that faunal province.

The most characteristic features of species (B) are: a regular, undulating concentric surface sculpture; an even rounded shape, although at times a hump in the frontal slope can be seen; a clear indication of radial sculpture between the concentric undulations. In general the material at hand possesses a surface sculpture, which is rather constant in intensity as opposed to the other three species. No color patterns have been observed.

This species has been collected at several locations off Louisiana and in the Galveston-Freeport area. It must be concluded that this is either a species endemic to the Texas faunal province or a South American species. One specimen was obtained from beachdrift (San Luis Pass, Galveston).

Previous references for the Texas faunal province are: 206, (as Crassinella spec. A), Tex. Conch., Vol. 9, p. 78.

Records H.M.N.S.: 10 lots, no live material, but some rather fresh.

Depth Range: 0-95 fms. (optimal 10-30 fms.).

Geographical Range: N.W. Gulf of Mexico, Surinam?

Maximum Size: 2.4 mm

Eastern Pacific Analogue: Crassinella adamsi Olsson, 1961. "La Paz and Guaymas, Mexico, to Ecuador" (Keen, 1971).

Genus Eucrassatella

Large, thick shelled bivalves, only one species in the subgenus Hybolophus in the Texas faunal province.

14. Eucrassatella (Hybolophus) speciosa (Adams, 1852)

Crassatella speciosa A. Adams, syn: Crassatella gibbesi Tuomey and Holmes, 1856, and Crassatella floridana Dall, 1881 (juvenile shell).

This is the largest of the Crassatillids of the Texas faunal province and apparently abundant in sandy mud bottoms in a range of 20-50 fms.

Live specimens are quite rare, but fresh dead valves are common. Remarkable is the discrepancy in shape during its life cycle. Very small juveniles (± 1 mm) are quite thin shelled, glassy, almost smooth and with a thin hinge plate, and the umbo is not very prominent. When the shell reaches about 5 mm it is quite flat, almost shapeless, with a prominent umbo and broad hinge plate. Only after this it acquires the typical shape of the mature shell and the sulcus becomes prominent. Often specimens are colored pink on the inside.

The species has never been collected on the beaches, but is dredged along the entire Texas-Louisiana coast in water depths of 13-70 fms.

Previous references for the Texas faunal province are: 32 (Crassatellites (Scambula) gibbesi Tuomey and Holmes), p. 1474, in artesian well at Galveston, Texas, at a depth of 2158-2920 feet below the surface, Singley; 45, repeats ref. 32, but credits it correctly to Harris; 144, offshore locations 504, 506, 1088; 145, deep shelf; 156, Stetson Bank (indigenous); 170, deep shelf assemblage, pl. 5, fig. 2; 175, outer shelf 40-65 fms.; common, mud bottom, whole coast, pl. 5, fig. 9; 206, Tex. Conch., Vol. 9, p. 78, (1973); 214, Campeche Bank; 225, Galveston; 236, Galveston.

Records H.M.N.S.: 47 lots, of which one contains live collected material.

Depth Range: 13-70 fms.; alive at 30 fms. in sandy mud.

Geographical Range: North Carolina, Florida, Antilles.

Maximum Size: 65 mm.

Eastern Pacific Analogue. None of the Panamanic forms appears close.

SUPERFAMILY CARDIACEA
FAMILY CARDIIDAE

In the N.W. Gulf of Mexico represented by the subfamilies Trachycardiinae with genera Trachycardium and Papyridea; Fraginae with genera Americardia and Dinocardium; Protocardiinae with genus Microcardium and Laevicardiinae with genus Laevicardium. The Cardiums or cockles have developed several endemic species in the Texas faunal province. They are bivalves with a characteristic hinge and usually outspoken radial sculpture and ventral crenulations.

Source: M. Keen in Treat. of Invert. Pal., Vol. N, part 2, pl. 583-590, 1969.
W.J. Clench and L.C. Smith, Johnsonia, Vol. 1 (13), 1944
R.T. Abbott, Monograph 11, Acad. Nat. Sci., Phila., 1958, p. 121-129.

Genus Trachycardium Morch, 1853.

Rather strongly built shells, higher than wide, often with spiny ribs. In our area five subgenera, each with a single species: Trachycardium ss., Dallocardia Stewart, 1930, and Acrosterigma Dall, 1900.

15. Trachycardium (Trachycardium) isocardia (Linne, 1758)
Cardium isocardia Linne, 1758, Syst. Nat., 10th ed. p. 679.

This heavy, fairly large bivalve is uncommon along the Texas coast. Beach specimens are known from Sargent, Matagorda Beach, Mustang and Padre Islands, especially south of Mansfield Cut from where live material is known (ref. 206). It does not enter the bays, but lives offshore. Valves have been dredged offshore Galveston and Freeport, but we have not seen any live material yet. The offshore Texas waters off Galveston are apparently the extreme northwest end of its range which is mainly along the South American coast from Surinam westwards (Altena, 1971).

As is often the case, the species appears to reach its largest size at the end of its range (77 mm.). In west Florida it is replaced by the endemic Tr. egmontianum (Shuttleworth), whose occurrence

in Texas was reported (ref. 110) but never confirmed. Juvenile specimens of a few millimeters have already all the characters of full grown specimens.

Previous references for the Texas Faunal province are: 15, single beach valves at Corpus Christi; 21, listed; 45, repeats ref. 15; 69, listed in appendix 8 and referred to on p. 53; 137, not in text, but figured on plate 9, fig. 1; 192, listed; 206, beach records in Tex. Conch., Vol. 2 (8), 1965; 269, figured on page 182.

Records H.M.N.S.: 9 lots, none alive, from beach and offshore sand bottoms.

Depth Range: 0-11 fms.

Geographical Range: Mainly in Lesser Antilles and along South American coast, west of the Guyanas.

Maximum Size: 77 X 64 mm.

Eastern Pacific Analogue: Trachycardium (Trachycardium) consors (Sowerby, 1833),

"The species is fairly common on tide flats from the northern part of the Gulf of California south to Ecuador and the Galapagos Islands and has been dredged from depths of 45 m." (Keen, 1971).

16. Trachycardium (Dallocardia) muricatum (Linne, 1758)

Cardium muricatum Linne, 1758, Syst. Nat., 10th ed., p. 680.

This rounder and smaller species replaces T. isocardia in the immediate shore area and in the hypersaline bays and inlets. In general, it lives too deep in the bays to be easily collected alive on the estuarine mudflats. Winter storms occasionally deposit live material on the beaches of Mustang and Padre Islands (ref. 206). Its popular name "yellow cockle" derives from its color which seldom has red in it as T. isocardia does. Only at Sargent one can occasionally collect reddish specimens. It lives along the entire Texas-Louisiana coast in shallow water and in the hypersaline bays (Galveston Bay, Matagorda Bay, Aransas Bay). Material from deeper than 15 fms. (Stetson Bank, Clay Pile Dome) is probably fossil. Juvenile specimens of 2-3 mm can be easily recognized and the differences which separate T. muricata and T. isocardia are already clearly visible in juvenile material of 1-3 mm.

Previous references for the Texas faunal province are: 1, single valve, Galveston; 7, listed; 15, dead valves at Galveston and Mustang Island; 16, Galveston and Corpus Christi, single valves common; 19, live specimens at Indianola, dead valves on Matagorda Island, Espiritu Santo Bay, Shell Bank and Corpus Christi Bay; 21, listed; 45, repeats previous references; 61, Corpus Christi area; 62, Mustang Is., 66, marine Pleistocene of Texas; 67, Port Isabel; 69, listed; 79, Port Aransas, Matagorda Bay, plates 1 and 5; 98, listed for the bays; 116, worn shells at Galveston, fresh shells St. Joseph Island, alive in Aransas Bays and Laguna Madre at Port Isabel, plate 10, figs. 7-8; 126, outer sandy beaches of Carolinian Province; 135, dead in Gulf, alive in bays; 136, dead shells on East Texas beach; off East Texas, 9 fms; 139, lower bays; 143, Matagorda Bay; 145, inlets; 146, inlets; 153, listed in Table 1; 160, listed for Matagorda Bay, alive at one, dead at many locations; 164, alive at Rockport, dead in Laguna Madre; 170, listed for shallow shelf assemblage; 174, listed; 175, listed for open lagoon or open lagoon margin assemblage; 202, figured; 206, beach records in Tex. Conch., Vol. 2, (8); 208, listed for tidal inlet assemblage, enclosed bay center and bay margin environment; 225, Galveston; 236, Galveston; 253, rare on reef off Padre Island; 269, figured on page 183.

Records H.M.N.S.: 37 lots, of which 6 contain live collected material.

Depth Range: 0-25 fms.; alive; 0-12 fms., in sand and sandy mud.

Geographical Range: In the entire tropical western Atlantic, from North Carolina, Antilles, Guyanas, Brazil into Argentina.
Maximum Size: 45 mm. Apparently this species reaches its maximum size at the southern extremity of its range in Argentina: 65 mm.
Eastern Pacific Analogue: Trachycardium (Dallocardia senticosum (Sowerby, 1833), "The recorded range includes the whole of the Gulf of California, south to Paitu, Peru" (Keen, 1971).

17. Trachycardium (Acrosterigma) magnum (Linne, 1758)
Cardium magnum Linne, 1758; Syst. Nat., 10th ed., p. 680.
This species has many of the characters of the subgenus, although Abbott, 1958, has expressed some doubt. Its outer surface is much smoother and its hinge line more curved than in Trachycardium or Dallocardia. Because of the narrower umbonal region this species appears more slender than the other two. Concerning the identity of T. elongatum Bruguière(see Clench and Smith) it may be remarked here that Texas specimens almost all have 36 ribs. T. magnum has been taken several times alive, but only on the offshore coral reefs and miocene shale outcrops (Stetson) where it is one of the many Caribbean species living there. Its color is more reddish than brown, sometimes with lighter areas and the inside may be suffused with yellow and pink. Early references in the literature mentioned this species for the beaches but these are erroneous identifications of Dinocardium robustum. The first correct report is by Parker and Curray (ref. 147), although perhaps Dall may have seen specimens as early as 1890.
Previous references for the Texas faunal province are: 7, listed; 147, dead on Big Southern Bank, alive on east Flower Garden; 206, listed in Tex. Conch., Vol. 9, p. 80, 1973.
Records H.M.N.S.: 3 lots, all of which contain live collected material.
Depth Range: 25-31 fms.; only on algal reefs and Miocene shale outcrops.
Geographical Range: Mainly along South American coast and Antilles, reaching extremity of range on Texas offshore coral reefs and shale outcrops. Southward into Brazil.
Maximum Size: 65 mm. (alive).
Eastern Pacific Analogue: Trachycardium (Acrosterigma) pristipleura (Dall, 1901). "This is not a common species, although it may be found by shore collectors anywhere between the southern portion of the Gulf of California and Guyaquil, Ecuador" (Keen, 1971).

Genus Papyridea Swainson, 1846.
Thin, somewhat rounded or elongate bivalves with coarse ribs on the posterior side, often with color patterns. Along the Texas-Louisiana coast live three species of which the most abundant surprisingly has remained unnamed. This species, related to P. soleniformis Bruguiere, 1789, is smaller, differently shaped and colored and lives in a different environment. Whereas P. soleniformis on the Texas coast is restricted to the offshore calcareous reefs, the other species is widespread over the muddy shelf, although it also has been taken on the reefs.

18. Papyridea soleniformis (Bruguière, 1789)
Cardium soleniforme Burguière, 1789, Encycl. Meth. 1, p. 235. (syn: Cardium hiatus Meuschen, 1787; invalid name used in Johnsonia).
This species in the Texas faunal province is restricted to the offshore calcareous reefs and Miocene shale outcrops (Stetson Bank) along the Texas-Louisiana coast where large, live specimens have been taken. It is much more elongated, more inflated than the next species and its ribs are never flattened in the median area of the

shell surface. It has a color pattern of rather squarish brown blotches on a light background, quite different from the pattern of the undescribed species. A few fragments of this species from a depth of 51 fms. probably come from a drowned coral reef. Juvenile specimens of a few millimeters can be easily separated from the other species which is, when small, more inflated and almost smooth.

References for the Texas faunal province are: 147, dead on Big Southern Bank; 175,(ex parte) only those reported for the calcareous bank environment; 206, (ex parte),listed in Tex. Conch., Vol. 9, p. 80.

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

Depth Range: 9-51 fms.; alive 9-25 fms. on calcareous reefs and Miocene shale outcrops.

Geographical Range: Apparently in the entire Caribbean area, outside sandy and muddy environments (not in the Guyanas).

Maximum Size: 48.5 mm (alive)

Eastern Pacific Analogue: Papyridea aspersa (Sowerby, 1833), "on sand-bars and beaches from Manuela Lagoon, Baja California, south to Peru, including the whole of the Gulf of California," (Keen, 1971). This species is so close, that I believe they are identical.

SEARCH AND SEIZURE

by Constance Boone

San Luis Pass is presenting a new look AGAIN. This area at the bridge between Galveston Island and Follets Island (the Freeport side) presents a new face so often that each time I go to collect I do wonder how to approach my favorite shelling areas. So many times now on the Galveston Island side one cannot reach the beach via the road to the Gulf just before you reach the bridge. The Gulf has taken a great deal of the beach area there except at very low tide. The old cars "planted" on the Gulf front once are now far inland. Water often laps the remaining dunes.

Nautical charts always list a caution that this shoreline is subject to continual change. For someone who has shelled this area for some twenty years, the yearly changes are fascinating.

My first memory of shelling on the Galveston side concerns a trip with junior high schoolers one spring Saturday. There was no bridge, and the dunes were deep and hard to walk across to reach the Gulf waters. The bus stopped at the road, and we trudged across the dunes to collect Olivas and Polinices. Most particularly, I remember going back to the bay areas, shallow and sandy and full of interesting "things". I saw my first live Mercenaria, a huge one dug by an eager student.

Through the years I have memories of foggy mornings when I had a hard time finding the water, listening for the roar of surf to locate the Gulf. There were early field trips when many shellers found good specimens, dead but fine, of the much-sought Amaea mitchelli, and I know one fellow who went one fall morning to shell and came home with two excellent Amaeas and a bucket of Busycon, Olivas, etc., but also some half dozen live Phalium granulatum.

Leola Glass and I used to hurry down to Galveston San Luis on cold, low tide mornings to walk the sand bars under the new bridge. It seemed to us that after the new bridge was built the sand built up at the pass and formed good bars that were exposed after northers caused low tides. We found many live shells, especially large numbers of both kind of Busycons. Live Phaliums, Murex fulvescens in the debris line, large Thais, Tellins, Terebras, Epitoniums, etc. We'd go one day, rush home to satisfy our husbands' wishes for return by nightfall, and then get up and go again the next morning. 1966, 1967, 1968 -- these were good years at the Pass. I saw two Tonnas collected there one morning. We dug heart urchins, collected gray starfish, picked up sea pansies live, all of which we watched in buckets of sea water and learned a little more about creatures of the sea.

To get to the bay side we usually had to wade across the inlet just west of the bridge at the Pass. This is sanded over now and only in spring months flows through.

The mud flats we waded to along the Pass west of the bridge were full of small shells like Tellina iris, Acteocina (formerly Retusa), Sinum, Terebra dislocata, Epitonium. It was like a nursery ground because you often found wee Busycon here and baby Polinices. More recently this area sanded up and you could drive to the bay point at this Pass area. Now once again the Pass waters have filled in almost to the dunes and you have to walk to the area. Fishermen have formed a road across the dunes to the bay some distance away from the Pass itself.

This whole area at the Pass must be treated with respect when driving. When the sand blows dry and soft a trap is set for cars. I've seen three at a time stuck trying to get from the turnabout at the Galveston bridge to the water at the Pass.

One of my pet shells is the Pandora. The mud flats at the Pass and along the edges of the inlets have supported living Pandora trilineata. For a few years I could count on finding several at very low tide, and for a time the sand bar on the Freeport side on the west end of the bridge was really a fine place to collect this species. This latter location is changed again; the sand bar is reduced and very poor for collecting. I have not found a living one at the Pass now for a couple of years, but it will be found again there.

On February 24th San Luis Pass was drained of much of its water due to very strong north winds some 24 hours before that morning. The sun was out; the winds had calmed; the temperature was rising from the low thirties. It was a good day to collect, and I spent several fine hours on the sand bars on the bay side. Several bars were completely exposed. The tidal change had been made, but the waters were slow to encroach the bars. The grassy knolls on some of the bars were almost dry. Polinices egg cases were everywhere. Busycons were popping up. I was more interested in the bars of sand exposed so rarely. I headed for these and began to see trails everywhere, tiny thready ones with gleams of white at the ends --- Epitoniums. Everybody knows I'm absolutely nuts about Epitoniums. The majority of the some forty I collected live were E. humphreysi. These bay shells are typically E. humphreysi. Sometimes I question the variety found in worm tube and sargassum debris on the Gulf front. Some of the specimens look like the humphreysi form, and I am never sure how much variability there is in the E. angulatum forms. I also collected E. rupicola and what I call E. apiculatum, at least that is the closest species to what I find. Once again I noted that on this bar were hundreds of living sand worms. What do these Epitoniums eat? I haven't been able to determine this yet to my satisfaction. I brought some home to watch under the microscope. This time I saw something new. E. rupicola has sooty slanting "eye-shadow" patches at each eye spot. I've never seen that on any other Epitonium, and I have looked at hundreds.

Collected also was a live Odostomia teres in a trail. I didn't know this until I got home as it is rather small. I just pick up trails in a sieve and examine when I get home. Of other collecting note was discovery of a Lyonsia and several live Solen viridis. The latter, as well as Ensis minor, seems not to be able to stand our Texas northers. This species and Ensis pop up out of their burrows and often flop up on the sand and die or lie stunned from cold. Even if found in the burrows, as were my Solen specimens, they are unable to retreat very rapidly and can be easily collected. Solen is not that easy to find live so I was pleased to get a few. The spring drift line usually has plenty of dead pairs along with Tellina iris pairs, so if you don't have this in your Texas collection, watch for it this year.

That day I could walk all across the bay beach to the point at the Pass. The inlet was completely sanded over. Only the lagoonal entrance at the foot of the bridge had a little water in it. The owner of the fishing camp does dredge this area for his boats. The mud around this lagoon was well exposed and slippery. I recovered a large Laevicardium mortoni

live and several Dinocardium.

I suppose that San Luis Pass will always be a mysterious, favorite place for me. Almost every time I go, I learn something new about the fauna. I doubt that man will ever really tame it, and it will present a new face from time to time. That just means I have something new to explore.

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Now if you have read this far I'll offer a few hints on some of the tools I use in this hobby of shell collecting. I promised to do this after talking about them to some of our members. Maybe some of the newer members will benefit.

Most of you know to use dental tools or crochet hooks in extracting animals and fishing out operculums of shells. I find that the thin copper wire bought on a spool is especially handy to use for tiny shells. This wire can be twisted easily, can be thrust up apertures of shells and curled in and around columellas and often brings out the operculum and animals when retrieved. A wee hook can be formed on the end to help the process. The wire can be doubled or tripled; it can be used on delicately-lipped shells; it doesn't corrode; it makes the life of a sheller a lot easier!

I also discovered long ago that I lose tools and need a goodly supply of inexpensive tweezers. I buy mine at the stamp and coin shops because these are lightly sprung and easy to work with. They come with many different points. They can be used to pick up micro shells and other shells that need special handling.

For Christmas I received an Opti-Visor which is very comfortable to wear in the field. It has a plastic band that is adjustable and you can buy several strength lenses for the eye piece that is set on so that it can be flipped up and down with ease, just as athletes use their dark glasses in the field. This visor lens could be used for sorting at home and can be used on the beach for examining drift. (Ask Hollis about the picture he made of me flat on my stomach picking out Epitoniums! Waders and all!) I found this device especially ideal for looking on and under rocks on my recent West Mexican trip. It was given to me to search out wee Nudibranchs, and for this it is ideal also.

By coincidence, I have learned that Larry Allen gave wife Betty this same device for Christmas, so it is available here in Texas. Mine came from California and has a 5 X lens.

Ask at optical companies, or call me for address of the company.

Shell stamps continue to proliferate.

Not too long ago, one was able to approach the collecting of sea-shells-on-stamp stamps with the comfortable feeling that after some effort, one would be able to obtain almost all of the stamps.

This is true no longer. More and more countries are issuing these philatelic items - with nice pictures of conchological goodies. For example, one of the latest issues (October, 1974) included the definitives (some 19 values) from Angola. They represent the West African fauna. The current price for this set is around $17 or $18. While these newer stamps are coming on the market, the older issues are becoming scarcer and more expensive.

Some years ago we started this series of comments with the intent of eventually reviewing and categorizing the various stamps. It is still planned to do this but it seemed useful to continue the preliminary compilation. The numbers run consecutively but the stamps are not listed in any special order. There are stamps that have been omitted (inadvertently) and these will be picked up when the entire list is revised.

From time to time we have hinted at the various ways in which seashell stamp collecting can be approached - depending on one's enthusiasm, time, and bank account. One point can be repeated - there will be no space problem at home. The stamps can be elegantly displayed in many ways in one or more albums that can be stored away easily on the shelf when not in use.

The philatelic aspects can be pursued additionally in several other directions. For example, there are many stamps showing allied marine life or marine environment or activities. Countries issuing seashell stamps have also put out stamps illustrating maps of the islands (or seacoast) and the surrounding waters. Fishing, diving, pearl culture and the like have been pictured on a number of stamps. The topical buff who is conchologically oriented could have a field day.

As for the conchological aspects, the rapid increase in the number of species depicted on the stamps now permit considerable exercise of individuality on the part of the collector. How can the stamp collection be organized? The easy and obvious way is to systematically separate the stamps by country of origin. But there are other methods of organizing the stamps. The cephalopods, for example, can now be put together in a meaningful way that will appeal both to the eye and the mind. The shell rarities constitute another interesting area. The bivalves on stamps are now beginning to grow into a sizable group. Certain families are represented regularly on stamp issues from many countries. The emphasis can be shifted to such subjects as shells and culture of the country, shells and art, shells and food, and so forth. Even a single stamp can lead to challenging research, conchologically and otherwise (such as the Burma stamp showing the "world's largest Pearl").

As before, the stamps are indentified by country of origin, face value, Scott number and mollusk depicted. Previous listings of seashells on stamps have appeared in the TEXAS CONCHOLOGIST for January 1969, February 1969, March 1969, April 1969, January 1970, February 1972 and September 1973.

	County	Face Value	Scott Number	Mollusk depicted
251.	Malagasy	3 fr	481	Volva volva
252.		10 fr	482	Lambis chiragra
253.		15 fr	483	Harpa major
254.		25 fr	484	Volva volva
255.		40 fr	485	Lambis chiragra
256.		50 fr	486	Harpa major
257.	Pitcairn Islands	4 ¢	137	Rhinoclavis & Mitra
258.		10 ¢	138	Pyrene
259.		18 ¢	139	Cellana & Siphonaria
260.		50 ¢	140	Clena (Lucine)
261.	Aitutaki	½ ¢	82	Murex ramosus
262.		1 ¢	83	Nautilus macrophalus
263.		2 ¢	84	Harpa major
264.		3 ¢	85	Phalium strigatum
265.		4 ¢	86	Cypraea talpa
266.		5 ¢	87	Mitra stictica
267.		8 ¢	88.	Charonia tritonis
268.		10 ¢	89	Murex triremis
269.		20 ¢	90	Oliva sericea
270.		25 ¢	91	Tritonalia rubeta
271.		60 ¢	92.	Strombus latissimus
272.		1 $	93	Biplex perca
273.	New Caledonia	3 fr	C113	Ovula ovum
274.		32 fr	C114	Hydatina sp.
275.		37 fr	C115	Dolium perdix
276.	Cook Islands	½ ¢	381	Phalicium glaucum
277.		1 ¢	382	Vasum tubinellum
278.		1½ ¢	383	Corculum cardissa
279.		2 ¢	384	Terebellum terebellum
280.		3 ¢	385	Aulica vespertilio
281.		4 ¢	386	Strombus gibberulus
282.		5 ¢	387	Cymatium pileare
283.		6 ¢	388	Cypraea caputserpentis
284.		8 ¢	389	Bursa granularis
285.		10 ¢	390	Terebra muscaris
286.		15 ¢	391	Mitra mitra
287.		20 ¢	392	Natica alapapillonis
288.		25 ¢	393	Gloripallium pallium
289.		30 ¢	394	Conus miles
290.	Cayman Islands	1 ¢	331	Hermit crab & shell
291.		3 ¢	332	Lyropecten nodosus
292.		15 ¢	339	Murex cabriti
293.		20 ¢	340	Strombus gigas
294.	Togo	10 fr	881	Tympanotomus radula
295.		20 fr	882	Tonna galea
296.		30 fr	883	Conus mercator
297.		40 fr	884	Cardium costatum
298.		90 fr	C230	Alcithoe ponsonbyi
299.		100 fr	C231	Casmaria iredalei
300.		90/100 fr	C231a	Souvenir sheet with the two values

BOOK REVIEW by H. Ode'
AMERICAN SEASHELLS, 2ND. EDITION, BY R. TUCKER ABBOTT,
VAN NOSTRAND REINHOLD COMPANY, 1974, $49.50, 663p.

It has long been my opinion--sometimes stated in print in the Texas Conchologist--that an intelligently annotated, modern checklist of the North American marine mollusk fauna should be written because it has become impossible to find one's way in the flood of papers, books and articles. Dr. Abbott has done much more in writing a scientific documentation of that fauna and has produced a book which will be intensively used for many decades to come. At the outset of this review, I would state that the value of this monumental compilation cannot be overestimated. Its importance lies, apart from its other merits, principally in the overview it affords over two entire faunas, one along the East Coast and one along the West Coast of the North American continent. In this review of the second edition of "American Seashells" I will discuss certain aspects related to completeness and usefulness for the reason that a more detailed evaluation of such a major and important work can be given only after it has been in use a year and preferably longer. No opinions about matters of interpretation shall be offered here.

Those who have grown up with the first edition will not recognize the second. The book has been expanded enormously and the arrangement of the illustrations has been changed. They are now distributed throughout the text, so that the book is much easier to use. As an apparent concession to the hobbyists, some of the larger, more colorful, collector's items are figured on a number of color plates, some of which--showing bivalves--I do not consider sharp enough.

The book reflects the explosive progress made during the last 25 years in the inventarisation of the fauna and the advances in systematic malacology. The previous edition was designed primarily for the serious amateur, but this edition is written much more with the professional biologist in mind and presents a long overdue scientific inventarisation of the fauna around the North American continent. It provides the student with an illustrated and annotated checklist composed with high competence and up-to-date knowledge of the subject. Categorical detail is much more systematically given than in the first edition; the arrangement has been modernized and much of the nomenclature has been updated. Among the many changes one finds that several long used and venerable names have been replaced by still older ones. For the first time shell-less mollusks are treated in extenso. Omitted are the introductory chapters of the first edition about shell collecting, elementary terminology and biology, which within the scope of the second edition would have been indeed out of place. Thus, it can be truly said that this is a completely new book.

How convenient it will be when in use is at this moment difficult to judge. Because its scope is so enormous, only the briefest details are given in the descriptions. These, in general, are excellent and often have been taken unchanged from the first edition. Occasionally, this produces some contradiction--for instance under the generic description of Pseudochama it is stated that only one species lives in the western Atlantic, but two are cited. For the Turridae now treated in 30 pages (570 spp) the author repeats the original statement that a book of this size cannot do justice to the many interesting species. Photographs and drawings are sometimes designed to provide only an overall impression of the species they depict, without really showing all significant detail. In my opinion, the hinge structure of many bivalves, e.g. the Leptonids, cannot be adequately judged from the figures. Hence for many small, but common and widespread species, it will be necessary that the user do a considerable amount of hard work in going to the original literature. In par-

ticular, this will be necessary for the Family Corbulidae, for which the old line drawings prepared for Dall have been used. These in my opinion are misleading. The omission of most references, except for those species reported or described in the last 20 years or so, is undoubtedly caused by limitations of price and volume, and however much one may regret this omission, one has to live with it.

Comparing the book with two other fairly recent publications, the "Treatise of Invertebrate Paleontology" and the second edition of Keen's "Sea Shells of Tropical West America", one notices many differences in taxonomic detail among all three. A discussion of these various other opinions is not given by Dr. Abbott, and for the sake of brevity correctly so, but I mention it here because the ease of use of the book will be affected by it. In this respect, it may be stated here that in the use of genera and subgenera any author should be allowed a certain freedom depending on his familiarity with certain groups and his personal preference. It is unavoidable that in this manner a somewhat random emphasis on taxonomic details is introduced, the more so because at present many groups of mollusks have not yet been carefully reviewed. Dr. Abbott considers for instance Pitar and Agriopoma to be generically different, but he does not separate, even on a subgeneric level, Timothynus from Diplodonta, whose hinges appear even more different to me. In general the author has followed a rather conservative course, without giving the user all possible detail, but enough to outline the main categories presently in use.

Under the heading "other species" many of the rarer or less well known species are listed, sometimes with brief annotations. These are mostly reported under the generic assignment by the original author although this may be in error. For instance Mysella triquetra Verrill and Bush is not a Mysella, but a Spheniopsid bivalve. Until for many of these listed species a more definitive choice can be made---which often will have to await dissection of soft parts as in the case of Henrya, of which it is very unlikely that it belongs in the Aclididae---the choice of the author to use the original assignment is a prudent one.

Distribution data are much more completely cited than in the previous edition, but I would have preferred to have seen the term "West Indies" replaced by more precise localities. I am pleased to see that among the location data the Gulf of Mexico is much better represented, although by no means completely. Here I may mention that remarks by Dr. Abbott about the rarity of a number of species gives additional weight to the view that the Northwest Gulf of Mexico harbors a fauna quite different from the so-called Carolinian fauna. Many bivalves common off the Texas and Louisiana coast are labelled "rare" in the book: Cyclocardia armilla, Nemocardium transversum, Nucula aegeensis. The author can hardly be blamed for this omission, but in spite of much dredging by oceanographic institutes, hardly any systematic results have been published for the N.W. Gulf of Mexico.

Often species are cited having their distribution entirely outside the North American continent. Such species are not nearly as completely reported as those from around the North American continent. For instance most of Altena's species from Surinam apparently did not make the deadline for the manuscript. On the other hand the number of species described from U.S.A. coastal waters omitted or missed by the author appears to be small. As examples can be cited Laevicardium fiski Richards, "Mulinia" pontchartrainensis Morrison and Vioscalba louisianae Morrison. Such omissions are in a work of this size unavoidable.

Because the work undoubtedly will be used as a standard reference for many years to come and justifiably so, an important aspect of its usefulness is its completeness not only in the enumeration of species, but also in the correct assignment of genera and location data. In the numerous papers

about local faunas which have appeared during the last twenty years, many misidentifications have been made, mainly because a reliable and comprehensive standard reference work was missing. Checklisters in the future will not have that excuse anymore. Once erroneous reports appear in print, they are repeated by other workers until finally everyone is convinced of the correctness of the initial report by the weight of the later "evidence". This course of events is illustrated by Nucula proxima, which has often been reported for the N.W. Gulf of Mexico. Abbott figures for the first time both N. proxima and N. aegeensis on the same page with excellent figures. From these it is obvious that the widespread Texas-Louisiana species of shallow water is not N. proxima, but must be very close if not identical with N. aegeensis. Thus Abbott's second edition has proved to be quite useful. But now there are two problems: (1) does N. proxima live in the Gulf of Mexico, for which Abbott cites it, (2) is our species really N. aegeensis? The first question cannot be answered without knowing the date on which the citation is based. The second question can in principle be solved by comparing Gulf of Mexico material with museum material of all listed species of Nucula. Thus one can arrive at a tentative identification--provided the species is not new--by exclusion of all nonspecific material. I might emphasize here that this exclusion principle is the only safe method of identification. But suppose now that one wants to identify the species described by Dall as Nucula callicredemma, which is widespread in the deeper waters of the Gulf of Mexico. It is not listed by Abbott. This argument may suffice here to show that some aspects of the usefulness of this compilation are difficult to judge at present.

Most of the preceding remarks concern relatively insignificant points when one considers the book as a whole. It impressed upon me more than anything else the need for additional taxonomic work and more precise distribution data. It is particularly gratifying to me that when used in conjunction with Keen's compilation, Abbott's work will make a significant comparison of Atlantic and Pacific faunas practical for the first time.

The book is surprisingly free of misprints: Lopho instead of Lopha on page 457, Barginella on page 250, Eulimastomia instead of Eulimastoma in the index; however a number of essential corrections in figure labels has escaped the eye of the proofreader: 4818 should be 4810, 1508 should be 1628, 5564 should be 5524 (page 480) and 5772 (page 505) is in error. Some slight errors in the use of Latin names have also escaped the attention of the author: Teinostominae instead of Teinostomatinae; Glyphostoma should be of neuter gender and Cerithiopsis has remained and is even specially mentioned to be of a neuter gender, which it is not. The Greek noun ἡ ὄψις means vision (ability to see), face, or in this context "the likeness of....". The neuter gender of Cerithium cannot change the feminine gender of ὄψις . The gender of the principal noun is always conserved and ὄψις is not an adjectival ending as for instance -oides in Parviturboides. Linga amiantus instead of Linga amianta also persists, although amiantus is the Latinization of a greek adjective meaning pure, clear, immaculate and hence should take the ending corresponding to the gender of Linga.

In conclusion I may state that the price of $49.50 for many may be too much of an investment, but for it one acquires the only up-to-date, fairly complete and certainly authoritative overview of the North-American marine mollusk fauna in existence, succinctly condensed into 663 pages.

BOOK REVIEWS

by W.W. Sutow, M.D.

THE SHELL MAKERS. INTRODUCING MOLLUSKS. BY ALAN SOLEM. John Wiley & Sons. 1974. 289 pages. $9.95.

Once in a great while there comes along a book that is strikingly different, that is readable, and that is authoritatively informational. Such is this book and it is strongly recommended to anyone who collects seashells seriously.

This is not a book of shell photographs for artistic or identification purposes. This is not a check-list of shells from specific geographic areas or from typical faunal habitats. Then what is this book all about?

As the title indicates this is a book about mollusks - not primarily the shell. It is an introduction to the biology, ecology and structure of shells. The point of view is that of "ecological anatomy" as the author puts it or perhaps "paleontological biology". In the author's own words, the book "presents new ideas about what the first mollusks might have looked like and why it eventually had a spiral shell". The author speculates "on the origin of shells, why pulmonate snails are so successful on land, and why so many land snails evolved toward slugdom".

The titles to the 13 chapters are in themselves intriguing and arresting. In order, the chapter headings are: Understanding Variety; The Molluscan Patterns; From Life's Start to Shells; The Slow and the Quick; Filtrationists; Gliding Browsers; Sophisticated Hunters; Vanishing Freshwater; To Scrape a Living; The Road to Land; Experiments in Living; On Becoming Sluggish; and, Why Who Lives Where.

There are 4 appendices: Outline Classification of Mollusks; Selected References; Glossary of Terms; and, a brief section on care and feeding of mollusks. The book is profusely illustrated. In addition to color photos of living mollusks, and line drawings of good scientific quality, there are electron microscopic photographs seldom seen outside the pages of specialty journals.

In the discussions, a firm scientific base is maintained, yet the style permits ready comprehension by the average conchologist. The book does not contain detailed descriptions that characterize a true reference source. But the scope and authoritativeness would qualify this book as required reading for varied courses in biology and invertebrate zoology.

The author is a well known professional malacologist who is currently Curator of Invertebrates in the Department of Zoology at the Field Museum of Natural History in Chicago. Dr. Solem was president of the AMU 1969-70. His research interests include systematics and zoogeography of non-marine mollusks, evolution and comparative morphology of slugs, and phylogeny of non-marine mollusks.

One of the seashells that has appeared on many, many stamps is the Indian chank. The very first stamps issued by Cochin (a feudatory state in the Madras States Agency in southern India) in 1892 showed the state seal. One component of the state seal was a stylized representation of the sinistral form of the sacred Indian chank. From then through 1949 many issues and numerous values all depicted that state seal and with it the stylized shell.

Travencore, another feudatory state in southern India, also began to issue stamps in 1888. The central design on the very first stamp was a stylized Indian chank which appeared on the state seal. Through 1933, several variations of the state seal were shown on the stamp, all of which featured the chank shell. Later issues through 1946 became more pictorial and the design changed. However, most of them still included the chank shell, though this was now reduced to a tiny, incidental item on the stamp.

In 1949, the United State of Travencore-Cochin was established and began to print stamps. The stamp design in the early issues was based on the Travencore issues. In 1950, however, the new country issued a stamp featuring a highly stylized chank shell as the central design.

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The religious significance of the Indian chank shell is discussed in detail by K.D. Rose in the article entitled "The Religious Use of Turbinella pyrum (Linnaeus), The Indian Chank" which appeared in The Nautilus, 88.1-5, January, 1974. It is interesting to note that the name for this shell was considered to be Xancus pyrum (through a ruling on priority by the International Commission on Zoological Nomenclature in 1926). However, the ruling was reversed in 1957, "formally suppressing the name Xancus and requiring the use of the name Turbinella." The Indian Chank Shell, therefore, is Turbinella pyrum (Linnaeus).

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The problem with some Japanese books on seashells is the fact that the text is in Japanese. The color photographs are superb and the Latin names provide satisfactory identification. But the rest of the material is not understood.

A case in point is the book called "KAI (SHELLS)", co-authored by Tadashige Habe and Sadao Kosuge. The fly-leaf translation of the title into English is "Common Shells of Japan in Color by Dr. Tadashige Habe". The main text under each item concerns the usual scientific data (professionally done) dealing with description, habitat, distribution and so forth. But the "footnotes" are something else again. They are tidbits of most fascinating information.

As one browses through these footnotes (which, incidentally, are appended vertically along the outside margins of the pages) one learns, for example, of the approximate numbers of species found in Japan for a number of genera. Some of the numerous molluscan speciations in Japanese waters include: Arcidae (50 species); Mytilidae (74); Pectiniade (62);

Cardiidae (60); Veneridae (125); Limidae (29); Asaphidae (35); Dentaliidae (31); Chitons (90); Fasciolariidae (69); Mitridae (180); Olividae (38); Conidae (120); Turridae (400+); Terebridae (75); Epitoniidae (100); Buccinidae (230); Nassariidae (71); Pyrenidae (65); Rapidae (52); Muricidae (200+); Cymatiidae (61); Cypraeidae (75); Eulimidae (100+); Maticidae (90); Strombidae (38); Cerithidae (70); Neritidae (40); Turbinidae (40); Fissurellidae (60); and, so on.

Other footnote items include mini-biographies of people and notations of events of significance to Japanese malacology. One reads that Hilgendorf in 1875 purchased in a souvenir shop in Enoshima the slit shell that established the existence of Pleurotomariidae in Japanese waters. However, what is probably Mikadotrochus beyrichii was figured as early as 1843 in a Japanese book. Early publications describing the molluscan fauna from this area were written by people like Philipp Franz von Siebold who collected in Japan from 1823-30 and 1859-61. Arthur Adams also collected in Japan in 1843-46 and 1859-61. William Dunker published "Mollusca Japonica" (1860) and "Index Molluscorum Maria Japonica" (1882).

The origins of many Japanese (and occasionally Latin) names for the seashells are discussed. Sometimes these comments appear to be speculative but nonetheless they are intriguing. For example, Guildfordia yoka is a fascinating shell and I had wondered what gave rise to the specific name of yoka. On page 17 of the book, it is stated that this is the expression for "good" or "fine" in the Kyushu (southern Japan) dialect. The name implies a good or a fine shell. (You can take it or leave it but it is a fact that the adjective is in daily use today in southern Japan).

The Japanese designations for the shells are truly fascinating, descriptive and picturesque. The Japanese name for Lunatia marmorata translates into "the shell that shines in the night". Terebridae are "bamboo shoot" shells. Conidae are "potato shells". Cowries are "treasure shells". The genus Donax are called "children (offsprings) of the waves". Spondylus barbatus sheds its beard and becomes, in Japanese, the "chrysanthemum of the sea". Some names are more or less direct translations of the Latin such as "purple-mouthed coral dweller" for Coralliophila violacea. Occasionally, the names are practically identical with the English common names. These include the "moon and sun" shell for Amusium japonicum, "spider shell" for Lambis lambis, "quail" instead of "partridge" tun for Tonna perdix. Rapa rapa remains the "turnip shell". But how about "devil's fang brush shell" for Mitra papalis?

Lambis chiragra is the "word for water shell". This derived from the arrangement of the six spines of the mollusk which was thought to resemble the Chinese character for "water". We recognize Arcidae as "ark shells". The well-known Arca noae from European waters refers to "Noah's ark". Arcidae are called "boat shells" in Japan. It is stressed, however, that the designation originated independently in the Orient and was not derived from the Occidental reference to "ark".

When Japanese names and particularly Japanese words are incorporated in the generic or specific designations, it becomes impossible for the non-Japanese to guess their origins. For example, let us look at Mancinella siro. "Siro" means "white" in Japanese but the spelling needs comment. During the recent World War nationalistic feelings ran high and anti-American attitudes influenced even the spelling of words.

White is still pronounced "shiro" and used to be written that way before the war. To indicate Japanese nationalism "shiro" changed to "siro". Now the word is written both ways.

In typical Japanese style, a number of short poems are inserted here and there. These poems relate to shells in various ways but the understanding of the subtleties of poetry requires more than a casual knowledge of the language.

oooooooooOoooooooooo

SEA SHELLS by S. PETER DANCE. Bantam Book/Grossett & Dunlap, Inc. 1973. 159 pages. $1.45.

This paperback is the British counterpart of Abbott's well-known Sea Shells of the World. The book is small, inexpensive and informational. It is a useful book for beginners and is suitable even for those who consider themselves more than casual shell collectors. It is recommended highly.

NOTICE OF SAN MARCOS SHELL SHOW

The San Marcos Shell Club will present "Our Molluscan Heritage from the Land and Sea", a bi-annual shell show, according to a schedule of events received from Mrs. R. Thacher Gary, on October 11 and 12, 1975, in San Marcos at the Austin Savings and Loan Association Building, 308 East Hopkins Street, San Marcos, Texas. Anyone interested in entering this show should write Route 1, Box 327C, San Marcos, Texas 78666, for a schedule. Deadline for returning entry blanks is September 12, 1975.

A number of our members prepared entries for the first San Marcos show two years ago and were successful with them, winning several awards. Mrs. Gary remarked in her note that this show will be an official Bicentennial affair and is being given nationwide publicity.

Texas CONCHOLOGIST

VOLUME XI, NO. 4 JUNE, 1975

NOTES & NEWS

The Officers and Directors for 1975-1976 are as follows:

President	Wilson Ward
Program Vice-President	Frank Petway
Field Trip Vice-President	Ruby Ray
Treasurer	James Sartor
Recording Secretary	Cynthia Biasca
Corresponding Secretary	Margaret Baldwin

Directors

Merle Kleb
Jim Hudson
John Kosut
Constance Boone
Rosemary Habermacher

At the April General Meeting, Dr. Sutow was the speaker. His topic was "molluscana" which covered several diverse areas. Of special interest to Conchology Society members everywhere was his wonderful tribute to Ernest Libby, a member from Saipan who died recently. Along with a commentary of charm and humor, he showed about 40 slides of "Ernie". Dr. Sutow presented the club with a check for $100.00, given by Dr. & Mrs. Sutow, Mr. & Mrs. Tom Kister, Mrs. George Major and Dr. Margaret P. Sullivan to buy books for the library in Ernest Libby's name.

The May Shell Show was a great success, both in terms of interest from the public and financial return. The gross income from the Shell Shop was $1,924.00, netting us, after expenses, $1,833.35.

At the May General Meeting, the club voted to add $50.00 to the Ernest Libby Memorial Fund, and to give $300.00 to the Museum of Natural Science for operating expenses. It was also decided to publish an extra issue of the Texas Conchologist next year, a continuation of Helmer Ode's articles, with this bonus issue to be mainly figures (illustrations) of shells previously discussed.

The Conchology library at the Museum of Natural Science will be open weekends to members this summer. Ask for Susan at the information desk.

The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas and is included in the membership dues.

The society holds meetings the fourth Wednesday of each month except June, July and December at 8:00 p.m. in the Houston Museum of Natural Science.

The TEXAS CONCHOLOGIST is mailed, postpaid, to regular members of the society, with the exception that only one copy is mailed to a family. Overseas members will be charged the additional postage required at the beginning of each fiscal year (June).

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

EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Odé
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double-spaced and should be submitted to the editorial staff.

Dues for the 1975-76 fiscal year starting June 1 are due and payable to:

Houston Conchology Society
James Sartor, Treasurer
5606 Duxbury
Houston, Texas 77035

DIRECTIONS TO 13 MILE ROAD FROM HOUSTON FOR JULY 19, FIELD TRIP

Take Inter. 45 to Galveston. Get off at 61st Street exit. Turn right at 61st Street and proceed straight ahead on 61st Street until it intersects with Sea Wall Blvd. (F.M. 3005). Turn right and proceed straight ahead towards San Luis Pass. 13 Mile Road intersects with San Luis Pass Road 6.2 miles after you come down off Sea Wall Blvd. Turn left at intersection and proceed to beach.

FALL AUCTION NEEDS SHELLS

Mrs. Barbara Hudson has accepted as Chairperson for the Fall Auction. Donations of shells for the sale are needed urgently. If you are collecting this summer, collect for the auction; if you are trading shells, trade for the auction; if you are screening dredgings, screen for the auction. Duplicates, triplicates, even quadruplicates are welcome. All proceeds go to the club.

Displays by members filled the east end of the Mall and were grouped for easy viewing by the public. This encouraged seeing all the displays. Votes from the public awarded Wilson Ward the first place ribbon and Constance Boone the second for most popular exhibits.

This is a non-judged show to encourage membership in the Houston Conchology Society, Inc., and to afford the chance to offer donated shells in the Shell Store for the purpose of deriving funds to maintain our growing library,available to members and housed at the Houston Museum of Natural Science. Funds are also used for assistance in publishing The Texas Conchologist, a quarterly mailed to members, the Newsletter, sent nine times a year before meetings, and for other planned publications. A yearly sum is given to the Houston Museum of Natural Science where the Society meets. The Society is a non-profit organization devoted to study and enjoyment of mollusks and other sea life.

Displays were set up as follows:

Fritz Lang, a general collection.
Clarice Van Erp, growth series of Pleuroploca gigantea, and other large shells, mostly orange, her favorite color.
Constance Boone, Spondylus from Florida and Gulf of California.
Laurence and Anella Dexter, Texas beach collection.
Ruth Goodson, Pectens and large worldwide shells.
Gary LeBlanc, age 16, worldwide.
Deborah Mahavier, age 13, general.
Mary Myers, rare shells of the past and shells from Mauritius.
Wilson Ward, Cypraeidae and Conidae, also worldwide.
Rosemary Habermacher, Murex and worldwide.
Fannie Miron, table for the blind.
Margaret Rogers, table for the children.
Cynthia Biasca, Florida shells.
Linda Serrill, shells from Matagorda Peninsula.
Lloyd Meister, Strombus.
John Edstrom, decorative shells.
Mary Lea Bivona, worldwide.
Laura Montgomery, Lambis and Epitonidae.
Sam Miron, worldwide, other marine life, display on how to clean shells.
Doug Reynolds, microscopes.
Frank van Morkhoven, photos of micro-mollusks.
Margaret Baldwin, Shells from Baja California.
Tina Petway, Conidae.

The success of this show is due in great measure to these members who took the time to bring their shells to the Mall for this special event sponsored by the Society.

The shell store proved to be a very popular part of our 1975 shell show. We met and talked to people from various parts of the world, including Canada, Alaska, Scotland, England and Singapore, as well as many people from Houston who professed an interest in joining The Houston Conchology Society. We invited them to attend our May meeting, and information slips were distributed to the public.

Financially, the store also proved successful. We completely sold out of packaged trays, Texas boxes, filled cockles and the smaller filled shells, plastic box arrangements and driftwood. We had over 800 packages of individual non-specimen shells and over 600 specimen packages and sold most of these. This success is due to the many hours of hard work given so faithfully and cheerfully by a number of our members. Those of us who worked together for so many sessions found it very rewarding because we all learned while we worked and because we became much better acquainted with each other. We were especially pleased that some of our newer members joined with us in preparing for the show. We want to thank Ruby Ray for the popular Texas shell boxes and Mary Myers for making all of the plastic covers for the boxes, as well as the ballot box and various signs; Barbara Hudson for cleaning, packaging and identifying all the specimen shells; Margie Woods for cleaning, packaging and identifying the non-specimen shells; Merle Kleb for the beautiful plastic box arrangements; Constance Boone for all of the driftwood and for pricing everything in the store; Jo and Beth Irwin for making the small filled shells; Tina Petway for the driftwood arrangement samples; Mary Courtade for the filled large cockles; Rosemary Habermacher for all of the price signs and the "butterflies from the sea" arrangements; Ruth Goodson for the plastic boxes of small shells, the Janthinas, and the many shells she brought us from Baja. These same members, along with Leola Glass, Cynthia Biasca, Margaret Baldwin, Thelma Loughmiller, Fannie Miron, Sam Miron, and Hazel McKee cleaned shells and packaged all of the trays.

We also thank those who worked in the store for their many hours of help: Rosemary Habermacher, Cynthia Biasca, Mary Ann Curtis, Margaret Baldwin, Clarie Van Erp, Ruby Ray, Constance Boone, Ruth Goodson, Jo Irwin, Beth Irwin, Barbara Hudson, Jim Hudson, Thelma Loughmiller, Fannie Miron, Sam Miron, Jim Sartor, Lloyd Meister, Merle Kleb, Tina Petway, Delssohn Conway, Mary Courtade, Wilson Ward, Jane Maier, Mary Lea Bivona, Jane Mahavier, Helmer Ode and Frank van Morkhoven.

Lastly, we thank everyone who donated shells (and some who hurriedly went home at night and cleaned and sorted some of their own shells for the store when we began to sell out). We are most grateful to our out-of-town members, Miss Mary K. Foote of South Padre Island; Mrs. Bonnie G. Holiman of Jacksonville, Florida; Dr. George E. Metz of Pleasanton, California; and George G. Gundaker of Atlantic City, New Jersey, for their most generous donations of shells. These helped tremendously and enabled us to offer a much larger variety of shells for sale.

Total receipts of store $1,924.50 !!

There will be some expenses before the net amount can be determined. This gross total does not include the expense check from Sharpstown Mall which will help pay for tables.

A TRIBUTE TO ERNEST L. LIBBY, SHELL COLLECTOR AND FRIEND

by W.W. Sutow, M.D.

Ernie Libby, beachcombing along the shores on the lagoon side, Rongelap Island of the Rongelap Atoll, Marshall Islands, 1969.

This is the "aurak" (Strombus taurus) country he loved so much.

Ernie Libby was born in New Hampshire on July 11, 1909 and died in Honolulu on April 3, 1975.

Ernie had many talents - and was the master of most of them. He is best known as a photographer (marine life), shell collector and electronics engineer. His photograph of the Scotch Bonnet (Phalium granulatum) sitting on top of the column of eggs it is depositing is one of the earliest and most famous pictures (widely reprinted) of living mollusks. His article, "Miracle of the Mermaid's Purse" first appeared in the National Geographic Magazine in September, 1959 and was republished in the book "Wondrous World of Fishes". Many of these photographs were the result of his work at the Marine Studios at Jacksonville, Florida, from 1953 to 1960. Since then Ernie's photographs have appeared in a number of quality magazines and books.

In recent years, Ernie directed the section of Medical Photography at the University of Texas M.D. Anderson Hospital and Tumor Institute in Houston from 1960 to 1966. Ernie joined the Houston Conchology Society in 1960 and continued his membership until his death. Ernie is responsible for the format of the TEXAS CONCHOLOGIST; the masthead is his design. In 1966, he moved to Saipan to become a renowned teacher of medical electronics and a friend of the native Micronesians.

Ernie possessed a unique feeling for artistic beauty. One expression of this talent was the preparation of several portfolios of prints of X-ray pictures of seashells. To his many friends, Ernie's outstanding personal attributes were his unlimited energy and contagious enthusiasm. One of the most memorable events occurred many years back on the Bolivar peninsula one cold windy wintry day. We dug up a mess of quahogs (pollution was minimal then) and Ernie cooked, out there at the beach, some genuine New England clam chowder. That really warmed up the body and nourished the spirit.

Ernie had many dreams that he did not have the time to fulfill. One was to serve to his fellow collectors a New England clam bake complete with lobster and all the trimmings, prepared in the field. He left for the South Pacific too soon. Another was a photographic portfolio of selected seashells. He had a thousand ideas that had to be put into hibernation while he underwent surgery (several times) on his eyes. Perhaps the

grandest dream he had was the construction of a museum on Saipan to preserve the Micronesian history and culture. The site was already selected. Prominent in these plans was an aquarium and a large shell display. He died too soon.

Ernie had an instinctive sense of timing. Even under the most trying circumstances, he communicated a wry humor that somehow eased the tension. And when the tables were turned and Ernie himself was the subject and not the cameraman, he really went to town. Hundreds of pictures attest to the unique histrionic ability with which Ernie was blessed.

We shall miss him.

MOLLUSCANA by W.W. Sutow, M.D.

Editing a publication is no mean feat and William R. Keeler, the present editor, should receive well-deserved thanks for undertaking the responsibilities. He is doing the job well. By the same token, Helmer Ode earned highest commendations for so superbly guiding the TEXAS CONCHOLOGIST during the preceding 10 years.

When a manuscript is forwarded to the editor, he may not have a precise knowledge of the exact space that the article will fill when printed. It is inevitable that blank spaces will be left over sometimes. Since these problems surface when the pages are laid out, there may be insufficient time to write additional material.

Hence we come to the subject of "fillers". They are those little bits of reading that fill out the pages - so well illustrated in the magazine READER'S DIGEST.

In order to help out our editor it is proposed to prepare a number of short paragraphs that the editor might use as the need arises. In order to maintain some continuity in the subject matter used as fillers, these brief paragraphs will be prepared under the following headings: "Shell Books of the Recent Past", "Mini-Book Reviews" and "Mini-Biographies". It is hoped that if these fillers turn out to be useful, other subjects might be added and that the readers may themselves forward contributions. As fillers, these paragraphs will be so written that the editor can lop off one sentence at a time (from the bottom) to fit the space need. What will appear in print, then, will vary in completeness with which the subject is discussed.

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"Shell Books of the Recent Past" will be short comments on those publications which appeared before 1950 (but after 1920) and which may not be published again in revised editions. For practical reasons, only those books in this writer's personal library will be reviewed initially. Almost all of these books are out of print. The titles of many may be unfamiliar to the current generation of shell collectors.

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LA CONCHIGLIA has been mentioned as an Italian publication that is printed in English, usually 10 issues to a volume during one year. The current volume completes the 6th year. Some beautiful color photographs of seashells have appeared in these pages.

Nawona A. Gary of the San Marcos Shell Club (and a fellow collector well-known to many of us) has written an article on "The Genus Lambis Röding, 1798". Colorful photographs show two views of each of the species discussed (photographs are credited to Mrs. Elizabeth Dibrell). The text concerns the author's efforts "in collecting this genus by purchase only".

In the following issue (January/February, 1975, Volume VII, No. 71/72) the author continues the subject and discusses "Taxonomy - the Characters that Determine Classification". Additional photographs are provided to illustrate the significant characteristics of the subgenus, species and subspecies that comprise this genus. These articles nicely supplement the scientific presentation of the genus by R.T. Abbott in Indo-Pacific Mollusca 1:147-174, 1961. (This is the only reference listed by the author in these two articles.)

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THE TABULATA (named for Neptunea tabulata) was a quarterly publication (and a darn good one) of the Santa Barbara Malacological Society (California). Beginning in 1967, seven volumes were published through October, 1974. Then the journal ceased publication.

During its lifetime, THE TABULATA published a number of top quality articles emphasizing heavily the mollusks of the American West Coast. Typical of its sensitivity towards scientific integrity, the final communication from this journal was a well-edited index of the material that had been published.

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The meetings of the American Association for Cancer Research and the American Society of Clinical Oncology were held in San Diego, California, this year. The scientific sessions as usual were excellent and instructive. The meetings, however, produced unrelated bonuses as far as I was concerned.

First, I had the opportunity, after a long period of time, to eat fresh abalone. These were of the green variety and were caught off the coast of Mexico. They were prepared, to order, by the Japanese cuisine at the restaurant. While many will sing the praises of the "abalone steak" (pounded and then prepared) nothing, in my opinion, can match the dish prepared by the Oriental techniques.

Second, and perhaps more memorable, I had the chance to meet Colonel (retired) George A. Hanselman. Those who have seen the chitons prepared by this gentleman will realize how well they can be mounted. We spent a whole afternoon browsing through his chiton collection. While Colonel Hanselman has a splendid general collection, systematically and effectively kept in his cabinets, it is easily apparent that his first love is the

chiton group.

Colonel Hanselman took time to show me the equipment he uses to tie down the chitons. His technique is well described in several publications but it is hard to put into print the meticulousness with which he works and the patience he has. Perhaps as impressive as the chiton collection was Colonel Hanselman's library (on chiton literature). One left with a deep respect for his knowledge of the subject and appreciation for his and Mrs. Hanselman's hospitality.

I was very anxious to learn if any new publications on chitons are in the offing. There doesn't seem to be one, not just yet. Most impressive to me was to learn that Pilsbry's books still appear to be the best on the subject - but getting the two volumes from the set is something else again.

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Talking about books, the sudden plethora of excellent references for the collector is a relatively new development. Except for some continuing monograph series (JOHNSONIA, INDO-PACIFIC MOLLUSCA, OCCASIONAL PAPERS ON MOLLUSKS) most of the books used widely by the collectors have been published after 1950. Here are the dates of the first edition of some of them:

Title	Year of Publication
Kira: The Shells of Japan	1954
Abbott: American Seashells	1954
Keen: Sea Shells of Tropical West America	1958
Warmke & Abbott: Caribbean Seashells	1961
Habe: The Shells of Japan (II)	1961
Cernohorsky: Marine Shells of the Pacific	1967
Burgess: The Living Cowries	1970

FIELD BIOLOGY COURSE

Dr. T.E. Pulley, Director of the Houston Museum of Natural Science, will teach a Field Biology course four Thursdays in July, beginning July 10. There will be at least two field trips on weekends, one probably to the Huntsville or Big Thicket area and one to the seashore area. The course is part of the Continuing Education series offered by the University of Houston. Fee is $15.00 per person. Anyone over 65 can attend free. Information on registration can be secured at the Houston Museum or at the University of Houston Continuing Education Center. Classes will be held at The Houston Museum and are evening sessions, starting at 7:30PM.

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The supplement to "American Malacologists" edited by R. Tucker Abbott, mentioned in the December issue, will be available in June for $2.00. The original "American Malacologists" is now published in paperback at $4.75. Either or both may be ordered from "American Malacologists", P. O. Box 4208, Greenville, Delaware, 19807.

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

(A Continuing Monograph) by H. Ode'

PART I -- CRASSATELLACEA - POROMYACEA

Note on Crassinella:

In a previous issue of the Texas Conchologist (Vol. 11, 3, p. 56-59) the genus Crassinella was discussed and data were given on a widespread but so far unidentifiable small species, Crassinella spec. indet. A. Since then it has come to my attention that a very similar species was described by Dall from the Pliocene of Florida (Caloosahatchee) under the name Carssatellites (Crassinella) acuta Dall, 1963, T.W.I.S., Vol. 3, pt. 6, p. 1479, pl. 50, figs. 1, 4.

I believe that Crassinella spec. indet. A is identical with C. acuta Dall, an opinion already earlier expressed by Smith (ref. 196) in 1962, who identified C. acuta in the Pleistocene deposits of the Mississippi delta (La.). Thus it appears that this small species still lives abundantly in sandy mudbottoms of the N.W. Gulf of Mexico. A comparison with the type specimen of C. acuta Dall has not yet been made.

Two photographs by Mr. van Morkhoven of this small species are given below, both from single valves obtained in a lot off the Texas coast near Galveston in 14 fms. of water. Both valves are somewhat wider than is typical for this species and in general the ventral margin is more sagging so that the valves are more sharply triangular than is shown. Juvenile specimens of C. lunulata of the same size as the photographed ones are much wider, more curved, thicker shelled and more coarsely ribbed.

A photograph of Crassinella spec. indet. B is also given. It is immediately apparent that this is quite a different species with a curved anterior side (the beaks are opisthogyrate) and quite different surface sculpture.

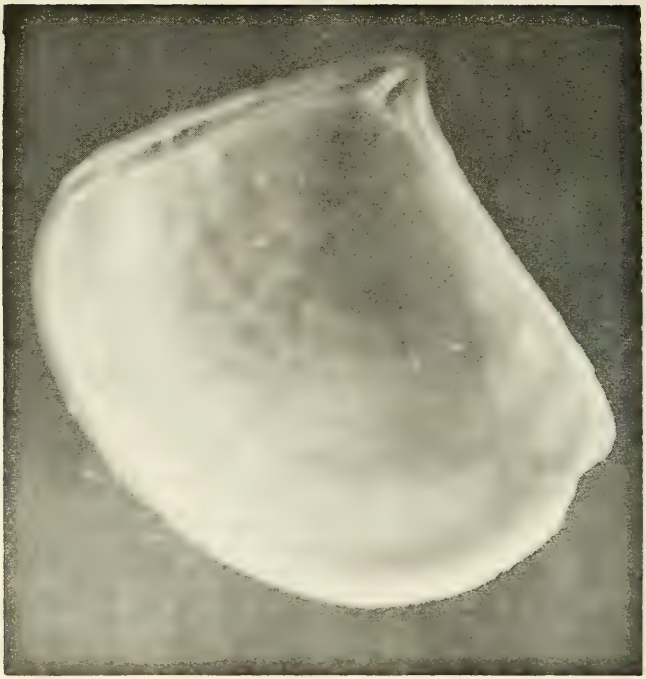

FIGURE 1

Inner side of right valve of Crassinella c.f. acuta Dall, to show hinge Size: 2.5 mm.

FIGURE 2

Outside of left valve of Crassinella c.f. acuta Dall, to show reticulate sculpture and radial color bands. Size: 2.06 mm.

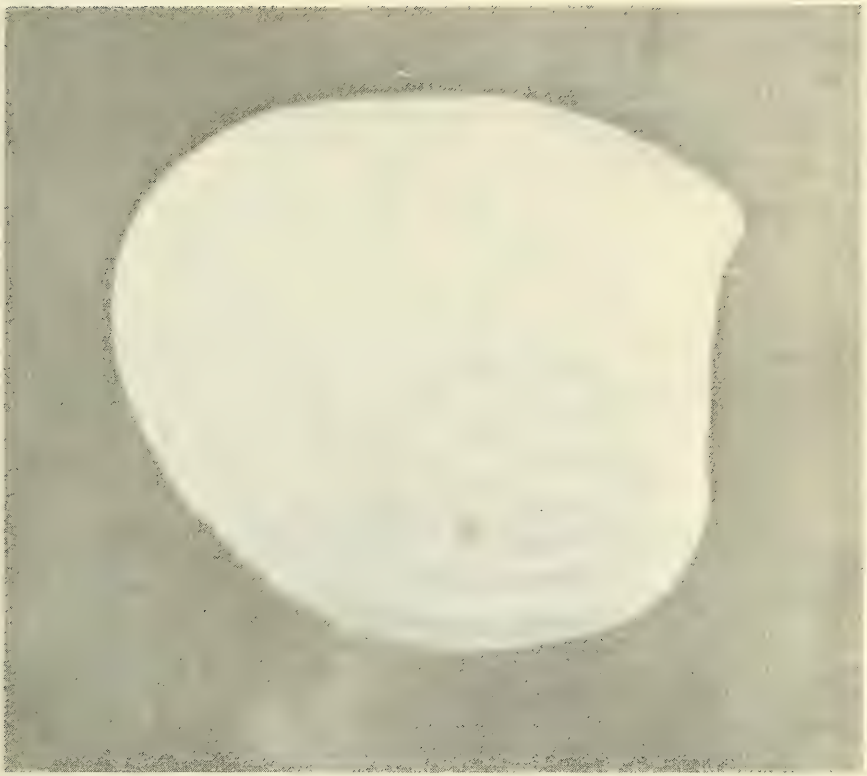

FIGURE 3

Crassinella spec. indet. B, from Texas shelf area, 11 fms. of water. Size: 1.34 mm.

Photos by Frank van Morkhoven

SUPERFAMILY CARDIACEA

FAMILY CARDIIDAE

Genus Papyridea Swainson, 1946.

19. Papyridea spec. indet. A.

This apparently undescribed species is endemic to the Texas faunal province. It lives all over the offshore shelf in sandy mud bottoms and also has been collected from beach-drift on Mustang and Padre Islands and at Sabine, Texas. It probably lives also in the Eastern Gulf of Mexico, because I have seen a valve in dredgings from the West Coast of Florida. P. soleniformis and P. spec. indet. A. are so different, both in shape and in color that they can be distinguished at a glance, and it is therefore remarkable that the species so long remained undescribed. The species has been figured (as P. soleniformis Brug.) and reported (as P. soleniformis Brug. several times. A description of this species will be published in The Nautilus.

This species can be readily separated from P. soleniformis by the following differences:

1. P. spec. indet. A is considerably smaller than P. soleniformis (30 mm. versus 45 mm. for large individuals).

2. P. spec. indet. A is more regularly elliptical. Its ventral margin does not sag towards the posterior end as in P. soleniformis, which makes the umbo of P. soleniformis appear to be placed more towards the front than in P. spec. indet. A.

3. The ribbing of P. spec. indet. A is flattened and smoothed out on the disc.

4. The hinge is lighter and less developed than in P. soleniformis.

5. Its color pattern is reddish or orange with a different arrangement of flecks.

*References for the Texas faunal province are (all as P. soleniformis):

139, listed for the outer shelf, Plate 39, fig. 49; 145, listed;
156, common on Stetson Bank (ex parte); 170, listed for deep shelf assemblage; 201, Mudlump fauna in Mississippi delta;
206, beach records Texas Conchologist, Vol. 2, (8).

*Footnote: The number in "references for the Texas faunal Province" refer to the serial numbers of the Bibliography of Texas literature published in Texas Conchologist, Vol. XI, (1), p. 7-18.

20. Papyridea c.f. semisulcatum Gray, 1825.

Cardium semisulcatum Gray, 1825; Ann. of Phil. 25 (n.s.), p. 138.

A single very small, fresh juvenile valve (1.5mm.) of this species was taken from beachdrift at the coast guard station at South Padre Island. It is so different from either juveniles of P. soleniformis or P. limosa that there can be no doubt of its being a different species. It agrees well with juvenile material we have seen from the Ajax reef off Florida. Remarkable is the very small prodissoconch of the shell (>0.1mm.). Whether the species lives along the Texas coast remains an open question, because at the location it was taken, often exotic shells are found. These are brought in by shrimpers and lost overboard when the decks are cleared coming into port. A number of such species may succeed in establishing themselves for several years, but usually their population dies out in winter time.

References for the Texas faunal province are: 206, beach record, Texas Conchologist, Vol. 7, p. 83.

Records H.M.N.S.: a single lot of one juvenile valve.

Eastern Pacific analogue: None

Genus Americardia Stewart, 1930.

In the Treat. Invert. Paleont., Keen considers Americardia as a subgenus of Trigoniocardia. We shall follow here the conventional usage of ranking it as a full genus (see also Abbott, 1958). Rather square shells, with the posterior slope set off by a ridge. In Texas only a single fairly large species.

21. Americardia media Linne, 1758.

Cardium medium Linne, 1758, Syst. Nat., 10th Ed., p. 678.

This species is widespread over the Texas-Louisiana shelf area, living in sandy and silty bottoms. Live material is rare, and when taken, is most often obtained from the offshore coral and algal reefs. The specimens from the latter locations are more starkly and contrastingly colored than those of muddy environments. This conforms with a trend in most groups of mollusks, where specimens from calcareous environments, even when living below the substrate, are more vividly colored than those from mud bottoms. Some specimens in the H.M.N.S. collection are dark yellow inside with a purple splotch of color inside the crest. Small juveniles of 2 mm. size exhibit the shape of mature specimens.

Previous references for the Texas faunal province are: 156, common on Stetson Bank; 174, listed; 175, outer shelf in 40-65 fms., rare Texas coast, not alive, sandbottom; 192, figured; 206, Tex. Conch., Vol. 9, p. 80.

Records H.M.N.S.: 32 lots of which 5 contain live collected material.

Depth Range: 9-55 fms.; alive: 9-24 fms., in sandy mud, algal and coral reef, and Miocene shale outcrops.

Geographical Range: Entire Caribbean Province, from N. Carolina to Brazil, reported by Altena from Surinam (1971).

Maximum Size: 45 mm.

Eastern Pacific Analogue: Trigoniocardia (Americardia) guanacastensis Hertlein and Strong, 1947. "Cape San Lucas, Gulf of California to Paita, Peru" (Keen, 1971).

FIGURE 4

Inner side of right valve of Papyridea soleniformis (Bruguiere, 1789) collected on the offshore shelf off western Louisiana in calcareous environment in 30 fms.

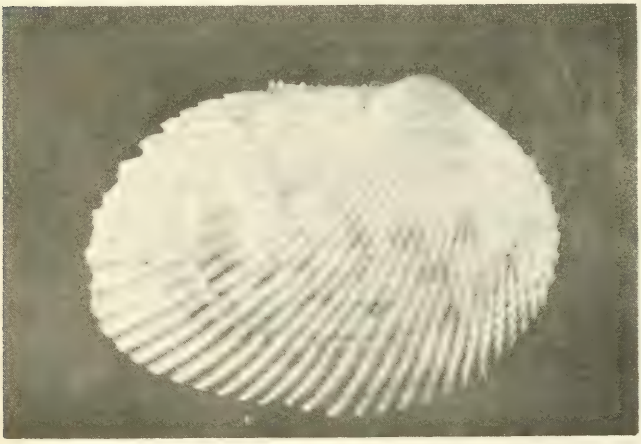

FIGURE 5

Outer side of same right valve. Size: 37.3 mm.

Photos by Frank van Morkhoven

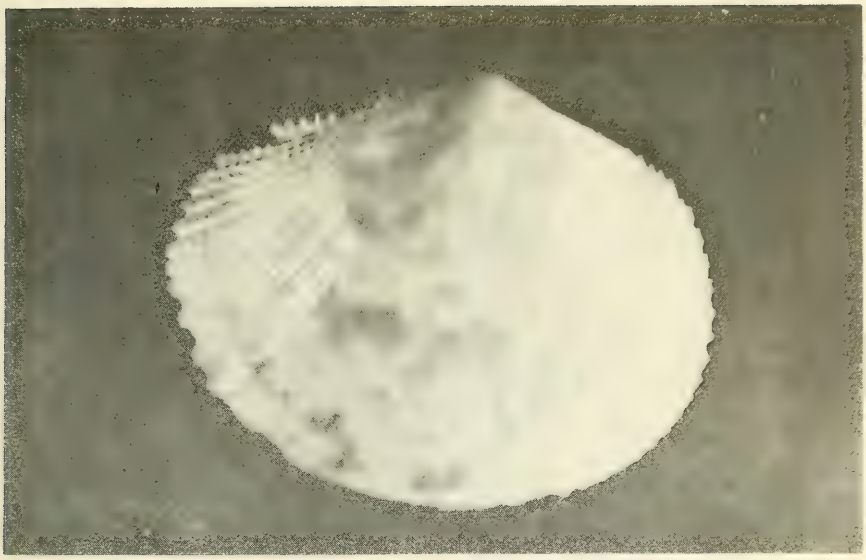

FIGURE 6

Outer side of right valve of Papyridea spec. indet. A. taken on the Texas shelf off Galveston in 25 fms. of water.

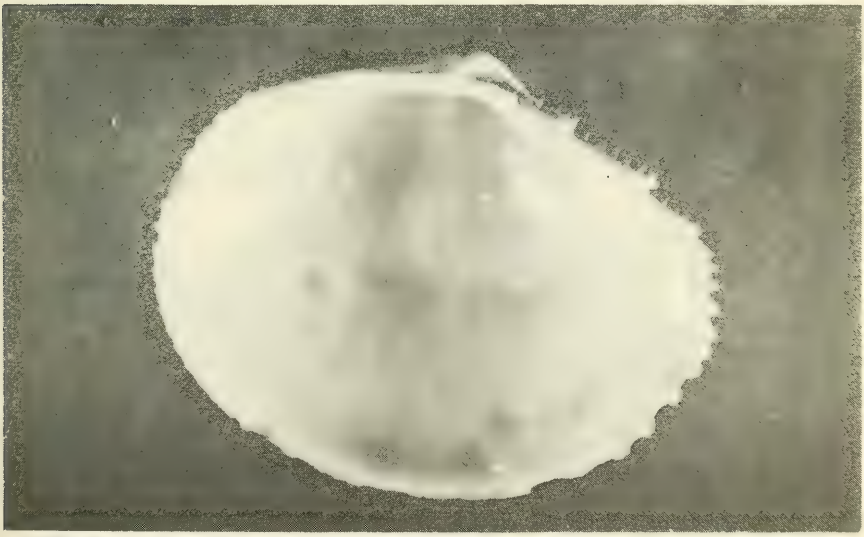

FIGURE 7

Inner side of same right valve of Papyridea spec. indet. A. Size: 24.5 X 18.0 mm.

Photos by Frank van Morkhoven

In the Treat. of Invert. Paleont., Vol. N, Keen considers Dinocardium as a subgenus of Laevicardium. Abbott, 1958, investigated the anatomy of the soft parts and reported "a great similarity in the two raised, complete siphons of Laevicardium laevigatum Linne and Laevicardium (Dinocardium) robustum Solander". There are however, a number of characters which we shall discuss, that make this arrangement not so certain as it appears. These characteristics are those of the juvenile shell which for Dinocardium are so completely different from those of Laevicardium that, in my opinion, a careful reassessment of the generic affiliation of Dinocardium is necessary. Unfortunately I can find little or no information about the morphological characteristics of juvenile bivalves in the literature because descriptions of bivalves are entirely based on fully grown material. The reason for this is the lack of juvenile material in our museums.

Juvenile specimens of D. robustum (1/2-3 mm.) are quite remarkable. In the first place, this giant Cardiid has an extremely small prodissoconch (0.2 mm.) very much smaller than I expected to find. After growing to about several times that size, sharp triangular costae appear in a rather smooth shell. Juveniles of about 2-3 mm. then have a very elegant shape, with slightly "S" shaped costae, but two characteristics stand out particularly: 1) on the posterior side the last two radial ribs are clearly spinose, carrying about 8-10 minute sharp spines. When the shell grows, these spines become submerged in rough knobs. 2) the costae of the posterior side are somewhat distinct in shape and structure from those on the anterior and median field, suggesting a relationship with the Fraginae. In fact, the whole aspect of Dinocardium at that state reminds one strongly of a species such as Americardia guppyi Thiele. The shell is wider than high, the anterior ribs increase slowly in emphasis toward the posterior and suddenly become smaller and more crowded. There is also an indication of a flexure in the ventral margin such as can be observed in Americardia media. Moreover, the last sharply triangular rib of the median field which is the highest and best developed, forms a kind of a crest. When these shells increase in size all these characteristics become submerged in the coarseness of further development. The costae flatten out and become somewhat uneven. Still to be noted is the fact that in some of the immature valves of 2-4 mm. size one can observe fine small pustules or scaly-like structures on the sides of the costae. Such pustules are present f.i. in Papyridea and scales in Americardia guppyi.

The most unexpected aspect of the Dinocardium problem is the fact that among the material in the H.M.N.S. two clearly distinct species are present. One representing the bulk of this material leads in a continuous sequence of size to shells in excess of 5 inches in largest dimensions. The other undescribed (?) species is present only in two valves of 2.2 mm., which are clearly different from the others, but unmistakably related to Dinocardium. It is at present not possible to say whether these valves are mature, but that this also should be a giant is highly unlikely. On the other hand, it remains

puzzling that one species should become gigantic while the other would stay under one centimeter in size. In these notes, the problem of Dinocardium cannot be settled. Necessary is an anatomical investigation not of full grown but of immature material of the genera Dinocardium and Americardia. Here I shall classify Dinocardium in the Fraginae on the basis of the discussed characteristics and because the evidence suggests to me that D. robustum is a gigantic form of a group of normally small sized shells, probably related to Americardia guppyi, a species probably absent in the N.W. Gulf of Mexico.

22. Dinocardium robustum Lightfoot, 1786.
Cardium robustum Lightfoot, 1786, Portland Cat., p. 58. (syn. Cardium ventricosum Bruguiere, 1789, Encycl. Meth., Vol. 1, p. 228 and Dinocardium robustum vanhyningi Clench and Smith, 1944, Johnsonia, Vol. 1, (15)

The largest Cardiid of our coast lives commonly in the mudflats near the inlets. Live specimens can often be dug at low tide at Bolivar Pass and San Luis Pass and have been taken at Port Aransas. Especially after rough weather, dead shells are common on our beaches and juvenile specimens of about 2 mm. are on occasion plentiful in beachdrift along all Texas outer beaches. Dead shells can be found all along the Texas and Louisiana coast. In dredged samples from offshore Galveston locations, dead shells are common to a depth of 25 fms. and have been taken at 43 fms., but those are probably fossil. Ref. 123 mentions offshore populations in shallow water. The species has also been mentioned for the Texas marine Pleistocene (refs. 66, 182). The subspecies D. robustum vanhyningi Clench and Smith, 1944, is, in my opinion, merely a form and washes ashore with typically shaped D. robustum and may not deserve subspecific recognition. The assymmetry in shape of D. robustum vanhyningi develops slowly in mature to senile specimens living in a soft substrate. I have never seen material less than two inches in diameter which displays this asymmetrical shape. In older references this species has been reported as Cardium magnum Born, 1780, which is the same (not of Linne, 1758).

References for the Texas faunal province are: 1, C. ventricosum Brug., common at Galveston; 15, C. magnum Born, single valves common at Galveston, Mustang and Padre Islands; 18, C. magnum Born, abundant at Galveston and Corpus Christi; 19, C. magnum Born, common from east end Matagorda Peninsula to Corpus Christi Pass. Living at 3 to 4 inches in sand; 27, C. magnum, listed; 45, Galveston, Corpus Christi, Padre Island; Galveston well at 2552-2600 feet; 58, Padre Island; 61, C. Magnum Born, Corpus Christi area; 62, C. magnum Born, Mustang and Padre Islands; 65, C. magnum Born, common along entire coast of Texas; 66, Marine Pleistocene of Texas; 67, Port Isabel; 69, gulf beaches of Texas; 79, Corpus Christi; Port Aransas; 98, listed for bays, beach Padre Island; 110, found on all beaches of Texas, Pl. 10, figs, 1, 2; 123, a single live specimen in 3-6 fms. off Green's Bayou, old valves in 6½ fms., 20 miles west of Sabine, Texas; 126, outer sandy beaches and near shore areas of Carolinian Province; 135, dead in Gulf, dead in bays; 136, dead at two stations off East Texas at depths of 7 - 9 fms.

145, upper sound, shallow shelf dead; 149, Stetson Bank; 153, listed in Table 1; 160, dead at one location in Matagorda Bay; 164, dead in open bay margin and inlet assemblage at Rockport; 170, shallow shelf assemblage off East Texas; 174, listed; 175, inner shelf 2-12 fms., common, East Mississippi Delta to Mexico; 188, listed; 201, Mudlump fauna Mississippi Delta; 206, beach records Tex. Conch., Vol. 2 (8); 208, "shelf mud and silt and tidal influence assemblages"; 225, Galveston, 236, Galveston; 248, Bolivar Peninsula; 253, fresh pairs and single valves on reef off Padre Island; 261, listed for offshore Galveston; 269, figured on page 181.

Records H.M.N.S.: 54 lots, of which 11 contain live collected material.

Depth Range: 0-43 fms.; alive 0-12 fms. in sandy bottoms.

Geographical Range: Restricted to northern fringe of Caribbean faunal province from New Jersey to North Florida and west Florida to Honduras.

Maximum Size: 128 mm.

Eastern Pacific Analogue: None. It may be remarked that Laevicardium elatum Sowerby, 1833, a similar, but not related, giant lives in similar environments (Southern California as far south as Panama).

23. Dinocardium spec. indet. A

Our material is insufficient to describe this species. Moreover, there is a remote chance that they are juveniles of Americardia guppyi, a species not yet obtained in our area but which is known from Campeche Bank (ref. 214, pl. 14, fig. 1-2). Until more material is uncovered we shall merely point out some differences. The main one is that the umbo is reticulated and is pointed quite forward so that the posterior part is larger and much higher. Our photographs,to be published in a later issue, will show these differences quite clearly.

Records H.M.N.S.: 2 lots, each consisting of a single valve, one collected in a depth of 4 to 8 fms.(26° 42' - 97° 18') and the other in 7.5 fms.(28° 58' 29" - 94° 19', Heald Bank area).

Genus Laevicardium Swainson, 1940.

Ribs without spines, often very smooth, fairly thin shelled. In our area only a single subgenus, Laevicardium s.s., with several species among which an endemic one.

24. Laevicardium fiski Richards, 1954.

Laevicardium fiski Richards, 1954, Nat. Naturae, 263, 8 p. Acad. Nat. Sci., 1954.

In the list of mollusks for the N.W. Gulf of Mexico (Tex. Conch., Vol. 9, p. 80, 1973) I have reported this typically endemic species together with L. pictum Ravenel, because I was then of the opinion that it merely represented a somewhat inflated form of L. pictum. Since then live collected material has been added to the collection of the H.M.N.S., which proves conclusively that this species is quite different from L. pictum and that my original views were in error. Not only is the shape in many respects different from that of L. pictum, but also its color pattern immediately sets it apart. L. fiski is a smaller, much

more inflated species, whose outline is far more skewed than that of the more spatulate and triangular L. pictum. Its umbo appears, when viewed looking into the cavity of the shell, much more massive than the umbo of L. pictum. The normal adult size of L. fiski is 15-17 mm., although rarely a few individuals of over 20 mm. are obtained. The color pattern is characteristic. L. fiski has a background of yellowish white on which a few indistinct blotches of color can be seen. The internal coloring in either live collected or very fresh valves is of a uniform pinkish or yellowish color, quite different from that of L. pictum. Externally L. pictum has a light brown background on which there are zig-zag or wavy patterns, concentrically arranged, of dark brown.

The biological habits of both species also appear different. Live L. fiski appears to be restricted to coherent and tough clay bottoms, although dead shells are often brought up in sandy mud samples, and it does not live on the offshore coral and algal reefs. L. pictum prefers sandier and cleaner environments and does live on the coral reefs. Not seldom are dead valves of both species brought up together in the same dredge. All of above mentioned differences can be noted clearly in juvenile material of about 2-3 mm. In still smaller material, the distinction becomes difficult. This species does not enter the bays, but a few dead shells have been collected from beachdrift (St. Joseph Island, Port Aransas, South Padre Island). It was first described from the Mississippi Delta and is also known from the Mudlump fauna.

Previous references for the Texas faunal province are: 122, original description; 145, deep shelf; 175, outer shelf, 40-65 fms., common on sandy botoom, rarely alive; 206, (ex parte) listed as L. pictum in Tex. Conch., Vol. 9, p. 80.

Records H.M.N.S.: 53 lots, of which 5 contain live collected material.

Depth Range: 0-70 fms.; alive 12-33 fms., in mud bottoms.

Geographical Range: Largely restricted to Texas faunal province, but I have seen material from off western Florida.

Maximum Size: 24.5 mm.

Eastern Pacific Analogue: Closest appears to be: L. clarionense Hertlein and Strong, 1947. "Santa Inez Bay, Gulf of California to Clarion Island Revilla Gigedo group, in depths of 64-155 m". (Keen, 1971).

25. Laevicardium pictum Ravenel, 1861.
Liocardium pictum Ravenel, Proc. Acad. Nat. Sci., Phila., p. 44, 1861.

In the discussion of L. fiski most of the characteristics of this species have been mentioned. It is the flattest and most triangular of our Laevicardiums and grows somewhat larger than L. fiski, whose average size is below 20 mm., whereas, that of L. pictum is over 20 mm. The brown spots visible on the outside are also present of the inside of the shell.

This species is slightly less common than L. fiski and lives

in a different environment. Once a small number of juvenile valves, one alive, was taken from a root attachment of whip-coral washed upon the beach at South Padre Island.

Previous references for the Texas faunal province are: 156, common on Stetson Bank; 174, listed; 206, beach records, Texas. Conch., Vol. 7, p. 83, 1971 , ex parte; 214, Campeche Bank; 225, Galveston; 236, Galveston; 253, Laevicardium sp. (could be L. fiski).

Records H.M.N.S.: 30 lots, of which 12 contain live collected material.

Depth Range: 0-55 fms.: alive 0-25 fms., in sandy mud, shale outcrops and calcareous reefs.

Geographical Range: From South Carolina, Gulf of Mexico into Brazil (Rios).

Maximum Size: 26.5 mm.

Eastern Pacific Analogue: None.

26. Laevicardium mortoni Conrad, 1830.

Cardium mortoni Conrad, Journ. Acad. Nat. Sci., Phila, 6, p. 259-260, pl. 11, figs. 5, 6, 7.

In the N.W. Gulf of Mexico, this species lives exclusively in the coastal bays of Texas, (Galveston West Bay, Matagorda Bay, Laguna Madre), and preferentially in the hypersaline ones. It becomes progressively more common from Galveston West Bay toward the southwest. We have no material from Louisiana. It is a fairly inflated straw-yellow species, often with patterns of zig-zag markings. A few valves have been dredged offshore as deep as 25 fms., but we doubt that the species lives offshore and the report (ref. 137) of 8 live specimens from 40 feet on Sabine Bank needs confirmation (L. fiski?). Probably these deep water valves are fossils. Juvenile material becomes abundant in bay dredgings in Matagorda Bay. Among this material are shells with an extremely heavy development of the hinge line. It may be that this is a pathological characteristic caused by varying conditions of salinity and temperature. Their size is about 2-3 mm. The species is fairly common in beachdrift especially in the southern part of Texas.

Previous references for the Texas Faunal province are: 15, common in Corpus Christi Bay; 18, abundant, living in Corpus Christi Bay. Single valves only at Galveston; 19, Keller's Bay, Carancahua Bay, Port Lavaca Bay, Matagorda Bay, Turtle Bay, Espiritu Santo Bay and Corpus Christi Bay; 21, listed; 45, repeats previous references; 67, listed for Port Isabel; 79, Indianola and Port Aransas, pl. 12, figs 6-7; 98, listed for the bays; 110, rare dead shells at Galveston, common from St. Joseph Island to Port Isabel. Living in Aransas Bay and Laguna Madre at Port Isabel, Pl. 10, figs. 3-4; 126, outer sandy beaches and near shore sandy areas of Carolinian Province; 135, alive in bays; 136, eight specimens alive at depth of 40 feet on Sabine Bank; 153, listed; 164, alive in Rockport area and Laguna Madre; 174, listed; 175, open shallow hypersaline lagoon near inlets, common on sand bottom; 178, listed for upper end of Laguna Madre, water depths less than 18", sand; 193, alive at Port Isabel, common over much of bay bottom; 194, listed as food item for black drum (fish); 206, beach

records in Tex. Conch., Vol. 2, (8); 208, listed for "bay margin" and "grass flats", 215, listed for Mudlump fauna (note: probably in error); 225, Galveston; 236, Galveston; 269, figured on page 182.
Records H.M.N.S.: 32 lots, of which 5 contain live collected material.
Depth Range: 0-25 fms.; alive 0-1 fms. in sand and mud bottom of bays.
Geographical Range: Carolinas, Florida, Cuba, Guatamala.
Maximum Size: 23 mm.
Pacific Analogue: None.

27. Laevicardium sybariticum Dall, 1886.
Laevicardium serratum sybariticum Dall, B.M.C.Z., 12, No. 6, p. 270.
Of this much less common species only three lots have been obtained. The material at hand conforms very well with Clench and Smith's discussion in Johnsonia (Vol. 1, (13)). This is a thin shell with pinkish color, quite different from the other three small species of Laevicardium in the N.W. Gulf of Mexico. In our area it is not a deep water species because our material comes from a depth range of 11-23 fms.
Previous references to the Texas faunal province are: 145, listed in Tex. Conch., Vol. 9, p. 80, 1973.
Records H.M.N.S.: 3 lots of which one contains live collected material.
Depth Range: 11-23 fms; alive: 12 fms. in mud.
Geographical Range: Bermuda, Carolinas into Caribbean region.
Maximum Size: 19 mm. (broken valve)
Eastern Pacific Analogue: None.

28. Laevicardium laevigatum Linne, 1758.
Cardium laevigatum Linne, Syst. Nat., 10th ed., p. 680.
This species has in early references been reported as L. serratum L., which is Indo-Pacific. It is a large species, which is not seldom dredged in the N.W. Gulf of Mexico where it can reach a size in excess of three inches (seldom), but is commonly 70-72 mm. It lives in muddy bottoms in a depth range of 11-50 fms. Specimens dredged in offshore Texas-Louisiana waters are fairly uniform in shape and color, an even light brown, (except for some beach material from South Padre Island), which already when small, shows the peculiar outline of this species.

The change in shape with size is a characteristic feature of this bivalve. When it has reached about one inch in diameter the outline of both valves is quite circular and a paired set of valves is quite inflated. Increasing in size, this circular outline is not maintained but the shell expands in an asymmetrical manner along the ventral margin so that a skewed outline is produced and in large specimens the shell becomes much elongated. Texas material seems to grow especially large. These live collected shells do not show a radial pattern of ribs, but are covered by a thick, sometimes frilly epidermis of dark color and concentric arrangement.

It is possible that the shape of the shell is controlled to some extent by the nature of the bottom sediment so that soft, muddy sediments produce large sized, skew and elongate forms, whereas, hard packed sands give rise to smaller, more rounded forms with lighter backgrounds and color patterns. For the entire area throughout which this species is known to live (Brazil-North Carolina), many forms have been described, some of which by some experts are considered different species (see Olsson and Harbison, 1953). However, forms like L. vitellinum Reeve and L. brasilianum Lamarck do not live in our area, but specimens often closely resemble L. laevigatum wagnerianum Olsson and Harbison, 1953 closely. In general, the Texas morph is narrow and elongated (see fig. 4, plate 11, not fig. 5, plate 11 of Olsson and Harbison's monograph 11). In the fifties, dead valves of L. laevigatum were not uncommon on the beaches of Galveston Island and around Freeport. During the sixties they have become quite scarce and now beach material is only found south of St. Joseph Island. Valves have also been collected from drift on Timbalier Island (La.).

Previous references for the Texas faunal province are: 19, (C. serratum L.) dead valves on Mustang Island; 21, listed as C. serratum L.; 45 repeats 18; 61, listed as C. serratum, area of Corpus Christi; 67, (as C. serratum), Port Isabel; 110, dead valves occasionally found from Matagorda Island to Port Isabel. Found living in 15-20 fms. off Freeport to off Port Isabel. Pl. 10, figs. 5-6; 123, not abundant, 30-40 fms. at Wine Island Pass in 12-13 fms.; 135, dead in bays; dead in Gulf; 144, reported from two offshore locations; 156, common on Stetson Bank; 164, dead in open bay margin and shallow hypersaline environments at Rockport; 170, transitional shelf assemblage off East Texas; 175, intermediate shelf, 12-35 fms. on sand bottom, few, rare; 192, figured; 201, listed for Mud-lump fauna; 206, beach records Tex. Conch., Vol. 2, (8); 251, Yucatan Shelf; 269, figured on page 181. Also Olsson and Harbison (106) mention this species for Texas.

Records H.M.N.S.: 52 lots of which 9 contain live collected material.

Depth Range: 0-70 fms.; alive 11-50 fms., with optimum at $\pm$ 20 fms. Almost solely in muddy or sandy mud bottoms.

Geographical Range: Entire Caribbean region (N. Carolina-Brazil).

Maximum Size: 78 mm.

Eastern Pacific Analogue: None.

Genus Microcardium Theile, 1934.

We reported the three N.W. Gulf of Mexico species as Microcardium, although in the Treatise, Microcardium is considered to be a subgenus of Nemocardium. Our species are characterized by their small size, habitat in intermediate to deep water depths and a difference in sculpture between the anterior and posterior parts of the surface.

29. Microcardium transversum Rehder and Abbott, 1951.
Microcardium transversum Rehder and Abbott, Revista de la Soc. Mal. C. de la Torre, Vol. 8 (2), p. 56, pl. 9, figs. 9-10, 1951.

This widespread and common species is one of the characteristic components of the Texas faunal province in a depth range of 20-35 fms. in sandy mud bottoms. Our material is quite uniform in shape and size and conforms perfectly with Rehder and Abbott's description and figure. We have seen the type at Washington which agrees with our material. Previously we had identified this as M. tinctum Dall, but this is in error. Apparently M. transversum Rehder and Abbott and M. tinctum Dall are allopatric species, but closely related. M. transversum can be immediately separated from the other two species in our area by its pink umbo and often has light brown or reddish color patterns, which may have the form of rather square blotches or radial stripes. It is also larger and lives on the whole in much shallower water. Apparently M. transversum is restricted to the Texas faunal province whereas, M. tinctum is an eastern Caribbean species which also has been reported from Surinam (Altena, 1971). Along the Texas-Louisiana coast M. transversum is usually taken in sandy mud and on the Miocene shale outcrops; it is known from the Mudlump fauna of the Mississippi Delta and has been reported, although we did not collect it there, from the offshore coral reefs.

Previous references for the Texas faunal province are: 95, original description; 145, deep shelf; 147, dead on Baker Bank and Big Southern Bank, alive on West Flower Garden; 156, common on Stetson Bank; 170, (as M. tinctum Dall) listed for deep shelf assemblage off East Texas; 174, listed; 175, listed for outer shelf 40-65 fms., common on sandy bottom, whole coast; 206, Tex. Conch., Vol. 9, p. 80 (as M. tinctum Dall); 214, figured (as M. tinctum).

Records H.M.N.S.: 32 lots of which 11 contain live collected material.

Depth Range: 14-60 fms.; alive 14-50 fms. (If a dead juvenile shell proves to be this species the depth range must be extended to 167 fms.)

Geographical Range: Restricted to the Texas faunal province.

Maximum Size: 19.8 mm.

Eastern Pacific Analogue: Of the two Panamic species none appears to be close.

SEARCH AND SEIZURE

by Constance E. Boone

Are you wondering what kind of shelling you can do during the several months of hot summer when the Texas beaches are crowded with surfers and sun seekers? I'd like to make a suggestion or two for beach roaming and study of our fauna.

One of my favorite areas has been the lonely stretch of beach from High Island fishing pier up to Sabine Pass. In late March, Ruby Ray and I went to Galveston East Beach, found the "Norther" had become a Northeast wind and drizzle , making shelling poor, and headed on across the Bolivar ferry for the peninsula area above. We went to Gilchrist, crossed Rollover Pass bridge and drove the block or two into the Gulf beach one-half mile above the bridge. I have sometimes found nice drifts of Epitoniums here. Club members have gone on field trips here also. Sometimes big Busycons and Murex fulvescens are blown in here. After hurricane Carla some years ago, many odd Busycons with the swollen ridge running across the body whorl as described for Busycon perversum were found. They were usually dead specimens but were large and spoke of what lived in this area in earlier days. Murex fulvescens lives offshore, as do big left-handed Busycons, and both are frequently trawled by shrimpers.

That day, Ruby and I faced hard drizzle, high rolling tides, and no drift line. Yet this area is interesting because there are mounds of shells, lots of driftwood, odd pieces of porous fossil coral called "floating coral" and pumice. Many areas along our coastline, such as Sargent Beach, are becoming so eroded that shell mounds such as these are disappearing.

We climbed back in Ruby's truck, drenched, cold, and miserable, and decided to go on to High Island anyway since Ruby had not been there. We needed shells for the Sharpstown Store, and Ruby is field trip chairman next club year and wants to find new places for members.

I knew we could find big Thais and big Polinices at High Island. We turned in a passable access road (50-100 feet in from the highway) to the Gulf from the main road approximately one mile above the Y at High Island. You cannot drive on this beach area if the tides are high. We knew that the highway above here towards Sabine had been closed to traffic so we were afraid to venture out on the beach with the truck. We parked in the road entrance, took pails and started walking. We will probably never forget the piles of orange-mouthed 3-5 inch Thais glistening and gorgeous in the drizzle and occasional glints of sun. We soon picked up buckets of these dead shells, as well as 2-3 inch Polinices that were everywhere. We stashed filled buckets against the dunes, continued on up the beach, greedily filling empty containers and torn plastic bags which we found in the trash against the dunes. By now you all know that we cleaned hundreds of these shells for the shell packs and for good individual sales at the Shell Store. It was worth the trip and our labors to lug back all our containers to the truck. We must have been a sight. It was cold and raining. We had on waders and parkas and were loaded down with full buckets, shakily-held full cartons, and I dragged one big trash bag of shells. We slid along the clay banks; I fell flat forward once and got thoroughly sticky with that mud.

The shells we collected would be there in the summer, too. The area is never all that crowded. Sometimes there is a very good drift line, and the grunge will have several species of Epitoniums, especially E. rupicola. Also on these beaches you can collect the biggest Pholas Campechiensis valves you'll probably ever see. This area is composed of clay banks, covered by beach sand but eroding from the sea. This species undoubtedly lives in these clay banks, and in the past must have been common, may still be offshore. Valves are found by the thousands.

The Thais you collect here is the subspecies we have always known as T. haemastoma haysae Clench, 1927. The new American Seashells by Abbott gives us a name change on this, to T. haemastoma canaliculata (Gray, 1839). I have gone into this a bit, but at this time have not discovered enough to report. There is a puzzle about the photo used in American Seashells for this subspecies, and I haven't yet read all the old literature. Typical "Hays' Rock Shell" is like the big, old shells found on the High Island beaches. Contrary to the statement in Andrews' book that this was named from Texas, the subspecies named by Dr. Clench in 1927 was designated from 66 specimens sent to him from Grand Bayou, Mississippi Delta, La., by Miss Marley L. Hayes. The Holotype was 88 mm. in length and 55.51 mm. wide, a typical specimen chosen from the lot. One specimen was 112.5 mm. long. Dr. Clench's monograph in Johnsonia, Vol. 2, No. 23, March, 1947, shows the Holotype, a grotesque adult shell of this form of Thais, common on the High Island-Sabine beaches. I have asked many times of friends in the Beaumont and Port Arthur area whether the really large, rugged, strongly-noduled and deeply-sutured ones were ever found alive. I mean the 4-5 inch ones we see dead in the shell heaps. These friends say they find many live Thais but of normal three-inch size like those at Galveston. They are, of course, of this subspecific form but not as grotesque as the old ones found. I do not know if the 66 sent to Dr. Clench in the original lot were alive or if some were. Two paratypes in the Houston Museum of Natural Science are both dead specimens. Allow me to follow up on this and report on the pieces of the puzzle later.

Ruby and I did find live Polinices, 2 to 2½ inch ones. We also found live Thais, 2½ to 3 inches. But there are 4 to 5 inch weird looking specimens of the latter to be picked up to add to your collection, and don't overlook a 3 inch dead Polinices for your collection either.

At best, the Thais is a subspecies of a very, very variable shell. We have forms up and down the coast that fit typical T. haemastoma floridana and there are plenty of intergrades. Also found are some reddish ones from South Padre Island jetties and other Texas jetty areas that are smaller and very different from either floridana or canaliculata. They are, however, floridana, I am told.

My prize of the day was my first Texas Natica canrena (Linne, 1758), a dead but very fresh large specimen. This species is trawled live offshore; it has been taken live on Padre, reported from Bryan Beach, and I have seen one live-taken specimen in Laura Bauer's collection from San Luis Pass. I'm not positive Laura's is this species as I have not handled it or checked the operculum. I remember it as grayish; it could be a related species from the Caribbean fauna.

MORE AND MORE SHELL STAMPS by W.W. Sutow, M.D.

Seashell stamps have been rolling off the presses in profusion recently. This has necessitated updating these lists in two consecutive issues of this publication.

While we have been discussing a great deal about the stamps themselves, we have said practicaly nothing about taking care of the stamps. Although I have been "collecting" stamps of various categories off and on for almost half a century, I probably do not qualify as a true philatelist. However, some of the lingo of the philatelist has rubbed off on me and I have learned some of the techniques of handling the stamps. It seemed opportune, therefore, to mention at this time certain practical suggestions for those who might be novices at working with stamps.

Certain minimum equipment is essential and such can be obtained quite inexpensively at any stamp store. This will include stamp tongs (tweezers), magnifying glass (for many of us), stock books or pages, stamp hinges and/or mounts, and clear acetate envelopes. The stamp tongs are specially made with flattened "spade" ends. Stamps can be handled with tongs without worry of injury or soiling of the stamps. Tongs with pointed ends are also available but the possibility of damaging stamps with the points exists. Tongs are always used in picking up or manipulating the stamps.

A number of different types and sizes of stock books are available. They are used to store the stamps and to keep them organized until final mounting in the album. The pages have transparent pockets so that the stamps can be easily seen.

Stamps should never be pasted or glued to the album pages. "Hinges" and various types of "stamp mounts" can be purchased. Using these, the stamps can be easily placed on the pages or removed. Good hinges are readily peelable. Transparent mounts can be obtained in various sizes or they can be cut to size to fit any stamp. Any stamp dealer will demonstrate the proper way to use hinges and mounts. One can also obtain acetate protective covers for an entire page so that the stamps can be protected after mounting.

The album page can be pre-printed with a suitable heading. I have pages printed with headings "SHELLS ON STAMPS" and "MOLLUSKS". Blank pre-punched pages or quadrille printed blank sheets are also readily available at the stamp stores. The stamps can be placed as the collector wishes - and comments as well as titles and explanations can be easily typed or written.

As for stamp catalogs, one of the handy ones is the multi-volume SCOTT'S STANDARD STAMP CATALOGUE. These volumes are revised annually but the edition can be useful for many years without needing to buy the new edition each year. There is available also ANIMALS ON STAMPS by Strom and Levy distributed by the American Topical Association as Handbook #62. This handbook lists many shell stamps but the material is dated.

As before, the stamps have been listed in consecutive numerical order. After a fashion, the listing indicates the chronological sequence in which the stamps have appeared.

LISTING OF SEASHELL STAMPS (Continued)

	Country	Face Value	Scott Number	Mollusk Depicted
301.	Cook Islands	50 ¢	395	Conus textile
302.		60 ¢	396	Oliva
303.	St. Vincent -	1 ¢		Atlantic thorny oyster
304.	Grenadines	2 ¢		Zigzag pecten
305.		3 ¢		Reticulated cowrie helmet
306.		4 ¢		Music volute
307.		5 ¢		Amber pen shell
308.		6 ¢		Angular triton
309.		8 ¢		Flame helmet
310.		10 ¢		Caribbean olive
311.		12 ¢		Common sundial
312.		15 ¢		Glory of the Atlantic cone
313.		20 ¢		Flame auger
314.		25 ¢		King venus
315.		35 ¢		Long-spined star shell
316.		45 ¢		Speckled tellin
317.		50 ¢		Rooster-tail conch
318.		1 $		Green star shell
319.		2.50 $		Incomparable cone
320.		5 $		File clam
321.	British Indian Ocean Territory	45 ¢	59	Terebra subulata Terebra maculata
322.		75 ¢	60	Turbo marmoratus
323.		1 r	61	Drupa rubisidaeus
324.		1.50 r	62	Cassis rufa
325.	British Virgin	5 ¢	274	Trumpet triton
326.	Islands	18 ¢	275	West Indian murex
327.		25 ¢	276	Bleeding tooth
328.		75 ¢	277	Virgin Islands latirus
329.		(4 V.)	277a	Souvenir sheet of the 4 values
330.	Tokelau Islands	3 ¢	41	Cypraea mauritiana
331.		5 ¢	42	Cypraea tigris
332.		15 ¢	43	Cypraea talpa
333.		25 ¢	44	Cypraea argus
334.	Maldives	1 l	533	Cassis nana
335.		2 l	534	Murex triremus
336.		3 l	535	Harpa major
337.		4 l	536	Lambis chiragra
338.		5 l	537	Conus pennaceus
339.		60 l	538	Cypraea diluculum
340.		75 l	539	Clanculus pharaonis
341.		1 r	540	Chicoreus ramosus
342.		2r/3r	541	Souvenir sheet
343.	Afars & Issas	5 fr	382	Darioconus textile
344.		10 fr	383	Conus sumatrensis
345.		15 fr	384	Cypraea pulchra
346.		20 fr	385	Murex scolopax
347.		40 fr	386	Ranella spinosa
348.	Aitutaki	$5	93B	Cypraea hesitata
349.		$2	93A	Terebra maculata
350.	Afars & Issas	40 fr	C79	Octopus macropus

THE AMERICAN MALACOLOGICAL UNION, INC.

by Constance E. Boone
Recording Secretary, A.M.U.

The Houston Conchology Society, Inc., became a member club of the American Malacological Union, Inc., in 1966. This society has been involved in helping host two annual meetings of A.M.U., in 1968 at Corpus Christi and in 1972 at Galveston, Texas. Several members have attended the annual meetings across the country through the years, several have served on A.M.U. committees or been councillors-at-large and are officers currently, and still others are individual members. Our first honorary life member, Dr. T. E. Pulley, Director of the Houston Museum of Natural Science, was President of A.M.U. in 1961.

The history of the American Malacological Union was reviewed by Margaret C. Teskey, Secretary-Treasurer and then Secretary of A.M.U. from 1951 - 1970, and printed in the Bulletin of 1973, a copy of which is in our society's library. I have liberally borrowed historical recounts from this Bulletin report for a brief resume for members. I have also included information from the application form for A.M.U. to give you the facts related to joining this organization.

Norman Lermond, of a small history museum and arboretum in Thomaston, Maine, is credited with the idea of starting such an organization as A.M.U. In 1929 or 1930 he began correspondence concerning the merits of such a group, writing to his friend, Dr. William J. Clench of Harvard. Then letters to friends interested in mollusks began to flow, and the movement was called the American Association of Conchologists. Dr. Henry A. Pilsbry invited the first meeting to the Academy of Natural Sciences at Philadelphia in April, 1931, when 29 attended. By then, 169 members had enrolled and were charter members, paying 25¢ dues. The name of American Malacological Union was accepted and a constitution was adopted at this meeting. Dr. Pilsbry became the first president, with Mr. Lermond choosing to be corresponding secretary after declining to be president.

A.M.U. grew slowly through the years, with annual meetings and the annual election of a president. World War II interrupted the meeting for four years. Each year an Annual Bulletin published news of members, of the meeting, and abstracts of papers given. The Maine meeting in 1941 had a collecting symposium, a popular report in the Annual Bulletin which finally resulted in the first How to Collect Shells (1955). As Houston Society members know, this year a new edition of How to Study and Collect Shells has been published. Our Society has purchased a large order of this booklet, and it is available from the treasurer for $2.50.

The Bulletin of A.M.U. has become a handy reference source for professionals and shell club members since it publishes both abstracts and complete papers given at the annual meeting. The 1964 Bulletin contains an index of all papers read since 1949. At the present time, procedure is to mail the Bulletin to members the spring after the annual meeting it reports. The Publications Editor is currently preparing reports of the Springfield, Mass., meeting of August, 1974 when Dr. Harold Murray of Trinity University, San Antonio, Texas, was President. This 1974 Bulletin will be distributed soon.

Through the years, membership has grown to 800, with many foreign corresponding members as well as member museums and organizations. For a while there was a Pacific Division of A.M.U. In 1956 this division entertained A.M.U. in San Diego, California. As time went by, the Pacific Division of A.M.U. disbanded and the Western Society of Malacologists was formed, with its own dues and separate publication. However, many professionals and shellers are members of both and liaison is maintained. This year the annual meeting of both organizations is a joint meeting to be held June 22-26 at San Diego, California, with the Western Society as host organization. Dr. George Radwin of the San Diego Museum is Western Society President. Dr. Donald Moore of the School of Marine Science, University of Miami, is President of A.M.U. A joint Bulletin of papers to be given at this meeting will be published.

Mrs. Teskey noted that "the friendly attitude of professional malacologists towards the non-professional has long been remarked upon, creating camaraderie reflected in the success of over forty years of happy annual reunions". Her comments are echoed by many of us who are amateurs and who feel very honored to be part of this organization.

The annual meetings are friendly meetings of people interested in mollusks. As time has marched along, conservation became and still is a major concern of many members. A.M.U. has been able to help. Other members bring news of mariculture and commercial research. Medical malacology has become important. Again, A.M.U. is able to provide assistance and knowledge. Member clubs and individual members, even amateurs, can be of help sometimes. The whole world seems to be interested in the sea and its creatures. We need this organization.

From the early years of A.M.U., shell clubs formed around the nation and world were invited to belong to this organization. Individual members are welcomed. The membership form states that this scientific non-profit organization is dedicated to the study of mollusks ------ morphology, shells, systematics, ecology, geographic distribution, etc. Regular membership is limited to residents of the Americas and the West Indies, and persons residing outside these boundaries are invited to become corresponding members.

To quote from the membership form: "A high point of each year's activities is the annual meeting held at a major museum, university, resort hotel or motel. The program includes symposia and contributed papers, exhibits, field trips, a banquet, and general good fellowship and professional interactions."

A current listing of members and each one's special interest is printed in the Bulletin each year. Newsletters are distributed twice yearly with information on shell clubs, professional members and their activities and research, major institutions and news of collections held there, and other news relating to A.M.U. publications and events.

Annual dues in 1975 for residents of the Western Hemisphere are $4.00. A new member or a reinstated member must pay an entrance fee of $1.50 with the dues. Additional family members may enroll for $1.00 each, but only one set of publications will be mailed a family. There is a corresponding member fee at present of $4.75 for those residing outside the Western Hemisphere. I wish, however, to note that the question of dues will be reviewed at the meeting in San Diego. 1976 dues will

probably go up. As we already know in our society, postage and printing costs are forcing higher dues. Anyone now joining will receive the year's Newsletters and the publication of the joint Bulletin of the San Diego meeting.

Clubs and museums or corporations are required to pay $6.00 membership, plus the entrance fee, when joining. However, members of clubs, museums, and other such member organizations are welcome to attend the annual meetings upon paying fees required at such meetings.

Anyone interested in becoming a member may secure an application form from me by calling 668-8252 or writing to 3706 Rice Boulevard, Houston, Texas 77005.

Texas CONCHOLOGIST

VOLUME XII, NO. 1 SEPTEMBER, 1975

NOTES & NEWS

DUES NOTICE. This will be the last issue of the Texas Conchologist mailed to those who have not paid their 1975-76 dues. After this issue, the mailing list will be reviewed and revised to include only those who are members in good standing. Please send $6.00 for a family membership, $5.00 for a single adult or $2.00 for a junior member to:

Houston Conchology Society
Mr. James C. Sartor, Treasurer
5606 Duxbury
Houston, Texas 77035

An extra issue of the Texas Conchologist will be published this fall which will include pictures of many of the mollusks previously described in Helmer Ode's series on Mollusca in the Northwest Gulf of Mexico.

FIELD TRIP REPORT

Thirty-seven shell collectors gathered at Thirteen Mile Road on the island west of Galveston at 8:00PM on July 19. For most of us this was our initial experience in collecting at night by lantern light.

In some aspects, this expedition reminded me of grunion (Leuresthes tenuis) hunting expeditions in Southern California. The group assembles with collecting equipment and refreshments, and although there are no grunion, you still have a great time.

The tide did not recede as far as hoped because of a fairly strong south wind. However, there was fresh sargassum weed on the beach which produced some nudebranchs, shrimp and crabs. There were live coquinas and polinices. One of the members found a number of shark teeth.

About 10:30 most of the party drove to San Luis Pass which was packed with campers containing fishermen. We found live mulinias popping out of the sand. After searching the bayshore for an hour, we gave up and turned homeward.

The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas and is included in the membership dues.

The society holds meetings the fourth Wednesday of each month except June, July and December at 8:00 p.m. in the Houston Museum of Natural Science.

The TEXAS CONCHOLOGIST is mailed, postpaid, to regular members of the society, with the exception that only one copy is mailed to a family. Overseas members will be charged the additional postage required at the beginning of each fiscal year (June).

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

EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Odé
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double-spaced and should be submitted to the editorial staff.

SHELL AUCTION

The annual Shell Auction for members, by members, will be held November 19, 1975. Mrs. Barbara Hudson, Chairperson, is calling for shells to be sold. We need the unusual, the rare , and the exotic shells. My dictionary defines exotic as (among other) "strikingly or excitingly different" and not as meaning undressed as in local lounges.

TRAVELING SEMINAR TO SOUTH PADRE

The Houston Museum of Natural Science, cooperating with Continuing Education, University of Houston, will offer a long week-end in the South Padre Island - Lower Rio Grande Valley, October 17-20, 1975.

The trip guides will be Dr. Tom Pulley, our life member; Mr. Carl Aiken, Assistant Director of the Museum, a Biologist and Ornithologist; and Dr. John Tveten, Nature Photographer and Author. During the three days on location, groups will visit several localities on Padre Island, the Laguna Atascosa Wildlife Refuge, Santa Ana Refuge, Benson State Park, the Sabel Palm Wildlife Sanctuary, and Baffin Bay on the shores of King Ranch.

A preliminary meeting for those going will be held at 7:30PM, October 8, 1975 at the Museum. Attendance is required. Costs, accomodations and schedules will be described at this meeting.

At various times, during the past dozen years, I have chronicled in the pages of this publication notations of events that occurred during the numerous trips to the Marshall Islands. As I browse through the material I had recorded concerning the medical work associated with these trips, I still find included therein odd items that have to do with shells and shelling.

My first venture to Rongelap Atoll in the Marshall Islands took place in March, 1958. En route there I had picked up a set of booklets by Sally Kaicher entitled INDO-PACIFIC SEA SHELLS. In one of the booklets I saw for the first time a picture of Strombus taurus. The initial descriptive word was capitalized and punctuated: RARE! This was a species that was "lost" for 100 years. In 1954 Hertlein discussed two specimens that had turned up in Guam. Dr. Morrison had dredged a live specimen from Bikini. Dr. Clench had one specimen from Tinian. In the foreword to the booklet, the Strombus taurus was considered to be "rarer than the Conus gloria-maris". Rongelap Atoll was prominently mentioned and that really perked me up.

That year (1958) I found several beach specimens of the Strombus taurus - all in good shape. They were found at the far end of Rongelap Island. The villagers recognized the shell but none had any in the village. The home of these mollusks apparently was miles on the other side of the lagoon. The only means of transportation was the two-man outrigger canoe so I did not get there.

In the following year (1959) we made the trip to Rongelap in a Navy LST. We anchored in the lagoon offshore from the village while we conducted our medical survey. One afternoon (March 11, 1959) the children had swum from shore to the LST and then had begun to dive off the ship. One of the boys came up clutching a seashell. I really flipped when I saw what it was. A live Strombus taurus! I dickered for the animal and put it away in the ship's freezer. The next day a couple of my state-side colleagues decided to do some diving. They came up with several more live Strombus taurus! This was all that year since we had to complete our examinations and sail for Utirik.

In all the years I have visited Rongelap Atoll, this was the only time I had seen living Strombus taurus brought up near Rongelap Island. I have never seen anyone diving in the area since. In subsequent years my supply of this species was obtained miles away across the lagoon near Eniwetok Island.

During this episode, I had jotted down some comments on the animal. They are reproduced below:

> "The taurus is an amazingly agile creature. It stretched out its flexible foot to unbelievable lengths. Utilizing the leverage given by hooking its operculum on to any surface, the mollusk easily somersaults. I had carefully put a live specimen in a plastic bag and placed it on a shelf in my cabin. (We used the sleeping facilities in the officers quarters on board the LST.) I was awakened in the middle of the night by a series of bangs. It was the valuable taurus. He (she?) had ripped a hole in the plastic bag,

had bounced off the shelf, and was now cartwheeling along the metal floor."

I had heard that a Navy engineer by the name of Dick Willis had dived earlier that year (1959) in the vicinity of the far islands of Rongelap Atoll. When I reached Eniwetok I made it a point to look up this engineer. I found him recuperating in the hospital but he felt well enough to chat about the shells. I learned that he had collected the rare Strombus taurus specimens (26 of them!).

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The U. S. military records tersely state that "landing" on Kwajalein Island commenced on 1 February, 1944 and that operations were "completed" on 4 February, 1944. When I first walked the reefs of Kwajalein Island 14 years later, I still found much evidence of the war - live machine gun and rifle ammunition as well as spent bullets in the depressions on the reefs. I have shelled these reefs each time I hit Kwajalein. I find that I had made the following notes after one of those shelling activities.

"2-5-67. Sunday. Much better day. Slightly cloudy but no rain. Tide 0.1 at 12:00 noon. Went out at 10:30. Number of people already out (estimate 50 to 60). Reef edge 100-150 yards out. 6 inches to 12 inches of water rushing from ocean across reef to lagoon. Striking number of Tridacnas embedded among corals somewhat to lagoon side. Beautiful blue, purple, green mantles. Shells 5 inches to 7 inches; the lips irregular and sinuous. Clam embedded deeply. Unable to dig them out. Need chisel and hammer. Hermit crab running around in beautiful houses. Helmet species prize find. Live cones of the lividus-flavidus and musicus types. Not many ebraeus types. Many Cypraea moneta, mostly porcelain white. Yellow ones uncommon. Looked for Cypraea cribraria and Strombus helli. No luck. Even Cypraea poraria and helvola not seen during daylight."

The above notes are of personal interest to me since no one can ever go shelling in the area just described above. The reef where we shelled has now been filled in. A half-mile spit (man-made) extending toward Ebeye Island now supports many trailer houses.

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Mrs. Wilbur C. Woods (Margie) talked to over 200 school children in June at the Bellaire Library. The subject, of course, was shells. She has done several programs for schools for the Houston Conchology Society, and she now has her "talk" shells arranged in wooden Coca-Cola boxes so that she has the displays ready to carry to schools. Several other members of the club have made talks to garden clubs, schools and libraries, as well as to other clubs interested in shells. This will continue to be part of the services afforded by the Society.

SEARCH AND SEIZURE by Constance E. Boone

I can't call what follows as "pearls of wisdom" but I like to think of the bits and pieces of information learned this summer as items of interest to members.

The joint meeting of the American Malacological Union and the Western Society of Malacologists held in June in San Diego, California, was a very interesting one. Club members will be able to read all about it in the huge joint Bulletin that will be published around the first of 1976. Dr. Dee Dundee of the University of New Orleans is the new AMU Bulletin Editor, succeeding Dr. Arthur Clarke. Dr. Dundee thinks the 1975 Bulletin, report of this year's joint meeting, will total some 150 pages. During the editorship of Dr. Clarke, the AMU Bulletin rose in stature as a scientific publication. Many full papers and photographs have been published. This policy will continue.

Anyone joining this year as a member of AMU will receive this 1975 Bulletin. A new schedule of dues was voted for 1976. As added incentive to becoming a member now, Dr. R. Tucker Abbott will send a gift copy of a paperback version of American Malacologists.

I shall not attempt to report the papers given because of the planned publication of the Bulletin early in 1976. I shall give you brief items gleaned from reports.

For instance: Dr. Abbott is already talking about a supplement or Third Edition of American Seashells. He reported that his Second Edition lacked complete coverage, as explained in the Edition. Much still needs to be checked and reported from South America. He also did not cover some of the material already published in Keen's Sea Shells of Tropical West America, Second Edition. The question now is what is to be done, to attempt to work out plans with the West Coast professionals for a supplement or to have a Third Edition, possibly requiring two volumes. Dr. A. Myra Keen said that it is already evident that another check list plan may be necessary for the Pacific area. At this meeting, the Western Society of Malacologists distributed for sale its first Occasional Paper, labelled "Additions and Corrections to 1975 to Sea Shells of Tropical West America" by A. Myra Keen and Eugene Coan. This Occasional Paper is available from WSM Treasurer, Bertram C. Draper, 8511 Bleriot Ave., Los Angeles, Calif., 90045, for $2.50.

The Symposium of Eastern Pacific and Western Atlantic faunal affinities, led by Dr. Emily H. Vokes of Tulane University, was especially interesting. I have more complete notes on this session but hope the coming Bulletin will report this more fully and in better form than I can.

Some brief remarks here, however, may be appropriate since I'd like to alert you to read the Bulletin when it arrives in our Library and to invite you to go back and reread Dr. Helmer Odé's remarks about the faunal affinities of our area and the Eastern Pacific and worldwide.

Dr. Harold E. Vokes of Tulane University set the stage for the discussion of mollusks by talking about the Atlantic ancestors of the Eastern Pacific fauna. We had received a lesson in geology of the Panamanic region from Dr. Emily Vokes. Dr. Harold Vokes pointed out that the story is far from understood. Dr. Myra Keen said the Pacific side has retained

the rich fauna of Tertiary fauna while the Caribbean has shallowed and cooled. There is no complete record for the Atlantic.

Of the 3,400 species on the Pacific side, including Cephlapods, there are 60 species common to the two coasts, of which 30 are tropical and worldwide. There are 112 similar species but with recognizable differences. Dr. Keen said the fossil record is meager. Differences of opinion arise in which manner a professional interprets the "look alikes". Some workers lump the species in question. Some prefer to make them cognates.

A PICTURE PUZZLE

NAME THIS SHELL

(Read to the end of this column for the answer.)

Photo by Constance E. Boone

Most of the species moved from the rich faunal background of the Caribbean to the Eastern Pacific. It was reported that only Anadara tuberculata, the food mollusk of Central America, moved from the West to the East. It has been found as a fossil at Fort Pierce, Florida.

There were many other papers of great significance. And there were lighter moments, too. Know what "turning of the head" came from? Dr. Clyde F.E. Roper talked about Octopus. It seems that this phrase is well know to the Mediterranean fishermen who grab the mantle of an Octopus in one hand, take the head in the other hand and pull the animal inside out. An Octopus is dangerous to death, so a "coup de grace" act by the fishermen is to bite the Octopus between the eyes to kill it. And also, Dr. Roper informed us that one of the problems with a species of Octopus has arisen because Rafinesque once ate his holotype.

The banquet speaker, a former Texan, Sam Hinton, of the University of California at San Diego, would have delighted most Houston Conchology Society members. Titled "The Taxonomy of Common Names", he gave many examples of the derivation of common names and pointed out once again that the common names used in one area can lead to problems of understanding in another part of the world where the names mean entirely something else. Once again it was very clear why shellers had better learn the Latin names and struggle through pronunciation even if you are like me and never had any Latin study.

Fresh from all the reports on geology of the world at this meeting, I came home to read in the papers that scientists at the University of Miami now claim they have found the first real proof that a continent sank millions of years ago in the middle of the Atlantic Ocean. It is claimed that the mystery was unraveled by studying fossils of crab excrement and limestone dredged up from 1,700 to 3,000 feet below the sea surface. This was done by a group of international oceanographers who have been studying the material brought up in a dredging expedition several years ago. A recent scientific paper published the results.

ooooooooooOoooooooooo

Have you decided what you want to name the Murex pictured in this column?

It is Phyllonotus peratus Keen, 1960, collected July, 1973, in 15 fms., mud and sand, off the NE end of Saboga Island, Perlas Islands, Panama (Pacific). From the collection of Constance Boone.

If you thought it was Phyllonotus pomum Gmelin, 1791,you were in the ball park anyway. Dr. Abbott's Second Edition of American Seashells comments that this might possibly be pomum, introduced some time ago to the Pacific side through the Panama Canal, possibly in the form of an eggmass.

P. pomum is certainly one of the most common Murex on the Atlantic side, but P. peratus is not at all common on the Pacific side. It took me a long time to see one.

The two species could eventually become the same named shell. The present designation is for our pictured Murex to be a cognate of pomum with its own name.

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Word from Mrs. R. Thacher Gary of San Marcos informs us that additions to the Shell Show schedule have been made to include another division of five classes concerning photography. The show is set for October 11 and 12. Anyone interested in application forms should contact Mrs. Gary, Route 1, Box 327 C, San Marcos, Texas, 78666. Judges selected are Tom Rice, Kirk Anders, Mr. & Mrs. Robert H. Yeargin, and Charles B. Lawrence.

COMMON MARINE INVERTEBRATES OF THE NORTHWESTERN GULF COAST by Nick Fotherington and Susan Brunenmeister. Houston. Gulf Publishing Co. 1975. 197 pages. $6.95. (Paperback. 6x9 inches).

This soft cover handbook in a horizontal format is intended to serve as an introductory field guide to the marine life (invertebrate) of the northwest coast of the Gulf of Mexico. It is stated that about 150 animals that inhabit the beaches and bays of this area are discussed.

Starting with comments of the general shore and faunal features, the animal life is related to several major habitats: jetties and groins; sandy beaches; flotsam and jetsam; salt marshes; mud flats; and, shell habitats. Plankton and nekton are covered in a separate short chapter.

The common representatives of a number of phyla are described for the various habitats. These include sponges, hydroids, jelly-fish, sea anemones, sea pansies, gorgonians, comb-jellies, flatworms, crustaceans (barnacles, copepods, amphipods, isopods, crabs and shrimps), echinoderms (sea urchins, sea cucumbers, sand dollars, sea stars), arrow worms, bryozoans, sea squirts and others.

As a field guide the authors have selected the organisms most commonly noted by the beachcomber. No effort was made to be all-inclusive or to provide the detailed data for a taxonomic reference. Consequently, only a handful of mollusks are described. As an example, the molluscan fauna mentioned for the mud flats include: Tagelus plebius, Ensis minor, Cyrtopleura costata, Rangia cuneata, Mulinia lateralis, Macoma constricta, Mercenaria campechiensis texana, Sinum perspectivum, Nassarius vibex, Terebra dislocata, Phacoides pectinatus, Chione cancellata, Aequipecten amplicostatus, Neritina virginia, Busycon spiratum, Busycon contrarium, Dentalium texasiana and Bulla striata. The illustrations are line drawings, in black and white; the magnification scale is given for each figure.

The book is inexpensive. It should be a useful and handy field guide for the shell collector - not necessarily for information on mollusks but rather to identify many of the other marine creatures that one encounters during shell collecting forays. The emphasis on descriptions of the "lifestyle" of the animals makes the book most interesting to read.

Can you recognize, for example, the rock louse, the porcelain crab, the peppermint shrimp, the beach flea, the fan worm, the mole crab, the sea pansy, the parchment worm, the sea cucumber? These are all pictured and described. Can you differentiate the acorn barnacle from the gooseneck barnacle? What kind of worm build the tubular structures so commonly seen on the sandy beaches? What are the favorite victims of the Scotch Bonnet? Do all fiddler crabs have one large and one small claw? The answers are found in these pages. Sufficient information is given for each organism mentioned to provide even the casual reader with enough data to react knowledgeably to the "tease of the beach creatures".

The senior author is an assistant professor of biology at the University of Houston. His colleague is a doctoral candidate in biology. The bibliographic material is particularly noteworthy since they consist mostly of very specific journal references.

Volume 3 of GRZIMEK'S ANIMAL LIFE ENCYCLOPEDIA is subtitled "Mollusks and Echinoderns". This volume was edited by Bernhard Grzimek, Otto Kraus, Rupert Riedl and Erich Thenius. The book consists of 541 pages, the first 225 pages of which are concerned with mollusks. Only this portion will be reviewed.

The table of contents indicates that the individual chapters on mollusks were written by L.V. Salvini-Plawen and R. Tucker Abbott. The two have compiled six of the seven chapters jointly. The remaining chapter (on cephalopods) was prepared by Dr. Salvini-Plawen. Dr. Salvini-Plawen is at the First Zoological Institute in the University of Vienna. Dr. Abbott is the well-known American malacologist.

As can be anticipated, the style of presentation is somewhat academic. By the same token, a broad perspective is maintained - a point-of-view that cannot be gained from the usual detailed conchological descriptions that characterize taxonomic references. The text in this volume emphasizes the distinguishing malacological characteristics at the level of subclass, order and family.

The book contains many full page color prints. About half are photographs and the others are drawings. In nearly every case, however, the animal is depicted as well as the shell. In addition there are small black and white illustrations along the inside margins of the pages.

CONCHOLOGICAL FOOTNOTES (1)

Monoplacophora (gastroverm) is the most primitive living shelled mollusk because the entire animal is covered by a mantle.

The suction force of the foot of the abalone is more than 4000 times the weight of the animal.

The tun (Tonna galea) produces a solution containing 2% to 4% sulfuric acid which it injects into its prey.

-From Grzimek's Animal Life Encyclopedia, Volume 3.

CONCHOLOGICAL FOOTNOTES (2)

What is the largest pearl in the world? A "pearl" measuring 23 X 15 X 14 cms. and weighting 7 kg. (15 lbs) was found in a tridacna clam in the Philippine Islands in the 1930s.

The "classical piddocks" (Adesmacea)do not have hinge teeth or hinge ligaments. The valves are held together only by muscles.

Europe appears to be the mussel-eating center of the world, consuming more than 100,000 tons of mussels annually (about half of it in France alone).

-From Grzimek's Animal Life Encyclopedia, Volume 3.

SUPERFAMILY CARDIACEA (Continued)

30. Microcardium peramabile Dall, 1881.
Cardium (Fulvia) peramabile Dall, Bull. Mus. Comp. Zool., 9, p. 132.

This is a difficult species to identify because in my opinion there exist two species which have been confused with each other. One was figured by Dall in 1886 (B.M.C.Z., 12, p. 269, pl. 4, fig. 7); the other form which is consistently different in our material was figured as M. peramabile Dall, by Clench and Smith in Johnsonia, Vol. 1, (13), p. 29, pl. 13, figs. 1-2. Clench and Smith do not state whether they figured a specimen identified by Dall as M. peramabile, or the lectotype. This would indicate that no holotype is available.

There are at this moment not sufficient grounds to make a clear distinction into two different species within our material, because the differences could have been induced by environment.

For the time being, we shall report those specimens conforming with Dall's original description and figure as M. peramabile and those resembling Clench and Smith's figure as M. spec. indet. A.

The differences between the two "species" are as follows: M. peramabile Dall is ovate in outline with a slight shoulder on the posterior part of the hinge line, quite inflated, and the sculpture on the anterior half is rather flattened. The other form is much more truncated posteriorly. Its anterior sculpture is much more nodulose and at least in our material is a much smaller shell.

Clench and Smith have figured a specimen of 16 mm., but our material does not exceed 10 mm. It is remarkable that though we have no live collected material the dead valves of both forms clearly are different in color. Those of M. peramabile are a dull brownish-white, those of the other form are white without a brownish hue. Both forms vary considerably in spinosity. Some have no spines at all, some are heavily spinose. Also the pattern of the sculpture on the posterior half can vary considerably in that the radial rows from which the spines arise and which look like ladders, may be separated from each other by a variable number of normal radial ribs. The separation of both fields of sculpture appears to be dif-

ferent in both forms. In M. peramabile the posterior field is smaller than the anterior one so that the dividing rib reaches the ventral margin considerably towards the posterior side of the shell. In the other form, both fields tend to be of equal size. We have only one lot in which both forms occurred mixed. One record of M. peramabile for Galveston West Bay is extremely puzzling. This single valve must be assumed to be adventitious. Normally the species lives in deep water, far below the range of M. transversum Rehder and Abbott, all along the Texas-Louisiana coast.

Previous references for the Texas faunal province are: 144, reported from offshore locations 540, 550, 1096; 170, deep shelf assemblage; 175, listed for upper continental slope, 65-100 fms., common mud bottoms, whole coast; 206, Tex. Conch., Vol. 9, p. 80; 214, figured; 251, Yucatan shelf.

Records H.M.N.S.: 20 lots, no live material.

Depth Range: 50-152 fms. (excluding Galveston Bay)

Geographical Range: Rhode Island - Lesser Antilles

Maximum Size: 16.5 mm.

Eastern Pacific Analogue: Nemocardium (Microcardium) panamense Dall, 1908, "Panama, 33 m." (Keen, 1971).

31. Microcardium spec. indet. A

We have already stated under the previous species, what its characteristics are. It is considerably smaller (maximum size 10 mm.), is strongly truncated and makes a more compact impression. We have no references to this species.

Records H.M.N.S.: 7 lots, of which 2 contain live collected material (small juveniles).

Depth Range: 50-150 fms., alive 140-150 fms.

Geographical Range: Cannot be given until this species is understood.

Maximum Size: 10 mm.

Eastern Pacific Analogue: None.

Remarks: The following references are either in error or adventitious shells: 170, Cerastoderma pinnulatum, listed for deep shelf off East Texas, pl. 16, fig. 6, (is Carditamera floridana Conrad); 110, Trachycardium egmontianum, two rather fresh dead shells were found at Galveston, Pl. 10, figs. 11-12.

SUPERFAMILY MACTRACEA
FAMILY MACTRIDAE

In the N.W. Gulf of Mexico, represented by the subfamilies Mactrinae with genera Mactra, Spisula, Mulinia, Rangianella and Rangia and Pteropseliinae with genera Raeta and Anatina. The Mactridae are remarkable for the large number of species of rather limited geographical extent.

Sources: M. Keen in Treat. Invert. Paleont., Part N. Vol. 2, p. 595-607.

Genus Mactra Linne, 1767.

Two differently shaped species, both reported as Mactra fragilis Gmelin, 1790 live in the N.W. Gulf of Mexico in quite different environments.

One a rather small, but relatively inflated form inhabits the sand bottoms of the more saline South Texas bays. Another, much larger, flatter and more regularly lined one, lives in the open Gulf in a depth range from 6-40 fms. and optimally between 15-25 fms. Although it is possible that the bay form, here labelled M. spec. indet., is merely an ecovariant of the large offshore form, we report here both forms as different species.

32. Mactra (Mactrotoma) spec. indet.

It is probably that this species received a name long ago. Inspection of the types of M. brasiliana Lamarck, Mactra oblonga Say, 1822 and Mactra anserina Guppy, 1875 and others, which Dall has synonymized with M. fragilis Gmelin, 1791 is necessary.

This small species is restricted to the coastal bays where it inhabits the sandy portions. It is rare along the East Texas Coast (not seen in Louisiana), but becomes increasingly common towards the south, becoming abundant south of Corpus Christi. It has never been dredged in the open Gulf and appears confined to the inlets and bays.

Previous references for the Texas faunal province are: (most as M. fragilis, Gmelin) 7 (Mactra braziliana Lamarck), listed: 15 (Mactra braziliana Lam.) single valves are common at Corpus Christi; 18 (M. braziliana Lam.), Corpus Christi; 19 (Mactra braziliana Lam.) common in Carancahua Bay, Matagorda Bay and Espiritu Santo Bay; 21 (Mactra braziliana Lam.), listed; 45, repeats above references; 67, Port Isabel; 98, bays; 110, dead shells on St. Joseph, Mustang and Padre Islands, found living in Aransas Bay, pl. 12, figs. 1, 2; 135, dead in Gulf, alive in bay; 145, listed; 160, dead in Matagorda Bay; 167, alive in Rockport area and in Laguna Madre; 175, listed; 178, northern Laguna Madre; 206, beach records in Tex. Conch., Vol. 1 (3), 1964; 225; Galveston; 236, Galveston; 269, figured on p. 185.

Records H.M.N.S.: 8 lots of which 3 contain live collected material (Galveston West Bay, Aransas Bay, South Padre Island).

Depth Range: 0-1 fms., often found in beachdrift.

Geographical Range: Restricted to Texas faunal province?

Maximum Size: 55 mm.

Eastern Pacific Analogue: None close.

33. Mactra (Mactrotoma) fragilis Gmelin, 1791.

Mactra fragilis Gmelin, Syst. Nat., 13th Ed., p. 3261, No. 22, 1791.

This large Mactra is restricted to the open Gulf and is separated from the previous species by a depth zone in which the genus is missing. Occasionally large live specimens are dredged from sandy mud bottoms, mainly in a depth range of 15-25 fms. This species is flatter and more triangular in outline than the previous one and reaches a much larger size (over 90 mm.). Beach specimens have been taken: one on Matagorda Beach, and another at the jetty of South Padre Island (trawler shell?). Previous students of the Texas fauna have recognized this species

as different but have reported it several times as Spisula solidissima raveneli Conrad, 1831. This confusion started with Maury (1944) who reported both Sp. solidissima similis and Sp. solidissima raveneli Conrad for Galveston. We have not seen this species in the bays.

Previous references for the Texas faunal province are: 45 (Sp. s. raveneli Conrad), Galveston; 135 (Sp. s. raveneli), dead in Gulf; 136, dead on Heald Bank, Pl. 9, fig. 3; 175 (Sp. sol. raveneli), inner shelf, 2-12 fms. sand bottom.

Records H.M.N.S.: 18 lots, of which 2 contain live collected material.

Depth Range: 0-40 fms.; alive: 9-24 fms, in sandy shelly mud.

Geographical Range: North Carolina - Florida, Texas; "West Indies".

Maximum Size: 94 mm.

Eastern Pacific Analogue: Possibly Mactra (Mactrotoma) nastuta Gould, 1851. "San Pedro, California to Colombia". (Keen, 1971).

Genus Spisula Gray, 1837.

Only a single species, restricted to the inlets and shore front (rarely), in the subgenus Hemimactra.

34. Spisula (Hemimactra) solidissima similis Say, 1822.
Mactra similis Say, J. Acad. Nat. Sci., Phila., 2, p. 309, 1822.

This large bivalve is restricted to the sandy flats of the inlets where it often lives in large populations. Its dentition separates it easily from the previous species. Very few valves (only worn juvenile ones) have been dredged in the open Gulf and are probably fossil. Reported from all along the Texas coast and localities along the Louisiana coast (Isles Dernieres) to South Padre Island and into Mexico.

Previous references to the Texas faunal province are: 1 (Mactra solidissima Chemnitz), Galveston; 7 (Mactra similis Say), listed; 15 (Mactra similis Say), single valves at Galveston and Corpus Christi; 19 (Mactra similis Say), Corpus Christi Bay, alive at Matagorda Bay; 21 (Mactra similis Say), listed; 45, Cameron, La., Galveston, Matagorda and Corpus Christi Bay; 65, listed; 69, listed; 110, alive at Galveston, pl. 12, figs. 14-15; 123, dead shells not common from 5-6 fms. off Sabine, Tex.; 136, listed, but not in text; 139, listed for beach and surf zone; 145, shallow shelf; 160, alive in Matagorda Bay; 174, listed; 206, beach records in Tex. Conch., Vol. 1, (3), 1964; 208, listed for several environments; 225, Galveston; 236, Galveston; 267, Marine Pleistocene of Texas; 269, figured on p. 187.

Records H.M.N.S.: 19 lots of which 9 contain live collected material (all Galveston Island, in sandy mud flats and inlets).

Depth Range: 0-27 fms.; alive: 0-1 fms.

Geographical Range: Cape Cod - Florida - Texas (Abbott 1974).

Maximum Size: 99 mm.

Eastern Pacific Analogue: The only small species of Spisula in the Panamanian province is not close to Sp. s. similis (Panama to Peru).

Genus Rangia Desmoulins, 1832.

Only a single species of this genus lives along the N.W. coast of the Gulf of Mexico. We do not believe that Rangianella is close to Rangia, and have allied Rangianella to Mulinia on the basis of the close

similarity of the hinge. Inspection of the hinge structure in Rangia, Rangianella and Mulinia, especially of juvenile specimens , shows some significant differences. The long laterals in Rangia are always minutely ribbed, a characteristic missing in Mulinia and Rangianella. Rangia has a pallial sinus resembling that of Mulinia, but the depth of this feature appears to us of less importance than the structure of the hinge.

35. Rangia cuneata Gray, 1831.

Gnathodon cuneatus Gray in Sowerby, Gen. Shells, No. 36, figs. 1-7, Syn. Rangia nastula Dall, 1894.

This highly variable bivalve is widespread throughout the coastal marshes and shallow bays. One of the forms was described as Gnathodon cuneatus var nasutus Dall, 1894 (Proc. U.S. no. M., 17, p. 98-99, pl. 7, fig. 8; and elevated to specific rank by Olsson and Harbison (Monograph 8, Acad. Nat. Sci., Phila., p. 142, pl. 13, figs. 2, 4, 4a, 1953). Dead shells can form huge accumulations and are dredged for use as road material. An attempt to market these clams for human consumption proved a failure (ref. 15). Very old valves are often dredged in offshore waters, even with their ligament intact (Stetson Bank), but these are drowned Pleistocene shells. Dead shells are abundant on all outer beaches along the Texas-Louisiana coast, where the species lives in the upper parts of practically all coastal bays, where the salinity is below normal. Very large live specimens were taken from Caney Creek at Sargent (over 80 mm.).

Previous references to the Texas faunal province are: 1, very common in brackish water at New Washington on Galveston Bay; 7, listed; 15, common all along the coast in brackish water, Nueces Bay, also as Pleistocene fossil; 16, (Gnathodon, nearest cuneatus), well at Galveston, 305-315 feet; 18, listed; 19, plentiful in small bays, which empty in Matagorda Bay, largest sizes in slightly brackish water, smaller in water that is salt all the time. Pleistocene in Victoria County; 21, listed; 26, listed, Matagorda Bay, Nueces River, etc., well at Beaumont, 600 feet, Port Lavaca, type locality (R. cuneata nasuta Dall); 55, mentioned; 56, Port Lavaca, Texas; 58, Carancahua Bay, Matagorda Bay; 66, Marine Pleistocene of Texas; 69, listed; 93, numerous dead Rangia shells along bay shores, no live colonies; 98, alive in Mission Lake, Hynes Bay, San Antonio Bay; 110, common in all bays of low salinity, pl. 12, figs. 7, 8; 126, listed; 135, dead in bays; 136, dead valves on East Texas beaches; 139, bays near rivers; 145, delta front, marsh; 146, interdistributary bays; 156, common on Stetson Bank; 164, alive in Rockport area; 170, shallow shelf off East Texas; 174, listed; 175, river influenced low salinity assemblage; 188, Pleistocene; 189, Pleistocene; 206, beach records Tex. Conch., Vol. 1 (4), 1964; 225, Galveston; 236, Galveston; 267, Pleistocene, Chambers County; 268, Pleistocene off Freeport, ± 8,000 B.P.; 269, figured on page 186.

Records H.M.N.S.: 52 lots, of which 10 contain live collected material.

Depth Range: 0-37 fms.; alive: 0-1 fms. in soft, organic rich mud. Fossil offshore material usually from sandy mud bottoms. Beach material more common east of Matagorda than south of there.

Geographical range: Chesapeake Bay to Texas.

Maximum Size: 86 mm. (dead beach valve); alive 80 mm. (Caney Creek)

Eastern Pacific Analogue: Rangia is missing in the Panamanic province.

Genera Mulinia Gray, 1837 and Rangianella Conrad, 1868.

At the present time, we will distinguish Mulinia Gray, 1837 and Rangianella Conrad, 1868 by the shape of the pallial sinus. The structure of the hinge is so similar that material outside our area should be compared with the Texas species. In Mulinia Gray, 1837. the sinus is short and small according to the Treat. Invert. Paleont. (p. N. 601), but in M. lateralis of our coast it is fairly deep and pointed. In Rangianella Conrad, 1868, the sinus is inconspicuous or obsolete, (ibid, p. N. 601). R. flexuosa of Texas shows a well rounded, very small sinus, and a similar one is shown by Mulinia pontchartrainensis Morrison, 1965, a species which we would rather refer to Rangianella.

Mulinia along the Louisiana and Texas coastline forms a poorly studied complex of forms and shapes, and may be a mixture of two little understood species. Apart from a recent study by Morrison, who described M. pontchartrainensis from just outside our region, no recent work on this group of bivalves is known to me.

The variability of the species so far called M. lateralis Say, is particularly noticeable in the development of the hinge line, not so much in shape and arrangement of the teeth as in strength and development. Over and over, one finds specimens with strongly developed and broad teeth, whereas others show a thin and slender development of the entire hinge plate. In paired valves, the distance between the umbo's can be quite different: in some they almost touch, in others they are wide apart. Finally, the amount of inflation of the valves is as variable as the other characteristics. Most Mullinia start out in the juvenile stage (up to 1/10 inch) as quite flat and thin shells but some then develop considerable curvature and become inflated, whereas others remain relatively flat throughout their entire life.

Juveniles do not show any appreciable periostracum, but in the adult stage they develop a regularly ridged periostracum covering the shell below the umbos and which becomes more or less bearded on the posterior side of the shell. Here they have a posterior ridge, but some specimens have two such ridges where the periostracum becomes frilly. The thickness of the calcareous cross section of the shell is also subject to enormous variation. On the whole, it is true that specimens collected along the beaches and sandbars of the inlets are thin, lightly developed, while those collected in the bays from organic rich mud bottoms have a dense periostracum and heavy hinge line. The species thus reflects a general character of the genus.

The distribution is remarkable throughout the area: Mulinia lives in great profusion in all coastal bays in any type of environment, but least in the oyster reef. For this reason, we have called the two principal types of environment of the East Texas bays, the Mulinia bottom and the

Dead shells have been taken offshore to a depth of 40 fms., often in great profusion, but live material is seldom dredged in offshore waters except at certain locations: Ship Shoal off Louisiana and off Freeport, Texas. Both locations are close to river mouths. Pulley (ref. 110) reports the species living in 12 fms. off Port Aransas, a depth at which we have never encountered live material off Galveston and Freeport. Most of the deep offshore dredge-material must be Pleistocene, but why it is so common remains an unsolved problem.

In summary then: I believe that the two forms of Mulinia lateralis living on the coast are a single species (ecovariants). A thin, lightly developed form lives offshore, along the beaches and in the inlets. A heavier, more inflated, thicker form, for which the name Mulinia corbuloides Deshayes is available, inhabits the mud bottoms of the coastal bays.

36. Mulinia lateralis (Say, 1822).

Mactra lateralis Say, J. Acad. Nat. Sci., Phila., 2, p. 309, 1822.

This species lives abundantly in those parts of the coastal bays which are not covered by oyster reefs (Mulinia bottoms). It is also found alive on the more sandy mudflats of the inlets, along the tide line of the outer beaches and at a few locations offshore in the company of typical bay fauna (Ship Shoal and off Freeport). Most offshore samples contain many dead valves of this species but never live ones. Thus it must be considered a bay species in spite of the fact that it is often the most abundant bivalve in offshore samples (up to a depth of 40 fms.). It is also by far the most numerous component of beachdrift near the inlets (up to 90% at Galveston, somewhat less south of Matagorda). Mulinia corbuloides Deshayes, 1854 is here considered a synonym.

Previous records of the Texas faunal province are: 1, Galveston; 7, listed; 15, Galveston and Corpus Christi, Sabine Pass, very abundant; 16, well at Galveston 300-315, 400-458 feet; 18, Corpus Christi and Galveston, abundant; 19, (M. lateralis, southern variety), common in all the bays; 21, listed; 26, Pleistocene and recent; 45, well at Beaumont, 600 feet, well at Galveston. Recent, Galveston, Corpus Christi, Sabine Pass; 56, listed; 58, Matagorda Bay; 66, Marine Pleistocene of Texas; 67, Port Isabel; 69, listed; 98, alive in bays and Laguna Madre; 99, alive in San Antonio Bay; 110, abundant on all Texas beaches, pl. 12, figs. 5-6; 126, listed; 135, alive in Gulf and bays; 136, off East Texas, common dead offshore, alive in intertidal zone; 139, open bays; 143, listed; 145, Delta front, abundant; 146, Delta front platform; 148, Baffin Bay; 151, Laguna Madre; 156, Stetson Bank; 160, alive in Matagorda Bay; 164, alive at Rockport, alive in Laguna Madre; 170, shelf off East Texas; 174, listed; 175, listed for various environments in N.W. Gulf of Mexico; 178, Laguna Madre and Baffin Bay; 188, Pleistocene; 191, marine Pleistocene; 193, food item of Black Drum (fish), Laguna Madre; 194, food item of Black Drum (fish); 206, beach records Tex. Conch., Vol. 7 (3), 1964; 208, listed for bay environments; 217, listed; 225, Galveston; 236, Galveston, 253, rare on reef off Padre Island; 261, dominant form shallow offshore, Galveston; oyster bottom (Tex. Conch., Vol. 10, p. 63-67, 75-83).

267, Pleistocene Chambers County; 269, figured on page 185.
Records H.M.N.S.: 154 lots, of which 34 contain live collected material.
Depth Range: 0-40 fms.; alive: 0-6 fms.
Geographical Range: Maine - Florida - Texas, Mexico.
Maximum Size: 16.2 mm.
Eastern Pacific Analogue: Of the two species in the Panamanic fauna, none appears close.

37. Rangianella flexuosa (Conrad, 1839).
Gnathodon flexuosus Conrad, Am. Journ. Sci., 38, p. 92, 1839.
A similar difficulty as for Mulinia exists for the genus Rangianella. It is possible that two species live along the Texas coast, but in spite of extensive material, I am unable to make a convincing case for this interpretation. There can be no doubt that Rangianella pontchartrainensis Morrison, 1965 is specifically different, but so far this species has not been found, although it probably will some day, west of the Mississippi River. The evidence for two species in Texas is indirect: At many locations in the bays (Galveston Bay, Matagorda Bay), only live juvenile specimens are found, without a trace of full grown material. For the time being, we have labelled this material Rangianella flexuosa, but further study might show this to be incorrect. R. flexuosa, full-grown, reaches a size of about 2.5 inches (60 mm.) and is thick shelled. Apparently for that reason it has been - incorrectly as we believe - aligned with Rangia, but in our opinion, it is much closer to Mulinia. Juvenile R. cuneata and R. flexuosa are separated at a glance - totally different hinges - but mixtures of juvenile M. lateralis and Rangianella flexuosa require careful inspection. Rangianella flexuosa, as defined here, is far less common than R. cuneata but sometimes lives with it in mixed populations. On the outer beaches of Texas and Louisiana (Isles Dernières), old valves are abundant, but they are rare in offshore samples. Live material is present from Lavaca Bay, Red Fish Bayou; Chocolate Bayou, Clear Lake; Seadrift; Swan Lake, Red Fish Lake; Caney Creek (all Texas). Dead shells are known also as far south as the Port Mansfield cut on Padre Island.
Previous records of the Texas faunal province are: 7, listed; 15, dead valves at Galveston; 18, dead valves at Galveston; 21, listed; 45, Galveston; 67, dead valves at Port Isabel; 110, living in Clear Lake, Galveston Bay; 145, marsh areas; 146, "levee" assemblage; 174, listed; 175, river influenced low salinity assemblage; 206, beach records, Tex. Conch., Vol. 1 (4), 1964; 225, Galveston; 236, Galveston; 267, Pleistocene of Chambers County, Texas; 269, figured on page 186.
Records H.M.N.S.: 47 lots of which 11 contain live collected material.
Depth Range: 0-25 fms.; alive 0-1 fms., in soft black mud. More common in Matagorda and Galveston Bay than other coastal bays, which is possibly due to more intensive collecting.
Geographical Range: Restricted to Texas faunal province (South to Vera Cruz).
Maximum Size: 60 mm.
Eastern Pacific Analogue: Rangianella mendica Gould, 1851. "Gulf of California, as far south as Mazatlán, Mexico" (Keen, 1971).

Genus Anatina Schumacher, 1817.
Large, thin shelled bivalves. Only a single species in the open Gulf, confined to the surf zone. Recently reviewed by Harry (see ref. 245).

38. Anatina anatina (Spengler, 1802).
Mactra anatina Spengler, Skrift. Naturh. Selskabet. Copenhagen, 5 (2), p. 92-128, 1802.
Syn. Labiosa lineata Say, 1822.

A somewhat uncommon species, only found on the outer beaches. It has never been dredged alive, neither in the open bays, nor in offshore waters. From the open Gulf, only a small number of fragmental shells is known. It must be concluded that this is a typical surf zone species. Live shells are rarely thrown upon the beaches; when they are it is usually after a cold spell, but loose valves are found the year round in small numbers along all Texas outer beaches. We have no material from Louisiana but presumably the species also lives there. In most references reported as Labiosa lineata Say, 1822.

Previous records of the Texas faunal province are: 7, listed; 21, listed; 45, listed; 56, listed; 58, Matagorda Bay; 69, listed; 110, rare on all Gulf beaches, somewhat more common to the south, plate 12, fig 4; 135, alive in Gulf, dead in bays; 145, shallow shelf (dead); 160, dead in Matagorda Bay; 174, listed; 206, beach records in Tex. Conch., Vol. 1 (4), 1964; 225, Galveston; 236, Galveston; 245, Galveston, figs. 7, 8, 9, 10; 269, figured on page 184.

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

Depth Range: 0-40 fms.; alive: 0-1 fms.,beach only.

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

Maximum Size: 66 mm.

Eastern Pacific Analogue: Anatina cyprinus Wood, 1828. "Off Bahia San Luis, Guaymas, to Ecuador and possibly Peru" (Keen, 1971).

Genus Raeta Gray, 1853.
Large, thin shelled bivalves, having a peculiar vermiculate sculpture when viewed under magnification.

39. Raeta plicatella (Lamarck, 1818).
Lutraria plicatella Lam., Anim. s. Vert., 5, p. 470, 1818.
Syn. Labiosa canaliculata Say, 1822. This is the name under which this species has been most often reported.

More common than the previous species, but apparently of quite similar habits. It is restricted to the surf zone and is missing in the bays and deeper offshore waters. Live specimens are uncommonly found along the beaches and then only after a cold spell. Dead valves are fairly common the year round along Louisiana and Texas beaches; never found alive in the coastal bays although a few rare dead valves are occasionally dredged there.

Previous records of the Texas faunal province are: 1, Galveston, common; 7, listed; 15, abundant at Galveston, less so at Corpus Christi; 16, well at Galveston, 46-63 feet; 19, Matagorda Bay and Corpus Christi Bay, Gulf beach, Matagorda Peninsula and Matagorda Island, not alive; 21, listed; 45, Galveston, Matagorda Bay, Corpus Christi, Galveston well, 46-2, 871 feet; 58, Padre Island; 61, listed; 62, Mustang Island, Padre Island; 65, listed; 66, Marine Pleistocene of Texas; 67, Port Isabel; 69, listed; 98, Padre Island; 110, sometimes common on all Gulf beaches,

pl. 12, fig. 3; 135, dead in Gulf, 136, dead on East Texas beach; 145, shallow shelf, dead; 160, Matagorda Bay, dead; 164, dead in Rockport area; 170, shallow shelf off East Texas; 174, listed; 175, inner shelf, 2-12 fms., few along whole coast; 206, beach notes Tex. Conch., Vol. 1 (4), 1964; 208, barrier-face and bars environment; 225, Galveston; 236, Galveston; 245, Louisiana and Texas; 267, Pleistocene of Chambers County, Tex.; 269, figured page 184.

Records H.M.N.S.: 25 lots, of which 2 contain live collected material.

Depth Range: 0-26 fms.; alive 0-1 fms., beach only.

Geographical Range: Carolinas, Texas, Surinam (Altena, 1971).

Maximum Size: 73 mm.

Eastern Pacific Analogue: Raeta undulata Gould, 1851. "San Pedro, California to Peru" (Keen, 1971).

FAMILY MESODESMATIDAE

In the Northwest Gulf of Mexico, represented by the subfamily Erviliinae Dall, 1895, with the genus Ervilia.

Sources: M. Keen in Treat. Invert. Paleont., Vol. N, part 2, p. 608-610.

Genus Ervilia Turton, 1822.

Small shells, concentrically striate, although some show traces of faint radial lines.

40. Ervilia concentrica (Holmes, 1860).
Ervilia concentrica Gould, Proc. Bost. Soc. Nat. Hist., 8, p. 280 (off N. Carolina).

When large numbers of this species are seen together, it is clear that the species is quite variable. It seldom reaches the size of 8 mm., but most specimens are about half that size. The ribbing or grooving is quite variable. Some specimens start out quite smooth and only later develop the typical concentric ribs. In others, the ribbing starts early. In many specimens, microscopic striae between the ribs can be seen and some specimens possess posteriorly a vague radial pattern. The umbo is always quite prominent. Sometimes it is placed centrally, other times considerably off center. Specimens are rarely pinkish in color. Beach specimens are quite rare at Galveston but become more common towards the south (St. Joseph Island - South Padre Island). Fresh pairs, mostly juveniles, have been taken from drift. Widespread offshore, mostly in the shell bank environment (Heald Bank), together with Semelina nuculoides and Strigilla mirabilis, (Ship Shoal, La., to S. Padre Island). Not in the bays.

Previous records of the Texas faunal province are: 136, reported from 12 stations in 33-56 feet off East Texas, alive; 164, Note: (probably an incorrect report. Figure shows (pl. 2, fig. 22) Mysella sp.); 170, off East Texas; 206, beach records in Tex. Conch., Vol. 1, (3), 1964; 225, Galveston; 236, Galveston; 269, figured on page 188.

Records H.M.N.S.: 37 lots of which two contain live collected material from sandy bottom.

Depth Range: 0-32 fms; alive 7-9 fms.

Geographical Range: N.W. Gulf of Mexico, off the Carolinas and West Indies.

Maximum Size: 8 mm.

Eastern Pacific Analogue: Mesodesmatidae do not live in the Panamanic fauna.

41. Ervilia nitens (Montagu, 1806).

This much rarer species is only known from two lots taken in deep water off Louisiana. It lacks the concentric striations of the previous species and also its shape is different.
Previous records in the Texas faunal province are: None.
Records H.M.N.S.: 2 lots of dead shells, which are immature.
Depth Range: 55 fms.
Geographical Range: Florida, Bermuda, West Indies.
Eastern Pacific Analogue: Mesodesmatidae do not live in the Panamanic fauna.

SUPERFAMILY SOLENACEA

FAMILY SOLENIDAE

In the Northwest Gulf of Mexico, represented by the single genus Solen.
Sources: M. Keen in Treat. Invert. Paleont., Vol. N, part 2, p. 610-611.
Genus Solen Linne, 1758.
Elongate bivalves, gaping at both ends. Beaks terminal. Straight dorsal margin. These animals live in sandy bottoms in which they can dig very rapidly (although I have not seen S. viridis do this trick).

42. Solen viridis Say, 1822.
Solen viridis Say, 1822; Journ. Acad. Nat. Sci., Philadelphia, 2, p. 316.
This species reaches its most western distribution at San Luis Pass, Galveston Island. Occasionally large numbers of live specimens are cast upon the beaches along the East Texas and Louisiana coast. Fragmental shells have been dredged in depths to 25 fms., but the animal probably does not live beyond 10 fms. Not living in the bays and apparently restricted to the beach zone and the inlets.
Previous records for the Texas faunal province are: 69, listed; 136, listed "alive" in final list; 170, shallow shelf assemblage, 175, inner shelf 2-12 fms., common, only off western Louisiana; 206, beach records in Tex. Conch., Vol. 2, (2), 1965; 225, Galveston; 236, Galveston; 269, figured on page 188.
Records H.M.N.S.: 13 lots of which 5 contain live collected material.
Depth Range: 0-25 fms.; alive 0-8 fms.
Geographical Range: Rhode Island to Florida; reaches the extreme Western limit of its range at Galveston.
Maximum Size: 38 mm.
Eastern Pacific Analogue: ?

FAMILY CULTELLIDAE

In the Northwest Gulf of Mexico, represented by a single genus Ensis.
Sources: M. Keen in Treat. Invert. Paleont., Vol. N, part 2, p. 611-613.
Genus Ensis Schumacher, 1817.
Quite different hinge structure as compared to Solen. Dorsal margin curved.

43. Ensis minor Dall, 1900.

Ensis minor Dall, 1900, Trans. Wagner Inst. Free. Sci., 3, pl. 5, p. 955.

This is a widespread and common species along the Louisiana and Texas (Timbalier Bay, La. to South Padre Island) coasts, occasionally found living in clay or sandy clay. Fragments are often found on the shallow shelf to a depth of 35 fms. but in the collection of the H.M.N.S., the deepest live record is 1.5 fms; presumably the species lives deeper than that. Early records refer to this species as Solen americanus, but express some doubt about the correctness of this identification. The latter is a synonym of Ensis directus Conrad, 1843, a species not known from the NW. Gulf of Mexico.

Previous records for the Texas faunal province are: 28, original description; 45, Matagorda and Corpus Christi Bays (based on earlier references of Solen Americanus 56, listed; 69, listed; 93 (as Solen sp.), in bird droppings on refuge. "Probably Solen viridis". (Note: This is quite unlikely and Ensis minor seems more probable) 98, alive in many bays; 99, living in San Antonio Bay; 110, lives in all bays of higher salinity. Plate 13, figs. 16, 17; 126, listed; 135, dead in Gulf, alive in bays; 136, alive on clay (East Texas); dead on beach; 145, upper sound, shallow shelf (Mississippi delta); 160, alive in Matagorda Bay; 164, Rockport area; alive; Laguna Madre, alive, 170, alive on shallow shelf; 174, listed; 175, common along bay margins; 178, upper extremity Laguna Madre; 193, south Laguna Madre; 206, beach records in Tex. Conch., Vol. 2 (2), 1965; 208, bay margin and grass flats environment; 225, Galveston, 236, Galveston; 269, figured on page 188.

Records H.M.N.S.: 33 lots, of which 11 contain live collected material.

Depth Range: 0-30 fms.; alive: 0-1.5 fms.

Geographical Range: "New Jersey to Florida to Texas" (Abbott, 1974)

Maximum Size: 81 mm.

Eastern Pacific Analogue: Not clear. 2 species of Ensis live in the Panamanic province.

Remarks: References to Ensis directus Conrad, 1843 all predate Dall's description of Ensis minor and sometimes express doubt as to the correctness of the name. They are: ref. 15, (as Solen Americanus Gould?), Corpus Christi Bay and Laguna Madre, common; 18, (as Solen directus) Corpus Christi, young shells abundant; 19, Solen americanus Gould), living in all bays from Matagorda to Corpus Christi except Mud Bay; 21, listed as Solen americanus.

SUPERFAMILY TELLINACEA
FAMILY TELLINIDAE

This world wide family of often pink colored shells is represented in the NW. Gulf of Mexico by the subfamilies Tellininae with genera Tellina, Angulus, Tellidora and Strigilla ; and Macominae with genera Macoma, Psammotreta and Cymatoica.

Sources: M. Keen in Treatise of Invert. Paleont., Part N, Vol. 2, p. 613-628.

K. J. Boss, Johnsonia, Vol. 4, 45, 46, 47, 1966, 1968 and 1969.

Genus Tellina Linne, 1758.

Revision of this genus should result in splitting the numerous species classified as Tellina in a number of separate genera, but at present it is not clear how this can be done without inconsistencies (M. Keen). On the other hand, it is equally inconsistent to classify all members in the single genus Tellina, even though we may not be sure of generic relationship, when it is customary to split other families (f.i. Veneridae) in a large number of separate genera. Even in the Tellinidae, the argument is not fully adhered to (f.i. Macoma-Psammotreta). The statement appears to imply that the generic relations are understood when generic distinctions are made, which obviously is not true. For that reason, I will report some of the smaller Tellins under the full genus Angulus, of which Scissula is considered here a subgenus.

44. Tellina (Eurytellina) angulosa Gmelin, 1791.
Tellina angulosa Gmelin, Syst. Nat., 13th Ed., p. 3244.

A single valve was dredged together with both T. alternata and T. tayloriana in 4 fathoms off Padre Island. It is our only record (trawler shell?). This species has so far not been reported from the NW. Gulf of Mexico, and is a typical South American species.

Previous records for the Texas faunal province are: None.
Records H.M.N.S.: A single valve from 4 fms. off Padre Island.
Geographical Range: Southern Florida, South America to Uruguay.
Maximum Size:
Eastern Pacific Analogue: ?

45. Tellina (Eurytellina) alternata Say, 1822.
Tellina alternata Say, 1822, Acad. Nat. Sci., Phila., 2, p. 275.

Old valves are often dredged on the shallow coastal shelf to a depth of 26 fms. The species is often found alive in beach drift along the entire coast line, where however, the next species (?) appears to be more common. Boss has enumerated a number of distinctive differences between T. alternata and T. tayloriana but in many instances, dealing with Texas material, the distinction is difficult. The pink T. tayloriana is the common Texas beach shell. It is practically impossible to separate worn, old material obtained from dredgings. We are doubtful whether T. tayloriana constitutes a valid species and in our opinion it appears more plausible that T. tayloriana is merely an ecological variant of T. alternata. Some of our observations are contrary to statements by Boss in Johnsonia. We invariably find that the yellow T. alternata is smaller than the pink T. tayloriana and our records clearly indicate that T. alternata on the average lives in deeper water than T. tayloriana, which appears almost completely restricted to the surf zone. T. alternata is only occasionally obtained from the bays.

Previous records for the Texas faunal province are: (early references did not distinguish between T. alternata and T. tayloriana) 1, very common, Galveston Island; 7, listed; 15, Galveston and Corpus Christi, abundant, the pink variety being the most common (=T. tayloriana); 18, listed; 19, Matagorda Island (both T. alternata and T. tayloriana, alive); 21, listed; 45, Galveston, Corpus Christi, Matagorda Island; 58, Padre Island; 61, listed; 62, Shamrock Island, Corpus Christi Bay; 65, St. Joseph Island; 66,

marine Pleistocene of Texas; 69, listed; 98, beach Padre Island; 110, shallow water, all along Texas beaches, pl. 13, figs. 10-11; 126, listed; 135, alive in Gulf, alive in bays; 136, intertidal zone off East Texas; 145, upper sound, shallow shelf, Mississippi delta; 156, Stetson Bank; 160, Matagorda Bay; 164, Rockport area, alive in open bay margins; 170, shelf assemblage; 174, listed; 206, beach records in Tex. Conch., Vol. 5, p. 11, 1968; 225, Galveston;235, listed; 236, Galveston; 253, rare off reef, Padre Island; 261, shallow offshore waters, Galveston; 269, figured on page 196.

Records, H.M.N.S.: 32 lots of which 11 contain live collected material.

Depth Range: 0-26 fms.; alive: 0-5 fms. on sandy bottoms.

Geographical Range: North Carolina, Florida, Texas, Mexico.

Maximum Size: 56.5 mm.

Eastern Pacific Analogue: Tellina (Eurytellina) laceridens Hanley, 1844, "Corinto, Nicaragua, to Tumbes, Peru, on mud flats at lowest tide". (Keen, 1971).

46. Tellina (Eurytellina) tayloriana Sowerby, 1867.
Tellina tayloriana Sowerby, in Reeve, Conch. Icon., 17, Tellina, pl. 30, fig. 168.

It is at present somewhat uncertain whether the pink T. tayloriana is conspecific or not with T. alternata. Differences in shell shape are stated to be as follows: T. tayloriana has: 1) a flatter shell, resulting in a narrower internal cavity; 2) its right valve is noticeably more flat than that of T. alternata; 3) the hinge plate of the right valve is broader and flattened. It appears probable to us, that the pink tayloriana is merely an ecovariant of alternata, restricted to the surf zone. Only a single fragmental shell was dredged from 25 fms. (fossil?). Otherwise all our material derives from depths less than 4 fms. T. tayloriana is often thrown upon the beaches along the entire coastline of Louisiana and Texas to the Rio Grande. Parker states (ref. 175) that T. alternata replaces T. tayloriana east of the Mississippi delta.

Previous records for the Texas faunal province are: 164, Rockport area, alive in inlet influence; 175, abundant along Texas beaches; 206, beach records in Tex. Conch., Vol. 5, p. 11, 1968; 208, listed; 235, listed; 269, figured on page 197.

Records H.M.N.S.: 13 lots, of which 4 contain live collected material.

Depth Range: 0-25 fms.; alive: beach only.

Geographical Range: Texas - Mexico.

Maximum Size: 64 mm.

Eastern Pacific Analogue: ?

47. Tellina (Eurytellina) nitens C.B. Adams, 1845.
Tellina nitens Adams, 1845, Proc. Bost. Soc. Nat. Hist., 2, p. 10.
Synonym: T. georgiana Dall, 1900.

This Eurytellina is the most widespread species on the deeper sandy bottoms of the offshore shelf. The few beach specimens known (South Padre Island, Mustang Island and between the Freeport jetties, the latter probably a trawler shell) are mostly adventitious on Gorgonia root masses.

Previous records for the Texas faunal province are: 145, (T. georgiana Dall), deep shelf; 170 (T. georgiana Dall) transitional shelf assemblage; 174, (T. georgiana Dall), listed; 175,

(T. georgiana Dall), intermediate shelf, common along whole coast; 206, beach records in Tex. Conch., Vol. 5, p. 22, 1968; 235, about 68 miles S.E. of Freeport in 48 fms., about 80 miles S. of Port Isabel in 40 fms.

Records H.M.N.S.: 51 lots of which 2 contain live collected material.

Depth Range: 0-40 fms.; alive 11-23 fms. on sandy mud bottoms.

Geographical Range: North Carolina, Florida, Brazil, Gulf of Mexico.

Maximum Size: 35 mm.

Eastern Pacific Analogue: Tellina (Eurytellina) inaequistriata Donovan, 1802, "Gulf of California to Guayaquil, Ecuador, mainly offshore at depths of 18 to 33 m". (Keen, 1971).

48. Tellina (Eurytellina) lineata Turton, 1819.
Tellina linaeta Turton, 1819, Conch. Dict., p. 168, pl. 4, fig. 16.
Synonym: T. decussatula C.B. Adams, 1845.

So far, no live material of this species is known from the N.W. Gulf of Mexico. Loose valves are often obtained from "spoil" material (mud piled up from dredgings of canals) in the south Texas bays. Beach shells are known from Galveston (quite rare) and south of St. Joseph Island (more common). In the Galveston area it is only rarely dredged. It appears plausible that the only place where T. lineata survives in the Texas fauna is on the offshore coral reefs (one lot). All specimens obtained from "spoil" material are probably Pleistocene fossils.

Previous records for the Texas faunal provice are: 110, St. Joseph, Mustang and Padre Islands; pl. 13, figs. 12-13; 160, Matagorda Bay; 174, listed; 206, beach records in Tex. Conch., Vol. 5, p. 11, 1968; 235, Port Aransas, probably Pleistocene; 269, figured on page 146.

Records H.M.N.S.: 10 lots, no live material.

Depth Range: 0-25 fms.; dredged at 4-and-25 fms.; valve from coral reefs.

Geographical Range: Florida - Texas - Brazil.

Maximum Size: 27 mm.

Eastern Pacific Analogue: ?

49. Tellina (Phyllodina) squamifera Deshayes, 1855.
Tellina squamifera Deshayes, Proc. Zool. Soc., London, 22, p. 365, 1853.

This species widely known as Phylloda squamifera Deshayes, is quite common over the sandy portions of the offshore shelf in a depth range of 6-57 fms., with an optimum at about 20-30 fms. It seldom reaches the beach and is only known from Sabine Beach and from between the Freeport jetties (trawler shell?). When fresh, the shell is often tinged by a faint yellow color, which rarely has a pinkish streak in it.

Previous records for the Texas faunal province are: 139, outer shelf; 145, deep shelf, alive; 156, Stetson Bank; 170, shelf assemblage; 175, intermediate shelf, common along whole coast; 201, mudlump fauna, Mississippi delta; 206, beach records, Tex. Conch., Vol. 5, p. 10, 1968; 221, off Port Isabel in 50 fms.; 236, Galveston; 251, Yucatan Shelf.

Records H.M.N.S.: 50 lots, of which 7 contain live collected material.

Depth Range: 0-57 fms.; alive: 11-50 fms.

Geographical Range: North Carolina, Florida, Texas.
Maximum Size: 27.7 mm.
Eastern Pacific Analogue: Tellina (Phyllodina) pristiphora Dall, 1900.
"Santa Inez Bay, Gulf of California, to Puntarenas, Costa Rica, offshore in 22 to 155 m. " (Keen, 1971).

50. Tellina (Merisca) aequistriata Say, 1824.
Tellina aequistriata Say, 1824, Journ. Acad. Nat. Sci., Phil., 4, p. 145.
Synonym: Quadrans lintea Conrad, 1837.
This common and widespread species used to be known as Quadrans lintea Conrad, 1837. It lives on sandy bottoms in a depth range of 9-28 fms. along the entire Louisiana and Texas coast. Known from beachdrift only at Sabine beach, east Texas, and south of St. Joseph Island in south Texas. Not in the bays but one lot taken in channels to Timbalier Island, La., in 1-3 fms. of water, and one in between jetties at Freeport (trawler shells?).
Previous records for the Texas faunal province are: (almost all as Quadrans lintea Conrad). 136, Sabine Bank at a depth of 7 fms.; 139, "open" shelf; 145, inlets, shallow shelf, deep shelf; 146, levee assemblage; 156, common on Stetson Bank; 160, Matagorda Bay; 164, Rockport area; 170, transitional shelf assemblage; 175, intermediate shelf; common along whole coast, on sand bottoms 12-35 fms.; 201, Mudlump fauna, Mississippi delta; 206, beach records in Tex. Conch., Vol. 5, p. 10, 1968; 214, figured; 221, Pass Caballo; 225, Galveston; 253, Offshore reef, Padre Island; 269, figured on page 197.
Records H.M.N.S.: 76 lots of which 5 contain live collected material.
Depth Range: 0-50 fms.; alive: 9-28 fms.
Geographical Range: North Carolina, Florida, Texas, Brazil.
Maximum Size: 21.5 mm.
Eastern Pacific Analogue: Tellina (Merisca) reclusa Dall, 1900.
"San Ignacio Lagoon, Baja California, to Panama, mostly offshore in depths of 5-70 m." (Keen, 1971).

51. Tellina (Laciolina) magna Spengler, 1798.
Tellina magna Spengler, 1798. Skriv. Natur. Selskabet, 4 (76), 12, fig. 2.
A rather rare species in the N.W. Gulf of Mexico. Our largest single valve (76 mm.) was taken by divers from an octopus den. Some fragments and shells have been found on the beaches of Padre Island. The color of Texas material is a uniform light orange. Boss states that Ardeamya columbiensis Hanley, 1844, is superficially close to it in the Pacific fauna but this species lacks lateral dentition and for that reason he assumes that both species cannot be closely related. Further investigations will have to establish the significance for classification of the hinge characteristics in the Tellinidae.
Previous records for the Texas faunal province are: 206, beach records in Tex. Conch., Vol. 5, p. 10, 1968.
Records H.M.N.S.: 4 lots (no live material and mostly fragmental).
Depth Range: 5-12 fms. on sand bottom.
Geographical Range: North Carolina, Florida, West Indies.
Maximum Size: 76 mm. (far below maximum size of 122 mm. cited by Boss).
Eastern Pacific Analogue: None close.

52. Tellina (Tellina) radiata Linne, 1758.

Tellina radiata Linne, 1758. Syst. Nat., 10th Ed., p. 675.

Only a single valve from Hospital Rock, offshore Port Aransas, dredged from algal community. The species appears to be rare in Texas and so far no material has been found on the reefs off Galveston and Louisiana, but it is not impossible that the species will be found there. Some early references have cited this species for the beach, but this was before Dall had described Macoma tageliformis, which we believe was mistaken for this species.

Previous records for the Texas faunal province are: 15, a single valve on the beach of Galveston; 45, repeated above reference; 56, listed (based on above references?); 61, listed; 62, Shamrock Island, Mustang Island, Corpus Christi Bay. All these references are undoubtedly in error. The following are possibly correct: 147, dead on Big Southern Bank; 192, Campeche Bank; figured.

Records H.M.N.S.: 1 lot of one immature valve from Hospital Rock.

Depth Range: Approximately 30 fms.

Geographical Range: South Carolina, Florida, Bermuda, Guianas (Abbott, 1974). The subgenus Tellina does not occur in the Panamanic Province.

SHELL BOOKS OF THE RECENT PAST

WEST COAST SHELLS by Josiah Keep. Revised by Joshua L. Bailey, Jr. Stanford University Press. 1935. 350 pages.

The book describes "in familiar terms . . . the principal marine, fresh-water and land mollusks of the United States, British Columbia, and Alaska, found west of the Sierra". Josiah Keep was curator of conchology at the California Academy of Sciences and Professor of Geology at Mills College (California).

Most comprehensive bibliographies will include this publication among the key references covering the Pacific Coast mollusks. The book is illustrated by 332 black and white drawings.

The first edition of WEST COAST SHELLS appeared in 1887. This actually followed an earlier book COMMON SEA-SHELLS OF CALIFORNIA (1881). The book was updated in 1904 as WEST AMERICAN SHELLS.

Little personal anecdotes interspersed among the scientific descriptions make interesting reading. Listed as the "aristocracy" among the West Coast shells are the Cypraeidae, the Ovulidae, the Volutidae, the Marginellidae, and the Olividae.

CONCHOLOGICAL PHILATELY by W.W. Sutow, M.D.

Editor, Tom Rice, has devoted considerable space in the Summer, 1975, issue of OF SEA AND SHORE to the subject of conchological philately. He has reproduced in color beautiful arrays of seashell stamps on the front cover, the back cover and in between. There are additional black and white photographs. The seashell stamps are shown in color and emphasize the impressive array of stamps that are currently available.

Tom has included 16 pages of checklists to identify the various stamps. He has also included in the lists other stamps that depict various types of aquatic life such as birds, fish, plants, mammals, crustaceans, echinoderms, reptiles, coelentrates and the like. More checklists can be anticipated since the arrangement seems to be alphabetical and the list goes only through Gabon. Many of the stamps that have been included in the continuing lists that have been published in the TEXAS CONCHOLOGIST can be seen in the Tom Rice magazine. These include (among others) stamps from Grenadines of St. Vincent (17), Cook Islands (17), Papua and New Guinea (15), Maldives (8), Comores (6), Philippine Islands (4), Seychelles (4) and the like.

Over the years, it has been the policy of SCOTT'S CATALOG to list on its pages only those items that are truly philatelic. Thus, "stamps" issued by some countries are not included in the catalog. These are stamps issued primarily for commercial reasons - to exploit the demands of the stamp collectors. One example might be the issuance of airmail stamps by a country that does not have such service. Another example is the printing of stamps in numbers that obviously exceed the postal requirements for that country. Among the countries that fail to meet the SCOTT standards is Fujeira. Of interest to the philatelic conchologist is the issuance (in 1972) by that country of six seashell stamps along with a souvenir sheet. To keep the tabulations as complete as possible, these stamps have been included in the current list.

When collecting seashells, one might desire to collect variants and subspecies of a given mollusk. Something of an analogy exists in philately. For example, Fiji, in 1968, issued a 2-pence stamp showing a Nautilus pompilius (Scott No. 242) and a 3-shilling stamp picturing Cypraea aurantium (Scott No. 252). In the following year, there occurred a currency change. New stamps were issued. The 2¢ stamps now showed the same Nautilus (Scott No. 261) and the 30¢ stamp the Golden Cowry (Scott No. 272). The 2¢ stamp was then overprinted in 1970 ("Royal Visit/1970") to commemorate the occasion (Scott No. 286). Then in 1972, the 30¢ stamps with the Golden Cowry was overprinted "Hurricane Relief" to raise funds for hurricane relief work (Scott No. B6). Thus, the collector will need to obtain 3 issues of the nautilus stamp and 3 issues of the cowry stamp, although the basic pictures of the mollusks remained the same.

What do the stamps cost? Fortunately, most sets can be obtained at modest costs when they are released. However, a few sets are on the expensive side. The current "store price" for the Angola set ranges from $17.00 to $19.00. The high value, Cook Island stamps catalog at $10.40, $15.60, $20.80 and $26.00 each.

LISTING OF SEASHELL STAMPS (Continued)

	Country	Face Value	Scott Number	Mollusk Depicted
351.	Angola	25 c	573	Harpa doris
352.		30 c	574	Murex melananathos
353.		50 c	575	Venus foliaceo lemallosa
354.		70 c	576	Lathyrus filosus
355.		1 e	577	Cymbium cisium
356.		1.50 e	578	Cassis tesselata
357.		2 e	579	Cypraea stercoraria
358.		2.50 e	580	Conus prometheus
359.		3 e	581	Strombus latus
360.		3.50 e	582	Tympanotonis fuscatus
361.		4 e	583	Cardium costatum
362.		5 e	584	Natica fulmines
363.		6 e	585	Lyropecten nodosus
364.		7 e	586	Tonna galea
365.		10 e	587	Donax rugosus
366.		25 e	588	Cymatium trigonum
367.		30 e	589	Olivancaris acuminata
368.		35 e	590	Semifusus morio
369.		40 e	591	Clavatula lineata
370.		50 e	592	Solarium granulatum
371.	Gilbert &	4 ¢	241	Cypraea argus
372.	Ellice	10 ¢	242	Cypraea cribraria
373.		25 ¢	243	Cypraea talpa
374.		35 ¢	244	Cypraea mappa
375.			244a	Souvenir sheet 4 values
376.	Cook Islands	$4	399	Various shells
377.		$6	400	Various shells
378.		$8	401	Various shells
379.		$10	402	Various shells
380.	Grenada	½ ¢		Chama macerophylla
381.		1 ¢		Arca zebra
382.		2 ¢		Trachycardium muricatum
383.		3 ¢		Strombus pugilis
384.		25 ¢		Janthina janthina
385.		50 ¢		Smaragdia viridis
386.		$1		Sthnorytis pernobilis
387.		$2		Voluta musica
388.	Fujeira	5 d		Strombus gigas
389.		10 d		Strombus pugilis
390.		15 d		Murex troscheli
391.		20 d		Pecten species
392.		25 d		Charonia species
393.		60 Dh		Hermit crab in shell
394.		10 r		Souvenir sheet
395.	Fiji	2 ¢	261	Nautilus pompilius
396.		30 ¢	272	Cypraea aurantium
397.		2 ¢	286	Overprint
398.	Australia Antarctic Terr.	$1	L34	Giant squid
399.	B.I.O.T.	1 R	28	Hermit crab/shell
400.	Br. Solomon Isd.	3 ¢	151	Lambis lambis

Texas CONCHOLOGIST

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NOTES & NEWS

SHELL AUCTION WAS A SUCCESS by Barbara Hudson

The marvelous cooperation of all our Club members made our November 19th auction a huge success. The gross total was $1,248.23. There was $90.60 spent on shells, so the net profit was $1,157.63.

I want to extend a special "thank you" to my committee members, Ruby Ray, who typed labels and helped with all the planning; Merle Kleb, who worked many hours and did such a good job with the silent auction. Also Constance Boone, an unofficial committee member, who gave generously of her time, advice, ideas, and shells. She also helped with the Santa's grab bag and the sale table. Lloyd Meister and Frank Petway kept things running smoothly at the cashier's table.

Our contributors were Ruth Goodson, Cynthia Biasca, Lloyd Meister, Margaret Baldwin, Carole Courtade, Merle Kleb, Laura Montgomery, Tina and Frank Petway, Dr. Sutow, Ruby Ray, Charlie Doh, Frank Von Markhoven, Barbara Hudson, Kaye and Herschel Sands, Fannie and Sam Miron, Fritz Lang, Leola Glass, Mary Knapp, Constance Boone, Mrs. Montgomery Skidmore, an anonymous donor from California, Walter Kurtz, Hugo and Laura Baur, Bob Morrison, and Kirk Anders and Elsie Malone.

Thanks all, for without you there could not have been such a pleasant and profitable evening.

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EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Odé
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

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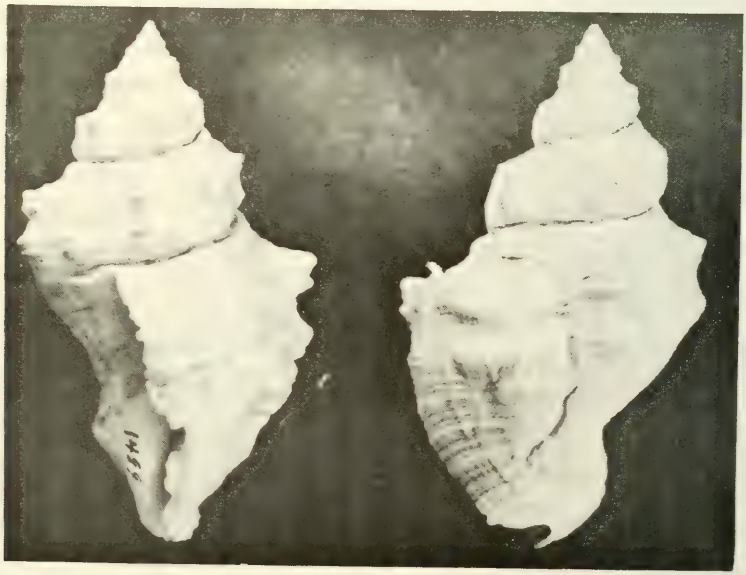

Thais haemastoma floridana (Conrad), forma haysae Clench. Two paratype specimens from Grand Bayou, Louisiana. Both 79 mm. in length. Delaware Museum of Natural History No. 1489.

NOTE ON THAIS HAEMASTOMA by R. Tucker Abbott

Many workers have commented on the variability of this common, widespread littoral species whose range extends from the Mediterranean and West Africa to the Western Atlantic and the Eastern Pacific. Despite a great deal of overlapping in certain characters, there are three fairly well-defined subspecies: 1) haemastoma (Linne, 1767), occurring in the Eastern Atlantic and parts of Brazil and Uruguary; 2) floridana (Conrad, 1837) occurring from North Carolina, through the Gulf of Mexico and the West Indies to parts of Brazil; 3) biserialis (Blainville, 1832) which extends from Baja California to Chile and the Galapagos.

Within the subspecies floridana there are several morphological forms believed to be ecological or minor genetic differences (Butler, 1954, p. 67; Moore, 1961, p. 25). These include various degrees of channeling of the suture; production of fluted knobs and rows of tubercles on the body whorl; relative height of spire; spiral beading; depth of spiral incised lines; and coloration. The most extreme form to be described first was canaliculata (Gray, 1839), an 83 mm. long specimen erroneously thought to be from China (see T.C. Yen, 1942, Proc. Mal. Soc. London, vol. 24, p. 224, pl. 21, fig. 140, holotype). Its suture is deeply channeled, bordered below by a fluted, spiral cord, and its body whorl bears weak nodules. This forma occurs in Cardenas Bay, Cuba, rarely in Lake Worth, Florida, and commonly from northwest Florida to Texas (Boone, 1975). A second extreme form was named haysae Clench, 1927. It is similar to canaliculata but additionally has two rows of fluted knobs on the last whorl. Intergrades occur in many areas. These two large forms occur in protected, brackish water in the areas of oyster reefs and man-made structures. The smaller, less-knobbed, and less-channeled, typical floridana occurs in waters closer to the open ocean where the water is cooler and more saline. Biologically the various forms appear to belong to the same subspecies -- floridana. The form names canaliculata and haysae may be used for extreme and readily recognized ecologic variations, but collectors must realize that intergrades occur in the same small geographical areas.

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SEARCH AND SEIZURE by Constance Boone

My New Year's Resolution -- to be more careful and to fully record all pertinent data on my self-collected shells -- was born from concern about what can be forgotten or missed or carelessly omitted from the records to go with the shells I so joyfully collect. My resolve to do the best I can to tell the story of what I see was also born from experiences with sparsely-written labels sent to me with exchanged shells, from seeing museum labels that bore less-than-adequate facts, from noting as I catalogue my own material that I knew a lot more from a day's collecting than I took the time to write down to store with the lot of shells. I hope to encourage you to resolve to do a better job of keeping your labels. To this end, I pose a series of questions that can be answered. Not everything will fit the collection you make every time, but each piece of information you add to your labels will help to make your collection more valuable.

For instance: Do you note the weather conditions? Not just the tidal reading but the weather factors that can cause you to have the luck you have in collecting. We know that here on the upper Texas coast, that disturbances that boil up the surf before a strong norther can trigger the big deposits of shells we get on the sandy beaches. A hurricane often brings in mounds of shells, but with this condition we sometimes note that the day after the hurricane is not the best -- it seems to take several days for the shells to get tossed up from bars offshore and to stay on the beaches with lesser tides. In our area we long for strong winter northers and learn to wait a day or so for the lowest and best tides for collecting when the surf is calm and the bays flat and clear. Yet, strong winter northers are exactly the wrong weather to long for at South Padre Island where the north winds hit differently and cause rolling surf and muddy bays. So--note the weather on your label.

Do you note if you collected the mollusks live? Bivalves are often tossed up paired but empty. They make just as good specimens, but the label should say in what condition the shells were collected. If you got the mollusks live, do you then go on to say if you dug them from the sand, or from trails and what kind of trails, or how deep you dug, etc.? Did you get the mollusks from a piling, under a rock, from a crevice in the rocks, from high up at the splash zone of jetties, how far out on the jetties, from under grasses, from stems of grasses, attached to debris washed in? I know you aren't going to write everything, always, but do at least note what you considered the norm, or very different, or your first time to see the shells. I recently catalogued a lot where the only different note to the usual Texas faunal material therein was the statement that it was the first time I had ever collected Tellidora cristata live on a Galveston, Texas, beach. It is not a common shell alive here.

It is well known that the collector picks the best specimens if

there are many to choose from. If you do this, at least tell the story complete enough to note if there were "hundreds", "dozens", etc., that day on the beach.

It can be important for the records to relate what other mollusks you found when you make the label for a specimen you catalogue. The nursery ground area on the bay flats at Galveston, San Luis Pass is especially interesting to me because there are so many young shells there for other species to feed on. Polinices lay egg collars on the grasses there and the young find all sizes of Mulinia and Tellina to eat, and Busycons hatch and find all sizes of Mercenarias.

The exact locality information is most important. It isn't sufficient to say San Luis Pass. That Pass has two sides, one Galveston Island and one Follett's Island (no one ever seems to know this and I usually end up saying the "Freeport" side of the Pass). You need to say if you collect the specimens on the Gulf side or the bay side; maybe both.

You already know to add the full date and your name. Perhaps you do not know that you are to add the names of others if they helped you add to your day's collection of shells. A museum label often has several names when several collectors were part of the museum collecting trip.

I have been part of fresh water collecting excursions and have learned that many of the professionals use county road maps to pinpoint stops at streams. They write complete labels with directions giving mileage from a nearby town, names of streams and drainage system, discussion of substrate, abundance of mollusks, type of water flow. I have sent collections of fresh water mollusks and labored on adding everything I could think of concerning the habitat and the mollusks and later learned that the museum field sheet quoted my ramblings.

I feel that it is of the utmost importance to make notes about the animal. If the mollusk is new to you, taking the specimen home in water and making observations under a lens is not only important but it is fun. The method of locomotion, the color, the design, the animal's reactions --- all these can be observed and written down. It will help to make your study of mollusks more interesting. I think of Pedipes we have here in Texas, usually farther south than our area of Galveston. Once you watched this tiny snail hop along you would surely understand why it was named Pedipes mirabilis. Sometimes you can learn something you don't see in print in most of the books available to you. I think Solen viridis, a small razor-type bivalve which we find tossed up in drift and which we dig in the passes and bays, has a beautiful animal seen under the microscope -- chartreuse with red veining -- but this is not evident to the naked eye. And once Solen is cleaned, you have a fragile shell that loses its shiny periostracum after a while and becomes a bland bivalve that tends to break at the slightest provocation.

Make your own additions to my suggestions on information for your labels. You may not make any great discoveries for science, but you may make some discoveries for yourself and make your collection a very good one. The Texas Conchologist is a good outlet for your exciting observations. We hope you'll share information on the shells you find and what you learn about them. It can be very important for faunal records and to help refine the range or the known records of live material. It can help sort out the differences of our species from the same species in other areas. The word "entire" for the range of a species in Texas does not seem correct. The Texas coastline is a long one, the Gulf beach hosts species not living in the bays and vice versa. This was brought home to me recently when members Betty and Larry Allen of Port Isabel spent a few days in our area collecting. They had a ball collecting live Oliva savana, taking some home for their aquariums. We think this is a common Texas shell, and we find it every year live in our area. Yet it is not a commonly-found live mollusk in the South Padre area. I have never found one live there. Can some of our members from that area report to us about live Olivas from that area, giving us facts and dates and conditions?

On the other hand, we haven't found many live Argopecten irradians amplicostatus in our area in recent years. We have little grass left in the bays. This species seems, however, to be making a great comeback at South Padre Island in Laguna Madre after a scarcity since Hurricane Beulah. While the Allens were up here, our members Carol and Eugene Courtade were at South Padre discovering live Argopecten. Conditions change. Your labels can help keep the records through the years.

MORE ABOUT NATICA CANRENA

by Laura M. Bauer

Reference is made to the last paragraph of Mrs. Boone's article "Search and Seizure", Page 100 of Volume XI, No. 4, June, 1975,

The Natica canrena found by me at San Luis was not "live-taken". It was freshly dead and it took a good deal of cleaning before it was fit to put in my case because of the odor of the body left inside of the shell. It is definitely a Natica canrena (the third I have found in Galveston since 1965) and it is definitely from the San Luis area and is not a related species from the Caribbean fauna. It is typical in form and color and in no way different from the Natica canrena found by me in 1965, the identification of which was confirmed by Dr. Harold W. Harry, Professor of the Marine Invertebrate course which I was taking at the time at Texas A. and M. University, Fort Crockett, Galveston, Texas.

OYSTERS AND HEPATITIS by W.W. Sutow, M.D.

The medical report is titled: "Oyster-Associated Hepatitis -- Failure of Shellfish Certification Program to Prevent Outbreaks". The authors are Drs. B.L. Portnoy, P.A. Mackowiak, C.T. Caraway, J.A. Walker, T.W. McKinney, and C.A. Klein, Jr. It appears in The Journal of the American Medical Association, issue of September 8, 1975 (Volume 233, pages 1065-1068).

The report describes the outbreaks of infectious hepatitis (type A) that occurred during October and November, 1973 in Houston and in Georgia. Oysters harvested from two bays in Louisiana were implicated in both outbreaks. The bay waters were contaminated by Mississippi River flooding (between April and July, 1973) some two months before the harvesting. At the time the oysters were gathered commercially, the national sanitation standards for growing and harvesting of oysters had been met satisfactorily.

In Houston, 263 persons were identified as having developed hepatitis associated with these oysters. In Georgia, 15 persons eating oysters at a private club came down with hepatitis. Those who developed the disease had ingested raw oysters two to eight weeks before the symptoms became noticeable.

The "follow-through" on the epidemic represents good, effective, epidemiological public health "sleuthing". It was established that the oysters were eaten at nine different restaurants in Houston, all of whom, however, had obtained the oysters from a single seafood supplier. This supplier had purchased all his oysters from a single oyster shipper in Louisiana. The contaminated oysters were eaten between September 20, 1973 and October 6, 1973.

Bay Crabe and Black Bay in the East Delta marshes of Plaquemines Parish in Louisiana were identified as the areas from which the oysters were obtained. Ten different oyster boats were implicated in four shipments of oysters to Houston. Investigations showed no "bootleg" sources for the oysters that came to Houston.

Several major epidemics of this type had been reported previously - the first in Sweden (629 cases) in 1956, 459 cases in New Jersey (1961), 200 cases in Mississippi and Louisiana (in 1961), 200 cases in Philadelphia (September 1963 to April 1964) and 123 cases in Connecticut (November 1963 to May 1964). Ingestion of raw oysters or clams were implicated.

The current report gives rise to some disturbing and serious questions in respect to the adequacy of sanitation monitoring techniques now being used. (Obvious are the real risks of major health hazards faced by those who like their molluscan delights "on the half shell".)

It is suggested that the hepatitis virus remains viable for long periods and that clams and oysters filter, accumulate, concentrate and retain the virus. Unfortunately, at present, there is no practical laboratory test to identify quickly the presence of virus in the mollusks.

Guayaquil, Ecuador. The air terminal here is hot, noisy and full of people, even well after midnight. While I waited for Braniff Flight #974 to take me home, I am preparing these notes for our publication.

My trip to this country at the Equator, as usual, was not for pleasure. The Pan American Medical Association was holding its XVIIth Congress. My two colleagues and I had been invited to provide a 3-day "International Postgraduate Course on Cancer". This was the sixth day here.

On the trip into this country, the route had taken us first to Miami via Continental Airlines. From Miami we loaded onto an Ecuatorian DC-8 at 3 AM. The first three hours were routine flying, smooth under clear skies. Then, somewhere over the Andes, we hit the clouds and the winds. We bounced around considerably but by dawn we were flying relatively smoothly again. But we could see nothing except the top surface of the clouds below.

Eventually, we began to spot mountain peaks jutting up through the clouds. When the peaks seemed to get higher and more numerous, we began our descent. The plane maneuvered among the peaks - and finally headed for the cloud bank that filled the gap between two towering mountains. The pilot knew what he was doing. We zoomed through the cloud layer, skimmed across the tops of the buildings at Quito and bounced onto the runway of the airport there, our intermediate stop, some 9200 feet high.

The takeoff was almost as exciting. The runway seemed short but we got off the ground and headed for the mountains and clouds. One was reminded of San Francisco when the planes headed in the northwest direction. But the mountains here were much higher and it was evident when we could see through the clouds that we were not going to fly over the top. However, the pilot banked to the right and we climbed through the rifts and gaps. We finally emerged above the clouds - and the 40 minute flight from Quito and Guayaquil was again routine.

Although my professional commitments at Guayaquil tied up my time pretty severely, I managed to get in some malacological activities of sorts. One of these was at the New Continental Hotel Cafeteria. The menu listed a "Cebiche de Concha". In small print, the English version said something about a "black shell". So I ordered it. The waiter returned a bit later and said they were out of it. I squinted at him and decided that it must be so. I changed the order to "Cebiche de Camarone" which contained shrimp. A day later I was to learn what the "Black shell" was.

Among other things gastronomical (though not strictly molluscan) the langusta (crayfish) here was something. It was huge and fat and tasty. We also had a feast on "Congrejo" boiled in beer. These were large crabs and we sat in front of a mound of them steaming hot from the pot. A small wooden mallet and a board were provided to crack the shells. We piled in without any instructions. Then

there were the fried calamares (squids). For those that go for the cephalapods, this dish was out of this world - the squids were cut bite size and fried quickly, tempura-style, with crust.

On the next to the last day at Guayaquil, I finally made contact with Dr. Jose Cañon at the Instituto Oceanografico de la Armada del Ecuador. He spoke excellent English. He graciously informed me over the phone that he would come to the meeting and pick me up after my lecture. An automobile tour through this ancient city was something else again. The cars here were small for the most part but there were busses and trucks in the heavy traffic. The pedestrians crossed the streets wherever they happen to be. I concluded that the requirements for a driver here were a good horn, good brakes and lots of guts. The roads even within the city seemed bouncy but eventually we left the city and headed south on a nice, smooth highway.

When we turned off through high metal gates into a fenced area, I learned that the word "armada" meant "navy". We were on naval military grounds. The Institute was a Navy activity and the impressive buildings were put up in 1973. New construction going on indicated a start on future plans which include a planetarium.

The malacological work was conducted in a three-room, single floor building (new construction) within the military grounds. Dr. Cañon functioned in the capacity of an "Expert in Marined Biology" and was salaried by UNESCO. All the other staff as well as the research budget were financed by the Ecuadorian Navy. Dr. Roberto Jiminez was Chief of Biological Branch. Dr. Manuel Cruz held the post as the malacologist and Professor of Malacology and Invertebrate Zoology at the University. Seven scientists and three technicians constituted the scientific personnel. None of them was in the Navy.

As usual, I was much interested in finding out what kind of literature on marine mollusks existed in Ecuator. I was disappointed to learn that there was practically none. Dr. Cruz utilized as references the well-known volume by Myra Keen and the publications from the Hancock Foundation such as Rost on Arcidae, Olsson on Pelecypoda and Grau on Pectinidae. The report of the "E.W. Scripps Cruise" by Emerson and Puffer was also being used. A checklist of mollusks of Ecuador was being prepared by Dr. Cruz but was not yet in print.

Dr. Cañon outlined some areas in which he and Dr. Cruz were engaged at present. They included the cataloging the phytoplanktons cataloging the zooplanktons, and studies of the fish and longusta. Dr. Cañon himself was conducting research on the benthic ecology of Guayaquil Bay.

I received the impression that commercial shellfish industry was practically non-existent. The only mollusk of any commercial importance appeared to be Anadara tuberculata. This was the "Concha" that I had seen on the cafeteria menu. In browsing through the museum specimens (which were just now being assembled) I noted (among species usually harvested for food purposes) a few pecten species, some Protothaca species, one Pinna species but no oysters. Some truly giant specimens of Anadara grandis as well as a heavy and big Spondylus species were impressive.

Dr. Cañon informed me that there was no museum of natural science in this city. He knew of a few amateur shell collectors but unfortunately I did not have the time to look up any of them. For couple of months prior to my trip I had tried desperately in the States (even contacting the Ecuadorian Embassy in Washington) to obtain hard information on how to get to the Galapagos Islands. I finally gave up.

Although I obtained various unofficial statements here and there I sense various problems. If anyone wants to travel to Darwin's islands, my suggestion would be to sign up with a tour. Even with the restricted time schedule and regimented activity, one should stand a better chance of at least seeing the islands. The mail service, I am told, is generally slow and sometimes undependable. Any correspondence should be planned well in advance (even a year or more). It may also be wise to be aware of the rainy season, too.

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Homeward-bound from Ecuador, a series of problems caused a delay in my flight plans and left me with several hours in Miami. I purchased a copy of the newspaper Miami Herald (of December 2, 1975). Somewhere in the inside pages, I saw the article with the title "It's All in Hands, Says New Champion of Oyster Shellers". This was a report of the world's oyster-shelling championship for 1975 held in Paris, France.

Apparently, the contest featured eight of France's top oyster openers. Flat knives and no gloves were used. Time required to open 100 live oysters was measured. The news item states that the match was sponsored by the French Interprofessional Oyster Growers Committee and Club Prosper Montagne (thus both producers and consumers were represented). The large "Breton oysters" used in the contest were four years old.

Gilbert Devilaine was the winner in four minutes and eight seconds. The world's record for opening 100 oysters is said to be three minutes and 37 seconds.

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In the March, 1975 issue of Texas Conchologist, the book titled "The Shell Makers" by Alan Solem was reviewed. Since then, I have had occasion to read sections of the book more critically. The book becomes more impressive on rereading. The volume looks thin but there is a world of fascinating information crammed into its pages. Do get it for your own library. There is no other publication like it.

Chapter V of the book, for example, discusses bivalves which filter food from the surrounding waters. In doing so, the bivalves pass great amounts of water through their system. A single Crassostrea virginica is said to filter 4 to 15 liters of water each hour (roughly 1 to 4 gallons). Mytilus edulis filters up to 1.4 liters per hour. When one considers that millions of these clams are filtering continuously while under water, the cumulative effect must be staggeringly enormous.

SHELLING VACATION IN WINTER
AT BAJA CALIFORNIA

by Margaret Baldwin

EDITOR'S NOTE: The following was taken from a letter to Cynthia Biasca and has been edited to delete certain family references. It was not intended to be an article in the Texas Conchologist.

Excerpts from a letter received by Cynthia Biasca from Margaret Baldwin vacationing in Baja California with her family. This was written from Punta Chivato and Coyote Bay.

We've just had a lunch of delectable lions paw scallops! The fishermen came in this morning with about four dozen. We bought eight plus three young Strombus galeatus and two Pinctada mazatlantica. They have depleted the pecten beds so badly that they're hard to find now. It's such a shame. The lions paws are 4-6" and will be a job to clean, but they're certainly nice to have.

At Puerto Peñasco we stayed in a motel overlooking its nice little harbor and searched the rocky beach till the moon came up, in mild pleasant weather. That day we bundled up because of a stiff wind and went out on the tidal flats to the north - had to walk a quarter mile to reach the water. It was interesting, though we found no live shells, strange in all these flats. Lots of variety in beach shells, though.

At Guaymas we couldn't reach Soldado Bay on roads the map shows, but found that a new development had opened up San Francisco Beach, so we went in there and walked about half a mile to the estuary. Had a delightful afternoon sloshing about at low tide and digging. Found quite a variety of live clams, olives, cones, tiny bubble shells and a big pen shell.

Bocochibampo Bay is beautiful - found some nerites and turbos there. North of San Carlos is not good - over shelled, as is the whole area. There were twenty Americans out the first day we were at Soldado Bay. We drove aroung Guaymas Harbor and did find lots of cup and saucer shells on the rocks and some live clams.

On Baja, spent two days at an island where the kids snorkeled and found live olives, egg cockles, large glycymeris, Conus princeps and pink murex. On the rocks I found jewel boxes, nerita of several kinds I don't know.

We're having a lot of fun as you can tell.

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

(A Continuing Monograph)

PART I by H. Ode'

SUPERFAMILY TELLINACEA

FAMILY TELLINIDAE

Genus Tellina, Linne, 1758 (continued)

53. Tellina (Arcopella) spec. indet. A.
Of this interesting rare and small species, only two lots are present in the collection of the H.M.N.S. It is the first time that this particular subgenus has been found in the western Atlantic. Our species is characterized by stronger dentition in the right valve than in the left and the distally remote position of the laterals from the cardinal complex. The subdued dentition in the left valve is the reason that this species has been previously reported as Macoma sp. A. (Tex. Conch., Vol. 9, p. 81, 1973, #932.
Records H.M.N.S.: 2 lots, no live material.
Depth Range: ± 25 fms. - 51 fms.
Geographical Range: Unknown
Maximum Size: Not precisely measured.
Eastern Pacific Analogue: None.

Genus Angulus Mühlfeld, 1811.
Small, somewhat elongate tellins, with reduced laterals and small cardinals. The subgenus Scissula has oblique scissulations over the disc of the shell.

54. Angulus (Angulus) probrinus Boss, 1964.
Tellina (Angulus) probrinus Boss, 1964, Occ. Pap. Dept. Moll. Harvard Univ., Vol 1, p. 319, pl. 55, fig. 4.
Rather common on sandy mud bottoms on the offshore shelf area of Texas and Louisiana in a depth range of 9-50 fms., with optimal range from 18 to 25 fms. Alive at 30 fms. The record includes one specimen from the beach at San Luis Pass (Galveston Island). Never in the bays.
Previous references for the Texas faunal province are: 206, beach records Tex. Conch., Vol. 7, p. 100, 1971; 209, off Freeport, original description; 235, off Freeport.
Records H.M.N.S.: 30 lots, of which one contains live collected material.
Depth Range: 9-50 fms.; alive at 30 fms. on sandy mud bottom.
Geographical Range: North Carolina, Texas to Tobago.
Maximum Size: 23.5 mm. (usually smaller).
Eastern Pacific Analogue: ?

55. Angulus (Angulus) versicolor (DeKay, 1843).
Tellina versicolor "Cozzens" DeKay, Nat. Hist., New York, Pt. 1, Zool. p. 20, pl. 26, fig. 172. (Syn. T. pauperata Orb., 1842 (nomen. oblitum).

This, the most common of the small tellins of the Texas faunal province, is widespread throughout all coastal bays of Texas and Louisiana and the offshore shelf areas along the coast. It lives in mud and sandy mud bottoms in a depth range of 0-11 fms., but dead valves have been taken from as deep as 40 fms. Some of these may be Pleistocene fossils. It is common in beach-drift along the entire coastline. In the coastal bays only Tellina texana and Macoma mitchelli tolerate lower salinity.

Previous references for the Texas faunal province are: 15, Corpus Christi; 21, listed; 45, Corpus Christi; 98, bays; 110, live specimens taken in 12 fms. off Port Isabel; 126, listed; 136, alive in Gulf, alive in bays; 145, Mississippi delta; 146, shallow shelf; 147, dead on Baker Bank; 150, Stetson Bank; 160, Matagorda Bay; 164, Rockport area (alive), Laguna Madre (alive); 206, beach records in Tex. Conch., Vol. 5, p. 22, 1968; 261, offshore Galveston; 253, off Padre Island; 269, listed in text, but figure on p. 195 is a mislabelled juvenile of T. tayloriana.

Records H.M.N.S.: 99 lots, of which 17 contain live collected material.

Depth Range: 0-40 fms.; alive: 0-11 fms. in sandy mud bottoms.

Geographical Range: Rhode Island-Florida, Texas and West Indies.

Maximum Size: 13.8 mm.

Eastern Pacific Analogue: ?

56. Angulus (Angulus) sybariticus (Dall, 1881).

Tellina sybaritica Dall, 1881, B.M.C.Z., 9, p. 134; ibid. 12 (6), pl. 6, fig. 11. (Syn. T. rubricata L.M. Perry, 1940.)

Rather common on sandy mud bottoms in a depth range of 0-50 fms. (optimal at 15-30 fms.). In shallow water it is largely replaced by the previous species, but ranges overlap. The few beach specimens known (at South Padre Island) have been rafted ashore attached to whipcoral. It is smaller, has a different sculpture and is colored a different shade of red ("wine red") or yellow, when compared to A. versicolor. In view of its common occurrence it has been surprisingly seldom mentioned in faunal lists. Also in mudlump fauna, but rare.

Previous records for the Texas faunal provice are: 145, deep shelf; 206, beach records in Tex. Conch., Vol. 7, p. 99, 1971; 236, Galveston; 251, Yucatan shelf; 253, off Padre Island (as T. sp.)

Records H.M.N.S.: 52 lots, of which 11 contain live collected material.

Depth Range: 0-50 fms.; alive 7½-25 fms.

Geographical Range: North Carolina, Florida, Brazil.

Maximum Size: Not precisely measured.

Eastern Pacific Analogue: ?

57. Angulus (Angulus) texanus Dall, 1900.

Tellina (Angulus) texana Dall, 1900, Proc. U.S. Nat. Mus., 23, p. 295.

A strictly coastal bay species living both in the East Texas bays of variable salinity and the South Texas hypersaline bays, but which is missing in offshore waters. Only Macoma mitchelli tolerates lower salinities. Synonyms are Tellina polita Say, 1822 and Tellina sayi Dall, 1900, used in early Texas reports.

Previous records for the Texas faunal province are: 15, Corpus Christi (as T. polita Say); 18, Corpus Christi (as T. Polita Say); 45, Corpus Christi Bay, 3-4 feet of water. Also lists T. sayi Deshayes for Corpus Christi, Tex.; 56, listed; 66,

Marine Pleistocene of Texas; 98, listed for bays, alive in Hynes Bay; 99, numerous specimens near Austwell and 3½ miles east of Austwell (Hynes Bay); 110, "Tellina sayi Dall, 1900", described by Dall from Corpus Christi Bay; 160, Matagorda Bay; 175, listed; 206, Beach records in Tex. Conch., Vol. 5, p. 22, 1968; 236, Galveston; 269, figured on page 195.

Records H.M.N.S.: 16 lots, of which 4 contain live collected material.

Depth Range: 0-1 fms. in mud bottoms (Galveston Bay, Christmas Bay, Matagorda Bay, Aransas Bay, Laguna Madre).

Geographical Range: N. Carolina to Texas, Mexico and Bahamas.

Maximum Size: Not previously measured.

Eastern Pacific Analogue: ?

58. Angulus (Angulus) C.F. tenellus Verrill, 1874.

Angulus tenellus Verrill, 1874, Rep. Inv. An. Vineyard Sound etc., p. 383, pl. 30, fig. 224.

A single, somewhat doubtful, specimen was obtained at one location offshore Galveston in 40 fms., together with many specimens of T. sybaritica. It is possible that it is a large senile and somewhat aberrant form of this species, but in general, it agrees so well with Boss' figure and description that we list it here as A. tenellus.

Previous records for the Texas faunal province are: 7, listed (according to Pulley); 15, as Tellina modesta Verrill, re-listed under this name by Singley who credits the reference to Dall. None of these references is direct.

Records H.M.N.S.: 1 lot of a single valve in 40 fms. offshore Galveston in shelly mud.

Geographical Range: Massachusetts, Florida, Mississippi.

Maximum Size: Not precisely measured.

Eastern Pacific Analogue: ?

59. Angulus (Angulus) tampaensis (Conrad, 1866).

Tellina tampaensis Conrad, A Jour. Conch., 2, p. 281, pl. 15, fig. 8.

This is a strictly coastal bay species, preferring the hypersaline environment of the South Texas Bays, where it is occasionally dredged alive. Much rarer at Galveston, but also here a few live specimens. As far as we know, not collected in Western Louisiana waters, nor in offshore waters in our entire range. In Texas this species does not reach the large size quoted by Boss (24 mm.) and the cited diameter of 1-inch by Andrews (ref. 269) is unjustified.

Previous records for the Texas faunal province are: 7, listed; 15, (as Macoma tampaensis) Corpus Christi Bay; 19, (as Macoma tampaensis) Espiritu Santo Bay; 21, listed (as Macoma tampaensis); 45, (as Macoma tampaensis) above references repeated; 56, listed; 67, (as Macoma tampaensis), "Port Isabel"; 151, listed; 160, Matagorda Bay; 164, Laguna Madre in hypersaline environments; 174, listed; 175, hypersaline lagoon assemblage "most abundant 6 inches of water close to shore"; 178, Northern Laguna Madre; 206, Beach Records in Tex. Conch., Vol. 5, p. 22, 1968; 208, listed for "grass flats"; 235, listed; 236, Galveston; 269, figured on page 193.

Records H.M.N.S.: 20 lots, of which 3 contain live collected material. (San Luis Pass, Matagorda Bay and south).

Depth Range: 0-25 fms. (alive 0-1 fms.). One valve from 25 fms. is probably a Pleistocene fossil.

Geographical Range: Florida to Texas, West Indies.
Eastern Pacific Analogue: Tellina (Angulus) suffusa Dall, 1900. "San Ignacio lagoon, Baja California to Corinto, Nicaragua, no habitat records available" (Keen, 1971).

60. Angulus (Scissula) iris (Say, 1882).
Tellina iris Say, Journ. Acad. Nat. Sci., Phila., Vol. 2, p. 302, 1822.
This is the most common, but least noticed tellin of the sandy outer beaches and inlet mud flats. Along the Texas coast, it is strictly confined to the narrow strip along the beaches and inlets, because we have never seen it in the bays nor in offshore dredgings. The very thin, glassy valves, irridescent when fresh, are easily broken in the surf, but fragments are practically always present in fine beachdrift along the entire Louisiana and Texas coasts.
Previous records for the Texas faunal province are: 40, (as Cirsula irrus (Sic!), Louisiana; 174, listed; 206, Beach Records in Tex. Conch., Vol 5, p. 23, 1968; 235, listed for Sabine and Galveston; 236, Galveston; 251, listed for shallow offshore Galveston, dominant form on sand bottoms; 269, figured on p. 198.
Records H.M.N.S.: 8 lots, of which 6 contain live collected material (Galveston, Freeport, St. Joseph Island, Port Aransas).
Depth Range: Beach only.
Geographical Range: North Carolina to Florida, Texas.
Maximum Size: Not precisely measured.
Eastern Pacific Analogue: Tellina (Scissula) virgo Hanley, 1844. "Magdalena Bay, Baja California to Peru, intertidally and to a depth of 15 meter" (Keen, 1971).

Genus Tellidora H. Adams and A. Adams, 1856.
Only a single species lives in the western Atlantic. The valves are surprisingly flat, leaving hardly any internal cavity for the animal and are easily recognized by their shape.

61. Tellidora cristata (Recluz, 1842).
Lucina cristata Recluz, 1842, Rev. Zool. Soc. Cuvier, 5, p. 270. (Syn: T. lunulata "Holmes", H. and A. Adams, 1860 (fossil).
Widespread but never common, over sand bottoms of the inlets and shallow coastal shelf. It is occasionally found living on the sandy flats of the inlets near Galveston, Port Aransas and other places along the Texas-Louisiana coast. Fragments are fairly common in beachdrift on the outer beaches along the entire coastline between the Mississippi delta and the Rio Grande. It does not penetrate in the upper bays, but has been taken in the open part of Matagorda Bay.
Previous records to the Texas faunal province are: 21, listed; 45, Texas; 98, listed for the bays; 110, dead shells, rare on St. Joseph, Mustang, and Padre Islands, Pl. 13, figs. 8, 9; 135, dead in Gulf, alive in bays; 136, listed "alive" in final list (not in text); 139, listed for the inlets; 143, Matagorda Bay; 145, upper sound and inlets, Mississippi delta; 160, Matagorda Bay; 164, Rockport area, alive, Laguna Madre, dead; 170, shelf assemblage; 174, listed; 206, Beach Records in Tex. Conch., Vol. 5, p. 23, 1968, 208, tidal flats; 225, Galveston; 235, Pass Caballo and Port Aransas; 234, Galveston; 269, figured on page 199.

Records H.M.N.S.: 24 lots, of which two contain live collected material. Among the locations are: Timbalier Bay, La.; Isles Dernieres, La.; Galveston, Matagorda Bay and Stetson Bank (fossil?).

Depth Range: 0-25 fms.; alive: 0-11 fms. A very aberrant juvenile specimen which probably is not this species, was dredged at 56½ fms.

Geographical Range: North Carolina, Florida, Texas.

Maximum Size: 30 mm.

Eastern Pacific Analogue: Tellidora burneti Broderip and Sowerby, 1829. "Baja California and throughout the Gulf of California to Salango, Ecuador in depths to 29 meter" (Keen, 1971).

Genus Strigilla Turton, 1822.

Only two species of this genus, one belonging to the nominate subgenus Strigilla and one in Pisostrigilla, have been collected in the N.W. Gulf of Mexico. They can immediately be recognized by the incised scissulations over the surface of the shell.

62. Strigilla (Strigilla) gabbi Olsson and McGinty, 1958.
Strigilla gabbi, Olsson and McGinty, Bull. Amer. Paleont., 39 (177), p. 50, pl. 5, figs. 3-3a.

Only a few times have valves of this recently described species been collected along the Texas coast. Once a large number of valves was taken from an excavation pit close to the beach at Rockport. These are supposed to be Pleistocene or older in age. Occasionally beach worn specimens can be collected at Port Aransas and South Padre Island and it is probable that some references to S. carnaria Linne for Texas are this species. We have never seen it alive and presumably the species is no longer living along the Texas coast.

Previous records for the Texas faunal province are: 206, Beach Records in Tex. Conch., Vol. 5, p. 23, 1968; 244, Rockport, Texas.

Records H.M.N.S.: 4 lots, only known from beach worn specimens, hence no depth record can be given.

Geographical Range: Key West, Surinam (Altena, 1971) and Brazil.

Maximum Size: 19.5 mm. which is considerably smaller than the maximum size cited by Boss.

Eastern Pacific Analogue: Strigilla (Strigilla) disjuncta Carpenter, 1856. From Nicaragua to Peru, intertidally and to depths of 15 m., (Keen, 1971).

63. Strigilla (Pisostrigilla) mirabilis (Philippi, 1841).
Tellina mirabilis Philippi, 1841. Wiegm. Arch. fur Naturgin 7, p. 260.

A common species in the somewhat specialized community of mollusks now living in exposed Pleiocene and Pleistocene shell banks such as Heald and Sabine Bank. It can be found sparingly in drift all along the Louisiana and Texas coasts on the outer beaches. The shell is somewhat variable in outline, some shells being almost circular in outline, others being rather skewed. Old shells, especially, become thickened. Most live collected material of the H.M.N.S. collection consists of juveniles, which are thin and surprisingly flat and are less round but somewhat triangular in shape. Strigilla flexuosa Say, 1822, the name applied to this species by early collectors, is preoccupied.

Previous records for the Texas faunal province are: 45, Galveston, Texas and in well Saratoga, Texas at 940 ft.; 66, Marine Pleistocene of Texas; 98, listed for bays; 110. Port Aransas; 136, many stations off East Texas; 145, inlets and shallow shelf, Mississippi delta; 160, dead in Matagorda Bay; 170, shallow shelf assemblage; 206, Beach Records in Tex. Conch., Vol. 5, p. 23, 1968; 236, Galveston, 269, figured on page 193.

Records H.M.N.S.: 46 lots of which 5 contain live collected material.

Depth Range: 0-33 fms. (alive at 0-12 fms.) in sandy mud, shale outcrops and coral reef debris (rare).

Geographical Range: Bermuda, North Carolina to Brazil.

Eastern Pacific Analogue: Boss (ref. 224) cites S. lenticula "Philippi" Hertlein and Strong, but true S. lenticula is closer to S. rombergi of the Carribean. (See also Keen, 1971.)

Genus Macoma Leach, 1819.

The macomas are tellins without lateral hinge teeth. Psammotreta, because of some differences in hinge structure, is by most authorities, considered a full genus. On the basis of completely different appearance of juvenile material we consider here Cymatoica as a full genus. In the N.W. Gulf of Mexico, Macoma is represented by several subgenera of which Psammacoma is the most diversified. In our opinion, some of these species classified as Psammacoma are probably not closely related. It is not immediately obvious that the Macominae form a significant group, since it is based on a negative character (lack of laterals). Such a trend could exist in several lineages of tellins. For instance, some small Psammacomas (tenta, mitchelli) remind one of Angulus, while Cymatoica presents points of resemblance with Merisca and large Psammacomas resemble Eurytellina. In Texas, the subgenera Austromacoma, Psammacoma and Macoma.

64. Macoma (Macoma) pseudomera, Dall and Simpson, 1901.

Macoma pseudomera, Dall & Simpson, 1901. Proc. U.S. Nat. Mus., Vol. 20, pt. 1, p. 481, pl. 56, fig. 5.

This common and widespread species has been dredged in depths of 8-50 fathoms. It is unknown from the bays or from the beaches.

Previous records for the Texas faunal province are: 156, common on Stetson Bank; 206, listed in Tex. Conch., Vol. 9, p. 81 (as #925).

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

Depth Range: 8-50 fms. on shelly and sandy mud bottoms and on shale outcrops (alive at 10-17 fms.)

Geographical Range: Bermuda, Porto Rico, Jamaica.

Maximum Size: 29 mm.

Eastern Pacific Analogue: - None

65. Macoma (Austromacoma) constricta (Bruguière, 1792).

Solen constrictus Bruguière, 1792; Mem. Soc. Hist. Nat. 1, 126, No. 3.

Dead valves of this large Macoma are often found on the outer beaches, but are almost never dredged offshore. Two lots, obtained in 25 and 26 fms. depth, are almost certainly Pleistocene fossils. It is a typical bay species, living in the sandy

mud flats in shallow water along bay shores of Louisiana and Texas coastal bays. Live specimens are not common and unexplained is why minute juvenile material is so rarely collected in dredge samples and in beachdrift.

Previous records for the Texas faunal province are: 7, listed (as Tellina lateralis, Say) Galveston; 15, Galveston, Sabine Pass; 18 Galveston and Corpus Christi, not common; 19, Galveston, Matagorda Bay and Carancahua Bay; dead in Lavaca Bay and Turtle Bay; 21, listed; 45, repeats records of 15 and 18; 66, Marine Pleistocene of Texas; 67, Port Isabel; 98, dead in bays; 110, found living in Galveston and Aransas Bay, figured, Plate 13, figs. 6-7; 135, dead in Gulf, dead in bays; 145, shallow shelf; 164, alive at Rockport, dead in Laguna Madre; 174, listed; 206, Beach Records in Tex. Conch., Vol. 5, p. 34, 1968; 225, Galveston; 236, Galveston; 267, Pleistocene; 269, discussed on page 190, figure erroneous.

Records H.M.N.S.: 21 lots, of which 4 contain live collected material.

Depth Range: 0-26 fms. (alive 0-2 fms.) (Deep offshore samples probably fossil). Some locations are Timbalier Island, Isles Dernières (La), Galveston Bay, Rockport.

Geographical Range: Florida, Texas to Brazil. Reported by Altena for Surinam.

Maximum Size: 62 mm.

Eastern Pacific Analogue: None

66. Macoma (Psammacoma) tageliformis Dall, 1900.

Macoma (Psammacoma) tageliformis Dall, 1900. Trans. W. Free. Inst. Sci. Vol. 3, part 5, page 1055.

Dead shells are not uncommonly dredged over sandy mud bottoms of the shelf area, but so far no live specimens have been seen. Worn beach material is surprisingly common along the entire Louisiana and Texas coast and it is surmised here that this species is a rather deeply buried surfzone form. Perhaps this explains the absence of juvenile material in beachdrift. Seldom in the bays (Aransas Bay, fossil?). It is here assumed that Macoma pulleyi is a different, but closely related species. Both are easily separated by the following characters: the shape of tageliformis is rounder anteriorly, whereas pulleyi is somewhat blunted. The anterior slope of pulleyi is steeper and in consequence, its oblique top angle is smaller. Most diognostic is the pallial sinus, which is more slender and deeper in the pulleyi. Finally, pulleyi is a smaller shell and usually thinner. In spite of those consistant differences, it is not impossible that both form single species. M. pulleyi is known to live in extremely tough clay whereas no live specimens of M. tageliformis are known to us. It is possible that M. tageliformis is a shallower sandy bottom form of the complex.

Previous records for the Texas faunal province are: 28, Pleistocene of Texas coast at Corpus Christi and recent in same region; 45, Galveston, Corpus Christi, Pleistocene Corpus Christi; 56, Corpus Christi Bay; 67, Port Isabel; 69, listed; 110, dead shells on beaches, taken alive offshore by shrimpers (error for M. pulleyi?); 123, most abundant bivalve on brown shrimp grounds, one live clam in 24 fms. off Padre Island,

dead from Sabine to Obregon, Mexico (error for M. pulleyi?); 145, Delta front, (Mississippi) (error for M. pulleyi); 146, Delta front platform (Mississippi) (error for M. pulleyi); 170, M. tegeliformis, shelf assemblage; 175, listed for prodelta slope (error for M. pulleyi); 206, Beach Records in Tex. Conch., Vol. 5, p. 23, 1968; 225 and 218, Galveston; 269, figured on page 192.

Records H.M.N.S.: 32 lots, none alive, on sandy mud bottoms.

Depth Range: 0-27 fms. (one poor lot from 40 fms.)

Geographical Range: Louisiana, Texas, Greater Antilles, Surinam, Brazil.

Maximum Size: 62 mm. x 34.0 mm.

Eastern Pacific Analogue: Macoma (?Psammacoma) lamproleuca Pilsbry & Lowe, 1932 comes closest. Gulf of California to Peru, mostly offshore in depth to 90 meters.

67. Macoma (Psammacoma) pulleyi Boyer, 1969.

Macoma (Psammacoma) pulleyi Boyer, 1969, Veliger 12. (1), p. 40-42 text figures.

Above we have stated some differences with M. tageliformis Dall. This form is often dredged alive in muddy shelf bottoms along the northern shores of the Gulf of Mexico in heavy and tough mud where it is, on occasion, the only live mollusk found. Although it constantly differs in shape from M. tageliformis, it could be an ecological variant. It also does not reach the size of M. tageliformis. We have two aberrant locality records: one in 8 feet near Timbalier Island (La.) and one in 3 feet in Churchill Bayou (Galveston Bay system). In view of extensive shrimping operations in the Gulf such incidental records need further confirmation. This species is farily common.

Previous records for the Texas faunal provice are: 146 and 175 (all as M. tageliformis); 206, Tex. Conch., Vol. 9, p. 81, 1971, (ex parte); 246, (original description).

Records H.M.N.S.: 23 lots, of which 4 contain live collected material.

Depth Range: 2.5 ft.? -70 fms. (alive 15-40 fms.), mostly in tough dark-blue clay or sandy mud (rarely).

Geographical Range: N.W. Gulf of Mexico, off Louisiana and Texas.

Maximum Size: 54 mm.

Eastern Pacific Analogue: See M. tageliformis Dall.

68. Macoma (Psammacoma) tenta (Say 1834).

Tellina tenta Say, 1834; Am. Conch., pl. 62, fig. 3.

Fairly widespread throughout most of the coastal bays, but seldom in large concentrations as M. mitchelli Dall. Not in offshore waters and quite rarely in the inlets and along the beaches. Not as far in the brackish portions of the bays as M. mitchelli Dall.

M. souleyetiana Récluz, 1852 is a synonym. In offshore waters replaced by M. extenuata Dall, 1900, which is not irridescent.

Previous records for the Texas faunal province are: 143, Matagorda Bay; 145, upper sound, shallow shelf (Mississippi delta); 146, open lagoon; 156, common on Stetson Bank (in error for M. extenuata Dall); 160, Matagorda Bay; 164, Rockport area (alive), Laguna Madre (dead); 206, Beach Records in Tex. Conch., Vol. 5, p. 34, 1968; 225 and 228, Galveston; 269, figured on page 192.

Records H.M.N.S.: 12 lots of which 4 contain live collected material.

Depth Range: 0-6.5 fms.; alive 0-5 fms. Locations from Timbalier Bay to South Padre Island.
Geographical Range: Cape Cod to Brazil, Bermuda.
Maximum Size: 23 mm.
Eastern Pacific Analogue: None

69. Macoma (Psammacoma) extenuata Dall, 1900.
Macoma Psammacoma) extenuata Dall, 1900. Proc. U.S.N.M., 23 (1210), p. 300, 314, pl. 2, fig. 7.
This is a common offshore species on sand bottoms in a depth range of 15-40 fathoms. It replaces M. tenta offshore. M. extenuata, M. tenta and M. limula form a closely related group. M. limula differs from M. tenta mainly by its granular surface, although Abbott states that it is somewhat longer and more slender. M. tenta and M. extenuata differ by several characters, but old shells equal in size of both species are difficult to separate. M. tenta can reach a much larger size (up to 25 mm.) than M. extenuata (up to 17 mm.) and is, when fresh, often quite irridescentand never colored. It lives in the bays and very shallow offshore water less than 8 feet deep. Beyond this it is replaced by M. extenuata (average size 12 mm.) which is smoother, somewhat shiny but never irridescent when fresh and which is often tinged with a faint brownish color below the umbo. Below a depth of 50 fathoms, specimens have been obtained which could very well pass for small specimens of M. tenta which lost their irridescence. Whether this is still another form in this complex, only further study can tell. So far, only a single beach specimen of M. extenuata (from Port Aransas) is known.
Previous records for the Texas faunal province are: 147, dead on Baker Bank and Big Southern Bank; 160, Matagorda Bay (this is a puzzling reference because also M. tenta and M. mitchelli are listed; they possibly are old valves of M. tenta, which lost their irridescence); 170, (as Tellina sybaritica) transitional shelf assemblage; 206, listed in Tex. Conch., Vol. 9, p. 81, 1971; 214, (as Macoma tenta) Campeche Bank.
Records H.M.N.S.: 50 lots of which 5 contain live collected material.
Depth Range: 0-70 fms. (alive 12-25 fms. in sandy mud).
Geographical Range: Gulf of Mexico only?
Maximum Size: 17.2 mm.
Eastern Pacific Analogue: Macoma (Psammacoma) siliqua siliqua (C.B. Adams, 1852). Southern Mexico to Panama in depths to 110 meters.

70. Macoma (Psammacoma) limula Dall, 1895.
Macoma limula Dall, 1895. Nautilus, Vol. 9 (3), p. 32-34.
Only fragmental shells were obtained from Heald Bank, a shell bank known for its Pleistocene and older fossil content. These fragments show the characteristic surface granulations of the species. Only once before reported (ref. 164) alive in open bay margin assemblage at Rockport, but since then never confirmed. We doubt that the species still lives in the N.W. Gulf of Mexico.
Previous records for the Texas faunal province are: 164, alive at Rockport.
Records H.M.N.S.: 1 lot of a few fragmentary shells (Heald Bank), depth 6-7 fms., probably fossil.
Eastern Pacific Analogue: ?

71. Macoma (Psammacoma) mitchelli Dall, 1895.

Macoma mitchelli Dall, 1895. Nautilus, Vol. 9 (3), p. 33, 1900; Proc. U.S. Nat. Mus., Vol. 24 (1210), p. 314, p. 2, figs. 4, 5.

Widespread, alive in organic rich muds of the upper coastal bays of Texas, especially Matagorda and Galveston Bay, living sometimes in huge populations. Other bays have been less well sampled and possibly the species is also common there. Unusual in beachdrift except locally on the Louisiana coast (Isles Dernières). Of all tellins in the bays of the Gulf of Mexico, this species tolerates the lowest salinity. In Galveston Bay specimens have been taken with a faint pink coloration near the ventral margins.

Previous records for the Texas faunal province are: 19, Carancahua Bay; 21, listed; 23, described by Dall from Matagorda Bay; 45, above references repeated; 56, listed; 110, found living in Clear Lake, Galveston Bay; 134, large numbers are eaten by the croaker (fish) in East Galveston Bay; 135, alive in bay ; 139, bays near rivers; 143, Matagorda Bay; 145, Delta front, Mississippi River; 146, river channel assemblage; 160, alive in Matagorda Bay; 164, alive at Rockport (river influence), dead in open bay center; 165, listed; 175, low salinity assemblage; 206, Beach Records in Tex. Conch., Vol. 5, p. 34, 1968; 236, Galveston, 237, (as Tellina alternata) for Pleistocene of Chambers County, Tex.; 269, figured on page 191.

Records H.M.N.S.: 46 lots of which 16 contain live collected material. 2 lots have been obtained from offshore dredging. one from Stetson Bank (± 20 fms.) and one from 7½ fms. Both are probably Pleistocene fossils.

Depth Range: 0-20 fms., alive 0-1 fms.

Geographical Range: South Carolina to Texas.

Maximum Size: 29 mm.

Eastern Pacific Analogue: ?

Genus Cymatoica Dall, 1890.

Characterized by undulating, oblique sculpture.

72. Cymatoica orientalis Dall, 1890.

Cymatoica orientalis Dall, 1890; Proc. U.S.N.M., 12 (773), p. 273, pl. 10, fig. 12.

On the basis of the shape of juveniles which is quite different from that of other Psammacomas, we consider Cymatoica a full genus. The western Atlantic species is widespread in our region over muddy sand bottoms. Also, it has been taken on Miocene shale outcrops and in the algal reef assemblage.

Previous records for the Texas faunal province are: 206, listed in Tex. Conch., Vol. 9, p. 81, 1973.

Records H.M.N.S.: 21 lots of which one contains live collected material.

Depth Range: 12-29 fms. (alive at 14 fms.)

Geographical Range: Florida to Brazil.

Maximum Size: 9 mm.

Eastern Pacific Analogue: Cymatoica undulata Henley, 1844. Gulf of California to Ecuador, offshore in 7 to 38 meter, (Keen, 1971).

Genus Psammotreta Dall, 1900.
Hinge slightly different from Macoma (see Keen).

73. Psammotreta (Psammotreta) breviforns (Say, 1834).
Tellina breviforns Say, 1834, Am. Conch., F, pl. 64, fig. 1.
This widespread species has been found along the entire Louisiana and Texas coastline on the shallow shelf. Beach specimens are known from Galveston, St. Joseph Island, Port Aransas and South Padre Island. Although reported from the bays (ref. 164), such occurrences are unknown to us.
Previous records for the Texas faunal province are: 6, listed; 7, listed; 15, Galveston; 18, Galveston; 45, as Macoma (Cydippina) brevifrons Say, Galveston, Tex.; 151, listed; 164, Rockport area: abundantly alive in open bay margin, Laguna Madre: abundantly alive in open hypersaline. (Note: both these statements require confirmation); 170, shallow shelf assemblage; 178, Baffin Bay (Note: requires confirmation); 206, Beach Records in Tex. Conch., Vol. 5, p. 34, 1968; 208, bay margin, deeper portions of the bays; 236, Galveston; 269, figured on page 191.
Records H.M.N.S.: 22 lots of which 1 contains live collected material at 12 fms. in sandy mud.
Depth Range: 0-23 fms.
Geographical Range: South Carolina to Brazil (Abbott, 1974).
Maximum Size: 25.5 mm.
Eastern Pacific Analogue: Psammotreta (Psammotreta) aurora, Hanley, 1844, Gulf of California to Boca de Pan, Peru, mostly offshore in depths to 33 m., (Keen 1971).

74. Psammotreta sp. indet. A.
Two lots of a small Psammotreta were obtained offshore, one alive in 45 feet at Heald Bank, the other in 12 fathoms at the Seven Sisters off Galveston, also alive. This small shell differs from the previous species in shape in that it is more truncated than the more rounded P. brevifrons. Its anterior portion appears suddenly cut-off.
Previous records for the Texas faunal province are: None
Records H.M.N.S.: 2 lots (both alive) at 7½ and 12 fms.
Maximum Size:
Pacific Analogue: None
Remarks: A large number of species has been reported of which we have either not found a trace, or which are obvious misidentifications. They are: Tellina (Laciolina) laevigata Linne, 1758. Undoubtedly misidentifications of Macoma tageliformis (ref. 15, 45).; Tellina (Tellinella) listeri, Roding, 1798 (reported as Tellina interrupta, Wood). Reported in reference 192, Campeche Bank which is outside our range; Apolymetis intastriata Say, 1827. Listed in 28, 45 (as Metis interstriata Say) for Texas. Probably in error. Also in ref. 192 for Campeche Bank; Tellina agilis Stimpson. Reported (probably misidentified) as Tellina tenera Say for the marine Pleistocene of Texas (ref. 66) and for Port Isabel (ref. 67), the latter probably erroneous for T. versicolor; Tellina (Angulus) mera Say. Reported in ref. 66 for the marine Pleistocene of Texas (possibly an error for T. tampaensis) for Baker Bank; offshore ref. 147 (as T. promera Dall) and for the deep shelf assemblage (ref. 170) which figures Abra sp. and hence is certainly in error; Tellina (Merisca) martinicensis Orb. listed in ref. 206,

Vol. 9, p. 81, 1973, is in error (worn T. lineata). Reference 66 lists Stringilla carnaria for the marine Pleistocene, which is almost certainly in error. Arcopagia fausta Pulteney and Tellina (Scissula) candeana Orbigny are reported for the Campeche Bank in ref. 192. Tellina (Tellina) guildingi Hanley, 1844, is listed in ref. 236 and must be considered doubtful. Macoma leptonoidea Dall, 1895 reported in refs. 23, 45, and 56 is probably not a valid species, but at this time its identity is unknown to me. The only report to which some credence must be given, although there remains some ground for uncertainty, is the report by Boss concerning Tellina (Eurytellina) vespuciana Orbigny, mentioned in ref. 235 in 50 fathoms off Port Isabel.

FAMILY SEMELIDAE

In the N.W. Gulf of Mexico, represented by the genera Semele, Semelina, Cumingia and Abra.
Sources: M. Keen (in) Treat. Invert. Pal., Part N; Vol. 2, p. 636-637, 1969. K.J. Boss, Johnsonia, Vol. 5, (49), p. 1-32, 1972.

Genus Semele, Schumacher, 1817.
Three fairly common species live in shallow water along the coast in the N.W. Gulf of Mexico. Except for size, these species agree very well with the description given by Boss (1972). Neither S. bellastriata Conrad nor S. proficua Pulteney along the Texas coast ever reach the maximum size cited by Boss (21 mm. versus 26 mm. for bellastriata and 34 mm. versus 42 mm. for proficua). On the other hand, S. purpurascens Gmelin and S. nuculoides Conrad grow somewhat larger here than Boss indicates (40 mm. versus 34 mm. for purpurascens and 8 versus 6 mm. for nuculoides). Semelina is essentially a small Semele, which however, is quite different in shape and sculpture in minute juvenile material when compared to equal size juvenile material of Semele. For this reason, we consider Semelina a full genus.

75. Semele proficua (Pulteney, 1799).
Tellina proficua Pulteney, 1799, Catalogues ... of Dorsetshire (in) Hutchins, History of Dorset, p. 29, pl. 5, fig. 4.
A fairly common species in the open bays, mainly in the sandy portions, inlets and shallow offshore areas. Worn valves are common in beachdrift along the entire Texas coast. Specimens collected far offshore in coral reef environment and on shale uplifts (Stetson Bank) present a slightly different surface sculpture. It is coarser and more irregular than that of bay specimens. Synonyms are Amphidesma orbiculata Say, 1822, Tellina reticulata "Linné" Spengler, 1798 and Amphidesma jayanum, C.B. Adams, 1845.
Previous records for the Texas faunal province are: 1, Amphidesma orbiculata Say, Galveston Island; 7, Semele reticulata Gm., Galveston; 18, Semele reticulata Gmelin, Galveston; 21, Semele orbiculata and Semele reticulata, listed; 45, Galveston; 67, "Point" Isabel; 69, Padre Island; 98, in coastal bays; 110, dead shells common on all Gulf beaches. Living in Aransas Bay. Pl. 13, figs. 4-5; 136, alive in bays; 145, upper sound Mississippi Delta; 160, dead in Matagorda Bay; 164, dead in bays at Rockport; 175, listed; 206, Beach Records are given in Tex. Conch., Vol. 1 (2), 1964; 225 and 236, Galveston; 253, one fresh pair off Padre Island reef; 267, Pleistocene of Chambers

County; 269, figured on page 203. Note: these records confirm the fact that this is primarily a bay species.

Maximum Size: 32.8 x 30 mm. (beach valve San Luis Pass).

Records H.M.N.S.: 31 lots of which one contain live collected material. Beaches: Isles Dernieres (La.), San Luis Pass, Port Aransas, South Padre Island; bays: Timbalier Bay (La.), Galveston Bay, East Matagorda Bay, Matagorda Bay. Also, on coral reefs and miocene shale uplifts.

Depth Range: 0-27 fms. (optimal 0-15 fms.). Alive at 3 feet. One lot dredged at 27 fms. could be fossil. (Pleistocene?).

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

Eastern Pacific Analogue: Semele lenticularis Sowerby, 1833. "Mexico to Peru" (Keen, 1971).

76. Semele purpurascens (Gmelin, 1791).

Venus purpurascens Gmelin, 1791. Syst. Nat., Ed. 13, pt. 6, p. 3288, No. 91.

This colorful species is occasionally dredged alive in shallow muddy sand bottoms in the open Gulf. Along the Texas coast exists two color forms: the usual purplish rayed one and a rare deep orange one. This species does not invade the bays and consequently valves are rare in beachdrift. Synonyms: Tellina obliqua Wood, 1815.

Previous Records for the Texas faunal province are: 15, Semele obliqua Wood, Galveston; 19, Semele obliqua Wood, Matagorda Peninsula; 21, Semele obliqua Wood, listed; 45, Galveston, Matagorda Peninsula; 110, Fresh shell from St. Joseph Island and one from Port Isabel, Pl. 13, Fig. 3; 135, dead in bays (almost certainly S. proficua); 136, off East Texas (Sabine Bank) in 40 and 42 feet; 145, listed; 156, common on Stetson Bank; 160, dead in Matagorda Bay (questionable); 164, inlets in Rockport area; 170, shelf assemblage off East Texas; 175, shelf 12-35 fms. sand bottom, common; 206, Beach Records are given in Tex. Conch., Vol. 1 (2), 1964; 225, Galveston; 236, Galveston; 253, two fresh pairs from reef off Padre Island, 269, figured on page 203.

Records H.M.N.S.: 38 lots of which 2 contain live collected material. Beaches: San Luis Pass, Matagorda, South Padre Island.

Depth Range: 0-30 fms. (live material 12-24 fms.) Bottom: sandy mud, Miocene shale uplifts, algal reef.

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

Maximum Size: 38 mm.

Eastern Pacific Analogue: Semele sparsilineata Dall, 1915. "Guymas and Barra de Navidad, Mexico, to Panama on mud flats and offshore (Keen, 1971).

77. Semele bellastriata (Conrad 1837).

Amphidesma bellastriata Conrad, 1837, Journ. Acad. Nat. Sci., Phila., 7 (2), p. 239, pl. 20, fig. 4.

This species is common on sandy bottoms along the entire N.W. Gulf of Mexico shoreline in a depth range of 0-32 fms. It never enters the bays but loose valves and a few live specimens have been taken from beachdrift (Galveston, Port Aransas, South Padre Island). Its surface sculpture shows all variations from almost

exclusively concentric ribbing with just a few anterior and posterior radials to strongly cancellate sculpture over the entire shell. For this reason S. bellastriata donovani McGinty, 1955 should not be recognized as a valid subspecies. This form is quite common off Texas and is probably merely an ecological variant, characteristic of shallow water. Synonym: Amphidesma cancellata Orbigny, 1842.

Previous records for the Texas faunal province are: 136, off East Texas, pl. 6, fig. 1; 145, listed; 156, common on Stetson Bank; 162, off East Texas; 206, Beach records in Tex. Conch., Vol. 1 (2), 1964; 225, Galveston; 236, Galveston; 269, figured on page 202.

Records H.M.N.S.: 49 lots of which 8 contain live collected material.

Depth Range: 0-32 fms. (0-26 fms. for live material), mainly in sandy mud bottoms. Also on Miocene shale outcrops and from mudlumps in Mississippi delta. Beach material from South Padre Island and Mustang Island.

Maximum Size: 21 mm.

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

Eastern Pacific Analogue: Semele pacifica Dall 1915: Gulf of California to Panama intertidally and to a depth of 38 m. (Keen, 1971).

Genus Semelina Dall, 1900.
Essentially a small Semele, which however, is quite differently shaped and sculptured in minute juvenile material.

78. Semelina nuculoides (Conrad, 1841).
Amphidesma nuculoides Conrad, 1841. Amer. Journ. Sci., 1st. Ser., 41., p. 347.

This small species is characteristic for the offshore Pleistocene (?) shell bank environment in a depth range of 6-15 fms. Rare beach specimens are rafted ashore by Gorgonia (South Padre Island, St. Joseph Island). Its color is mostly white, but some populations produce specimens which are on the inside, colored by an orange spot in the center of the shell. Some of these colored specimens show on the outside, colored radiae (from lirulata Dall which has no particular significance). On the basis of minute juvenile material we believe it is best to consider Semelina as a separate genus. These juvenile shells are very skewed in outline and are heavily and densely ribbed by concentric ridges.

Previous records for the Texas faunal province are: 136, (at 13 stations off East Texas, some alive, 33 ft. - 55 ft.); 170, off East Texas; 206, beach records, Tex. Conch., Vol. 1 (2), 1964; 225, Galveston; 236, Galveston.

Records H.M.N.S.: 29 lot of which 8 contain live collected material.

Depth Range: 0-32 fms. (alive 6-10 fms.)

Maximum Size: 8.2 mm.

Geographical Range: North Carolina, Gulf of Mexico, West Indies, (Abbott, 1974).

Eastern Pacific Analogue: Semelina subquadrata Carpenter 1857, Gulf of California to Colombia.

Genus Abra, Lamarck, 1818.
Three species, each a different depth range, of these small white or yellow unadorned shells live in the N.W. Gulf of Mexico.

79. Abra (Abra) aequalis (Say, 1822).
Amphidesma aequalis Say, 1822. Journ. Acad. Nat. Sci., Phila., 2, p. 307.
This common beachdrift species is often dredged on the shallow offshore shelf. It lives in the open bays, inlets, along the beaches and in shallow water to a depth of 10 fathoms, all along the coastline of the N.W. Gulf of Mexico. Two forms seem to be present, a thick shelled one and a thinner, somewhat more shiny one, which we believe are identical.
Previous records for the Texas faunal province are: 1, Amphidesma aequalis Say, Galveston; 7, listed; 15, Galveston Island; 16, Syndosmia aequalis well at Galveston at depth of 305-315 ft. and 440-458 ft.; 18, Galveston, not common; 21, listed; 44, Galveston; 56, listed; 66, Pleistocene; 67, Port Isabel; 69, listed; 98, alive in Redfish Bay; 110, dead shells on all Gulf beaches. Pl. 13, figs. 1-2; 126, Carolinian Province; 135, alive in Gulf and in bay; 136, alive in surfzone off East Texas; 143, listed; 145, upper sound, inlets; Mississippi delta; 153, coastal bays and inlets mid Texas coast; 156, Stetson Bank; 160, alive in Matagorda Bay; 164, Rockport and Laguna Madre, both alive; 170, off East Texas; 174, listed; 175, open sound or open lagoon center assemblage; 202, Pl. 2, fig. 5; 206, Beach Records in Tex. Conch., Vol. 1, (2), 1964; 208, tidal inlet and influence assemblage; 225, Galveston; 236, Galveston; 253, common off Padre Island; 261, offshore Galveston; 269, figured on page 201. This is the second most common bivalve of the Texas coastal beaches, living in a great variety of environments.
Records H.M.N.S.: 95 lots of which 21 contain live collected material.
Depth Range: 0-40 fms. (alive 0-10 fms., 25 fms?). Some of the deepest material is probably Pleistocene in age.
Maximum Size: 14.6 mm.
Geographical Range: North Carolina to Texas, West Indies, Brazil (Abbott, 1974).
Eastern Pacific Analogue: Closest to Abra aequalis Say is Abra tepocana Dall, 1915 off Puerto Peñasco to Cape Tepoca, Sonora, Mexico in 26 meters. Some of the larger material resembles Abra palmeri Dall, 1915, Baja, California to Panama Bay, 30-165 m., a depth range incompatible with that of A. aequalis Say.

80. Abra (Abra) lioica (Dall, 1881).
Syndosmia lioica Dall, 1881. Bull. Mus. Comp. Zool., 9, p. 133.
This thinner and slightly differently shaped species has been dredged often in a depth range of 40-167 fms. Its vertical range appears thus to be completely separated from that of A. aequalis.
Previous records for the Texas faunal province are: 45, Galveston, Texas; 145, lower and upper sound of Mississippi delta, shallow and deep shelf; 146, shallow shelf, recent delta influence; 147, dead on Big Southern Bank; 175, Prodelta slope 2-11 fms.; abundant in silty clay sediments; 206, Tex. Conch., Vol. 9, p. 81, 1973; I suspect that several of the above identifications

are in error and that rather immature specimens of A. aequalis in which the lateral tooth is poorly developed, have been mistaken for A. lioica.

Records H.M.N.S.: 15 lots (none alive), mud bottoms.

Depth Range: 40-167 fms.

Maximum Size: 7.7 mm.

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

Eastern Pacific Analogue: None

81. Abra (Syndosmia) longicallis americana Verrill and Bush, 1898.
Abra longicallis americana Verrill & Bush. Proc. U.S.N.M., 20 (1139), p. 778, pl. 83, figs. 6, 7.

This much more elongate, straw colored species is not uncommon in very deep water on mud bottoms, from the Mississippi delta to the Freeport area.

Previous records for the Texas faunal province are: 206, Vol. 9, p. 81, 1973, Tex. Conch.

Records H.M.N.S.: 14 lots (none alive, but some quite fresh).

Depth Range: 60-450 fms. in mud bottoms.

Geographical Range: Arctic Ocean to the West Indies (Abbott, 1974).

Maximum Size: 23.7 mm.

Eastern Pacific Analogue: None.

Genus Cumingia Sowerby, 1833.

Two species in our area. They are characterized by having a spoon-like chondrophore in the hinge structure.

82. Cumingia tellinoides (Conrad, 1831).
Mactra tellinoides Conrad, 1831. Journ. Acad. Nat. Sci., Phila., 6, p. 258, pl. 9, figs. 2-3.

This species is fairly common to the coastal bays but does not occur in offshore waters. It lives between roots of vegetation and has rarely been found in abandoned bore holes in oysters (H. Ode) giving the shells a misshapen exterior outline. The density of the concentric ribbing is somewhat variable. It reaches a much larger size than the next species. The subspecies vanhyningi Rehder (Nautilus, Vol. 53 (1), p. 19, pl. 6, figs. 13, 14) is probably the same.

Previous records for the Texas faunal provice are: 15, Shamrock Cove, Corpus Christi Bay; 18, Corpus Christi (not common); 21, listed; 44, Shamrock Cove, in Corpus Christi Bay, Tex.; 58, Matagorda Bay; 63, subspecies vanhyningi Rehder, listed for coastal bays; 110, a few dead shells have been taken at Port Aransas; 153, listed; 160, Matagorda Bay; 174, listed; 206, Beach Records in Tex. Conch., Vol. 2, (2), 1964; 225, Galveston; 236, Galveston; 269, figured on page 202.

Records H.M.N.S.: 22 lost of which one contains live collected material.

Depth Range: 0-1 fms. (also alive). Two lots dredged at 7½ and 25 fms. must be considered Pleistocene fossils. Most of this material except above mentioned two lots comes from Galveston West Bay (alive), East Matagorda Bay, Matagorda Bay and Aransas Bay.

Maximum Size: 21 mm.

Geographical Range: Nova Scotia to Florida to Texas.

Eastern Pacific Analogue: Cumingia mutica Sowerby, 1833, "Ecuador to Chile" (Keen, 1971).

83. Cumingia antillarum (Orbigny, 1842).
Lavignon antillarum Orbigny, 1842. Moll. Cubana, Atlas, pl. 25, figs. 36-38, text. 1853, Vol. 2, p. 236.
Only a single valve is known from the offshore reef off Padre Island. This is the species which lives normally in abandoned bore holes.
Previous records for the Texas faunal province are: 206, Tex. Conch., Vol. 9, p. 81, 1973.
Records H.M.N.S.: 1 lot (25-50 ft., limestone outcrop), no live material.
Geographical Range: South Florida, Caribbean, Bermuda, Brazil (Abbott, 1974).
Maximum Size: Not measured.
Eastern Pacific Analogue: Cumingia lamellosa Sowerby, 1833. "Baja California to Peru, intertidally and to a depth of 24m." (Keen 1971)
Remarks: It is possible that this species has been reported as Amphidesma deforme Philippi by Roemer in ref. 1, (Galveston). There appears to be some uncertainty about the trivial name. Abbott names the species C. coaretata Sowerby, 1833. Other workers consider this name as a synonym of C. lamellosa Sowerby, 1833.

SHELL BOOKS OF THE RECENT PAST

HANDBOOK FOR SHELL COLLECTORS. By Walter Freeman Webb. 1935. Revised 1948.
UNITED STATES MOLLUSCA. By Walter Freeman Webb. 1942.

For generations of shell collectors, these two books served as "bibles". They filled the needs of those who took up the hobby in the 1940s and the 1950s, before Abbott's books and the Japanese publications became available. The HANDBOOK illustrated and described over 2000 marine species foreign to the United States. The UNITED STATES MOLLUSCA was intended to be "a descriptive manual of many of the marine, land and fresh water shells of North America, north of Mexico".

The illustrations are all in black and white, either photographs or line drawings. Details are blurred in many of them and the absence of color detracts from the usefulness of the book in shell identification (by modern standards). However, these volumes were among the few readily available during the war years and immediately afterwards.

At the time the books appeared, the author was the largest shell dealer in America. He bought and sold a number of outstanding shell collections. He was the co-founder of the St. Petersburg Shell Club.

Texas CONCHOLOGIST

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NOTES & NEWS

REPORT ON FEBRUARY FIELD TRIP

In lovely mild weather 22 people gathered last Saturday at the Texas City dike and discovered there were three kinds of environment to explore. On the sandy beach they found live Polinices duplicatus, Sinum perspectivum and ?Acteocin candei. The rocks yielded live Congeria leucophaeta, Brachidontes and Crassostrea virginica, some of the latter with unusually nice frills. In the clay banks there were live Cyrtopleura costata but these proved impossible to get because water kept filling in the holes dug by eager collectors. Dead ones were found complete, though, along with dead Petricola pholadiformis, Tagelus divisus, Tellina iris and Nassarius vibex. To everyone's pleasure, several flights of snow geese passed over during the day.

MARCH FIELD TRIP

Our last field trip this year will be held Sunday March 7. We'll meet at 10:00AM at the fishing camp near the intersection of S.H. 87 and 124. You may take either Interstate 10 to Winnie and turn south on 124 or take Interstate 45 to Galveston-Bolivar ferry and then 87 east.

This area of our coastline does not have a wide driveable beach if the tide is high, so we'll probably have to park roadside and do some walking. Neither does it offer an abundant of live mollusks, but it does have those very large Thais with the beautiful orange apertures (remember the ones we added to the shell packages last year?), large Polinices, driftwood, some very interesting rocks (some people collect these to paint with designs), and occasionally, Janthinas and Murex fulvescens. The time I went, I saw a dead Natica canrena collected. Fossils also show up there. I highly recommend rereading Constance Boone's account of our trip to High Island last March. (Tex. Conch., Vol. 11, No. 4, p. 99).

It rained.

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EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Ode
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

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Thou shell not steal

The shell game is an honest affair on the coast. Beach houses are robbed, other crimes occur, but shells are generally left where their owners put them. What is so precious about a shell? One home owner still has a fine collection sitting almost on the road outside his house. It's been there for months. A beachcomber found a massive conch in the surf and set it on top of an old fishing pier post while he sorted through some other shells. He inadvertently left it there on his way back to Houston. Returning to the beach the next weekend, he found the shell exactly where he had placed it.

People feel a personal pleasure in collecting their own shells. Persons who might be prone to thievery seem to respect this feeling. Perhaps if we listened more closely to the shell, we'd hear more than the sound of the sea.

The above clipping was published on the editorial page in the Houston Post during December, 1975. While I would like to believe that shell collectors are more honest than others, I suspect that few people, including shell collectors, know enough of shell values and shell markets to make stealing worthwhile. For the time being, we will steal cameras, color TV sets and citizen band radios where we know the resale value.

SEARCH AND SEIZURE by Constance Boone

Back in the marsh area at San Luis Pass, Galveston Island, on February 23, 1976, when the tide was very, very low after a howling norther, recovery was made of one specimen of a tiny-like animal which is an Elysia. This mollusk is a Sacoglossan. I had not collected one in Texas before, but there are reports of specimens from this Genus collected in Galveston and Corpus Christi area.

At this time, I have no specific name to offer for my specimen, nor do I have specific names for those I have been told were collected elsewhere in Texas. I also do not know if what I collected is a juvenile or if it is like the others collected.

My Elysia is typically green, with other pigment colors. It is 12 mm. long extended swimming in seawater. Observed under magnification of up to 30 power, it has an overall color of emerald green spotting, these spots being inner pigmentation zones. Sacoglossans prefer feeding on filamentous algae and there are several of these green algaes. The animals absorb the coloration of the algaes they feed on.

The wing-like expansions which help this animal swim are somewhat undulate in my specimen. Around the edge of the parapodia the color is made lighter by pigment cells of deep pink and sprinkling of white "sugar-crystal-like" pigments. All over the body this crystal spotting seems to overlay the animal. The rhinophores roll inward, are rather long, and are whitish. Around the mouth there is dusting of black pigment.

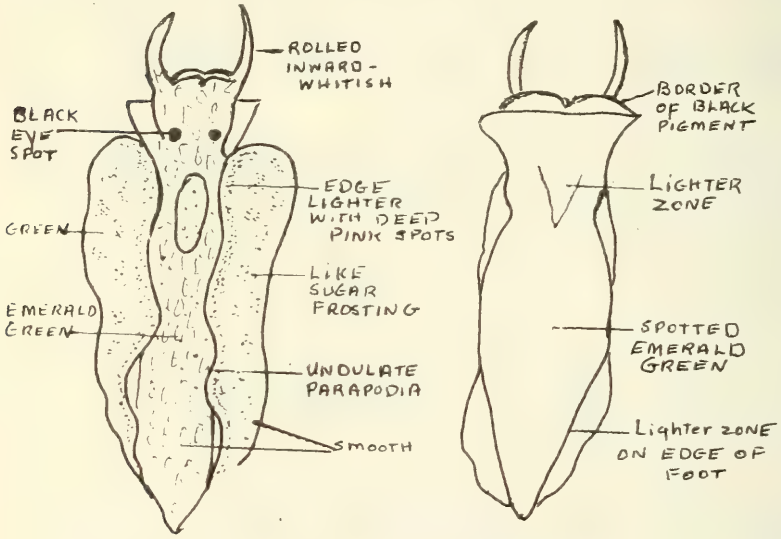
My animal was not recovered on algae. It was picked out of what seemed a trail in the muddy pool. This may simply mean that it landed there after having been blown in from the bay. There are patches of filamentous green algae on jetty rocks and concrete pilings and other areas of Galveston Bay.

I remembered that Dr. Harold Harry of A. & M. University had talked to Jim Lance and me several years ago and told of the recovery of an Elysia from some filamentous green algae near Offats Bayou. I do not know whether it has been determined what species this was. A message relayed to me from Dr. Harry by his wife confirms my memory of this collection and also adds the information that Dr. Harry talked about this specimen at the Galveston Shell Club's banquet and that he told that club that he believed there were two Elysias in Texas waters, another species reported from the Corpus waters. His Galveston species was one inch in length, the report from Corpus was of a one-fourth inch animal. My specimen could be either. Without animal study and extraction of the radula teeth it would be difficult to know if mine is a juvenile or adult. I report it here with drawings from the living animal to put this animal on record and to hope that it will add another bit of information about our fauna.

Drs. Eveline and Ernst Marcus in Studies in Tropical Oceanography, No. 6, of the Institute of Marine Sciences, University of Miami, 1967, present Elysia in the Superfamily ELYSIANCEA, Family Elysiidae. In this report, no Elysia is listed for Texas.

Dr. R. Tucker Abbott's Second Edition of American Seashells, 1974, presents the Genus Elysia under the Superfamily PLAKOBRANCHIACEA and the Family Plakobranchidae. There is no record here of an Elysia in Texas waters directly, but there are several species which could range in this area. I did collect Elysia on green algae at Isla Mujeres, Mexico, several years ago.

The specimen I have will be eventually preserved. I hope to be able to present more about the Genus in the future. Anyone wishing to offer more information or records is urged to write to me. Search and Seizure is always ready to publish your material.



Elysia sp., 12 m.m. living animal

Elysia sp., 12 mm., collected by Constance Boone February 23, 1976, in marsh area at San Luis Pass, Galveston Island. Drawing by collector.

MORE COLLECTING NOTES: Ruby Ray recovered several juvenile specimens of Rangia this winter from the mud flats near Tiki Island, approach area to Galveston Island from Houston, when the tides were subnormal. There has been some discussion about which species she did get, and there will have to be examination under lens to confirm identification. Please reread Dr. Odé's report of Rangia in Texas Conchologist, Vol. XII, No. 1, Sept., 1975, and check Abbott's Second Edition of American Seashells. At the February meeting of the Houston Conchology Society, Leola Glass brought a tray of both Rangia cuneata and Rangia (Raniganella) flexuosa she had collected at Clear Lake near her home some years ago. Several professionals have confirmed the identification of these specimens. Although these species may certainly still live there in the mud, Leola reports that the lake has risen several feet in the last years and winter low tides now do not uncover the ooze area.

One note is made here that the description of Rangia (Rangianella) flexuosa in Abbott always states that this is a rare and elusive species and that it is colored light brown inside. None of the specimens seen in the Northwest Survey housed at the Museum of Natural Science here and none of the specimens in other collections I have seen are light brown inside. They are whitish and in color little different from Rangia cuneata. Maybe we need to know about this.

From member Linda Serrill from Matagorda, Texas, has come a note about collecting three young specimens of the hard-to-find Agriopoma texasiana (see Abbott, Second Edition on this change from Callocardia texasiana). There are plenty of old large valves of this species on our beaches, but it is an uncommonly collected bivalve live or paired.

The Courtades were at San Luis Pass, Galveston side, on Feb. 22 when the sand bars on the bay side were well exposed. They were able to collect a growth series ot Sinum and collected Epitoniums, Busycons, and Tellina alternata, the yellow, whitish, and pale pink ones that are true alternata.

Ruth Goodson also collected at San Luis Pass on a winter low tide and recovered Epitoniums, much to her delight.

My day at San Luis Pass, in addition to the Elysia, yielded a number of very nice Epitonium humphreysi. My interest in Epitoniums has not dimmed. Each time I try to study the material, this series of E. humphreysi confirms my earlier statements that the operculums are not dark but are pale amber. The species seems to have much more purple dye than other local Epitoniums and they flood the animal with color when handled. The operculums finally are stained dark. Having these humphreysi on hand and able to put them under the lens, it is noted that the costae are not only thicker than E. angulatum but also twist strongly when joining the upper whorl's costae. I find E. humphreysi has whorls that are more globose than those of E. angulatum and the aperture more rounded oval. The shells of E. humphreysi are like dull silk fabric while those of E. angulatum are more like milk glass.

ANGEL WINGS, TRUE AND FALSE, DEAD AND ALIVE by Cynthia Biaska

In mid-January, Bill Keeler, my husband and I decided to check out Sargent Beach, where none of us had been before. The tide had already reached its low point and was beginning to rise when we arrived. The beach area close to the water had large patches of sticky clay, with sand higher up. Walking on the clay was difficult because great gobs of it stuck to our sneakers.

At first we thought there was nothing of interest on the beach, not even good beach shells, but on closer observation, I saw a narrow trail in the clay, at the end of which was a false angel wing, Petricola phaladiformi not more than ¼ inch long. We soon found others in the area, as well as a series of small round holes. In many of these were live false angel wings, all small, perhaps ½ inch in length. We put a few into a pill bottle to examine later. We had no idea from the literature that false angel wings tracked in the clay like snails. They are referred to as borers only.

After finding nothing more in this area, we moved a few hundred yards east and here we saw an astonishing sight-hundreds of round holes, in each one a dead angel wing (Cyrtopleura costada) with its two valves sticking out the top like a flower. They were an inch or two long and they must have been there for several days, because the tops were broken in almost every case. There had been a freeze ten days before and apparently that had killed them.

While examining this angel wing graveyard, my husband noticed something in one of the "empty" holes. Sure enough, here and there among the skeletons was the siphon of a still live but sluggish angel wing. Although we had no tools with us at this point, by using pieces of clam shell and a strong stick we were able to dig out several whole ones. Since these were the first pairs that I had ever seen live, much less collected myself, I was delighted.

An epilogue of this incident, showing it never rains but it pours, is that in early February Margaret Baldwin, Janet Williams and I took advantage of a -.7 tide and a beautiful sunny day to shell at San Luis Pass. After a brief, unproductive search on the Galveston side, we drove over the bridge and walked along the shore, away from the Gulf. Believe it or not, we found and successfully dug out 5 angel wings, (Cyrtopleura costada) up to 4 inches long. Margaret also found a live Sinum perspectivum popping out of the sand and we gathered several olives, 2 large Mercenaria, a large Thais, a busycon and some interesting beach shells. But angel wings twice in a row? These two experiences provided a real education in the life and death of angel wings.

THE GENUS STROMBUS: by Lloyd Meister

A LIST OF RECOGNIZED TAXA WITH ABBREVIATED SYNONYMY

For the past ten years or so, I have been studying and building a collection of Strombus shells. I am called by some an "expert" on the subject. While it is true that I have read everything on Strombus that was available to me, have studied the 50 species and 12 subspecies in my own collection and specimens from others which I do not have, and, as a result, I have learned to tell one species from another and to give each a name. I hardly think this qualifies me as an "expert", although I must admit it is a little flattering.

I have been asked, from time to time, to provide a list of taxa (names) of recent Strombus shells, which I have done.

One day I received a call telling me that a person had obtained a shell labeled Strombus ustulatus Schumacher, 1817 and why was that name not on the list. It was not listed because it is considered to be a synonym of Strombus urceus Linne, 1758 and because ustulatus refers to a specimen with an all black columella and aperture. It is sometimes called:

Strombus urceus forma ustulatus Schumacher, 1817

Names become synonyms for a number of reasons, some of which are: 1) Non-binomial, a name that has only the genus or the species but not both; 2) Nude-name, a name without description and/or illustration; 3) Preoccupied, a species name was already in use within the genus from an earlier date, although such a name may be used in another genus; 4) Genuine misidentification, probably due to insufficient research. For those shells which are the bones of contention as to whether they are species or subspecies, the name selection remains largely personal, since one must draw the line somewhere. I will discuss some of these as they come up to show why I used the name that I did.

I will group the species together under their subgeneric name for those who may wish to use them in their labeling. Remember that the subgeneric name is capitalized and contained within parentheses and will appear as:

Strombus (Canarium) urceus Linne, 1758

In some instances you will note that the authors name and the date are also contained within parentheses. This indicates that the author placed his species in a genus other than, in this case, Strombus and was later corrected. In the genus Strombus this author is, with one exception, Roding and the one exception is Kira. These original citations will appear in the synonymy.

By "abbreviated synonymy" it is meant that there will reference only to the author and date but none to the publication in which the citation appeared. Some citations will be omitted because of repetition of names. Where the generic name Strombus is used it will appear as: S. All other generic names will be spelled out.

The sources for the synonymy were: Abbott, American Seashells, 2nd Ed, 1974, Indo-Pacific Mollusca Vol. 1, No. 2, 1960 and Keen, Seashells of Tropical West America, 1971.

For the purpose of this list I am recognizing 56 species and 18 subspecies for a world total of 74.

If that last statement sounds pretentious, I apologize, it was not meant to. When a person has read all available material and examined all available specimens,it follows that conclusions are reached. These,then,are mine. Some, I am sure, will not agree.

Genus STROMBUS Linne, 1758
Subgenus STROMBUS s.s. Linne, 1758

pugilis Linne, 1758 (Type)
S. sloani Leach, 1814
S. nicarguensis Fluck, 1905
S. peculiaris M. Smith, 1940

alatus Gmelin, 1791
S. undulatus Kuster, 1845
S. pugilis alatus Gmelin, Clench & Abbott, 1941

gracilior Sowerby, 1825
no synonymy known to me.

Subgenus LAEVISTROMBUS Kira, 1955

canarium, Linne, 1758 (Type)
Lambis turturella Roding, 1798
S. isabella Lamarck, 1822
S. vanikorensis Quoy & Gaimard, 1834
S. taeniatus Quoy & Gaimard, 1834
S. gibbus "Martini" Issel & T.-Canefri, 1876

This last name is a homonym for gibbosus (Roding, 1798), see under Gibberulus.
There are those who say there are two species in this subgenus, the second one being S. isabella Lamarck, 1822. I have seen hundreds of specimens of S. canarium and can see no evidence to support the contention. There are many integrades between the two. For two of several discussions on this matter,see Abbott, Indo-Pacific Mollusca, 1960 and Romagna-Manoja, La Conchiglia, November-December, 1973.

Subgenus TRICORNIS Jousseaume, 1886

tricornis Humphrey, 1786 (Type)
S. tricornis G. Fischer, 1807 (preoccupied)
S. tricornis Lamarck, 1816 (preoccupied)
S. orientalis "Jonston" Duclos, 1844
S. pertinax Duclos, 1844

thersites Swainson, 1823
S. thersites Wood, 1828 (preoccupied)
S. ponderosus Philippi, 1842

latissimus Linne, 1758
Lambis picta Roding, 1798
Pterocera alata Schumacher, 1817

taurus Reeve, 1857
no synonymy

sinuatus Humphrey, 1786
Lambis lobata Roding, 1798
Pterocera palmata G. Fischer, 1807
S. laciniatus "Chemnitz" Dillwyn, 1817
S. cristatus Lamarck, 1822

oldi Emerson, 1965
no synonymy

raninus Gmelin, 1791
S. bituberculatus Lamarck, 1822
S. lobatus Swainson, 1822
S. rarimus Bosc., 1801
S. nanus Bales, 1938

peruvianus Swainson, 1823
no synonymy known to me

gallus Linne, 1758
Lambis turrita Roding, 1798

costatus Gmelin, 1791
S. intermis Swainson, 1822
S. accipitrinus Lamarck, 1822
S. leidyi Heilprin, 1887
S. spectabilis A.H. Verrill, 1950

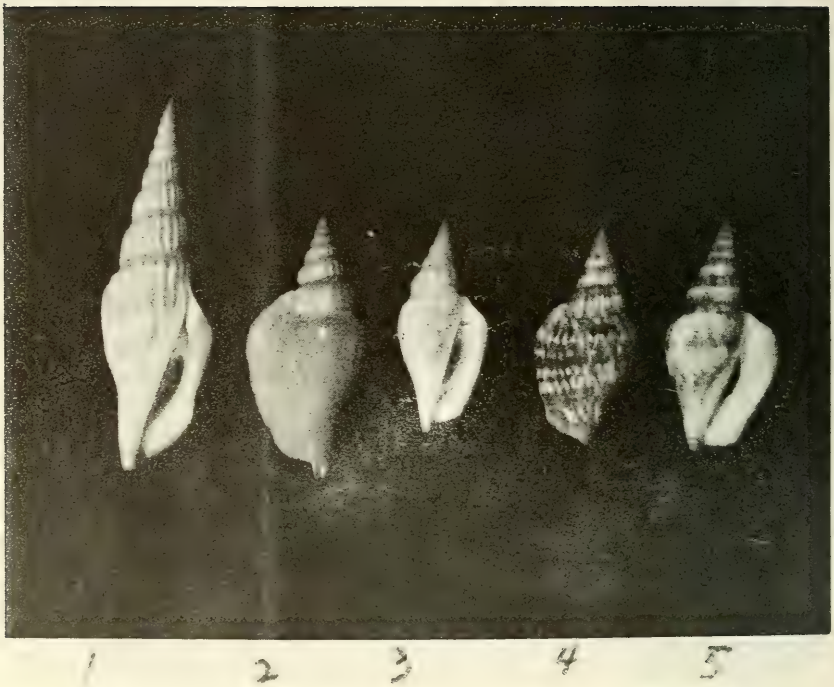
galeatus Swainson, 1823
S. crenatus Sowerby, 1825
S. galea Wood, 1828

goliath Schroter, 1805
no synonymy known to me

gigas Linne, 1758
S. samba Clench, 1937
S. horridus M. Smith, 1940
S. gigas verrilli McGinty, 1946
S. canaliculatus L. Burry, 1949

Subgenus CANARIUM Schumacher, 1817

urceus Linne, 1758 (Type)
Lambis reticulata Link, 1807
Canarium ustulatus Schumacher, 1817
S. incisus Wood, 1828
S. anatellus Duclos, 1844
S. crassilabrum Anton, 1839
S. muricatus "Martini" Watson, 1885
S. ustulatus forma laevis Dodge, 1946



1 Strombus vittatus forma australis
Schroter, 1805
Size: 102 mm.
about 4 5/8"

2 & 3 Strombus vittatus Linne, 1758
2 - 72 mm. about 2 13/16"
3 - 59 mm. about 2 1/4"

4 & 5 Strombus campbelli Griffith
& Pelgeon, 1834
4 - 59 mm. about 2 1/4"
5 - 62 mm. about 2 5/16"

urceus orrae Abbott, 1960
no synonymy

labiatus (Roding, 1798)
Lambis labiatus Roding, 1798
Lambis reticulatus Link, 1807
S. plicatus Lamarck, 1816
S. dentatus Linne, Reeve, 1850
Camarium otiolum Iredale, 1931

labiatus olydius Duclos, 1844
no synonymy

klineorum Abbott, 1960
S. urceus Linne, Duclos, 1844

microurceus (Kira, 1959)
Camarium microurceum "Kuroda, MS" Kira, 1955 (nude name)
Camarium microurceum "Kurda, MS" Kira, 1959

mutabilis Swainson, 1821
S. floridus Lamarck, 1822
S. epinellus Duclos, 1844
S. flosculosus "Martini" Morch, 1852
S. floridus forma zebriolatus "Dautzenberg" Adam & Leloup, 1938

mutabilis ochroglottis Abbott, 1960
no synonymy

maculatus Sowerby, 1842
S. maculatus "Nutall" Jay, 1839 (nude name)
S. maculatus "Nutall" Sowerby, 1842
S. floridus var. depauperata Dautzenberg & Borge, 1933

fusiformis Sowerby, 1842
no synonymy

erythrinus Dillwyn, 1817
- erythrinus Chemnitz, 1795 (non-binomial)
S. erythrinus "Chemnitz" Dillwyn, 1817
S. elegans Sowerby, 1842
S. radians Duclos, 1844
S. ruppelli Reeve, 1850

rugosus Sowerby, 1817
S. jugosus Wood, 1828
S. corrugatus, A. Adams & Reeve, 1848

haemastoma Sowerby, 1842
no synonymy

scalariformis Duclos, 1833
This is a doubtful species without synonymy known from only three specimens and possibly is a high spired form of S. haemastoma.

helli Kiener, 1842
S. cancellatus Pease, 1860

dentatus Linne, 1758
S. tridentatus Gmelin, 1791
Lambis dentata Roding, 1798
S. samar "Chemnitz" Dillwyn. 1817

terebellatus Sowerby, 1842
S. dentatus Wood, Kiener, 1843

terebellatus afrobellatus Abbott, 1960
no synonymy

fragilis (Roding, 1798)
Lambis fragilis Roding, 1798
S. samar "Chemnitz" Dillwyn, 1817
S. dubius Swainson, 1823
S. bulbulus Sowerby, 1842
S. (Canarium) terebellatus Sowerby, Abrard, 1946
S. bullatus Dodge, 1946

wilsoni, Abbott, 1967
no synonymy

Subgenus DOLOMENA Iredale, 1931

plicatus (Roding, 1798)
Lambis plicata, Roding, 1798
S. deformis "Gray" Griffith & Pidgeon, 1834
S. sibbaldi Sowerby, Kiener, 1843

plicatus columba Lamarck, 1822
S. columba Lamarck, 1822
S. tankervillii Swainson, 1823

plicatus sibbaldi Sowerby, 1842
S. sibbaldi Sowerby, 1842
S. kieneri Issel & T. -Canefri, 1876
S. yerburyi E.A. Smith, 1891
S. deformis Gray, Kiener, 1843

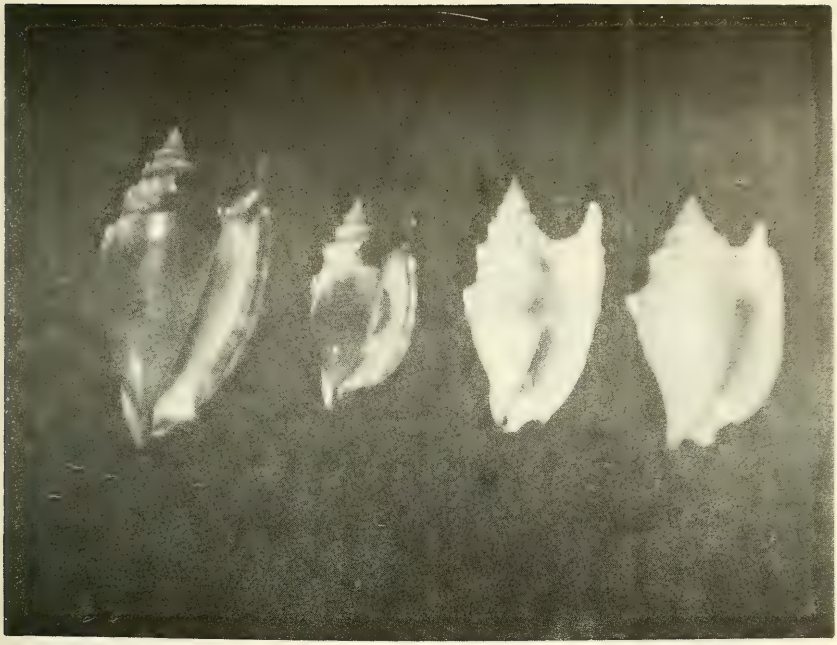
plicatus pulchellus Reeve, 1851 (Type)
S. (Gallinula) malekulensis Abrard, 1946
S. (Gallinula) minimus Linne var. minor Abrard, 1946

dilatatus Swainson, 1821
S. orosminus Duclos, 1844

dilatatus swainsoni Reeve, 1850
S. swainsoni Reeve, 1850

labiosus Wood, 1828
S. labiosus Gray, Reeve, 1851

marginatus Linne, 1758
Lambis carinata Roding, 1798



1 & 2 Strombus aratrum (Roding, 1798)
1 - 96 mm. about 3 3/4"
2 - 53 mm. about 2 1/16"

3 Strombus vomer (Roding, 1798)
73 mm. about 2 27/32"

4 Strombus aurisdianae Linne, 1758
70 mm. about 2 3/4"

marginatus succinctus Linne, 1767
S. succinctus Linne, 1767

marginatus robustus Sowerby, 1874
S. robustus Sowerby, 1874
Labiostrombus succinctus Linne, Kira, 1959

marginatus septimus Duclos, 1844
S. succinctus var. septimus Duclos, Tryon, 1885

variabilis Swainson, 1820
S. lituratus Menke, 1829

variabilis athenius Duclos, 1844
S. variabilis Swainson, Kiener, 1843
S. athenius Duclos, 1844

minimus Linne, 1771
S. minimus Gmelin, Roding, 1798
S. troglodytes Lamarck, 1822

kleckhamae Cernohorsky, 1971
no synonymy known to me

Subgenus LABIOSTROMBUS Oostingh, 1925

epidromis Linne, 1758
Lambis epidromis Gmelin, Roding, 1798
S. expansa "Martini" Tryon, 1885

Subgenus DOXANDER Iredale, 1931

vittatus Linne, 1758 (Type)
S. sulcatus Holten, 1802
S. australis Schroter, 1805
S. turritus Lamarck, 1822
The last two synonyms refer to a highspired form of vittatus Linne and while the latter is more commonly used, the former is correct since turritus is a homonym for turrita Roding (see gallus Linne) and therefore is not available. Labels should read: Strombus vittatus forma australis Schroter, 1805, if a form name is used at all.

vittatus japonicus Reeve, 1851
S. japonicus Reeve, 1851

campbelli Griffith & Pidgeon, 1843
Alaba Styliferina) sulcata Watson, 1886
This is another one of those bones of contention. The shell of campbelli is heavier although, on the average, smaller than vittatus. The color of vittatus is a very light tan with little spiral banding, while campbelli has an almost white ground color overlaid with dark red-brown axial streaks and/or zigzag lines which may become fairly solid except where they cross the, usually four, white spiral bands. Both vittatus and campbelli have rather smooth body whorls except for a few incised spiral lines toward the base of the shell. There is a low, rounded but prominent knob at the shoulder in the center of the dorsum

of campbelli. The spire of vittatus has very strong shoulders which are rounded, while campbelli has almost no shoulders at all. The subsutural band in vittatus and campbelli is prominent and in vittatus seems to be composed of two spiral cords, while in campbelli it is broad with a few, about three, incised spiral lines and crossed by numerous low, rounded, axial ribs that extend down to the next suture. The axial ribs in vittatus are a little more prominent and extend from below the subsutural band down to the next suture but do not cross the bands. In vittatus these axial ribs begin to disappear in the penultimate whorl, while in campbelli they continue onto the body whorl and terminate at the dorsal knob. The spire of vittatus has several incised spiral lines that generally disappear with the axial ribs, while in campbelli these lines are confined to the subsutural band. The aperture in both is white. Based on the differences I have discussed I would accept Strombus campbelli Griffith & Pidgeon, 1834 as a distinct species.

I have in my collection a specimen of S. campbelli which is a pink color form that lacks the white ground color and has the red-brown markings confined to the subsutural band and down the dorsal edge of the outer lip. The aperture is also pink. I can find no reference to such a color form in the literature nor can I find anyone who has seen such a specimen. It must therefore be exceedingly rare and as such, would alter little the description of campbelli, except to say, "rarely a pink color form".

Subgenus LENTIGO Jousseaume, 1886

lentiginosus Linne, 1758 (Type)
Lambis rana Roding, 1798
S. rana Oken, Isis, 1824

granulatus Swainson, 1822
no synonymy known to me

pipus (Roding, 1798)
Lambis pipa Roding, 1798
S. papilio "Chemnitz" Dillwyn, 1817
S. exustus Swainson, 1822

fasciatus Born, 1778
S. subulata Herbst, 1788
Lambis elegantissima Roding, 1798
S. polyfasciatus Dillwyn, 1817
S. lineatus Lamarck, 1822
S. lineolatus Wood, 1828
S. flavigula Meuschen, Tryon, 1885

latus Gmelin, 1791
S. fasciatus Gmelin, 1791
Strobus auratus Spalowsky, 1795
Lambis carnea Roding, 1798
Lambis carnaria Roding, 1798
S. bubonus Lamarck, 1822

S. dilatatus Lamarck, 1822
S. adansoni Defrance, 1827
S. bubo Lamarck, Deshayes, 1833

Subgenus EUPROTOMUS Gill, 1870

aurisdianae Linne, 1758 (Type)
Lambis stiva Roding, 1798
Lambis buris Roding, 1798
S. lamarcki Gray, Sowerby, 1842
S. chrysostomus Kuroda, 1942
S. striatogranosus "Morch" von Martens, 1880

aratrum (Roding, 1798)
Lambis aratrum Roding, 1798
S. aurisdianae var. adusta "Chemnitz" Dillwyn, 1817
S. melastomus Swainson, 1822
S. aurisasini Dillwyn, 1823
S. melanostomus Sowerby, 1825
S. adusta Gray, 1826

I am accepting S. aratrum as a species for two reasons. The first is my own comparisons of aratrum and aurisdianae. I have always felt that they were not subspecies of each other, I did not have S. vomer to compare with them. Before I got my specimen of vomer an article appeared in Hawaiian Shell News Vol. XV, No. 10, p. 5 by W. O. Cernohorsky, 1967, in which he compared vomer, aurisdianae and aratrum. Since then I have added vomer to my collection and have compared the three species on my own and came up with much the same conclusions. I would amend his article, as to extend the size range of aratrum from 58 to 91mm. to 49 to 96mm. to include my specimens. I would suggest that this article be read carefully by those interested.

bulla (Roding, 1798)
Lambis bulla Roding, 1798
S. laevis Perry, 1811
S. lamarckii Gray, 1826
S. lamarckii Swainson, 1840
S. guttatus "Martini" Kiener, 1843

vomer (Roding, 1798)
Aratrum T. Martyn, 1784 (non-binomial)
Lambis vomer Roding, 1798
S. acutus Perry, 1811
S. zelandiae Gray, 1826
S. pacificus Swainson, 1821
S. chemnitzii Pfeiffer, 1840
S. novae-zelandiae Chemnitz, Reeve, 1842
Euprotomus donnellyi Iredale, 1931
S. hirasei Kuroda, 1942
Euprotomus atratum Allan, 1950

vomer hawaiensis Pilsbry, 1917
S. hawaiensis Pilsbry, 1917

vomer iredalei Abbott, 1960
S. australis Gray, 1826
S. australis Sowerby, 1842
Both these names are preoccupied by S. australis Schroter, 1805 (see under vittatus Linne).

listeri T. Gray, 1852
S. mirabilis Sowerby, 1870

Subgenus CONOMUREX P. Fischer, 1884

luhuanus Linne, 1758 (Type)
S. luguanus Herbst, 1788
Lambis luhuana Roding, 1798
S. pusillus Anton, 1839

decorus (Roding, 1798)
Lambis decora Roding, 1798
Lambis miniata Link, 1807
Lambis flammea Link, 1807
S. cylindricus Swainson, 1821
S. mauritianus Lamarck, 1822
S. lutruanus Dillwyn, 1823
S. laevilabris Menke, 1828
S. coniformis Sowerby, 1842

decorus persicus Swainson, 1821
S. persicus Swainson, 1821
S. ismarius Duclos, 1844
S. belutschiensis Melvill, 1898

Subgenus GIBBERULUS Jousseaume, 1888

gibberulus Linne, 1758 (Type)
S. labiatus Perry, 1811

gibberulus gibbosus (Roding, 1798)
Lambis gibbosa Roding, 1798

gibberulus albus Morch, 1850
S. gibberulus var. rhodostomus "Morch" von Martens, 1869

This completes the list and I hope that it will be of some value to other members interested in the Genus Strombus.

Pet shells were available this past Christmas season in some of our better department stores here in Houston. It is said that the shells were packaged by mentally handicapped persons; nothing is said or to be construed concerning customers who would part with $4.00 for a three inch tiger courie, Cypraea tigris Linne. Abbott in "Kingdom of the Sea Shell" has an interesting paragraph or two on tiger cowries and their place in primative religions and folklore.

There is no evidence to date that people are tiring of their pet shells and discarding them as has been observed with pet rocks. In some areas surplus rocks have been a serious problem.

Some day we may be able to buy pet shells year round and not just at Christmas time. Some stores were selling pet rocks for Valentine's Day. I would prefer to give my wife something softer and not so likely to be thrown - such as a shell.

MOLLUSCANA by W.W. Sutow, M.D.

Ernie Libby was a most unusual man. He had an uncanny ability to sense one's interest. One can recall many, many instances when Ernie unselfishly expended his busy time, his energies and even his money to help others. Here is a story about Ernie - about a chain of events that only Ernie could have set in motion.

As the result of many trips to the Rongelap atoll in the Marshall Islands, Ernie built up a stock of Strombus taurus specimens for trading purposes. He also made trips to Japan and he knew of the malacological activities of the Emperor of Japan. The Emperor has an incomparable collection of rare seashell specimens, but it was highly probable that he did not have a specimen of Strombus taurus. Only Ernie could have thought about it. He decided to present the Emperor with three specimens of the rare Strombus taurus! And there begins this tale.

How does one go about presenting something to the Emperor of Japan? Ingenious Ernie thought that he had found a way. One of his trading buddies was a Japanese shell collector by the name of Taizo Ninomiya. Mr. Ninomiya had one of the best shell collections in Japan. Surely, Mr. Ninomiya would be able to find a way through channels to deliver the shells safely to the Emperor. So Ernie sent his three best specimens to Tokyo. That was more than three years before Ernie's illness.

Mr. Ninomiya's letter recounts the sequence of events that followed. He states "but this matter was not so simple". At first he was unable to find a way that "plain foreign people" could give anything to the Emperor. It seemed best to route the shells through someone who was a member of the Japan Malacological Society. So Mr. Ninomiya tried this method by turning over one specimen to a friend who was a conchologist and who served as an assistant of the Biological Laboratory of the Imperial Household. There was no subsequent word, even after more than a year. So Mr. Ninomiya asked another gentlemen who was a shell collector and who apparently knew the Grand Chamberlain well. Again nothing happened. After three times, Mr. Ninomiya felt that he could not urge his friend any more lest he be suspected of "self-advertisement".

Finally, Mr. Ninomiya sought out the chief priest of the government shrine who had frequent contacts with the Emperor. The priest himself was a most serious shell collector. This time, the Strombus taurus safely reached the Emperor. Along with the Strombus taurus there went from Mr. Ninomiya's collection specimens of Voluta lyriaeformis exsoptanda and Voluta wisemanii.

Ernie's wishes were realized on August 25, 1975. The Emperor and the Empress listened to the story and "were very pleased with the shells". The receipt of the Strombus taurus was acknowledged. Tragically, in the meantime, Ernie had died.

As a footnote, attention is called to the December, 1975 issue of HAWAIIAN SHELL NEWS. On page 4, Elmer Leehman profiles the Japanese collector, Taizo Ninomiya. This is the same man that Ernie had asked to present the Strombus taurus to the Emperor. He was Ernie's good shelling friend and had supplied Ernie (as well as Elmer) with a goodly number of rare shells (including Cypraea guttata) from all over the world.

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It is well known that the Emperor of Japan has a deep interest in malacology. It is not surprising, therefore, that even during his recent carefully controlled state visit to the United States, the Emperor was human enough to remember his hobby. During his stay in San Francisco, one of the few personal appointments was given to Dr. Myra Keen who was invited to chat with him about mollusks common to the countries on the opposite side of the Pacific Ocean. Dr. Keen had written on this subject and the Emperor was well aware of the publications.

STANFORD OBSERVER (November, 1975) reports this interview under the heading: "Sharing Shells with the Emperor of Japan". Dr. Keen presented the Emperor with two boxes of shell exhibits including some rare specimens. The Emperor gave to Dr. Keen five volumes on invertebrate groups he had collected from Sagami Bay, including reproductions of paintings by the Empress, and two personal gifts.

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The following short discourse here on writing southpaw-style actually is a comment stemming from reading a scientific malacological article. The entirety of No. 53 of the OCCASIONAL PAPERS ON MOLLUSKS (1 October 1975) is a biography and bibliography of Felipe Poey, the famous Cuban naturalist, by K.J. Boss and M.K. Jacobson. In the article, the authors quote Charles Wright as saying that "Poey (wrote) with his left hand and straight down the page like the Chinese, or he (turned) the paper sidewise to him - the lines running up and down.

Such an observation is indeed astonishing. The description is accurate but the connotation is erroneous. This is the natural way for lefties to write. Some of us gray-haired people actually went to the ancient two and three room grammar schools. We sat at desks that had ink wells on the upper right hand corner. The teacher very rigidly instructed all pupils to line the top margin of the paper slanting upward and pointing to the inkwell. For a right-hander this is normal.

With the paper in that position, however, the southpaw must turn his hand completely around and scribble awkwardly upward and backward. The pen and hand must be held above the line he is writing. Otherwise he cannot see what is being written - the fist will cover

the words. All of this can be obviated very easily by turning the paper around so that the top edge slants from the upper left corner of the desk toward the lower right corner. It is really quite simple to turn the paper even further so that the edge is vertical. I do this all the time and writing straight up and down is no trick at all. In fact, it is comfortable and it is the truly natural way for lefties to write.

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The books listed below have been purchased by the Ernie Libby Memorial Fund and have been added to the library:

THIS LIVING REEF by Douglas Faulkner. Quadrangle/The New York times Book Company, New York. 1974. 179 pages.

THE COLLECTOR'S ENCYCLOPEDIA OF SHELLS by Peter Dance. McGraw Hill Book Company, New York - St. Louis - San Francisco - Toronto. 1974. 288 pages.

BIOLOGY AND GEOLOGY OF CORAL REEFS. Edited by O.A. James & R. Endean, Volume I. Geology 1. 410 pages.
Volume II. Biology 1. 480 pages.
Academic Press. New York and London. 1973.

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SHELL BOOKS OF THE RECENT PAST

SHELL COLLECTOR'S HANDBOOK by A. Hyatt Verrill. L.C. Page & Company. Boston. 1936. 211 pages.

This widely distributed book by the well-known naturalist-author was written "to serve as a guide and handbook for the beginner, the amateur conchologist and those who make or contemplate making sea shells a hobby". Written in popular style (how many can recall Verrill as a pioneer science-fiction writer?) the pages read easily, often sensationally, but the scientific precision of present-day references. Nonetheless, the book was very popular and could be found in almost every public library.

BOOK REVIEW by W.W. Sutow, M.D.

SHELL COLLECTOR'S GUIDE. By Ruth H. Fair. Charles E. Tuttle Company. Rutland, Vermont and Tokyo, Japan, 1976. 213 pages. $8.50.

This handy sized volume provides the beginning collector with a variety of hints and suggestions that will save hours of irretrievable loss of time and effort from unprepared bungling.

The most valuable section of the book comprises the appendix on "Shelling Areas around Oahu". For the collectors and vacationers who head for Honolulu, these 25 pages provide 9 maps and descriptions of shelling sites around the entire island of Oahu. Anyone intending to do any shelling from Honolulu will do well to scan information of this type.

The chapters are short - sometimes too abbreviated - but they present the type of background knowledge that will be generally required for a productive collecting venture. Such preparation is especially beneficial when trips to far away places (such as the South Pacific) are planned. Laws and regulations do exist in various geographic areas and they can materially affect the scope and timing of one's shelling activities. Such aspects are briefly outlined in the book.

The annotated bibliography would have been more useful had the references been more carefully chosen. The book assuredly is not a manual for identifying the shell species. Yet, the bulk of the references deal with descriptions of shells arranged by genus or family or by geographic distribution. Such monographs as "Helpful Hints for Shell Hunters" published by the Hawaiian Malacological Society and "How to Study and Collect Shells" put out by the American Malacological Union are not listed. S. Stillman Berry's classic papers on the handling of chiton specimens are mentioned in the text in the chapter on Habitats (the word chiton does not appear in the index). (In the January, 1976 issue of HAWAIIAN SHELL NEWS, it is stated that this book was an outgrowth of what was undertaken as a revision of the "Helpful Hints for Shell Hunters").

The chapter headings give a synoptic view of the guidelines the author wanted to cover: Laws, regulations and protected species; The shell collector's equipment: The nature of the reef; Dangerous shallow-water dwellers; First aid; Some notes on habitats; Fanning and tracking; Unusual collecting methods; Night shelling; Snorkeling and scuba diving for shells; Dredging for shells; The traveling shell-collector; Cleaning shells - inside and out; Cataloguing and curating a collection; The cabinet - storing and display; The saltwater aquarium.

This book should prove helpful to all who are just learning about collecting seashells. The writing style is non-technical and carries the flavor of personal experience. It should be an ideal traveling companion since the chapters can be read very quickly - during the plane flights or at the airport.

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

(A Continuing Monograph)

PART I

by H. Ode'

SUPERFAMILY TELLINACEA

FAMILY SOLECURTIDAE

In the Northwest Gulf of Mexico, represented by the genera Solecurtus and Tagelus.

Sources: M. Keen (in) Treatise of Invert. Paleont. Part N, Vol. 2, p. 637-639.

In this family are brought together a number of elongate, somewhat rectangular bivalves, some of which are becoming estuarine. (Tagelus).

Genus Solecurtus Blainville, 1824.

This genus is characterized by oblique grooves crossing the incremental growth structure.

84. Solecurtus cumingianus (Dunker, 1861).

Macha cumingiana Dunker, 1861. Proc. Zool. Soc., London, 29, p. 425.

A widespread species in a depth range of 0-70 fms. along the entire coastline but rarely found alive. Does not invade the bays. Beach specimens have only been found at Freeport and South Texas beaches (Mustang Island, South Padre Island).

Previous records for the Texas faunal province are: 7, listed; 28, Psammosolen cumingianus Dunker; 45, repeat ref. 27; 56, Psammosolen cumingianus Dunker, 14-111 fms.; 69, listed; 145, listed; 156, Stetson Bank; 170, off East Texas; 175, intermediate shelf, 12-35 fms., sand bottoms; few along whole coast; 201, mudlumps Mississippi delta; 206, beach records in Tex. Conch., Vol. 2 (2), 1965; 214, Campeche Bank; 225, Galveston; 236, Galveston; 269, figured on page 200.

Records H.M.N.S.: 42 lots of which one contain live collected material.

Depth Range: 0-70 fm. (alive at 26 fms.) in sandy mud bottoms. Excluding specimens from beachdrift, the shallowest depth at which the species was dredged is 8 fms.

Maximum Size: 68 mm.

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

Eastern Pacific Analogue: There are two Panamanic species of which we at the moment cannot judge the closeness to S. cumingianus.

85. Solecurtus sanctaemarthae (Orbigny, 1842).
Solen sanctaemarthae Orbigny, 1842. Moll. Cub. 2, p. 232, Pl. 25, figs. 31, 32.
This is a much smaller and more irregular species, probably living in a similar depth range as the previous one, but our records are too scarce; never on the beaches.
Previous records for the Texas faunal province are: 175, "outer shelf, 40-65 fms., rare, south Texas; not alive, sand bottom; 206, Tex. Conch., Vol. 9, p. 81, 1973.
Records H.M.N.S.: 3 lots (no live material).
Depth Range: 17-25 fms., in sandy mud and on outcrops of Miocene shale (Stetson Bank).
Maximum Size: 23.1 mm.
Geographical Range: North Carolina, Florida, Bermuda, West Indies, Brazil (Abbott, 1974).
Eastern Pacific Analogue: None

Genus Tagelus, Gray, 1847.
Tagelus replaces Solecurtus in estuarine environment. Its umbo is more centrally located than in Solecurtus. Two subgenera in Texas.

86. Tagelus (Tagelus) plebeius (Lightfoot, 1786).
Solen plebeius Lightfoot, 1786. Portland Mus. Cat., pp. 42, 101, 156. Synonyms are: T. caribaeus Sowerby, 1874 and T. gibbus Spengler, 1794.
A widespread and common species living along bay margins in the matted roots of vegetation. More numerous in Louisiana and East Texas bays than in South Texas bays. We have never dredged material in offshore waters.
Previous records for the Texas faunal province are: 1, Solecurtus caribaeus Blainv., Galveston; 7, listed; 15, Port Isabel, Port Lavaca, Galveston and Corpus Christi; 18, Corpus Christi; common; 19, Carancahua Bay, Keller's Bay, Lavaca Bay, Matagorda Bay, Espiritu Santo Bay, and Corpus Christi Bay. (Good eating when stewed); listed; 45, repeats earlier references; 56, listed; 58, dead at Aransas Pass; 61, "Nueces River Basin and Islands"; 62, Indian Point and McGloin's Bluff (Corpus Christi); 66, Pleistocene of Texas; 67, Port Isabel; 69, listed; 93, dead shells in Aransas wildlife refuge; 98, bays, Cedar Bayou; 110, dead shells on all Gulf beaches (lives in all bays of higher salinity) Plate 12, fig. 9; 126, listed; 135, dead in Gulf, alive in bays; 136, listed; 145, upper sound Mississippi delta; 160, Matagorda Bay; 164, alive at Rockport; dead in Laguna Madre; 174, common along bay margins; 178, upper extremity of northern Laguna Madre; 193, alive at Port Isabel; 194, food item of Black Drum, (fish); 206, Beach records, Tex. Conch., Vol. 1, 1965; 225, Galveston; 236, Galveston; 267, Pleistocene of Chambers County; 269, figured on page 201, mistakenly assigned to Mesopleura.
Records H.M.N.S.: 26 lots of which 7 contain live collected material.
Depth Range: 0-2 fms. (same for live material).
Maximum Size: 85 mm.
Geographical Range: From Cape Cod to Florida and Brazil (Abbott, 1974).

Eastern Pacific Analogue: Tagelus (Tagelus) affinis C.B. Adams, 1857; Gulf of California to Panama on mudflats to 73 m. (Keen, 1971). This species is cited as analogue by Keen, but its depth range appears to be incompatible with that of T. plebeius. Others also appear close.

87. Tagelus (Mesopleura) divisus (Spengler, 1794).
Solen divisus Spengler, 1794. Skriv. Nat. Selsk., Copenhagen 3(2), p. 96.
Slightly less numerous than the previous species and not so much preferring bay margins. Often alive in mud environment in the coastal bays along the entire Texas and Louisiana coasts. This is a smaller, more colorful species, showing when fresh, a purplish vertical streak under the umbo. As the name implies, there is a weak internal ridge halfway the shell. Dead material is sometimes dredged offshore, but is possibly Pleistocene in age. A synonym is Solecurtus centralis, Say 1822.
Previous records for the Texas faunal province are: 21, listed; 45, listed; 56, listed; 66, Pleistocene; 110, rare in Galveston Bay, common in Aransas Bay and Laguna Madre at Port Isabel. Pl. 12, figs. 12-13; 135, alive in bays; 136, listed; 139, "open bays"; 145, upper sound and inlets of Mississippi delta; 146, "open lagoons"; 160, alive in Matagorda Bay; 164, alive at bay margins at Rockport; dead in Laguna Madre; 170, shallow shelf assemblage (must be considered in error); 174, listed; 175, open sound or lagoon margin assemblage; 206, Beach records in Tex. Conch., Vol. 1, (7), 1965; 208, listed for several types of assemblages; 225, Galveston; 236, Galveston; 269, figured on page 200.
Records H.M.N.S.: 25 lots of which 7 contain live collected material.
Depth Range: 0-12 fms. (alive 0-1 fms.).
Maximum Size: 30 mm.
Geographical Range: From Cape Cod to Florida and Brazil (Abbott, 1974).
Eastern Pacific Analogue: ?

FAMILY PSAMMOBIIDAE

In the N.W. Gulf of Mexico, represented by the subfamilies Psammobiinae with genera Gobraeus and Asaphis, and Sanguinolariinae with genus Sanguinolaria.
Sources: M. Keen (in) Treatise of Invert. Paleont., Part N, Vol. 2, p. 629-634.
R. A. McLean, 1951, Scientific Survey of Porto Rico and the Virgin Islands, Vol. 17, part 1, p. 101-103.

Genus Gobraeus Brown, 1844.
A single, delicately colored species, lives on the offshore coral reefs off Galveston and the Louisiana coast.

88. Gobraeus circe (Mörch, 1876).
Psammobia circe Mörch, 1876. Jour. de Conchyl., 24, p. 373.
A few live specimens were collected by divers on offshore coral reefs, and algal reefs, the only environment in which this species has been found. Fragments are fairly common in coral rubble. This is a rather flat, and when fresh, delicately pink colored species. McLean gives white as its color.

Previous records for the Texas faunal province are: 193, Tex. Conch., Vol. 9, (4), p. 81, 1973.
Records H.M.N.S.: 5 lots of which one contains live collected material.
Depth Range: 10-28 fms. (alive at 15 fms.).
Maximum Size: over 50 mm. (specimen broken).
Geographical Range: Porto Rico (McLean).
Eastern Pacific Analogue: There are several Panamanic species, none of which seems close.

Genus Asaphis Modeer, 1793.
The only known western Atlantic species of this genus is quite rare in our area.

89. Asaphis deflorata (Linne, 1758).
Venus deflorata Linne, 1758, Syst. Nat., 10th ed., p. 687.
On this well known Caribbean species, only a single valve was once dredged offshore Galveston in 20 fms. (Trawler shell?).
Previous records for the Texas faunal province are: 174, listed.
Records H.M.N.S.: A single lot of one valve at 20 fms.
Geographical Range: Florida, Bermuda, to Brazil.
Maximum Size: 41 mm.
Eastern Pacific Analogue: Asaphis does not live in Panamanic Province.

Genus Sanguinolaria.
Only one, rare species.

90. Sanguinolaria sanguinolenta Gmelin, 1791.
Solen sanguinolenta Gmelin, 1791. Syst. Nat. 13th ed., p. 3277. Synonym: S. rosea Lamarck.
The only evidence for this species are a few dead valves from beachdrift collected at Port Aransas and a fresh pair from Matagorda Beach. We have never seen it in offshore dredged samples, but further collecting in south Texas waters may turn up more material. It has been, in the past, erroneously reported as S. cruenta Lightfoot, a species belonging in the subgenus Psammotella.
Previous records for the Texas faunal province are: 7, listed (as S. rosea Lamarck); 15, Galveston (as S. rosea Lamarck); 19, fresh shells at Pass Caballo (as S. rosea Lamarck); 45, Pass Cabello; 69, listed; 110, Padre Island (Pleistocene fossil?); 174, listed; 206, Beach Records in Tex. Conch, Vol. 1, (7), 1965 (as S. cruenta); 269, figured on page 199 as S. cruenta.
Records H.M.N.S.: 2 lots of beach shells (Port Aransas and Mustang Island).
Depth Range: Unknown.
Geographical Range: South Florida, Texas and West Indies, Brazil (Abbott, 1974).
Maximum Size: 48 mm.
Eastern Pacific Analogue: S. tellinoides A. Adams, 1850. "California to Ecuador". (Keen, 1971).

Remarks: The other species with which this species has been confused has been reported under various synonyms: S. cruenta Lightfoot, S. operculata Gmelin (Sanguinolaria (Psammatella) operculata Gmelin, Gulfcoast - Texas, ref. 45) and as Soletellina refescens Chemnitz in ref. 7.

FAMILY DONACIDAE

In the northwest Gulf of Mexico, represented by the genus Donax.
Sources: M. Keen (in) Treatise of Invert. Paleont., Part N, Vol. 2, p. 628-629,
J.P.E. Morrison, 1971. Proc. Biol. Soc., Washington, Vol. 83 (48), p. 545-568.

Genus Donax, Linne, 1758.
Restricted to the intertidal zone of the beaches, where the animals dig in pure sand. Recently Morrison has reviewed the species of Donax in the western Atlantic. According to his interpretation, three species of Donax live in the northwestern Gulf of Mexico. The common beach species in Texas is Donax roemeri roemeri which can reach a size in excess of 1" (rarely) and which is closely related to the common Florida species, formerly listed as D. variabilis Say, but corrected by Morrison to D. roemeri protractus Conrad. The other common Texas species is D. texasianus Philippi, formerly known as D. tumidus, a more obese, blunter and less colorful species than D. r. roemeri. Often these two species live in mixed populations along the Galveston beach, but on the whole D. texasianus extends to deeper water than does D. r. roemeri. In the eastern part of our area D. texasianus is replaced by D. dorotheae Morrison, 1971, which I here consider to be merely a form of D. texasianus. Occasionally forms which are almost impossible to identify occur along the beach. Most of these are immature forms of D. r. roemeri having a strong twist in the ventral outline.

All Texas Donax might be placed in the subgenus Chion, but according to Keen, Panamanic Donax, which are quite similar to the Gulf of Mexico species, are difficult to fit into schemes proposed for subgeneric ranking. As Keen remarks, Donax is of masculine gender. (ὁ δονάξ).

91. Donax roemeri roemeri Philippi, 1849.
Donax roemeri Philippi, 1849. Zeits. f. Malakoz., 5, p. 147.
This is the most common Donax of Texas beaches (not in Louisiana). Reported in the past under a variety of names, most of which are either in error or found to be inapplicable. The species lives in pure sand of the intertidal zone along the beaches and is almost never dredged offshore. Often with rayed patterns of color. The interrupted growth lines on the posterior side of mature specimens sometimes cause a slight "beading" resembling that of the next species. Forms resembling D. r. protractus have been collected (ref. 110).
Previous records for the Texas faunal province are: 1, as Donax variabilis Say, as Donax texasianus Philippi, as Donax roemeri, Philippi, Galveston; 7, as D. variabilis, Say, listed; 15, as D. variabilis Say, Galveston and Corpus Christi; 18, as D. roemeri, Galveston and Corpus Christi, not common; 19, very plentiful along Gulf on Matagorda Peninsula and Matagorda Island;

21, listed; 28, listed; 45, Texas to Vera Cruz, Mexico, Galveston (type locality), Corpus Christi and Matagorda Island; 56, listed (as D. variabilis, D. roemeri, D. texasiana); 58, Matagorda Peninsula, Padre Island; 61, listed; 62, Mustang Island, Corpus Pass; 65, Mustang and Padre Islands; 67, as D. variabilis, Port Isabel; 69, as D. variabilis, D. roemeri, D. texasianus Philippi; 98, Padre Island beaches; 110, as D. texasiana Say, 1822, the most common Donax of the Texas beaches. Pl. 12, figs. 10-11 (also: "shells resembling D. variabilis have been taken on Padre Island"); 126, listed for sandy beaches; 135, alive in Gulf, dead in bays; 136, alive in surf zone off East Texas (as D. variabilis); 139, listed for beach and surf zone near shore Gulf; 156, Rockport area; 160, as D. variabilis texasianus (Matagorda Bay); 174, listed, (both D. roemeri and D. variabilis); 175, Donax variabilis texasiana, surf zone of sandy beaches; 194, food item of black drum (fish); 206, Beach records in Tex. Conch., Vol. 3 (2), 1966 (as D. variabilis roemeri, Philippi) listed for surf zone and fore beach; 208, listed; 225, Galveston (as D. variabilis); 236, Galveston; 265, listed; 266, as D. variabilis, abundant on Padre Island; 269, (Donax variabilis texasiana) figured on page 189. It is impossible to separate records for both species consistently. Some of the above may pertain to the next species.

Records H.M.N.S.: 10 lots of which 5 contain live collected material.

Depth Range: 0-4 fm. (alive 0-1 fm.)

Geographical Range: Texas, Mexico.

Maximum Size: 26 mm.

Eastern Pacific Analogue: Closest appears to be Donax peruvianus Deshayes, 1855. "Manta Ecuador to Chile" (Keen, 1971).

92. Donax texasianus Philippi, 1847.

Donax texasianus Philippi, Feits. f. Malakoz., 4, p. 77. Previously reported as D. tumidus Philippi, but Morrison has decided that this is Donax texasianus, Philippi. It also inhabits the intertidal zone where it is often found living mixed with D. r. roemeri. Apparently it extends to deeper water on the shelf, as our records indicate. Almost never with rayed color patterns, but when colored only with evenly diffused and subdued hues of blue and yellow. The beading of the posterior slope area is quite variable in intensity. Commonly found on all Texas beaches, and in Louisiana, the most common species of Donax. Donax tumidus Philippi (Zeits. f. Malakoz. 5, p. 147) is a synonym.

This is virtually the only species which is dredged (always dead) in offshore waters (to a depth of 28 fms.). These however, may be Pleistocene specimens. It also apparently can invade the bays and tolerates slightly brackish waters (Matagorda Bay and east Matagorda Bay).

Here we consider Donax dorotheae Morrison, 1971. Proc. Biol. Soc., Washington, Vol. 83 (48), p. 5546 as identical with D. texasiana.

This recently described "species" lives mainly along the Louisiana coast, but has been found as far west as Matagorda Bay. In the Houston Museum is a lot from Isles Dernieres (La.),

designated as paratypes by Morrison. It differs on the whole so slightly from D. texasianus in ornamentation of the posterior slope that we cannot rank it as a full species. In large collections of D. texasianus the intensity of the beading and serrations on the posterior slope is quite variable. Especially in mature specimens, these serrations often disappear and it virtually becomes impossible to distinguish both "species". There is another circumstance that must be mentioned here. The type locality of D. dorotheae is in Florida. From here the species ranges all the way to east Texas. Along many parts of this coast huge amounts of brackish water reach the Gulf and a brackish water fauna is sometimes found far offshore (Ship Shoal, La.). D. dorotheae could under these circumstances, be interpreted as an ecovariant of the previous species. Its occurrence in Matagorda Bay points also in that direction. Further investigation of this matter is required.

Previous references for the Texas faunal province are (including those for Donax dorotheae: 1, Latin diagnosis by Philippi, Galveston Island; 7, as Donax obesa Orbigny, listed; 15, Donax tumida, "very abundant at Galveston and Corpus Christi"; 16, from well at Galveston at 305-315' and 440-458'; 18, Galveston and Corpus Christi, abundant; 21, listed; 45, Galveston (type locality), Corpus Christi, Texas; 56, listed; 58, Matagorda Peninsula, Padre Island; 61, listed; 62, Mustang Island, Corpus Pass; 66, Pleistocene of Texas; 110, "This is the Donax found in Louisiana and occasionally from Sabine to Galveston"; 139, beach and surf zone; 145, "Upper sound, shallow shelf" (Mississippi Delta); 146, beach shore; 149, Mustang Island; 164, Laguna Madre; 170, listed for deep shelf assemblage off East Texas, none; (doubtful!); 174, listed; 175, sand beaches, somewhat deeper than D. variabilis (=D. r. roemeri) along whole coast; 206, beach records in Tex. Conch.,Vol. 3, (2), 1966 (as D. tumidus); 265, Jefferson County, Texas, 269, figured on page 189 (as D. tumidus) gives too small a size.

Records in H.M.N.S.: 43 lots of which 5 with live collected material. 9 of these are "D. dorothaea (2 with live collected material) collected at Isles Dernieres, Ship Shoal, Mudlump Mississippi delta all La., and, Sabine Beach and Matagorda Bay, Tex.

Depth Range: 0-28 fms. (alive 0-1 fms.)

Geographical Range: Northern Texas to Vera Cruz, Mexico (Abbott, 1974).

Maximum Size: 18.5 mm.; 14 mm. for "D. dorotheae".

Eastern Pacific Analogue: D. obesus Orbigny, 1845, "Corinto, Nicaragua to Paitu, Peru", (Keen, 1971).

Remarks: A number of 8 lots of somewhat different looking specimens has not been identified with certainty. Probably they are somewhat aberrant forms of D. r. roemeri, the same that in (110) are compared to D. r. protractus (=cited as D. variabilis).

Not in the H.M.N.S. collection are specimens of Iphigenia brasiliana Lamarck, 1810. Valves of this species have been rarely taken on Padre Island

beaches but so far, no material has been dredged offshore (see Tex. Conch., Vol. 6, p. 82, 1970). References to this species are in 7 and 45 while 110 expresses doubt. References 7, 15 (well at Galveston), 45, 56, 67, 145 (with question mark to Donax denticulatus Linné, 1758 are probably all misidentifications of D. r. roemeri. Similarly references 7, 45 to D. fossor, Say 1827 must be in error. The status of D. galvestonensis Harris 1895 (Bull. Am. Pal., Vol. 1, (3), p. 92) obtained from an artesian well at Galveston (2552-2920 ft.) must be further investigated.

SUPERFAMILY DREISSENACEA

FAMILY DREISSENIDAE

In the northwest Gulf of Mexico, represented by the single genus Mytilopsis.

Sources: M. Keen in Treat. of Invert. Paleont., Vol. N, pt. 2, p. 643-644.

Genus Mytilopsis Conrad, 1858.
Mytiliform shells, with anterior beaks, possessing a septum and a strong periostracum.

93. Mytilopsis leucopheata Conrad, 1831.

Mytilus leucopheatus Conrad, 1831; Jour. Acad. Nat. Sci., Philadelphia. Vol. 6, p. 263, pl. 11, fig. 13.

Of wide occurrence everywhere in fresh to brackish water along the entire coastline from the Mississippi Delta to the Rio Grande. It has been found living in several of the coastal bayous and streams (Chocolate Bayou to Galveston Bay, Aransas River, St. Bernard River, etc.). Fairly common in beach drift.

Juvenile specimens are usually much flatter than mature ones because only later in life, the valves develop a high shoulder. This species together with a number of hydrobiids enters the rivers so far that hardly any appreciable salt content in the water is present. It does not live in sea water and the six lots obtained offshore in 20-30 fms. are without doubt Pleistocene. The taxonomy of this species needs to be cleared up. Reported for Texas is also M. sallei Recluz, which may be synonymous.

Previous references for the Texas faunal provice are: 66, marine Pleistocene of Texas; 156, Stetson Bank (definitely not living in the area at present); 174, as Congeria sallei, Recluz, listed; 193, as Congeria sallei Recluz; Aroyo Colorado (1956); 206, Beach records in Tex. Conch., Vol. 5, p. 35, 1968 (as Congeria leucopheata); 225, Galveston; 228, lower Sabine River (as Mytilopsis sp.); 236, Galveston; 269, figured on page 204.

Records H.M.N.S.: 24 lots of which two contain live collected material.

Depth Range: 0-30 fms; alive 0-1 fms; Galveston Bay, Matagorda Bay, Vermillion Bay, La.)
Geographical Range: New York, Florida to Texas, Brazil (Abbott, 1974).
Maximum Size: 26 mm.
Eastern Pacific Analogue: Mytilopsis zeteki Hertlein and Hanna 1949. Canal zone, Panama (may be the same).

SUPERFAMILY ARCTICACEA

FAMILY TRAPEZIIDAE

In the northwest Gulf of Mexico represented by the single genus Coralliophaga.

Sources: M. Keen in Treat. of Invert. Paleont., Vol. N, part 2, p. 655-657.

Genus Coralliophaga de Blainville, 1824.
Elongate shells, resembling somewhat the Mytilid genus Lithophage, but with cardinals in hinge; sculpture with radiating striae.

94. Coralliophaga coralliophaga Gmelin, 1792.
Chama coralliophage Gmelin, 1792; Syst. Nat., p. 3305.
In spite of several references to this species, not more than four small lots of this species have been obtained and no certainty exists that the species still lives in our area. Early references are given as C. carditoidea Blainville.
Previous references for the Texas faunal provice are: 7, listed as C. carditoidea Blainville; 19, listed; 45, listed; 56, listed; 110, "A few young, dead shells were taken at Port Aransas"; 136, 4 stations off East Texas (depth 33'-54'), listed "alive"; 170, listed for shelf assemblage off East Texas.
Records H.M.N.S.: 4 lots (no live material) in 15-228 fms. in sandy mud (all off Louisiana).
Depth Range: 15-228 fms.
Geographical Range: North Carolina, Texas, West Indies, Bermuda, Brazil (Abbott, 1974).
Maximum Size: 19.3 mm.
Eastern Pacific Analogue: not in the Eastern Pacific.

FAMILY BERNARDINIDAE

Very small concentrically grooved bivalves with cardinals and laterals in a heavily developed hinge line. Pallial line entire.

Sources: M. Keen in Treat. Invert. Paleont., Vol. N, pt. 2, p. 650 (1969).

Genus Bernardina Dall, 1910.
This genus is characterized by a prodissoconch set off from the mature shell by a ridge or a groove. The discovery of this genus in the Texas-Louisiana offshore waters furnishes one of the clearest proofs that the western Gulf of Mexico still harbors some Pacific (relict?) elements.

95. Bernardina spec. indet. A.

This not uncommon small species can be immediately recognized by its enormous prodissoconch which in most specimens is of a light brown color, whereas the shell itself is white. The prodissoconch in this species is set off by a deep groove, thus giving the impression that it is laying on top of the shell. For such a small species, the hinge is enormous and heavy. The hinge structure appears to be somewhat more simple than is stated by Keen (1969, 1971). At least for mature valves, the cardinals and lateral teeth are better separated, because during growth, one of the lateral teeth grows inordinately at the expense of the others and obliterates all evidence of them. In juvenile shells there are three cardinals, but one of them is but a hair thin ridge.

There can be hardly any doubt that this species belongs in the Bernardinidae as defined in the Treatise, because all characters other than the hinge agree well with the familial diagnosis. Often the prodissoconch area, which apparently remains thinner than other parts of the shell, is broken in dredged material. The small bivalves with a hole in the umbonal area of the hinge are quite characteristic. The hole forms because the strong development of the hinge plate prevents the entire umbo from breaking away.

Previous records for the Texas faunal province are: 206, (as Fabella sp. A), Tex. Conch., Vol. 9, p. 79, 1973.

Records H.M.N.S.: 17 lots, two of which contain live collected material.

Depth Range: 9-32 fms.; alive 10-15 fms., coral reef. Also dredged on miocene shale outcrops and on sandy mud bottoms.

Geographical Range: Only known from the Texas faunal province.

Maximum Size: 4.2 mm.

Eastern Pacific Analogue: The only Panamanic species does not appear to be closely related.

Genus Halodakra Olsson, 1961.

Small, rather triangular bivalves, with complicated hinge. (see Keen, 1971). The only N.W. Gulf of Mexico species is minute.

96. Halodakra sp. indet. A.

This probably is a minute species, although the only valve in the H.M.N.S. collection may represent an immature specimen. It differs considerably from the Panamanic species Halodakra subtrigona Carpenter, 1857. Firstly in size, and secondly by the presence of a number of concentric ridges on the shell. Its color is white, and the hinge is well developed and rather heavy for so small a species.

Previous records for the Texas faunal province are: 206, Tex. Conch., Vol. 9, p. 79 (erroneously listed as Fabella sp. C).

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

Depth Range: 10-13 fms. (Coral reef).

Geographical Range: Unknown.

Maximum Size: Small, not measured.

Eastern Pacific Analogue: Halodakra subtrigona (Carpenter, 1857) is a much larger shell and probably not closely related.

SUPERFAMILY GLOSSACEA

FAMILY GLOSSIDAE

In the northwest Gulf of Mexico represented by the single genus Meiocardia.

Sources: M. Keen (in) Treatise of Invert. Paleont., Part N, Vol. 2, p. 657-658.

Genus Meiocardia, H. Adams and A. Adams, 1857.
The rolled under beaks of our only species are quite characteristic.

97. Meiocardia agassizi, Dall, 1886.
Bull. Mus. Comp. Zool., 12 (6), p. 271; ibid 1889, 18, pl. 40, fig. 7.
So far taken only at a few locations off East Texas and the Louisiana coasts. Juvenile specimens appear surprisingly different from mature ones. Rather thin shelled, with concentric growth lines and a posterior groove.
Previous references for the Texas faunal province are: 170, deep shelf assemblage off East Texas.
Records H.M.N.S.: 4 lots, none alive.
Depth Range: 17-55 fms. in sandy mud.
Geographical Range: Off West Florida, Caribbean, Bermuda (Abbott, 1974).
Maximum Size: 21 mm.
Eastern Pacific Analogue: Glossidae are not known from the Panamanic province.

FAMILY VESICOMYIDAE

In general, deep water forms, rare throughout their range and unfortunately poorly known. In the N.W. Gulf of Mexico a number of species lives, of which one, because of poor preservation can be hardly identified; there are a number of species which may belong to Vesicomya, Veneriglossa and Callogonia.

Sources: M. Keen (in) Treatise of Invert. Paleont., Part N, Vol. 2, p. 664. K.J. Boss, 1968, Bull. Marine Science, Vol. 18, p. 731-48.

Genera Vesicomya Dall, 1886, Veneriglossa Dall, 1886, and Callogonia Dall, 1889.
We are not quite sure about the defining characters of these genera. In the N.W. Gulf of Mexico there are at least two, and perhaps three species of small size in the genus Vesicomya, one of which is quite abundant, but surprisingly, not yet recorded.

98. Vesicomya pilula, Dall, 1881.
Diplodonta pilula Dall, 1881. Bull. Mus. Comp. Zool., 9, p. 136. Callocardia (Vesicomya) pilula Dall. Blake Rep., pt. 1, p. 274; pl. 8, fig. 13.
This very small bivalve with a typical Vesicomya hinge is the only species in this family in the N.W. Gulf of Mexico which is abundant. Not larger than 2 mm., complete specimens and loose valves are often found abundantly in dredge samples all along the Louisiana and Texas coast. A number of valves has also been collected from the mudlump clay in the

Mississippi Delta and a single valve comes from the offshore coral reefs.

Previous records for the Texas faunal province are: 206, Tex. Conch., Vol. 9, p. 80, 1973.

Records H.M.N.S.: 63 lots (many of over one hundred specimens) but so far not seen alive. Among the material of Vesicomya pilula are three lots which may be different. The shells are larger (2.8 mm.), much rounder, somewhat flatter, but are clearly closely related to V. pilula. Probably this is an as yet undescribed sepcies.

Depth Range: 7½-167 fms., but optimally below 25 fms. Mostly in sandy or shelly mud.

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

Maximum Size: 2.2 mm.

Eastern Pacific Analogue: None

99. Vesicomya sp. indet.

Five lots of small valves may belong to several different species. At this time it is not possible to identify these shells.

100. Veneriglossa c.f. vesica, Dall, 1886.

Cytherea (Veneriglossa) vesica, Dall, 1886. Bull. Mus. Comp. Zool., 12, p. 275. Proc. U.S.N.M., Vol. 12, p. 270, pl. 14, figs. 8, 12, 1889.

Three lots of well preserved valves of a much larger species of a Vesicomyid have been obtained in 50-55 fms. off Louisiana. Our identification is tentative but there can be little doubt they are Vesicomyid in affinity.

Previous references for the Texas faunal province are: 70, pl. 7, fig. 1.

Records H.M.N.S.: 3 lots (no live ones).

Depth Range: 50-55 fms. off Louisiana.

Geographical Range:

Maximum Size: 34 mm.

Eastern Pacific Analogue: Not determined.

101. Callogonia ? sp. ident.

A quite differently shaped species has been obtained in one lot from 167 fms. The material is poorly preserved and needs further study.

Previous references for the Texas faunal province are: None.

Records H.M.N.S.: 1 lot (no live material) of 3 defective valves.

Maximum Size: 11 mm. for an incomplete valve.

Eastern Pacific Analogue: Undetermined.

SUPERFAMILY CORBICULACEA

FAMILY CORBICULIDAE

In the northwest Gulf of Mexico represented by the genera Polymesoda, Pseudocyrena and Corbicula.

Sources: M. Keen and R. Casey (in) Treat. Invert. Paleont., Part N, Vol. 2, p. 685-669.

Genus Corbicula Mühlfeld, 1811.
The single species known from our area is listed here only because a few times specimens of this purely fresh water species have been taken on the beaches. It is a fairly recent invader of the Texas freshwater fauna, and is known from a number of locations in the state (f.i. Huntsville State Park).

102. Corbicula c.f. manilensis, Philippi, 1844.
Sources: M. Keen and R. Casey (in) Treat. Invert. Paleont., Part N, Vol. 2, p. 685-669.
Under this tentative identification, a single complete, but immature, specimen is reported found in beachdrift along Galveston West Beach. Apparently this species is a fairly recent import from the Orient but the identity of Texas specimens is not certain. Beach specimens undoubtedly derive from rivers, in which the species became established through human activity (aquarists?). At this time the species cannot yet be considered a permanent part of the Texas fauna.
Previous references for the Texas faunal province are: None.
Records H.M.N.S.: A single lot consisting of a complete but immature specimen from Galveston West Beach.
Eastern Pacific Analogue: None.

Genus Polymesoda Rafinesque, 1828.
A single rather rounded species rarely found alive.

103. Polymesoda caroliniana, Bosc, 1801.
Cyclas caroliniana, Bosc, 1801, Hist. Nat. des Coquill., 3, p. 37, pl. 18, fig. 4.
This is a rather rare species, although dead and eroded valves are regularly found in beach drift along Louisiana and Texas shores. (Isles Dernieres, Galveston, Sargent, Matagorda Beach and South Padre Island (rare)). Recent records of live material in the upper portions of eastern Texas and Louisiana coastal bays are scarce, but early listings mentioned this species as "very common". More complete collecting will probably discover more live populations, especially in the Matagorda Bay system and some Louisiana bays.
Previous references for the Texas faunal province are: 1, as Cyrena carolinensis, Say; very common in brackish water at New Washington on Galveston Bay; 7, listed as Cyrena carolinensis, Bosc; 19, reported as Cyrena carolinensis Lam. from Lavaca and Carancahua Bays (quite plentiful); 21, listed as Cyrena carolinensis, Lam.; 32, listed; 45, repeats reference 18; 56, listed; 58, as Cyrena carolinensis Lamarck from Matagorda Bay; 110, living in Lavaca Bay; dead in Galveston Bay; 126, listed for Carolinian Province; 135, dead in Gulf; 174, listed for river influenced low salinity assemblage; missing from Mobile east and Matagorda Bay, west and south; 206, Beach Records in Tex. Conch., Vol. 2, (7), 1966; 225, Galveston; 236, Galveston; 248, listed (Polymesoda sp.) for lower Sabine River; 269, figured on page 205.
Records H.M.N.S.: 8 lots of which 1 contains live collected material (Chocolate Bayou, Galveston Bay). Lives in muddy bottoms.
Depth Range: 0-1 fms.

Geographical Range: Virginia to northern half of Florida, Texas (Abbott, 1974).
Maximum Size: 59 mm.
Eastern Pacific Analogue: Undetermined.

Genus Pseudocyrena Bourguignat, 1854.
In Texas only a single species, much smaller than the previous one, preferring the environment of the hypersaline south Texas bays.

103. Pseudocyrena maritima Orbigny, 1842.
Cyrena floridana Conrad, 1816. Proc. Acad. Nat. Sci., Phila., 3, p. 23.
Widespread and living in the hypersaline portions of the south Texas coastal bays. A few beachdrift specimens are known from Galveston. Many but not all, specimens of bay populations are purplish in color. In general, the shape is quite variable and also the hinge line is variable in strength. Usually the right valve has the weaker hinge line.
Previous references for the Texas faunal province are: 15, (as Cyrena floridana, Conrad) Shamrock Cove, Corpus Christi Bay and Laguna Madre; 19, (as Cyrena floridana, Conrad) Matagorda Peninsula; 21, listed as Cyrena floridana, Conrad; 44, Corpus Christi, Laguna Madre; 98, listed for the bays; 110, dead shell rare at Galveston Island, common at Port Aransas, Pl. 9, fig. 4; 151, listed; 160, listed for Matagorda Bay; 164, alive in Rockport area; 174, listed; 175, listed for hypersaline lagoon; 193, alive at Port Isabel; 206, beach records in Tex. Conch., Vol. 2, (7), 1966; 269, figured on page 205.
Records H.M.N.S.: 19 lots of which one contains live collected material.
Depth Range: 0-1 fms. in muddy sand bottoms. 2 lots obtained from offshore in 7½ and 26 fms. (probably Pleistocene shells). There is no material in the H.M.N.S. collection collected east of Galveston.
Geographical Range: Key West to Northern Florida and Texas (Abbott, 1974).
Maximum Size: 21 mm.
Eastern Pacific Analogue: Apparently none.

SUPERFAMILY VENERACEA

FAMILY VENERIDAE

The Veneridae form a large diversified group of bivalves and according to Keen, they are "the most advanced of the bivalves". They vary in size from minute (Gemma) to large and massive (Mercenaria). They often have beautiful color patterns (Macrocallista)and, complex surface sculpture (Chione). Most live in sandy environments, some in muddy bottoms (Pitar) and but few of them descend into deep water. In all probability, the family is polyphyletic in origin. In the N.W. Gulf of Mexico, the family is represented by a number of subfamilies: Venerinae with genera Periglypta, Circomphalus and Ventricolaria; Circinae with genus Gouldia; Meretricinae with genus Transsenella; Pitarinae with genera Pitar, Macrocallista, Costacallista and Nanopitar; Dosiniinae with genus Dosinia; Cyclininae with genus Cyclinella;

Chioninae with genera Chione, Timoclea, Anomalocardia and Mercenaria; Gemminae with genera Gemma and Parastarte.
Sources: M. Keen in Treat. Invert. Pal., Vol. N, pt. 2, p. 670-688. Clench: Johnsonia, Vol. 1.

Genus Ventricolaria Keen, 1954.
Large, inflated, concentric sculpture.

104. Ventricolaria rigida Dillwyn, 1817.
Venus rigida Dillwyn, 1817. Cat. Shells, 1, p. 164.
This, the largest and rarest of the N.W. Gulf of Mexico Ventricolarias lives on the offshore coral reefs, the Miocene shale outcrops and in sandy bottoms off Louisiana and Texas. As Keen says, full grown specimens resemble dented tennis balls. The concentric ribbing is irregular and much coarser than that on V. rugatina or C. strigillinus. Even small juveniles of the species can be easily told apart. Those of Ventricolaria rigida have strongly lamellar initial ridges between which there are about 7 to 10 smaller ridges which are finely and minutely crenulated. The juvenile of V. rugatina miss the large lamellar ridges and the intermediate ridges are subdued and even more finely crenulated. Juveniles of C. strigillinus have the smaller concentric ridges, almost without crenulations. In all three species, the secondary concentrics only develop after the shell has reached a size of about 1 mm. Before that, the interspaces are smooth. Not on the beaches.
Previous references for the Texas faunal province are: None.
192, Plate 6, figs. 3 A-B (Yucatan).
Records H.M.N.S.: 6 lots of which one contains live collected material.
Depth Range: 14-51 fms.; alive: 14 fms. in miocene shale.
Geographical Range: Florida Keys (rare); West Indies to Brazil (Abbott, 1974).
Maximum Size: 71 mm.
Eastern Pacific Analogue: Ventricolaria isocardia (Verrill, 1870); "the Gulf of California to Gorgona Island, Colombia in depths to 110 m." (Keen, 1971).

105. Ventricolaria rugatina Heilprin, 1887.
Venus rugatina Heilprin. Tr. Wagn. Free Inst. Sci., Vol. 1, p. 92, pl. 11, fig. 24.
This is the smallest of the Texas-Louisiana Ventricolarias, and in my opinion, also the prettiest. Many specimens show an extremely delicate fine zig-zag pattern of reddish brown markings. It is locally common on the coral banks (Flower Gardens) and the shale banks (Stetson Bank and Clay Pile), where many live specimens have been taken. As is often the case, those from calcareous environment are lighter colored than specimens from the shale uplifts. It does not live as deep as the other two species and the single juvenile valve from 51 fms. probably did not live there.
Previous records for the Texas faunal province are: 206, Tex. Conch., Vol. 9 (4), p. 80, 19.
Records H.M.N.S.: 14 lots of which 6 contain live collected material.

Depth Range: 10-51 fms.; alive: 10-25 fms.
Geographical Range: North Carolina to Southeast Florida and the West Indies (Abbott 1974).
Maximum Size: 30.5 mm.
Eastern Pacific Analogue: None.

106. Circomphalus strigillinus (Dall 1902).
Cytherea (Ventricola) strigillina Dall; Proc. U.S.N.M., Vol. 26, No. B 12, p. 372, 381; pl. 12 fig. 5.
This widespread and common species has been dredged all along the Texas-Louisiana coast, but we have not yet seen live material. It prefers sandy to muddy environment and does not seek out the coral reefs, although a few specimens are known from drowned and now dead coral accumulations. Its concentric sculpture is much more regular than that of V. rigida. In general, there are from 2 to 8 small concentric ridges between two more prominent ones. The umbo is more prominent than in V. rigida or V. rugatina and its juveniles are much more rounded in the shape than those of V. rugatina. Not on the beaches. Also in the mudlump fauna and on the shale banks (Stetson, Clay Pile).
Previous references for the Texas faunal province are: 145, listed in Table 1; 147, dead on Baker Bank, Big Southern Bank and West Flower Garden; 156, common on Stetson Bank; 170, listed for deep shelf assemblage.
Records H.M.N.S.: 34 lots, no live material.
Depth Range: 13½-76 fms. in sandy, shelly and muddy bottoms.
Geographical Range: Off South Carolina to Brazil (Abbott, 1974).
Maximum Size: 55 mm.
Eastern Pacific Analogue: Possibly: Ventricolaria magdalenae Dall, 1902 "outer coast of Baja California at Magdalena Bay, and into the southern end of the Gulf of California in depths of 65-80 m." (Keen, 1971).

Genus Periglypta Jukes-Browne, 1914.
The differences with Ventricolaria are the presence of a large pallial sinus (small in Ventricolaria) and cancellate instead of lamellar sculpture (Keen).

107. Periglypta listeri (Gray, 1838).
Dosinia listeri Gray, 1838. The Analyst, 8 (24), p. 308.
The specimen reported by me previously (Tex. Conch., Vol. 9, (4), p. 80). turns out to be a juvenile Ventricolaria rugatina Heilprin. However, Mrs. Tate has in her collection a single large valve of this species taken off Freeport (Tex.) and a single valve of this species was obtained from a dredge sample obtained on Hospital Rock off Port Aransas.
Previous records for the Texas faunal province are: no confirmed reports available.
Records H.M.N.S.: 1 single valve from Hospital Rock off Port Aransas.
Depth Range: ± 35 fms.
Geograpical Range: Florida, and southern Caribbean. Reported in Ref. 192 from Yucatan.
Maximum Size: 63.5 mm.
Eastern Pacific Analogue: Periglypta multicostata Sowerby, 1835, "Gulf of California to Peru", (Abbott, 1974).

SHELL BOOKS OF THE RECENT PAST

WORLD-WIDE SEA SHELLS by Maxwell Smith. Tropical Photographic Laboratory. Lantina, Florida. 1940. 139 pages.

This was another popular book by this prolific writer. The publication also included two articles by Joshua L. Baily on "Origin of Scientific Names" and "Pronunciation of Scientific Names". The book contained geographical ranges, illustrations and other data covering more than sixteen hundred species and subspecies of mollusca.

Maxwell Smith (1888-1961) was the 8th president of the American Malacological Union and an enthusiastic amateur conchologist. He was also a skillful photographer and owned an excellent stamp collection. The library and the shell collection were donated to the University of Alabama.

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SHELL BOOKS OF THE RECENT PAST

EAST COAST MARINE SHELLS by Maxwell Smith. Edward Brothers, Inc. Ann Arbor, Mich. 1937. 308 pages.

Along with the publications of Walter Webb, the books by Maxwell Smith provided valuable information (and psychological support) for the shell-collectors during the 1930s, 1940s and the 1950s. This book gave "descriptions of shore mollusks together with many living below tide mark, from Maine to Texas inclusive, especially Florida". Chapters in the book discusses where to collect, how to collect, cabinets, labels, catalog, as well as packaging and transport of shells.

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SHELL BOOKS OF THE RECENT PAST

THE SHELL BOOK by Julia Ellen Rogers. Charles T. Branford Co., Publishers. Boston, Mass. Originally published in 1908. Reissued in 1951.

This was another popular book before and during the World War II days, being a "Guide to a knowledge of the families of living mollusks, and an aid to the identification of shells native and foreign". The new issue retained the text but the nomenclature was updated and revised. The list of "modern names" was prepared by Harald A. Rehder and was appended in the form of 15 extra pages. As an old standby, the book provides historic perspective (and considerable nostalgia) but it has outlived its scientific merits for most collectors.

SHELL BOOKS OF THE RECENT PAST

REEF AND SHORE FAUNA OF HAWAII. By Charles Howard Edmondson. 1933. Revised 1946.

This is a college text on the subject, written by Dr. Edmondson who was Professor of Zoology at the University of Hawaii from 1920-42 and Zoologist at the Bishop Museum from 1920-70. Discussions of the Phylum Mollusca comprise a substantial portion of the book and probably represent the first comprehensive description of the molluscan fauna of Hawaii. Mollusks constitute the largest group of marine invertebrates in Hawaii. The author at that time conservatively estimated the number of marine mollusks to be "not less than 1,500".

Only a few typical species in each genus are described. Even fewer are illustrated (black and white photographs). However, the pages provide a sound scientific perspective that becomes useful when newer (though not necessarily better) books are consulted. In contrast to many publications, the pelecypods are not neglected.

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LA CONCHIGLIA, the large size slick magazine from Italy also has been printing reproductions of shell stamps in color. The May-June, 1975 issue depicts (in color) 12 stamps from Aitutaki-Cook Islands. These are not shown in OF SEA AND SHORE. In the September-October, 1974 issue appeared the set of stamps from Cook Islands that is also pictured in the publication by Tom Rice.

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RECENT BOOKS ON SHELLS:

SEA SHELLS OF THE WEST INDIES by Michael Humfrey, 1975.
WHAT SHELL IS THAT? by N. Coleman, 1975.
THE WORLD OF SHELLS by Robert Scase and Eric Storey, 1975.

Texas CONCHOLOGIST

VOLUME XII, NO. 4 JUNE, 1976

NOTES & NEWS

MAJOR MUSEUM SHOW SET FOR SOCIETY, MAY, 1977

The Houston Conchology Society has voted to prepare a major exhibit of shells for the public at the Houston Museum of Natural Science the first two weeks of May, 1977.

Tentative plans available at this time indicate that this will be a planned event, with a center core of exhibits in the Herman Brown Auditorium. There will be other displays telling the story of shells, their use, their history, their importance. The Museum has offered four stand-up cases for displays, and there will be extra cases on tables used along the east and west walls of the Auditorium. The two bronze cases in Abercrombie Hall in the entrance area will be available for "Gem Shells".

We will prepare shell packs, educational packets, individual shells, etc., as usual, and these will be sold to the Museum store and be offered to the public during the show at a special Museum store annex in the Auditorium. This annex will be manned by members.

In order to initiate the overall plan, members voted to have slant-topped, glass covered, wooden cases made to fit the six-foot rental tables. These will be thirty by thirty-six inches each and will be fitted with locks. The cases will be offered to members for purchase for their own use after the show. Arrangements for this will be announced in the fall. Some details on price and equipment need to be worked out before we can offer them to members.

It is obvious that this kind of special event will need the utmost cooperation of every member in this society. We need to think of gathering beach shells this summer, cleaning them and sorting them for the shell trays. Merle Kleb has agreed to be chairman of the shell trays and individual shells to be sold. She will be assisted by Barbara Hudson and will ask for more help from members in packaging and sorting. Margie Wood has accepted the job of preparing the educational packets. Leola Glass and Ruby Ray are assistants in this project. More help will be needed. We need hundreds of each readily available Texas beach shell. Dead pairs, good singles, cleaned specimens with opercs will be welcomed.

The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas and is included in the membership dues.

The society holds meetings the fourth Wednesday of each month except June, July and December at 8:00 p.m. in the Houston Museum of Natural Science.

The TEXAS CONCHOLOGIST is mailed, postpaid, to regular members of the society, with the exception that only one copy is mailed to a family. Overseas members will be charged the additional postage required at the beginning of each fiscal year (June).

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

EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Ode
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double-spaced and should be submitted to the editorial staff.

Carol Courtade will serve as hospitality chairman for the opening event for Museum and Society members and guests.

Frank Petway assisted in securing Dick Caven to make the cases for the Society. Fritz Lang served on the committee to plan the display cases. Both will continue to assist in display materials.

Dr. T.E. Pulley, Director of the Houston Museum of Natural Science, will advise us on displays and the overall plan for the event. Carl Aiken, Assistant Director of the Museum will help with booking and arrangements for setting up the show.

We need your suggestions; we need your volunteer help and appreciate the offers we have had already to help. We need your selfless cooperation in aiding with displays. You will be asked, perhaps, to

do several jobs. We are not a large organization, so we need you to help in different ways --- to act as host, to clean shells, to display shells, to occasionally share a special shell you have to go into a larger theme arranged by several of you. We do not anticipate asking anyone else to handle your shells, unless you so volunteer this. We will carry special insurance, required by the Museum. This will be your show for the public. We shall want to make it satisfactory to everyone. May is a time for many hundreds of students to visit Houston and the Museum. It is a good time of year to invite the public of all ages to see the beauty of shells.

Please let me hear from you if you have any questions, suggestions, or offers to help.

Constance E. Boone, Chairman
668-8252

SHELL TRADING - FUN OR CATASTROPHE? by Frank Petway

This article is being written using my experiences hopefully to help those individuals who are interested in trading but never knew quite how to go about it.

Trading shells with other collectors can be very rewarding or it can be very disappointing as well as frustrating. If carried out in the right manner, it can be a lot of fun with the advantages far outweighing the disadvantages. Trading is one way of enlarging ones collection at a nominal cost. It also enables you to acquire shells from areas that you yourself would never be able to collect. Half of the enjoyment in trading is corresponding with people all over the world, and if nothing else it is a good way to obtain foreign stamps.

The two primary questions which enter most beginning traders' minds are: (1) Where do I obtain shells to trade? and (2) Where does one find information on who to trade with? To the first question, one can trade using duplicates which you already have in your collection. Collecting trips either locally or while on vacations are good for obtaining trading material. Dredging is also very productive (dredging yourself or from purchased dredging). Shells acquired from shrimp trawlers can be very rewarding but they are the hardest to acquire. Finding people with whom to trade is the easy part of trading. There are offers of exchange in H.S.N. and Of Sea and Shore Magazine which are widely distributed. I take these publications and know about them and I'm sure there are others in which to find traders. If you have trade material and want to go another route, you can place an ad in one of these publications and tell what you have to offer. If you chose this last method, I can safely say you will be swamped with mail although the majority you receive will not interest you.

After contact has been established with a prospective trader, several things are extremely important and the importance of these cannot be stressed enough. These tips are for your protection as well as the person you are trading with. First of all, for your shells, state the name of the shell (technical name and author) and the price you want for it. I have found that a selling price of 10-25% below the market value is satisfactory. You, as well as your trader should grade the shells according to specific standards. I have found that the grading system published in H.S.N. is becoming universally accepted. Although there are a few loopholes in the system, it's the best available at the present time. Upon establishing that you and your trader have a certain shell or shells you wish to trade, make it clear that you wish to acquire the shell at a certain value and you offer a specific shell with its value in return. In my correspondence I always state values in U.S. dollars. It's also advisable to ask your trader to specify how he wants the customs declaration filled out because some countries are very sticky on this matter. I myself always send any parcel airmail and insured. Surface mail is cheaper but setting up a trade usually involves 4-5 weeks and if surface mail is used you can add 2-5 months to that.

After a trade has been established the most important aspect of it is-and make this agreeable to both parties and very clear: That if either party is not completely satisfied with the shells traded, they have the right to return the shells.

As for buying shells from dealers, I have a few tips that might be helpful. First of all, know your dealer. When ordering be specific as to the quality and shell you desire and its price. If you receive a shell with which you are not satisfied, return it immediately with an explanation of why!

Language can also be somewhat of a hindrance. Therefore, be sure to state clearly and as simply as possible all your correspondence.

If by some chance the person you correspond with isn't interested in anything you have to offer, ask him to pass your name and address on to some of his fellow collectors as they might be interested.

When sending parcels I have found it much easier if each party pays for his own postage and insurance.

Although trading is a lot of fun and very interesting, it can, in your own mind, seem like a disaster. Therefore, I hope these helpful hints I have given here will make the process more enjoyable to those of you who are contemplating entering the world of shell trading.

CORPUS CHRISTI SHELL SHOW, 1976

The Coastal Bend Shell Club will present a biannual shell show October 1 through October 3 at Holiday Inn, Emerald Beach, 1102 S. Shoreline, Corpus Christi, Texas. Our club has been sent an invitation for our members to attend and exhibit. There will be no admission fee. If you are interested in entry forms, write the President, Theresa Stelzig, 109 Duke Lane, Portland, Texas, 78274.

SHELLS AND HISTORY

Two of our members found out this spring that shells and history go well together. Margie Wood was scheduled to talk to the elementary school at Magnolia, Texas, on shells in late May. The high school social studies teachers found out about the talk, went to the school principal and told him they thought shells and history went well together and asked for permission to have Margie talk to their classes in the afternoon, which Margie did. This is done for our Society by Margie.

Rosemary Habermacher went to her son's school to talk to the history class on Hawaiian shells in late May, part of the class study on that geographical area.

There were several explosions of mollusks on the Texas coast during the spring months, a bonus for many members and an exciting time for those of us who saw some species for the first time. Some reports probably prove to be firsts for the literature from Texas.

In March, Merle Kleb, Barbara Hudson, and I spent several days at Port Aransas. The Gulf beaches were filled with sea weed and tar, Physalia (Portuguese-Man-OF-War), and Velella (By-The-Wind-Sailor), all of which heightened our hopes for Janthinas. In fact, jokingly, I said that first morning on the beach that by noon I predicted we would find Janthinas. The tide would begin to roll in and I hoped that the waves would also bring in live Janthinas on their favorite hosts and food, Physalia and Velella. I even hoped we'd be lucky enough to get the rare brown Janthinid, Recluzia, a shell I have yet to collect in Texas. There were many live Minyas, a floating sea anemone, and this is food for Recluzia.

Well before noon we did find wee Janthinas washing in live with their bubble floats. How many times could one predict such an event and have it really happen?

These Janthinas proved to be, for the greater majority, the rather uncommon Janthina exigua. Note that Abbott's Second Edition of American Seashells now presents this species in a separate subgenus, Jodina. This dwarf purple sea snail has a prominent notch on the outer lip.

We did also recover Janthina janthina and Janthina globosa but no Recluzia.

Merle knew that I was looking also for Nudibranchs and was cued to show me anything that wiggled. At one point on the beach she called to me to say she had something live and blue in her collecting spoon. On observing the animal I gave a shout of glee and saw my first live Glaucus atlanticus Forster, 1777. Of the Family GLAUCIDAE, this Nudibranch is pelagic and is known to wash in with Janthinas, Valellas, and Physalia. They have no shell, are vivid blue as the animals they eat (Velellas and Physalia) and store nematocysts (stinging cells) taken from their food as stated. They float on the seas by producing a bubble of gas in their body.

These have certainly been known for Texas waters and are worldwide animals, but the huge bloom of them seen for two days on the island of Mustang may be a new report for Texas and the Gulf of Mexico. There were hundreds and hundreds washing in live, from one-half to one and one-half inches in size. Quite acrobatic, in sea water they turned somersaults and swam with their multi-fringed arm-like extentions which were on each side of the body.

Later I was told by Betty Allen that numbers of Glaucus were on South Padre Island beach about the same time, and Mildred Tate reports them from Freeport also. The bloom was quite extensive. I have slides for the record.

Of equal excitement for me was the recovery of hundreds of another pelagic Nudibranch, Fiona pinnata (Eschscholtz in Rathke, 1831) of the Family FIONIDAE. Known from both coastlines of the Americas, this Nudibranch comes in both a blue and tan or brown phase, and I was lucky to see both. I have slides of a Velella with both a blue and tan specimen on it although usually the animal would be blue on the Velella it feeds on. It was common tan and brown on old pieces of wood having small goose-neck barnacles. Old coconuts, plastic and anything having the goose-neck barnacles of the pelagic variety hosted the Nudibranch. These barnacles are food for these Nudibranchs.

One of my specimens laid the collar-like egg mass in an observation bowl at home, and I collected a Velella with several collars of the eggs, each collar suspended below the Velella by a mucuous strand the animal made. This is typical procedure for this Nudibranch.

This was the first time I had seen this animal, and I do not see it listed for Texas shores in literature available to me.

To my eye, although I know the animals are documented to be the same, the blue phase is a more delicate animal, since the cerata's transparent veil or sail portion had a far looser coil or blood vessel. The translucent dorsum was like crepe de chine and the inner parts had a pinkish cast, altogether a beautiful animal. The tan animals seemed coarser, somehow, and the cerata's veil had more loops in the coil or blood vessel. Faint sprinkling or frosting of white pigments seemed present.

These animals seemed able to cling very tightly to their hosts and were hard to remove without damaging them.

Two specimens of Doridella obscura Verrill, 1870, came from one of debris pieces. This tiny, umbrella-like Nudibranch can be found on material having the bryozoan Membranipora growing on it. They are sometimes on the seaweed at Galveston.

Carefully examining some of the plastic pieces of debris I brought home, I recovered two extremely small specimens which I compare to the known minute Nudibranch, Capellinia concicla Marcus, 1958. The specimens were live and I observed them for two days under the scope until I found them moribund the second day. Since I had never seen anything like this animal, I compare it on what I have to read. The circle of pigment on each bumpy cerata was near the apex and there was a transparent tip above the ring. The picture of Marcus' species seems to have a mantle dorsal border of color patches. The 2 mm. animal I had, had less color to observe, but the approximate 4 mm. specimen had reddish-brown pigment thickly patterned on the mantle border but not solid or in patches. There were scattered pigment spots on the rhinophores but not in zones. There was a flower-like pattern of reddish pigment on the dorsal center of the body between the cerata. The overall coloration of body was cream.

These two minute specimens were taken from a cervice of the plastic ring covered with barnacles and Hydroids. I had brought it home because I had seen many Fionas on it.

For the record, I present a drawing I made of the live 4 mm. specimen.

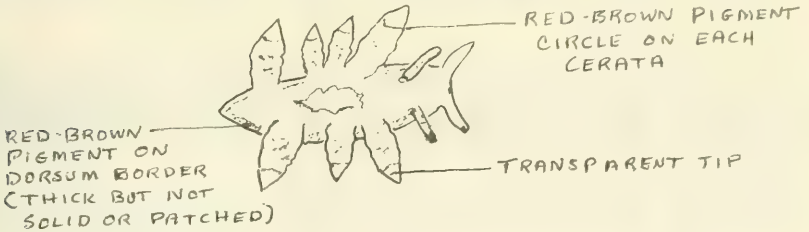


Figure 1. Compare the animal above to the described Nudibranch, Capellina conicla Marcus, 1958. The animal is drawn from an approximate 4 mm. specimen, one of two, collected by Constance Boone March 12, 1976, at Port Aransas, Texas, in a crevice of a plastic ring tossed up on the Gulf beach.

The second explosion of mollusks concerns a family of shells long a favorite of mine. Fannie and Sam Miron first reported some live Epitonium angulatum from "worm goop" from the Galveston jetty area. They reported getting large ones from the surf zone a week or so later from the same area. Leola Glass came back from Mustang Island with some live-taken Epitonium angulatum and E. albidum, as well as a beautiful dark and almost perfect specimen of Amaea mitchelli, a dead shell but a prize for any collection. Then Herschel Sands called to ask how common were Epitoniums and then confessed he and his wife had collected some 500 specimens at Matagorda beach. All this took place the last weeks of April and the first week of May.

I told myself that I had missed the bonus of Epitoniums because I couldn't get to the beach until May 2. Surely the bloom couldn't last more than two weeks, but I hit that sand bar area at Matagorda about 9:00AM and immediately began to see large Epitonium angulatum being tossed up with the waves of the receding tide. We (Hollis helped!) picked up hundreds of live ones, and I then began to examine the debris and worm strands. I could see tiny live Epitoniums there, picked up many, and finally just collected a sack full of debris to sort at home. We drove down the beach and everywhere found Epitoniums, thousands alive. At one place I stood in the surf and collected them as the waves tossed them up to the debris line. This was too great to leave, so I gathered up handfuls of debris from the surf zone and sacked it for home viewing.

Examination at home has been most rewarding. There are several species of doubtful designation, but probably most are Epitonium albidum and and E. Tollini. There are a few E. multistriatum and E. novangliae. The others, well these I have pondered about before. I say that someday these Epitoniums in Texas have to be studied by an interested professional.

I did pick out some nice dead specimens of several species of Turbonillas, some live Cyclostremella humilis and made some observations concerning this species and feeding, and live Odostomia gibbosa.

I was pleased also to bring home some really huge Donax, what seem to be three-year-olds of Donax variabilis roemeri. They were tossed up live with each wave and immediately dug in the surfzone. Some reached one full inch in size.

Tired at home from the many bends to get this material, I got a telephone call the next day from member Linda Serrill of Matagorda saying she had collected many, many Epitoniums that day and had been trying to call me for several days to report she had heard about the bloom of Epitoniums on that beach.

Cautious note: The Sands were back at that beach the day I went but they were there later in the day and did not see many live Epitoniums.

On May 12, Ruby Ray, Carol Courtade and I swung by this beach once more to see if any Epitoniums were left. These stranded bonus finds don't hurt the population; the specimens will die so they might as well be collected. We did not find hundreds but some. However, we did find the sand bars fully exposed at the river mouth as it was full moon and a gentle tide. Never have I seen so many huge Thais with such lovely orange apertures. They were laying egg clusters. These were the rugged, channeled forms with rough, big knobs, the haysae form. We picked up quite a few. The largest live one measures a little over 3½ inches tall and over 2½ inches wide. A few, fresh dead, with meat still in them, were larger, but I still haven't gotten a live one that reaches the 4½ inches of literature.

I think it is quite a coincidence that I received a request for some of these Thais haysae from Dr. William J. Clench, the author of the form. These specimens from Matagorda will be just perfect to send if I can ever get them completely clean and odor free. Thais is one genus I wish I didn't have to clean.

The high winds of these spring months seem to be the cause of our bonus of shells. Even the 60 mile an hour freak windstorm two days in late May at Galveston caused me to hurry to the beach. Sure enough, the debris tossed up was most productive. There weren't many Epitoniums when I was there, but I did collect a few live pinkish Semele proficua, Dosinias, Periploma margaritaceum, Trachycardium muricatum, and several fresh pairs of Anatina anatina. There were many stranded Busycon and Thais egg cases. I brought some home and observed the capsules under the scope. I note that I collected both forms of Anachis obesa, a good growth series which shows that there are differences from the earliest stages. One form, the tan and brown form, starts with a transparent protoconch and on the third whorl begins the vertical ribs with smooth spacing in between and older ones continue this. The rosy brown form, known perhaps as ostreicola, starts with a rosy brown protoconch and on the third whorl begins a kind of cancellate pattern with vertical ribs and strong incised horizontal striations between. This continues in older shells. The tan specimens have a stronger outer lip varix and a slightly twisted inner lip at the columella. The brown form is straight at the columella and has less inflated varix on the outer lip. Both were together on the egg capsules.

I also observed the emerging veliger forms of Thais when they came out and were stranded on the purplish egg capsule out of water and couldn't swim away. I had seen the funny older young Thais with its outer sinuate lip, but this tiny veliger I had not seen at this period in its life, only observed it as it swam inside the capsule as it reached maturity but had not yet emerged.

MOLLUSCANA by W.W. Sutow, M.D.

I first picked up these cones on my initial trip to the Marshall Islands. We were quartered in the BOQ on Kwajalein Island, then under military jurisdiction. The BOQ was situated at the water's edge alongside the reef. When the tide went out, some fifty yards of the reef were exposed. In the little sand-bottomed depressions that dotted the reef surface, I found these cones embedded nose down.

The books available then (1959) indicated that there were two species that looked alike: Conus lividus and Conus flavidus. At Kwajalein, I could not find any access to reefs on the lagoon side. So I collected these cones on the seaward, windward reef-flats and in the shallow surge channels that connect Kwajalein Island with the next islet. I found these cones, in abundance (and larger) on Rongelap Island, too, - again on the seaward reefs primarily.

I learned early to distinguish Conus lividus as the species that had coronated spires. The look-alike Conus flavidus did not. Variations in size and color commonly occur and do not always constitute dependable distinguishing parameters. Life was simple. If the spire was rough and coronated, the cone was put in the box as Conus lividus. If the spire was smooth, it went into the box for Conus flavidus. These cones were abundant and could be collected readily in daylight. After a couple of years, I no longer picked them up.

This calm state of affairs was rudely disrupted when Ernie Libby suggested on one of our trips that we re-examine our lividus flavidus stock. To my surprised inquiry, Ernie stated that he had heard that there were such species as Conus frigidus, Conus sugillatus, Conus sanguinolentus, Conus balteatus, and Conus moreleti that could easily be confused with the lividus-flavidus duo. My natural tendency was to accuse Ernie of taking up the splitter's cult, but my scientific training cautioned me to first look into the available data.

As usual, my intentions far exceeded the time I could muster for my hobby. It was only recently, while going over Ernie's shells (after his death), that I began to think of this subject again. This is a preliminary report of my exercise in the differential diagnosis among the lividus-flavidus look-alikes. A more definitive and precise characterization of each species will require additional intensive work. In essence, the several tabulations below represent compilations of the descriptions by several authors identified in the text.

How about the literature? The September, 1969, issue of HAWAIIAN SHELL NEWS (1) pictures Conus frigidus and carries a description of the species by Holemand and McGill. W.O. Cernohorsky describes the various species in his article entitled The Conidae of Fiji published in THE VELIGER 7:61-94, 1964 (2). In this article all of the species listed are shown (black and white) on one page (plate 16). Cernohorsky again described many of these species in his book MARINE SHELLS OF THE PACIFIC, Volume 1, revised in 1971 (3). The books SHELLS OF NEW GUINEA AND THE CENTRAL INDO-PACIFIC by A. Hinton (4) and AUSTRALIAN SHELLS by B.R. Wilson and K. Gillett (5) show in color the species under discussion.

Pragmatically, the easiest distinguishing characteristic is the presence or absence of the coronated spire. A dichotomy is established promptly.

coronate spire	smooth spire
lividus	flavidus
sanguinolentus	frigidus
sugillatus	
moreleti	
balteatus	

In the several tabulations that follow, the descriptions of several authors have been scanned for each species. Abbreviated notations of the descriptive features were then listed for each of the species.

	Conus frigidus Reeve, 1848	Conus flavidus Lamarck 1810
Habitat:	reef	sand
Size:	smaller, under 1½ inches	larger
Sides:	convex	flat
Shoulder:	rounded, smooth	angulate, smooth
Color:	variable (pale blue gray, yellow or greenish) two pale bands at center and shoulder	variable (yellow, orange, olive or brown) transverse bands white or bluish-white
Whorl:	distinctly striate; granulations common at base	obsoletely striate
Aperture:	deep violet; pale median band; whitish oval spot on lower half	deep violet; marginal edge orange
Base:	deep purple, spirally striate	deep purple
Spire:	moderately elevated apex pale violet	low
Pictured in:	(1), (2), (3), (4), (5)	(2), (4), (5)

	Conus moreleti Crosse, 1858	Conus sanguinolentus Quoy & Gaimard, 1834
Size:	elongate and slender 17 to 43 mm	20 to 52 mm
Shoulder:	Angulate and coronate	angulate and coronate
Color:	orange brown to olive brown; pale white bands at shoulder and center	olive brown to dark brown; generally lacks central transverse band
Aperture:	purple with orange marginal edge	uniformly purple, lacks bluish white median band
Spire:	low convex; coronate	depressed, sculptured white coronations
Base:	purple granulose spiral striate	purple
Body whorl:	striate sides straight	lower half spirally striate; often granulose
Pictured in:	(2), (3), (4)	(2), (3), (5)

	Conus balteatus Sowerby, 1833	Conus sugillatus Reeve, 1844
Size:	small 23 to 38 mm	19 to 44 mm
Shoulder:	angulate coronate	angulate obsoletely nodulose
Color:	light olive fawn to dark brown; irregular whitish blotches tending to form bands at center and shoulder; flecked overall with white dots	brown to violet brown
Aperture:	violet with pale band near center and shoulder	purple, darker toward base; two light bands center and shoulder
Base:		spirally ridged; violet
Body whorl:	prominently straited; pronounced basally	fine, brown striae; darker below light central band
Pictured in:	(2), (4)	(2), (3), (4)

Conus lividus
Hwass in Gruguiere, 1792

Shoulder:	angulate, coronate
Color:	extremely variable; olive brown with two white or bluish white bands near shoulder and center
Aperture:	purple with light bands near shoulder and center
Spire:	white; often elevated
Base:	purple
Body whorl:	striate, striae granulose towards base, obsolete towards shoulder
Pictured in:	(2), (3), (4), (5)

The synonymy listed by Cernohorsky (2) for these species are as follows:

Conus balteatus Sowerby, 1833

Conus flavidus Lamarck, 1810

Conus lividus Hwass in Bruguiere, 1792

Conus moreleti Crosse, 1858

Conus sugillatus Reeve, 1844

Conus primula Reeve, 1849

Conus neglectus Pease, 1860
Lithoconus peasei Brazier, 1877

Cucullus monachos Röding, 1798
Conus plebejus Link, 1807

Conus elongatus Reeve, 1843
Conus oblitus Reeve, 1849

Conus floridulus A. Adams & Reeve, 1848

DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN

THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph)

by H. Odé

Genus Mercenaria Schumacher, 1817.
To this genus belong species close in shape and structure to Chione, but much more massive. In Texas only a single species.

108. Mercenaria campechiensis (Gmelin, 1790).
(Venus) campechiensis (Gmelin, 1790) Syst. Nat. 13th Ed. p. 3287.

By far the most massive and one of the largest clams on the Texas-Louisiana coast, where it lives in the bays, inlets and very shallow offshore waters. Bay specimens grow much heavier than those of more open water, that is, those living along the beaches. This is the usual trend with many bivalves (Anadara, Mulinia, etc.). The most massive beach specimens appear to be Pleistocene fossils f.i. Matagorda Peninsula, from where it was already reported by Mitchell. He collected at stretches along the beach where Mercenaria shells of old bay deposits are even today exposed by the transgressing Gulf of Mexico. Live specimens can be gathered from the mudflats near the inlets (San Luis Pass, Bolivar Pass) and the sheltered bayshores along the barrier side of the bays. It lives at many places along our entire coast line from Louisiana to South Padre Island. Old shells are often dredged in offshore waters, but, except in the immediate vicinity of the shore, do not live there.

It is customary to separate the New England form as Mercenaria mercenaria Linné but both species are, if not identical, extremely close. Early references all report the species as Venus mercenaria Linné. Mercenaria campechiensis texana Dall is a somewhat smooth form, usually quite massive and is common in the bays and inlets, contrasting sharply in size and form with the open water form of the beaches, which is far more sculptured on its outer surface. This form, usually found after rough weather, is much smaller, lighter colored and has continuous concentric ridges. As notata Say, specimens have been designed with ziczac markings of color, but no particular significance should be attached to those as they are mostly immature specimens. I do not believe that M. c. texana represents a subspecies; rather it is an ecological form peculiar to the coastal bays. The very heavy bay form has in references also been reported under the name Venus mercenaria var. mortoni Conrad. The presence of two forms is stressed over and over again in the early faunal lists. Personally, I believe that one deals with an outspoken ecological difference, not a subspecific difference.

Only rarely are specimens found which are entirely colored purple on the inside and most Texas specimens are almost completely dull white on the inside. Juvenile material is common in the coastal bays and very juvenile material is extremely small (1mm.). The prodissoconch is one of the smallest in the Veneridae.

Previous records for the Texas faunal provice are: 1. Galveston (1849); 7, listed (V. mercenaria and V. mercenaria var. mortoni Conrad); 15, Galveston (V. mercenaria and Port Isabel, Corpus Christi Bay and Galveston Bay (Venus mercenaria var. mortoni Conrad); 18, Galveston and Corpus Christi (both forms); 19, as Venus mercenaria var. mortoni, Alligator Head to Pass Cabello, Matagorda Bay. Immense dead shells on Gulf Beach on the Peninsula; 21, listed as V. mercenaria and V. mercenaria notata Say; 32, listed as V. mercenaria var. notata Say (rare along the Texas coast) and as V. campechiensis Gmelin. (Westward to Texas and Yucatan); 45, as V. mercenaria, Galveston and Corpus Christi, Galveston, deep well 2236-2600 feet as V. campechiensis, Corpus Christi, Aligator Head, Pass Cabello, Matagorda Bay, Galveston. Dall has named the Texas form var. texana; 54, reported from Indian kitchen middens in the Corpus Christi area; 56, listed as V. campechiensis texana Dall, 1902 and Venus campechiensis campechiensis Gmelin 1792 (V. mortoni of authors); 58, listed as V. mercenaria Linné, Matagorda Bay; 61, listed as V. mercenaria for Corpus Christi area; 62, listed as V. mercenaria for McGloin's Bluff, Oso Flat and Flower Bluff (all Corpus Christi area) 66, listed as V. mercenaria Linne' and V. campechiensis Gmelin for marine Pleistocene of Texas; 67, listed for Port Isabel; 69, listed under a variety of inconsistent names, V. mercenaria, V. mercenaria mercenaria, V. campechiensis campechiensis, V. campechiensis texana; 98, listed as V. mercenaria for the bays and the beach of Padre Island; and as V. campechiensis texana for the bays; 110 V. campechiensis texana Dall, living in Galveston and Arkansas Bays; worn dead shells on all Gulf beaches. All of the Texas specimens seem to belong to the subspecies which is recognized by the distinctive smoothing of the ribs seen in older specimens. The young cannot be separated from true V. campechiensis, Plate 11, figures 10-11; 123, hard shell clams were not taken on the brown shrimp grounds. Old clams, possibly Pleistocene in age, are abundant in wide areas between the beach and fore dunes on Padre Island. Live shells on Thalassia flats in Aransas and Corpus Bay. A few worn valves off Sabine 6½ fms.; 126, listed as M. mercenaria for Carolinian province (bays, lagoons, sandy or muddy bottom); 136, listed dead for Heald Bank; 139 M. mercenaria texana Dall, 1902; listed for "lower bays", 143, listed as M. mercenaria for Matagorda Bay; 145, listed as M. c. texana for upper sound; 146, listed for "sound shore"; 153, listed as V. mercenaria and as V. campechiensis texana; 156, listed for Stetson Bank; 160, listed as M. mercenaria Linne' for Matagorda Bay, alive at 3, dead at many locations; 164, listed for Rockport area, dead in open bay outer, alive in open bay margin, abundantly alive in inlet influenced area, 170, listed for shallow shelf

assemblage; 174, both forms listed; 175, listed as M. m. texana for sound or open lagoon assemblage, abundant in dense beds at inlet end of lagoons; 193, a few specimens remain in South Bay. This species was harvested commercially before the dumping of spoil from the Brownsville ship channel dredging; 194, V. mercenaria mentioned as food item for black drum (fish); 202, Mercenaria listed for Pleistocene; 206, beach records Tex. Conch., Vol. 4, p. 35, 1968. 225, listed as V. mercenaria for Galveston; 231, listed as V. mercenaria for Galveston, 253, rare on reef off Padre Island; 261, listed for shallow offshore of Galveston; 266, never alive. Supposed to be shifted by current over long distances; 269, figured on page 212.

Records H.M.N.S.: 60 lots of which 23 contain live collected material.

Depth Range: 0-33 fm. (alive 0-2 fms.)

Maximum Size: 148 mm. (in the literature said to reach 7 inches).

Geographical Range: Off southern New Jersey to Florida, Texas and Cuba (Abbott, 1974).

Eastern Pacific Analogue: Mercenaria apodema Dall, 1902, Panama and Guaymas, Mexico, Keen, 1971 writes: "...positive proof has yet to be furnished for the occurrence of Mercenaria in the Panamanic Province".

SUPERFAMILY VENERACEA

FAMILY VENERIDAE

Genus Anomalocardia Schumacher, 1817.
A single species in Texas, fairly thick with undulating concentric ribs, radial striae and impressed lunule.

109. Anomalocardia auberiana (Orbigny, 1842).
(Venus) cuneimeris Conrad, 1846. Prod. Acad. Nat. Sci., Phila., 3, p. 24, is a synonym.
In the hypersaline bays of the south Texas coast, this is a common and often abundant species. At some locations in the Corpus Christi area counts of 2,000 individuals per square meter have been made. It is understandable that in those areas dead valves are abundant on the beaches. In general, one can say that at Galveston the species is rare (only a few dead valves from the beaches and West Galveston Bay); it increases rapidly in numbers towards the southwest, so that it is already common in Matagorda Bay. In the Houston Museum collection, no specimens from the Louisiana coast are present and I have no records from that area. In offshore dredged samples the species is rare and the few valves obtained should be considered fossil. Thus, it appears restricted to the hypersaline bays of the Texas coast. The species is quite variable: the concentric ribs vary in number and the shape varies from triangular to quite wedge shaped. Juveniles are almost all triangular. Older specimens show a characteristic posterior elongation. The relation of this species to several described fossil species needs to be cleared up.

Previous records for the Texas faunal province are: 7, listed as Venus rostrata Sowerby; 15, (as Venus rostrata, Sowerby) common in beachdrift at Galveston and Corpus Christi, Shamrock Cove, Corpus Christi Bay; 18, (as Venus rostrata, Sowerby) Corpus Christi, common; 21, listed as Venus (Anomalocardia) rostrata Say; 45, Galveston and Corpus Christi; 66, listed for marine Pleistocene of Texas. Also lists Anomalocardia rostrata Savage for marine Pleistocene; 69, listed in appendix 8; 98, alive in Redfish Bay, dead in Laguna Madre; 110, dead shells occasional at Galveston, fresh shells on Mustang and Padre Islands, living in Aransas Bay, Plate 10, figs. 9-10; 135, dead in Gulf, alive in bays; 139, beach and surf zone, nearshore Gulf; 148, common in Baffin Bay; 151, common in Laguna Madre; 153, listed in Table 1; 160, dead at two locations in Matagorda Bay; 164, alive at Rockport, alive in Laguna Madre; 170, listed for deep shelf assemblage (Note: this is probably a mis-identification of Spheniopsis);174, listed; 175, listed for hypersaline environments; 178, northern Laguna Madre, sand and shell bottoms, also in Baffin Bay; 193, alive in south Laguna Madre; 194, mentioned as food item for blackdrum (fish); 202, listed as Anomalocardia brasiliana (Mexico); 206, beach records in Tex. Conch, Vol. 4, (6), 1042, 1968. 208, listed for open bay center, enclosed bay center, bay margin and "grassflats"; 269, figured on page 210.

Records H.M.N.S.: 26 lots (none alive).

Depth Range: 0-25 fms. All five offshore samples are old shells.

Geographical Range: South half of Florida to Texas, (Abbott, 1974).

Maximum Size: 16 mm.

Eastern Pacific Analogue: Anomalocardia does not live in Panamanic Province.

Genus Chione Muhlfeld, 1811.

Of this genus, often with strong concentric sculpture, lamellar ridges and in possession of a lunule and escutcheon, the subgenera Chione ss, Choniopsis and Lirophora live in the N.W. Gulf of Mexico.

110. Chione (Chione) cancellata (Linné, 1767).

Venus cancellata Linné, 1767. Syst. Nat., 12th ed., p. 1130.

This common beach shell is not often collected alive, except near Corpus Christi and further south. Beach worn valves are not uncommon near Galveston, but so far little evidence of live material has been found in that area and a count of material from West Galveston Bay (Tex. Conch., Vol. 10, (7+8), 1974) did not show any. Very little material has been taken offshore and the few fragments obtained are without doubt fossil. Thus the species must be considered a member of the bay fauna only.

Previous records for the Texas faunal provice are: 15, Galveston and Corpus Christi, not common at Galveston but at Corpus Christi the bulk of the beachdrift is composed of worn valves of this species; 18, dead shells are very abundant at Corpus Christi, few beach worn valves at Galveston; 19, dead shells common everywhere on the coast, never seen a live one; 21, listed; 45, Galveston, Corpus Christi, Port Isabel; 58, Aransas Bay, fresh shells (Strecker); 61, listed

for Corpus Christi area; 62, listed for McGloin's Bluff, Oso Flat and Flour Bluff (Corpus Christi Area); 66, listed for marine Pleistocene of Texas; 67, listed for Port Isabel; 69, listed in Appendix 8; 98, listed for bays, widespread, alive in Red Fish Bay, Aransas Pass, also listed for beach of Padre Island; 110, rare dead shells at Galveston, fresh shells common from Matagorda Beach to Port Isabel, living in Aransas Bay and Laguna at Port Isabel, Pl. 10, figures 16-17; 123, a few odd valves in 2-7 fms. off Sabine, Texas; 126, listed for bays and lagoons, sandy or muddy bottom of Carolinian Province; 135, dead in Gulf, alive in bays; 139, inlets; 153, listed in Table I; 160, dead at several locations in Matagorda Bay; 164, alive in several types of environment at Rockport, and alive in Laguna Madre; 174, listed; 175, listed for open sound or open lagoon assemblage; 178, southern end of Laguna Madre, 3-4 feet depth, salinity above normal, mud bottom, abundant vegetation; 192, figured; 193, common during spring and summer months from Three Islands south to Brownsville Ship Channel; 194, mentioned as common food item of black drum (fish); 202, figured; 206, beach records, Texas Conch., Vol. 4 (5), p. 35, 1968; 208, listed for bay margin and grass flats; 225, Galveston; 236, Galveston; 251, Yucatan shelf; 269, figured on page 210.

Records H.M.N.S.: 26 lots of which 6 contain live collected material.

Depth Range: 0-55 fm. (alive 0-1 fms.)

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

Maximum Size: 38 mm.

Eastern Pacific Analogue: Since C. mazycki Dall, 1902, is only a form of C. cancellata Linné, the closest Pacific species is Chione (Chione) guatulcoensis Hertlein and Strong, 1948, although it is much smaller than C. cancellata; off Port Guatulco, Mexico, to Panama Bay in depths to 13 m., "Keen, 1971".

111. Chione (Choniopsis) intapurpurea (Conrad, 1849).

Venus intapurpurea Conrad, 1849. Journ. Acad. Nat. Sci. 2nd Ser., (1), p. 209, pl. 39, fig. 9.

In offshore waters Chione cancellata is replaced by Chione (Choniopsis) intapurpurea, a species which does not enter the bays. Along the beach its distribution pattern is closely similar to that of C. cancellata, that is, it becomes more and more common towards the south. At Sargent, specimens are occasionally picked up but already at St. Joseph Island, the species is common in beachdrift. However, living specimens are not uncommonly dredged all along the Texas-Louisiana coast and are known from many localities, among which Heald Bank may be mentioned. Chione morsitans Olsson and Harbison, 1953 looks suspiciously like some Texas material. The development of the ribbing is quite variable. In some specimens the ribs are close and relatively thin, in others, they are wider apart and thicker. The latter specimens are somewhat more rounded and on the whole, somewhat smaller. It is not impossible that these are two different species and a comparison with Venus cribraria Conrad,

Foss. Med. Tert., 1845, p. 67, pl. 38, fig. 2 and Proc. Acad. Nat. Sci., Phila., 1, p. 310, 1843 should be made. Comparable Pacific species are much larger.

Previous records for the Texas faunal province are: 45, "Texas"; 56, "North Carolina to Texas and south to Honduras"; 66, listed for the marine Pleistocene of Texas; 67, listed for Port Isabel; 69, listed in Appendix 8; 110, one dead shell from St. Joseph Island and two from Padre Island, Plate 10, fig. 15; 135, dead in Gulf and bays; 136, reported from 15 stations off East Texas at depths between 6-10 fms, alive at 9 fms; 145, shallow and deep shelf (all dead); 170, listed for transitional shelf assemblage; 175, listed for inner shelf, 2-12 fms., common, only off western Louisiana; 206, beach records, Tex. Conch., Vol. 4 (5), p. 35, 1968, 225, Galveston; 236, Galveston; 269, figured on page 212.

Records H.M.N.S.: 48 lots of which 5 contain live collected material.

Depth Range: 0-30 fms. (alive 6-12 fms.) in a sandy shelly bottom.

Maximum Size: 30 mm.

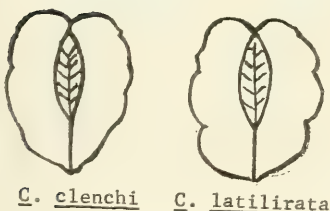
Geographical Range: North Carolina to Texas, West Indies, Brazil (Abbott, 1974).

Eastern Pacific Analogue: Chione (Choniopsis) olssoni Fischer, Piette, 1969, "Ecuador". (not close)

112. Chione (Lirophora) latilirata (Conrad, 1841).
Venus latilirata Conrad, 1841. Proc. Acad. Nat. Sci., Phila., 1, p. 28.

There is some difficulty in giving a good account of Lirophora for the N.W. Gulf of Mexico. On the basis of the Houston Museum material, there lives only a single quite widespread and quite common species in the western Gulf, a second species is quite rare on the offshore coral reefs and perhaps a third species is present but our material does not allow a definite opinion. The matter is further confused by contradicting reports in the litterature and uncertainties in nomenclature.

The two common Caribbean species are Lirophora latilirata Conrad, 1841 and Lirophora paphia Linné, 1767. In 1952 Pulley described a third species, Chione clenchi, from the western Gulf, which is supposed to be different from Chione latilirata in several respects: 1). Its circumferential shape is more hooked posteriorly than that of C. latilirata, 2). The concentric surface ribbing is not as massive as in C. latilirata. In reference 109, a posterior view of both species is given which shows this difference in development. (See also figures 6, 7, 8 in Peterson's "Field Guide for Shells of Atlantic and Gulf Coasts", 3d. edition by W.J. Clench, 1973). The figure of ref. 109 may be slightly misleading because when a posterior view is made of a specimen which just has completed a thick rib one obtains a somewhat intermediate figure. Although I will report the species, common in the western Gulf, as C. (Lirophora) clenchi, I consider it quite probable that it is not more than at



C. clenchi C. latilirata
Posterior View
Redrawn from Ref. 109

most, a subspecies of C. latilirata Conrad, characteristic to the mud environment of the Texas-Louisiana coast. In the calcareous environment of the eastern Gulf and the Caribbean where waters in general carry far less suspended particulates, the species merely develops in a somewhat different fashion.

The most intriguing question concerning Lirophora is the occurrence of a species similar to C. clenchi Pulley in the Panamanic fauna. In 1902, Dall described Chione obliterata from the Bay of Panama, a figure of which is reproduced in Keen's "Sea Shells of Tropical West America", 1971. This species is suspiciously similar to specimens of C. clenchi in the Houston Museum collection. Until a comparison can be made it remains unprofitable to speculate about its identity.

Apparently C. clenchi does not extend to similar environments outside the Gulf of Mexico or Caribbean. Van Regteren Altena does not mention C. clenchi or C. latilirata in his study of the Surinam fauna. (Zool. Verh., No. 119, 1971), in which he corrected an earlier report of 1968. (C. latilirata changed to C. paphia).

The only two lots of Chione (Lirophora) latilirata Conrad, 1841, in the Museum collection might be: 1). a specimen hand collected along the Aransas Pass Causeway. Unfortunately, it is a juvenile one, but it differs in some respects from the countless specimens of similar size of C. clenchi in the collection. It has deeper and wider interspaces and is the only specimen which shows a concavity of the ribs towards the umbo. If the specimen is indeed true C. latilirata, its presence in the Texas fauna may not signify much. At the locality where it was taken more adventitious species have been collected, most of them imported by shrimpers from the Yucatan shelf. The second lot comes from 4 fathoms off Galveston. Chione latilirata has several times been reported for our area. Without doubt, all these reports pertain to C. clenchi Pulley, except the ones given here.

Previous records for the Texas faunal provice are: 110, "one live specimen and a few fresh valves from 15-20 fathoms off Port Aransas (also reports C. clenchi); 145, listed in Table 7 (also reports C. clenchi); 201, listed for mudlump fauna (C. clenchi also listed).

Records H.M.N.S.: one juvenile valve taken at Port Aransas, but perhaps adventitious.

Depth Range: 0-4 fms.

Maximum Size: Not measured.

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

Eastern Pacific Analogue: None.

113. Chione (Lirophora) clenchi, Pulley, 1952.

Chione clenchi Pulley, 1952. Tex. J. Sci., Vol. 4, (1), p. 61-62, Pl. A, figs. 3-5.

This, one of the most widespread venerids in our area, has been often dredged alive in a depth range from 7-28 fms. in silty bottoms, and miocene shale outcrops. It does not live on the coral reefs. Juvenile specimen are abundant in most offshore dredged samples and are characterized by the

fence-like character of the early concentric ribs. They stand up perpendicularly to the shell surface and have wide interfaces between them. Only the 4th, 5th and later "fences" become rapidly thickened. These show a thinning at the dorsal end just as in C. paphia, but while in C. paphia, this character persists throughout the entire life of the clam, the concentric ridges in C. clenchi loose this character when they mature. Juvenile specimens of Mercenaria are surprisingly similar to those of C. clenchi, in that they also show the fence-like concentrical ribs. However, the shells of Mercenaria are rounder and the pallial sinus is much deeper and the hinge is slightly different.

C. clenchi is on many beaches, an abundant clam, especially in south Texas. Thus it is somewhat surprising that it has never been found alive on our beaches, but very fresh specimens have been rafted ashore by whipcoral.

Previous records for the Texas faunal province are: 7, (as Venus varicosa, Sowerby) listed; 21, (as Venus varicosa, Sowerby) listed; 45, Galveston (as Chione (Lirophora) latilirata Conrad); 67, listed for Port Isabel (as Chione latilirata Conrad); 69, (as Chione paphia) listed in Appendix 8; 98, listed for beach Padre Island (as Chione latilirata Conrad); 109, original description; 110, worn dead shells rare at Galveston, fresh shells occasional from St. Joseph Island to Port Isabel. Taken alive by shrimpers in 15-25 fms. off Port Isabel, Pl. 10, figs. 13-14; 123, this little clam is sympatric with Chione latilirata at least in the Port Isabel area. It was not as abundant off Freeport in 11 to 16 fms. A few dead shells in 6½ fms. off Sabine. Only P. cordata and M. tageliformis were more abundant in trynet catches; 135, alive in Gulf; 136, (as C. latilirata) reported from 11 stations off East Texas in 33-58 feet, 139, listed for open shelf; 145, deep shelf (alive); 156, common on Stetson Bank; 164, alive in inlet influenced assemblage at Rockport; 170, listed as C. latilirata for transitional shelf assemblage; 174, listed; 175, intermediate shelf, 12-35 fms. on sand bottom, abundant, whole coast; 201, (as C. latilirata) mud-lump fauna; 206, beach records in Tex. Conch., Vol. 4, p. 42, (1968); 225, Galveston (as C. latilirata clenchi Pulley); 236, Galveston (as C. latilirata clenchi Pulley); 251, Yucatan shelf; 253, worn valves on Gulf side bottom Padre Island reef; 269, figured on page 211.

Records H.M.N.S.: 93 lots of which 18 contain live collected material.

Depth Range: 0-50 fms. (alive 7-28 fms.) in sandy mud bottom and on miocene shale uplifts.

Maximum Size: 36.5 mm.

Geographical Range: North Texas to Gulf of Campeche, Mexico, (Abbott, 1974). Note: our records include the entire Louisiana coast, west of the Mississippi.

Eastern Pacific Analogue: Chione (Lirophora) obliterata Dall, 1902. Keen (1971) remarks: "described as of Panama Bay".

114. Chione (Lirophora) paphia (Linné, 1767).

Venus paphia Linné. Syst. Nat., 12th ed., p. 1129.

A single valve of this species was taken from the Flower Gardens. It is much whiter, has the characteristic pinching of the concentric ribs and shows a more concave lunule than C. clenchi.

The reference to this species in ref. 69 is clearly in error for C. clenchi. The species lives on the Yucatan platform and is another example of a Caribbean faunal element - mainly Yucatan related - of the coral reefs in the N.W. Gulf of Mexico.

Previous records for the Texas faunal province are: 214, (Chione c.f. paphia) Yucatan shelf.

Records H.M.N.S.: 1 lot (single valve) from Flower Gardens.

Depth Range: 13-16 fms.

Maximum Size: 28 mm.

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

Eastern Pacific Analogue: Chione (Lirophora) mariae Orbigny, 1846.

"Cedros Island, Baja California, through the Gulf of California and south to Guagaquil Ecuator, mostly offshore in depths to 110 m." (Keen, 1971).

Genus Timoclea Brown, 1827.

Small, ovate shell, with cancellate sculpture.

115. Timoclea grus (Holmes, 1858).

Tapes grus Holmes, 1827. Post. Pleioc. Fossils S. Car., p. 37, pl. 7, fig. 5.

This common and widespread offshore species lives in rocky and shelly environments along the entire Louisiana-Texas coastline. Their color in Texas is usually yellowish white, often with brown markings on the outside. Uniformly colored specimens of brownish orange are not rare, but darkly colored specimens are unusual. The posterior end of fresh specimens often carries typical Chione laminations which are frilled. Beach specimens have been found at Sargent and South Padre Island. Never in the bays, except for a single valve from Chocolate Bay (Galveston Bay system) which may be adventitious.

Previous records for the Texas faunal province are: 98, listed for the bays; not in text; 136, reported for 5 stations off East Texas (33-54'), alive; 145, dead on deep shelf; 147, dead on Baker Bank; 153, listed in Table I; 156, listed for Stetson Bank; 159, one specimen taken alive from sand bottom along jetty at Port Aransas; 170, deep shelf assemblage; 174, listed; 175, listed for intermediate shelf, 12-35 fms., on sand bottom. Common along whole coast; 206, beach records in Tex. Conch., Vol. 4 (6), p. 42, 1968; 225, Galveston, 236, Galveston; 251, listed for Yucatan shelf; 253, one of the most abundant micro pelecypods (offshore reef Padre Island), many collected alive; 269, figured on page 211.

Records H.M.N.S.: 68 lots of which 21 contain live collected material.

Depth Range: 0-55 fms. (alive: 7-30 fms.) mostly on shelly or rocky bottoms.

Maximum Size: 12.5 mm.

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

Eastern Pacific Analogue: Chione (Timoclea) squamosa Carpenter, 1857. "Gulf of California, southward to Peru" (Keen, 1971). It is smaller than T. grus, but a larger Pleistocene form T. pecta Willett, 1944 is fairly common as a Pleistocene fossil in southern California.

Genus Transennella Dall, 1883.
Small, rather oval bivalves, with obliquely grooved microscopic lines on the internal margins. In the N.W. Gulf of Mexico only a single species.

116. Transennella c.f. cubaniana (Orbigny, 1846).
Venus cubaniana Orbigny, 1846. Moll. Cuban. 2, pl. 26, figs. 44-46.

Only a few valves of this deep water species have been taken off Galveston. They are old valves still showing the tangential grooves on the internal ventral margins. Some are strongly concentrically ribbed, but in a few juvenile specimens the ribbing is quite subdued. Pallial sinus very shallow, almost obsolete and thus hardly conforms with generic description in McLean Scient. Surv. Porto Rico and the Virgin Islands, Vol 17, part 1, 1951, but better with that of the "Treatise" ("small, rounded").

Previous records for the Texas faunal province are: 193, Tex. Conch., Vol. 9, (4), p. 80, (1973).

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

Depth Range: 75-140 fms. in globigirina mud.

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

Maximum Size: 10 mm.

Eastern Pacific Analogue: none of the several species is close; T. modesta Sowerby, 1835, is figured by Keen with a deep sinus, but is close in sculpture.

Genus Pitar Romer, 1857.
A number of somewhat elliptically shaped (when mature), sometimes rather inflated species, which in the western Atlantic are in need of revision, live in the N.W. Gulf of Mexico. They are provisionally assigned to the subgenera Pitarenus Rehder and Abbott, 1951, Agriopoma and Pitar. To assign subgeneric rank to these species is difficult and I have based my choice to a large extent on the remarks in Keen's "Seashells of Tropical West America". Pitarenus and Agriopoma are unknown in the Panamanic faunal province. Pitarenus is characterized by a very inflated shell, somewhat pointed posteriorly and irregularly crenulated on the ventral margin. In Pitar ss a number of smaller and smooth small species is brought together, which according to Keen's key of subgenera should be placed there. Agriopoma texasiana is a difficult one to place. This typical large Texas species, which Dall made the type of Agriopoma is usually placed in the genus Callocardia (Treat. Inv. Paleont., Vol N, p. 678). As Keen remarks its hinge shows clear affinities with the subgenus Pitarella Palmer, 1927 and apart from minor differences in shape outline of pallial sinus etc., it may well be that Agriopoma, Dall 1902 and Pitarella Palmer, 1927, are synonymons.

117. Pitar (Agriopoma) texasianus (Dall, 1892).
Cytherea texasiana Dall, 1892. Nautilus, Vol. 5 (12), p. 134-135.

This large and relatively thin shelled species is a common one on beaches in the N.W. Gulf of Mexico. Dr. T. E. Pulley told me that in his opinion, the species should be assigned to Pitar, a conclusion in which I concur. When one compares its hinge line with that of the quite different P. cordatus Schwengel, it is impossible to see any differences of enough importance to warrant generic distinction. Its beaks are not more "rolled under" than in many other species in Pitar. This species has a long and confused history and was labelled Cytherea idonea Conrad and Cytherea convexa Say in early faunal lists until Dall finally labelled it Cytherea texasiana. Abbott ("American Sea Shells") remarks that little is known about it and today it remains as enigmatic as ever. Live specimens are rare but can be occasionally taken from beach-drift (High Island, Bolivar Peninsula, Port Aransas) especially after rough seas. Thus it is surprising that I have never been able to collect a single juvenile valve ($< \frac{1}{2}$inch) from the many gallons of fine beachdrift I picked during fifteen years of collecting except for two very small live collected pairs, one from Christmas Bay and one from Matagorda Bay. They almost must be juvenile P. texasianus because there is no other possibility, but if they are, P. texasianus, when juvenile, is remarkably different from the fullgrown form. They very closely resemble rather inflated Leptonids such as Kellia. Further material and dissection have to prove my identification. In one juvenile valve the arched structure of the cardinals is clearly visible. The species sometimes dredged in offshore waters from which it must be concluded that it probably lives in the bays or in the immediate vicinity of the shore (surf-zone) although reference 123 states that it is not uncommon on the "white shrimp grounds" and along the edge of Sabine Bank. In contrast to the scarcity of juvenile and live specimens, is the number of mature dead valves on all our beaches from Louisiana to South Padre Island. Some phase in the life cycle of this clam must prevent juveniles from reaching the beach. Reference 269 mentions that R.E. Parker has dredged live material from clay bottoms in Matagorda and Aransas Bay and Boyer (reference 231) has reported live specimens off Louisiana in 24-80 feet depth living in clay.

Previous records for the Texas faunal provice are: 7, (Cytherea idonea Conrad) listed; 13, described by Dall from Texas; 14, (Cytherea convexa Say) Indianola, Texas; 15, (Cytherea texasiana Dall), beachworn valves moderately common on the outer beach at Galveston; 18, Galveston; 19, (as Callista convexa Say) Gulf, beach worn valves only; 21, listed as Callista convexa Say; 45, Galveston, Indianola; 56, Louisiana to Texas; 67, Port Isabel; 110, dead shells common at Galveston, less common on all beaches south to Port Isabel, Plate 11, figs. 3-4; 123, not on "brown shrimp" grounds but not uncommon on "white shrimp" grounds. One hinged shell taken off Pass Cavello in 11 fms. (Dec. 1950). Old shells common along the edge of Sabine Bank; 135, dead in Gulf; 136, not in text, but in final list; 145, shallow shelf; 160, dead at two stations in Matagorda Bay; 170, transitional shelf

assemblage; 174, listed; 201, listed for mudlumps; 206, beach records in Tex. Conch., Vol. 4 (6), p. 43, (1968) as Callocardia texasiana, Dall, 1892); 231, live specimens off Louisiana in 24-80 feet, clay; 269, figured on page 206.
Records H.M.N.S.: 22 lots of which 5 contain live collected material. Bay records: Timbalier Bay (La.) and Galveston West Bay (Christmas Bay) and Matagorda Bay.
Depth Range: 0-25 fms. (5 offshore lots) (alive: only beaches and bays).
Geographical Range: Northwest Florida to Texas and Mexico (Abbott, 1974).
Maximum Size: 77 mm.
Eastern Pacific Analogue: None.

118. Pitar (Pitarenus) cordatus (Schwengel, 1951).
Pitaria cordata Schwengel, 1951. Nautilus, Vol. 64 (4), p. 118, pl. 8, fig. 6-8.
This is the common Pitar of the N.W. Gulf of Mexico, which is close, if not the same, as P. morrhuanus Linsley, 1845 of more northwestern Atlantic coasts. Also Pitar arestus Dall and Simpson 1901, described from Puerto Rico might be identical. The species often is found alive in silty mud, seldom in sandy environment, in a depth range of 20-40 fms. Not often are specimens taken on our beaches (Port Aransas, St. Joseph Island, High Island) except on Timbalier Island (La.)and south of the Mansfield Cut on South Padre Island.

It is a very inflated, heavy shell, of dull white color, sometimes with faint pink color inside, which when mature, develops a kind of posterior angle. Juvenile specimens are much thinner and rounder and smoother and thus can be distinguished from the next species. Its ventral margin shows fine, somewhat irregular, shallow crenulations, which are not present in juvenile material and may be invisible in worn material. It is uncertain whether these crenulations justify the separation of Pitarenus from Pitarella.
Previous records for the Texas faunal province are: 110, dead shells rare on beaches of Mustang and Padre Islands but commonly taken by shrimpers in 20-30 fms.; 123, most common pelecypod on "brown shrimp" grounds, characteristic for it; 135, alive in Gulf; 144, reported offshore from several locations (167, 504, 1084); 145, deep shelf; 146, deep shelf, recent delta influence; 156, common on Stetson Bank; 170, (as Pitar c.f. morrhuana Linsley), transitional shelf assemblage off east Texas; 174, listed; 175, intermediate shelf 12-35 fms. on mud bottoms, common off Texas outer shelf 40-65 fms., abundant northern Gulf coast, mud bottom; 206, beach records, Tex. Conch., Vol. 4 (6), p. 43, (1968), 208, shelf mud and silt; 225, (listed as Pitar morrhuana Linsley, 1845 =? Pitar cordata Schwengel) Galveston.
Records H.M.N.S.: 64 lots of which 9 contain live collected material.
Depth Range: 0-60 fms., alive 22-40 fms. in silty or sandy mud; also obtained from mudlump fauna.
Geographical Range: Florida Keys, Texas, Brazil, (Abbott, 1974).
Maximum Size: 48 mm.
Eastern Pacific Analogue: none ?

There are three other small Pitars on the Texas coast which for the time being cannot be identified here. One is not larger than about 13 mm. and possesses a color pattern of irregular brown blotches, somtimes in zig zag form with triangular outline. This shell is extremely like Pitar helenae Olsson, 1961 from the Pacific province and some less intensively colored specimens approach Pitar hoffstetteri Fischer Piette of the same province. They do not appear to be fulminatus of the Caribbean province. There is another somewhat larger species, occasionally taken on Texas beaches and quite abundant in offshore waters, closely related to Pitar cordatus, but much smaller than the latter (maximum size 22 mm.). This might be P. simpsoni, but the Texas specimens never show a trace of color. The third species has a somewhat different hinge, is thin shelled, colorless and should be classified as a Callocardia (shallow pallial sinus); which species of the genus this is, must be further ascertained.

119. Pitar (Pitarella) sp. ident. (A).

This widespread, small Pitar has been mainly found in shallow offshore waters, but only a few times on our beaches (Galveston, Freeport, Mustang and Padre Islands). It is closely related to Pitar cordatus Schwengel, but although it might be mistaken for juveniles of that species, it is much thicker and more inflated than specimens of P. cordatus of similar size. Only rarely found alive. It is rather triangular in shape with rounded ventral margin and a sculpture of rather regular growth lines which stand out as concentric ribs and prominent umbo. It is possible that this is Pitarella simpsoni.

Previous records for the Texas faunal province are: Tex. Conch., Vol. 8 (4), p. 44 (1971) and Vol. 9 (4), p. 80 (1973) (as Pitar sp. A.)

Records H.M.N.S.: 41 lots of which 2 were live collected.

Depth Range: 0-50 fms. (alive 25 fms.) in sandy mud.

Geographical Range: unknown.

Maximum Size: 21.5 mm.

Eastern Pacific Analogue: ?

Note: This might be P. zonatus Dall, 1902, P.U.S.N.M., No. 1312, pp. 370, 381, pl. 12, fig. 4.

120. Pitar (Pitar) sp. indet. B.

We have reported this species before and probably erroneously as P. simpsoni. It is a very small species very closely resembling P. helenae Olsson from the Panamanic province. Its hinge line is longer, the shell shape more elliptical than that of other species. But its immediate character is its sometimes outspoken color pattern and in some specimens its pink umbo. It lives on the whole, deeper than the previous species and until more is known about it, little can be said here apart of referring to Keen's discussion of P. helenae, with which it is undoubtedly closely related if not identical.

Previous records for the Texas faunal province are: 145, listed as P. fulminatus; 206, Texas Conch., Vol. 8,p. 44, (1971) (as P. stimpsoni).

Records H.M.N.S.: 16 lots of which 2 contain live collected material.

Depth Range: 10-55 fms. (alive: 10-55 fms.) in sandy mud, algal reef and miocene shale outcrops.

Geographical Range: Unknown.

Maximum Size: 13.5 mm.
Eastern Pacific Analogue: Pitar helenae Olsson, 1961, "Gulf of California to Panama mostly offshore in depths to 45 meters" (Keen, 1971).

121. Pitar (Pitar) sp. indet. C.
A valve of still another small species closely related to the one Pitar (Pitar) sp. indet. A was dredged at one location. It is conspicuously grooved with deep grooves leaving broad intermediate flat areas. It could be a discrepant form of the other but I doubt this.
Previous records for the Texas faunal province are: none.
Records H.M.N.S.: 1 lot (single valve) off Louisiana.
Depth Range: 55 fms.
Geographical Range: Unknown.
Maximum Size: 9 mm.
Eastern Pacific Analogue: ?

Genus Callocardia A. Adams, 1864.
The main difference with Pitar is the thinness of the shell, although juvenile Agriopoma and Pitarenus also show this. In the "Treat. Invert. Paleont.", Vol. N, p. 677, the narrow hinge plate is given as one of generic characters. In our specimens, this is not obvious; but clearly visible, is the connection of the cardinals to cured arches and a very shallow pallial sinus. In our area only a single species of the nominate subgenus.

122. Callocardia (Callocardia) sp. indet. A.
Because of the confusion of Callocardia and some closely resembling species in the subgenus Veneriglossa Dall of Vesicomya (see "Treat. Invert. Paleont.", Vol. N, p. 664) we are unable to place this species. The safest course appears to align it with the Veneridae as the hinge as definitely Veneroid and the shell appears as a small Pitar with quite shallow pallial sinus. Its beaks are not particularly cured as in Glossus; all Pitars are somewhat rolled-in. For the time being we leave this species unidentified. It resembles a pure white thin Pitar which differs from the others also in the concentric ribbing, which is present at a much earlier stage than in the two previously treated species.
It is quite uncommon in our area.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 5 lots of which one contain live collected material in sandy mud, all off Louisiana.
Depth Range: 51-55 fms.
Geographical Range: Unknown.
Maximum Size: 16.5 mm.
Eastern Pacific Analogue: Unknown.

Genus Costacallista Palmer, 1927.
Closely related to Macrocallista, but sculptured with strong rather flat concentric ridges. Examination of the material of the only species from the Texas-Louisiana coast explains the difficulty of relating the genus to other genera. Originally described by Dall as a Pitar, Van Winkle Palmer in 1947 argued that this shell is more "callistid" than

"pitarid" in nature ("Nautilus", Vol. 61, p. 44-47) on such rather unreliable characters as curvature of the posterior end, the shape of the lunule, the flattening of the ribs and the angularity of the pallial sinus. I have compared it with juveniles of Macrocallista maculata which certainly are "callistid" and find some differences in hinge structure. These juveniles show a denticulated lateral (?) tooth of which no vestige is present in my material of Costacallista. Before the matter can be settled (closer relationship to Lamelliconcha or to Callista) more and especially fresh juvenile material must be obtained. For the time, we shall retain Costacallista here as a full genus of Callistid affinity.

123. Costacallista eucymata (Dall, 1889).

Cytherea eucymata Dall, 1889. U.S.N.M. Proc., Vol. 12, p. 271, pl. 13, fig. 11.

Of this very beautiful species, only three lots are in the collection of H.M.N.S. It apparently lives in a very special environment, namely that of Miocene shale, and the only locations from which it was taken fresh are Stetson Bank and Clay Pile Dome. There can be little doubt that it lives on Stetson Bank because our specimens, although not live collected, are beautifully fresh. They have an almost white background on which there are dark reddish brown triangular blotches of color. A single, very large valve, has lost its original color and was dredged off Freeport, Texas in 26 fms.

Previous records for the Texas faunal province are: 156, Stetson Bank; 175, listed for upper continental slope, 65-600 fms. Few, mostly associated with shell or calcareous deposits below 65 fms.; 206, Tex. Conch., Vol. 9 (4), p. 80 (1973).

Records H.M.N.S.: Three lots from offshore Texas waters.

Depth Range: 16-25 fms. in Miocene shale mud.

Geographical Range: North Carolina to south half of Florida, Texas to Brazil (Abbott, 1974).

Maximum Size: 33 mm.

Eastern Pacific Analogue: None.

Genus Macrocallista Meek, 1876.

Large, ovate, smooth shells, with striking color patterns. In our area two species, one of which is classified in the subgenus Megapitaria Grant and Gale, 1931.

124. Macrocallista nimbosa, (Lightfoot, 1786).

Venus nimbosa Lightfoot, 1786. Portland Cat.,p. 175, No. 3761.

Synonyms: Venus gigantea Chemintz, 1791.

This large species is in our area only known from the beaches of Texas. Except for a single juvenile specimen dredged from Heald Bank, no material has been obtained in offshore waters. Very rarely obtained alive (once from the beach at Freeport and from South Padre Island). Fragments have been rarely taken along Galveston Island but increase in frequency to the south. On Matagorda Peninsula, a beach which cannot be reached except by private boats, the species is common. It is probably that these are quite old shells, and in the past, the species was more widespread in most of the coastal bays than at present. It has been reported from indian middens in the

Corpus Christi area and can also be found in pairs in spoil banks of Corpus Christi Bay.

Previous records for the Texas faunal province are: 7, listed as Callista gigantea Gmelin; 15, (as Cytherea gigantea Gmelin) common on the outer beach of Mustang and Padre Islands. A few worn valves at Corpus Christi; 18, (as Cytherea gigantea Gmelin) Galveston and Corpus Christi, common; 19, (as Callista gigantea Gmelin) Gulf, beach worn valves only; 21, listed as Callista gigantea Gmelin; 32, coast of Texas at Matagorda Bay; 45, Matagorda Bay, Texas; 54, old coastal indian kitchen middens from Corpus Christi area; 65, (as Callista gigantea Gmelin) Shamrock Island; 66, Marine Pleistocene of Texas; 69, listed; 110, a few dead shells have been found at Port Isabel and Port Aransas, Pl. 11, fig. 5; 126, listed for Carolianian province; 135, dead in Gulf, dead in bays; 136, Heald Bank, listed "alive" in final text; 170, shallow shelf assemblage; 174, listed; 206, beach records, Tex. Conch., Vol. 4, p. 43, (1968); 269, figured on page 207.

Records H.M.N.S.: 8 lots (no live material), one juvenile valve from Heald Bank (34-40 ft.); all others from the beach, fresh looking material from Matagorda Beach.

Depth Range: 0-7 fms.

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

Maximum Size: 131 mm.

Eastern Pacific Analogue: None.

125. Macrocallista (Megapitaria) maculata (Linné, 1758).

Venus maculata Linné, 1758. Syst. Nat., 10th ed., p. 686.

This, on our beaches, an uncommon species, is widespread on the shallow offshore shelf. Old and worn shells are occasionally collected at Sargent and along Matagorda beach, but become more common on the southern part of Padre Island, below the Mansfield Cut. In offshore waters, live specimens are not uncommonly dredged in sandy mud bottoms off Galveston and Freeport. This species apparently stays away further from the coast than M. nimbosa. Juvenile valves up to 6 mm. are common in dredging in depths to 25 fathoms.

Previous records for the Texas faunal province are: 7, (as Callista maculata Linne) listed; 32, listed; 45, (as Macrocallista (Paradione) maculata Linnaeus) Mustang Island, Corpus Christi, Texas; 69, listed; 73, Port Aransas, Plate 4; 110, a few dead shells at Port Isabel; 136, reported from 8 stations between 5-9 fms off East Texas, alive at 9 fms; 145, dead on deep shelf; 170, transitional shelf assemblage (10-13 fms), alive; 174, listed; 206, beach records in Texas Conch., Vol. 4 (6), p. 43, (1968); 225, Galveston; 236, Galveston; 251, Yucatan shelf; 269, figured on page 206.

Records H.M.N.S.: 48 lots of which 6 contain live collected material always in sandy shelly mud bottoms.

Depth Range: 0-30 fms.; alive: 6½-12 fms.

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

Maximum Size: 78.5 mm. (beach shell South Padre Island).

Eastern Pacific Analogue: Not in Panamanic Province.

Genus Gouldia C.B. Adams, 1847.

Small, long lunule, subdued color pattern, radial sculpture present.

126. Gouldia cerina (C.B. Adams, 1845).

Thetis cerina C.B. Adams, Proc. Bost. Soc. Nat. Hist., p. 9, 1845.

This, the most numerous and most ubiquitous of all N.W. Gulf of Mexico Venerids, is rarely found on our beaches. It seldom enters the bays, but can be dredged often in large numbers in offshore waters along the entire Texas-Louisiana coast. It is an easily recognizable small bivalve with a surface sculpture reminiscent of that of Semele bellastriata and as in that species, the cancellations are quite variable in intensity. Usually Texas specimens are a dull yellowish color but not rarely, specimens with dark brown blotches and somewhat more uncommonly with triangular zig zag of dark brown occur. A carmine red blotch of color is often present on the inside under the umbo. The species is widespread in offshore waters both in mud and sand bottoms, Miocene shale, algal reef, coral reef and ranges down to about 30 fathoms. Juvenile specimens abound in most dredge samples. Taken on the beaches at South Padre Island (rafted ashore on whipcoral) and at Port Aransas and one specimen was dredged from the Matagorda Bay.

Previous records for the Texas faunal province are: 136, reported from 5 stations off East Texas, alive at 9 fms; 145, deep shelf; 147, alive on Baker Bank and Big Southern Bank; 156, listed as Gafrarium cerina for Stetson Bank; 170, transitional shelf environment; 175, intermediate shelf 12-35 fms., sand bottoms, abundant whole coast; 201, mudlump fauna; 206, beach records, Texas Conch., Vol. 4 (6), p. 43 (1968); 214, Campeche Bank, 218 and 225, Galveston; 251, Yucatan shelf; 253, on reef off Padre Island.

Records H.M.N.S.: 98 lots of which 20 contain live collected material.

Depth Range: 0-70 fms. (alive: 6-30 fms.) in sandy mud, algal and coral rubble, mud and sand.

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

Maximum Size: 11.5 mm. (usual size about 9-10 mm.).

Eastern Pacific Analogue: Gouldia californica Dall, 1917, "Gulf of California to Panama, offshore in depths to 160 m" (Keen, 1971).

REVIEW: SALT WATER AQUARIUM

Perhaps we can divide the community into those who have salt water aquariums, those who have tried and finally; those who haven't attempted it as yet. "How to Set up a Salt Water Aquarium" in the February issue of Texas Parks and Wildlife written by Rick Pettit, starting on page 29, is an interesting, practical article which is clear enough for me to follow. The author recommends an aquarium with at least 20 gallon capacity filled with synthetic sea water prepared by dissolving purchased salt in fresh water. An extended conditioning period of several weeks allows the accumulation of bacteria on the filter which destroys ammonia which is produced by aquatic animals and is toxic to them. Then, and only then, is it possible to introduce fish or invertebrates gradually and carefully. The complete article should be read by anyone considering a salt water aquarium. A local source of additional information mentioned is Hawaiian Marine Imports at 465 Town and Country Village.

A BORING FIND

by John Ogle

Specimens of Ostrea equestris Say, 1834 collected from oil platforms 12 and 29 miles south of the Galveston Lighthouse were found to be bored by date mussels. Utilizing SCUBA, oysters were collected from the pipes of the two oil platforms at depths from 6 to 21 meters. Three to five Lithophaga bisulcata (d'Orbigny, 1842) averaging 12 mm, greatest dimension, were found in every O. equestris examined. In addition a specimen of Lithophaga aristata (Dillwyn, 1817) 24 mm was found.

Both species of mussels are reported as occurring from North Carolina to Brazil by Abbott (Van Nostrand Reinhold Company, 1974) and from a station 107 miles southeast of Galveston by Turner and Boss (Johnsonia 4:81-116, 1962). Ode and Spears (Tex. Conch. VI (6): 59, 1970) report L. bisulcata from Galveston but list L. aristata as unreported from Galveston beaches.

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SHELL BOOKS OF THE RECENT PAST

SHINTARO HIRASE: A Handbook of Illustrated Shells in Natural Colors from Japanese Islands and their Adjacent Territories. Revised and enlarged edition of A Collection of Japanese Shells (1934). By Isao Taki, 1951.

This book probably is the first and the prototype of the successive shell books in color published by Japanese authors. One hundred and thirty color plates beautifully illustrate the shells. The names, sizes and locality are in English and are readily identifiable with the pictures.

The Hirase collection of Japanese seashells including many type specimens were destroyed during the war. However, the "printing blocks of the color plates" were kept in safety elsewhere. Thus, the photographs are the only records of those specimens which Hirase himself had selected as the most striking ones from the collection that he and his father had put together.

AMU ANNUAL MEETING SET FOR AUGUST AT OHIO STATE

The 42nd annual meeting of the American Malacological Union will be held on the Ohio State University campus at Columbus, Ohio, August 2-6, 1976. The opening session will be at 7:30PM on Monday, August 2, with an informal social at 4:00PM preceding the formal session. There will be formal sessions of papers Tuesday through Thursday, ending with a business meeting on Thursday. Evening activities include Conservation Committee and Executive Council meetings on Tuesday, Shell Club Night and Literature Auction on Wednesday and the Banquet on Thursday. A field trip is being planned for Friday.

Housing will be in the North Residence Halls, and registration for the sessions and for the housing may be made before July 1. Complete information on this may be obtained by calling either Margaret Baldwin who has the club's packet of information sent out by the AMU's 76 meeting committee, or by contacting Constance Boone, our member, who is also Recording Secretary of AMU.

Tom Rice's publication of a series of checklists of stamps showing marine life in four consecutive issues of OF SEA AND SHORE must have generated a tremendous amount of interest among the readers - particularly among those who enjoy both hobbies of conchology and philately. Entitled "A Checklist of Aquatic Life on Postage Stamps", the articles appeared in the issues for Vol. 6, No. 2 (Summer) 1975, Vol. 6, No. 3, (Fall) 1975, Vol. 6, No. 4 (Winter) 1975, and, Vol. 7, No. 1 (Spring) 1976.

The checklist is arranged by countries producing the stamps. For each country, the stamps are identified separately under subject classification of mollusks, birds, fish, plants, coelenterates, plants, mammals, crustaceans, echinoderns, reptiles and miscellaneous. The date of issue, the subject matter, value, and both Scott and Minkus catalog numbers are shown. The most significant aspects of these articles are the photographic representations of the stamps, many in color, that accompany the checklists. The visual impact of the beautiful stamps is outstanding. In the last article, the author has updated the lists. He indicates editorially that he has undertaken the monumental task of keeping these lists current.

Over the years, we have published in the pages of THE TEXAS CONCHOLOGIST a series of comments and lists of seashells on stamps. The issues in which they have appeared are listed below:

Volume III	No. 6	January	1967
IV	7	March	1968
V	5	January	1969
V	6	February	1969
V	7	March	1969
V	8	April	1969
VI	4	November	1969
VI	5	December	1969
VIII	6	February	1972
X	2	September	1973
XI	3	March	1975
XI	4	June	1975
XII	1	September	1975

At the time the above articles were prepared there were no comprehensive lists available in print. About the only interesting and informative of the early articles was the one written by Elmer J. Binker, Jr., and published in SHELLS AND THEIR NEIGHBORS, June, 1964. Even now, published lists of seashells on stamps would appear to be extremely scarce.

The initial impetus to generate a good checklist was catalyzed by correspondence with shell-collector stamp-collector hobbyists Paul Schoen in Jacksonville, Florida and George Major in Little Rock, Arkansas. Both of these colleagues have since died. Subsequently, two dealers, Richard Petit and John D'Aiuto had helped to rekindle some of the old enthusiasm.

Now, with the appearance of the comprehensive checklist compiled by Tom Rice, there is little point in concocting competitive lists which would necessarily duplicate most of the information tabulated. Instead, it is intended to explore in the future the various directions in which the conchologist who collects seashell stamps could expand his interests. Basically, philately should involve more than the simple collection of stamps. For full enjoyment of his hobbies, it is proposed that the collector could examine in depth the background of the stamp issue and the scientific, economic and even political implications of the depicted design.

As a starter, there is in preparation a review on pearls and the pearl industry as pictured philatelically. Several countries have shown pearls, pearl oysters and pearl farming scenes on stamps. The extent of these activities, the geographic distribution of pearl bearing oysters, the chemistry and practical utilization of mother-of-pearl would seem to be interesting subjects to delve into.

Itemized below is the final list of shell stamps that have accumulated in the past few months.

	Country	Face Value	Scott Number	Mollusks Depicted
401.	Russia	4k	4344	Salt water shell
402.	Grenada	½¢	652	Leafy jewel box
403.		1¢	653	Emerald nerite
404.		2¢	654	Yellow cockle
405.		25¢	655	Purple sea snail
406.		50¢	656	Turkey wing
407.		75¢	657	West Indian fighting conch
408.		$1	658	Noble wentle trap
409.		$2	659	Music volute
410.	Thailand	75s	749	Mytilus smaragdinus
411.		1b	750	Turbo marmoratus
412.		2.75b	751	Oliva mustelina
413.		5b	752	Cypraea moneta
414.	Samoa	30s	423	Pu shell horn
415	Congo Republic	10fr	344	Shell money

DUES PAYABLE NOTICE

Dues for the 1976-1977 fiscal year of The Houston Conchology Society are now payable. Our fiscal year is July 1, 1976 to June 30, 1977.

Please mail your remittance along with the form stapled to this issue to:

Houston Conchology Society
c/o Mr. James C. Sartor, Treasurer
5606 Duxbury
Houston, Texas 77035

According to our practice, a membership list for the next year will be drawn up by September 1, 1976. Names on that list will continue to receive the Texas Conchologist. Names not included will not receive the December issue. Please pay your dues and continue to receive your copy of the society publication without interruption.

Editor

HOUSTON CONCHOLOGY SOCIETY, INC.

1966-77 Officers

President: Mr. Wilson B. Ward, P. O. Box 26341, Houston, Texas 77207 (645-9938)
Program Vice-President: Mr. Frank Van Morkoven, 4923 Loch Lomond, Houston, Texas, 77035 (667-2479)
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Texas CONCHOLOGIST

VOLUME XIII, NO. 1 SEPTEMBER, 1976

FIELD TRIP REPORT

by Margaret Baldwin

Forty-seven members of the Club began gathering at Mustang Isle Apartments in Port Aransas on Friday afternoon, September 10. After a tasty weiner feed planned and served by Dr. Pulley, it was dark enough to go for a beach walk with lanterns. We found tiny Littorini and a few Melampus on the jetty, but little else. Later we went to the bay, but the shells must have been hiding. We did see a lot of dead ones occupied by very active hermit crabs!

Saturday we were up at seven for an ample breakfast in Dr. Pulley's apartment. Then we caravanned to the pecten beds near Corpus Christi bridge. Argopecten irradians amplicostatus were plentiful, lying in the grasses, and we collected buckets-full to be used for Sunday dinner. Those who sat in the water and felt around the base of the grasses were rewarded with delicate Amygdalum papyrium, two species of Anachis, Laevicardium mortoni and Bulla striata. Dr. Pulley screened sand in a large box to find Mulinia lateralis, two varieties of Tellina, young Mactra fragilis and Cyclinella tenuis. Living on the pectens were at least two kinds of Crepidula. On our way back for lunch we stopped to collect Donax variabilis on the Gulf shore. They live by the thousands at tide line and by screening sand we had a big bucket-full in a few minutes.

That afternoon several crews went to work to boil the pectens and prepare the meat for Sunday's feast. Then we set out to explore the rocks along the ship channel. Charlie Doh dived for rocks that Dr. Pulley showed us how to break open to find Gregariella coralliophaga, Botula fusca, Rupellaria typica and Lithophaga bisulcata. Ruby Ray lifted out rocks that also held Thais, Siphonaria and Anachis. After a pleasant hour or two everyone returned to clean up and do as they wished for the rest of the day.

Sunday after another good group breakfast we headed for the bay flats to dig for angel wings. New shellers had to learn the difference between the slanted siphon holes of Tagelus and the vertical ones of Cyrtopleura costata. To the delight of all, each person had the unique experience of digging at least one specimen. We also found Cerithium in the grasses and a few Neritina, Odostomia and Pedipes mirabilis.

We gathered on the terrace to enjoy a delectable meal of broiled scallops and shrimp creole before leaving for home. Everyone agreed that it had been a wonderful weekend. We learned a lot about where and how to collect, besides having the fun of finding a variety of shells ourselves. Many people expressed appreciation for the good fellowship and his excellent, well-planned meals. Thanks also go to the Courtades and to Constance Boone for a smoothly-organized and highly successful outing. Let's do it again!

The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc., and is published quarterly at Houston, Texas and is included in the membership dues.

The society holds meetings the fourth Wednesday of each month except June, July and December at 8:00 p.m. in the Houston Museum of Natural Science.

The TEXAS CONCHOLOGIST is mailed, postpaid, to regular members of the society, with the exception that only one copy is mailed to a family. Overseas members will be charged the additional postage required at the beginning of each fiscal year (June).

RATES AND DUES

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EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Odé
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

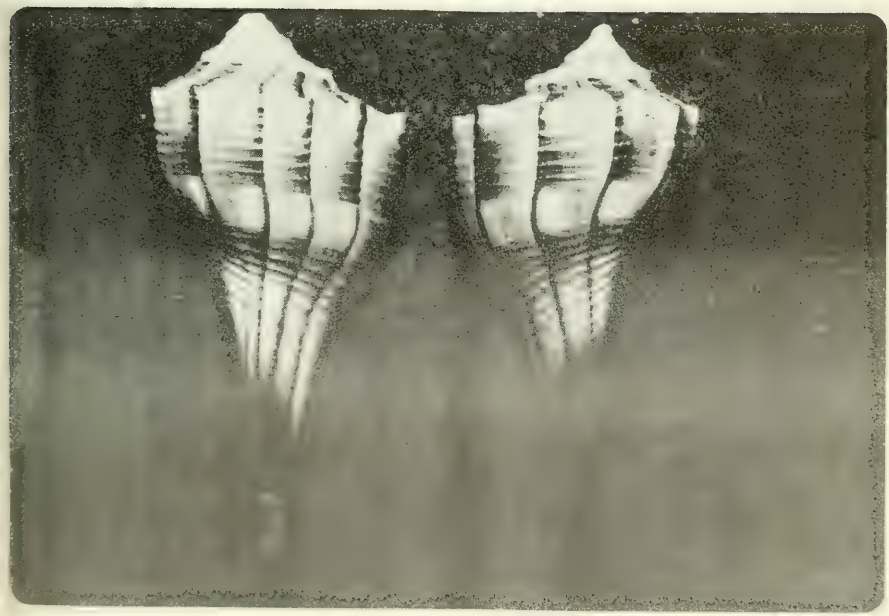
W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double-spaced and should be submitted to the editorial staff.

Fig. 1. Busycon perversum (Linne, 1758), a rare find of live specimens of both the normal left-handed, or sinistral, and the extremely uncommon abnormal right-handed, or dextral, animals. These three inch "twins", so identical in size as to make one think they could have come from the same egg case, were collected June 9, 1976, at 5:00PM at low tide in one foot of water on a mud flat near Blind Pass, bayside, at Sanibel Island, Florida, by Mrs. Jim (Sandra) Clark, a novice collector and a new member of the Houston Conchology Society.

Fig. 2. Busycon perversum (Linne, 1758) dorsal views of two shells seen in Figure 1, showing the brown striping exhibited by young Busycon shells of this species. We note to members that this species is often listed as Busycon contrarium (Conrad, 1840), a name given a fossil species by Conrad. Right handed specimens of B. perversum have been reported and known but no studies have been made of animals of such specimens. Sandy Clark is keeping the specimens alive at home and feeding them Donax. The animals will be preserved for study.

Photos by Constance Boone



A MEMORIAL TO BILL

On June 21, 1976, our member and friend, William M. Ray, husband of Ruby Ray, died of cancer at his home, 5010 Westbriar, Houston, Texas.

Bill was a faithful member of the Society, led to participate so actively, probably, by his wife who fell in love with shells after seeing our show at Sharpstown Mall in 1972 and after honeymooning at Cozumel Island with Bill where they saw live shells. Ruby and Bill joined the Society in January, 1973, and missed few meetings until Bill became ill last year.

While Bill didn't collect shells as ardently as Ruby, he offered his business experience to help solve problems for the Society and his practical suggestions were very valuable. There was no doubt that Bill loved the sea and its creatures. For years he has been a fisherman and owner of a "camp" at Bay Harbor near San Luis Pass, Galveston Island. Ruby and Bill spent almost every week-end there during their marriage. Bill loved watching the birds and was always interested in every mollusk or other sea animal Ruby brought home. His natural instinct was to ask questions that demanded answers from those of us who happened to be there when something new was brought in from a collecting trip.

Therefore, it seems very appropriate that members who knew Bill and the Society which wishes to remember Bill have set up a proper memorial in our library. We have had Volume VI, Mollusca 1, of The Invertebrates by Libbie H. Hyman, a classic in biology, but there are five other volumes dealing with invertebrates from Protozoa through Echinodermata and smaller Coelomate groups. All five of these volumes and a new copy of Mollusca 1 have been purchased and will be placed in the Houston Conchology Society's library at the Houston Museum of Natural Science. They will be our memorial to Bill.

SEARCH AND SEIZURE by Constance E. Boone

Last spring I began to hear stories from the Port Aransas area that the common bay pecten was back in large numbers. Having never satisfied my own collecting for this species, I began to ask questions about the locality of beds of such pectens in the bays. I tried on several occasions in early spring to tramp the grass beds near Port Aransas but tides were not right for me to get very far by wading. In April I happened to see some nice large pairs, beautifully cleaned, taken by several of our members who are also members of the Conchology Group of the Outdoor Nature Club and had been on a field trip to the Port Aransas area.

I had also learned that dredge operations connected with the building of off-shore drilling platforms near the ferry to Port Aransas had caused many pectens to be thrown up on sand spoil piles and that collectors were finding the shells there. Leola Glass tried to get into this area, but was turned back as it was by then closed to the public.

Knowing I was going to the Port Aransas and Rockport area in July, I called Leola at her apartment on Port Aransas (she's lucky enough to stay there a month or so each year) and asked her to check out once again some of the bits of information I had been given earlier. I was determined to find those pectens.

To recap for members, I mention here that some of the Houston Conchology Society members in the years before 1967 know well that beds of Argopecten irradians amplicostatus Dall, 1898 were common in the Aransas Bay and Corpus Christi Bay areas, as well as farther south off South Padre Island. Though I collected some in those years and even found a few in the Galveston area, I never did get into the big beds. Then hurricane Beulah hit the coast and the damage to the bays with the accompanying rain and continuing rain for months changing salinity killed out marine grasses and killed mollusks too. For some years the bay pectens had declined in the Galveston-Freeport area because of housing developments, canalization and other pollution factors which caused the disappearance of sea grasses. My own records show only a few very small specimens found in the grasses in Christmas Bay. They have not come back in abundance in this area to my knowledge.

A number of us found small specimens in recent years at South Padre Island. Last fall I was told that beds of pectens were showing up again in Laguna Madre near Port Isabel.

This species has been a food source for many years. I don't know if it has ever been a major one in Texas. I expect that it is collected by fishermen and the few others who know the taste of scallops. On the East Coast of the U.S. and on the West Coast of Florida the other two subspecies, Argopecten irradians (Lamarck, 1819) and Argopecten irradians concentricus (Say, 1822), are collected avidly for food. In North Carolina, and probably elsewhere where the pectens are abundant, there are collecting restrictions designed to allow the pectens to multiply and develop to sizes considered legal for gathering. This pecten lives only two years, according to published reports.

Fig. 2. A closeup of specimens of Argopecten irradians amplicostatus Dall, 1898, shows the strong white adductor muscle that holds the two valves together but also allows the species to open wide. It is this muscle that makes delicious eating. Blue eye eye spots are found in each scallop of the shell edge.

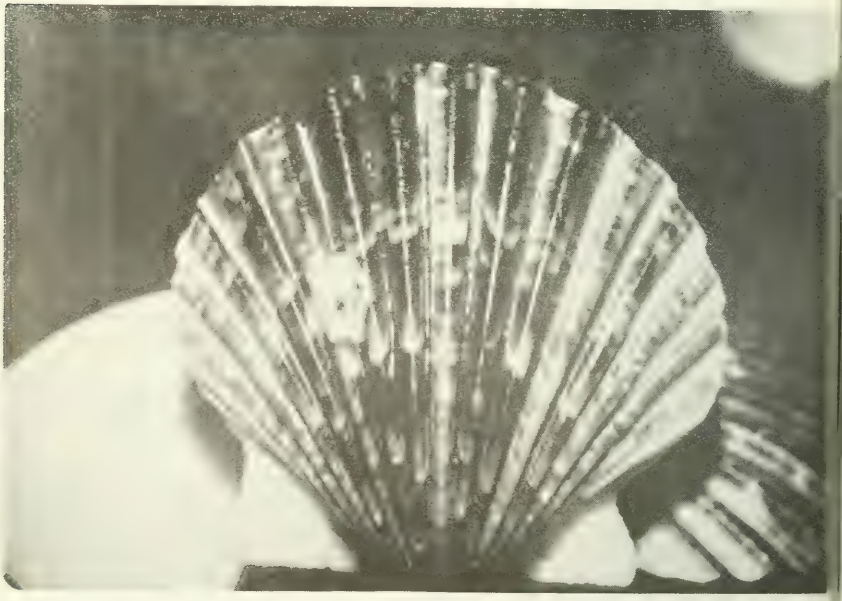


Fig. 3. A cleaned specimen of Argopecten irradians amplicostatus exhibits the mottling of colors which range from white to gray and red. This specimen measured two and one-half inches in breadth.

Photos by Constance Boone

Leola and I headed first to the Port Aransas bay flats. We found many valves washed up and picked these up for the club, and then we investigated the grasses. We did not find live pectens, though occasionally a dead pair, very dead with worm tubes and barnacles, was found. We next went to the N. Padre Causeway bridge area (Flour Bluff Causeway area to the North Padre Seashore). We found stranded live specimens on shore and started out to the grasses, confident of finding a true bed of pectens. Going no deeper than thigh deep, we "bumped" pecten after pecten, filling our buckets. By bumping I refer to my favorite method of collecting pectens when the water is murky and grasses are thick. I am cautious to shuffle my feet in heavy grasses as this is the favorite hiding place for sting rays and crabs. I do not want to be "hit" by either. By shuffling my tennis-clad feet and moving slowly in grasses I "bump" objects and then reach down to recover them. That day most of the time the objects turned out to be lively, snapping pectens. I simply never tire of seeing the beautiful design of scallops on the two valves and the gorgeous blue eye spots in each scallop. I do enjoy putting the specimens in water and observing the animals as they clap their valves together and propel themselves through the water. I refer you to the little book, Seashells, by R. Tucker Abbott, which on page 135 has a color picture of a living bay scallop, not our subspecies but the same species.

Leola and I took our scallops home and boiled them quickly to remove the muscle, the white portion of the animal holding the valves together, for eating. This white three-quarter-inch chunk of meat is delicious however you wish to prepare it. By the time you see this in print I am hopeful some of you have collected the pectens at this same locality and have eaten some of them also. This was scheduled to be part of the field trip to Port Aransas September 10, 11, and 12, weather and tides co-operating.

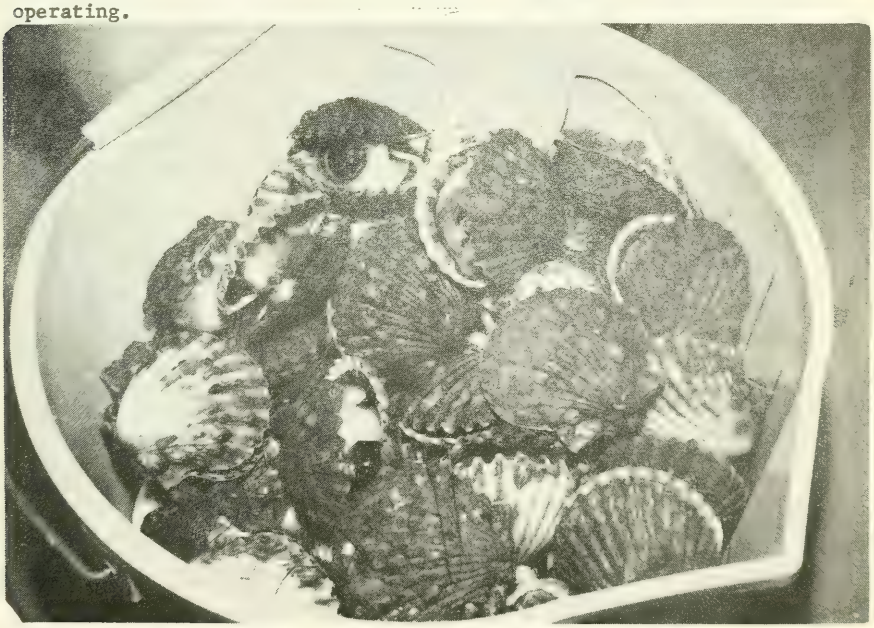


Fig. 1. Argopecten irradians amplicostatus Dall, 1898 collected by the bucketful by Houston Conchology Society members in July, 1976, near Corpus Christi, Texas, in grasses in the bridge area to the North Padre Island Seashore. This species is sought for food.

Our subspecies is a fatter version of this species. Most of our specimens are about two and one-half inches as adults, but a few go to three inches. They are usually gray-brown-speckled white-reddish hued on the top valves. The bottom valve is usually all white but sometimes the umbonal area has sprinkling of brownish red color. These specimens found in July seemed to me to have more underlying color of red than I have noticed before. Maybe I have never had this many to look at before. However, it now makes more sense to me to understand why so many top valves weather to red or orange as we find them on the gulf beaches. I have never heard of anyone finding our subspecies with solid color of orange or yellow as both the other two subspecies are colored occasionally (and much sought by collectors). Both Leola Glass and Carol Courtade have been successful in finding a number of yellow and orange pairs live in West Florida bays. Leola tells the story of chasing one little yellow one that swam ahead of her after she had disturbed it. (Yes, she caught it.) My very first time to collect this species in Florida I found a lemon yellow one and thought for a long time I had a different species.

The Texas subspecies is not only a fatter species but it has only 12 to 17 ribs, less than either of the other subspecies. These ribs are high and somewhat squarish. The subspecies range from west of the Mississippi into Mexico. For a comparison of the three subspecies, I refer you to the drawings and pictures in the Guide to Field Identification Seashells of North America by R. Tucker Abbott, pages 210 and 211. The Second Edition of American Seashells omits a picture of the Texas subspecies. In late July, Merle Kleb, Carole Courtade, Barbara Hudson, Ruby Ray and I returned to the pecten bed near Corpus. We gathered a large enough number of the species so that we will be able to include a specimen in the educational packs for the Museum exhibit next May. Never did I dream we would be able to supply this species in numbers. I had expected to supply valves and hoped we'd be lucky enough to get typical valves unweathered. Even these have been scarce. Now we can use the specimens as "specimen shells" with correct labels to demonstrate this for the public.

This article has been only on pectens, but members involved in the pecten hunts also collected other species in the grasses. One should be reported because of the large size. We found one and one-fourth inch live Bulla striata Bruguiere, 1792. Dead specimens of this size are common on southern beaches, but live ones are not common.

These sea grasses, incidentally, are not all the same, and I do not attempt identification here. For some years I have wanted to know the sea grasses and algaes to better describe habitats of mollusks and to help decide food supply for some species. The publication I sought was out of print but this summer has been re-printed. I refer to Peter Edwards' Illustrated Guild to the Seaweeds and Sea Grasses in the Vicinity of Port Aransas, Texas. It previously appeared in September, 1970, in Vol. 15 of Contributions in Marine Science by the University of Texas Marine Science Institute. It may be obtained now for $7.30 from the University of Texas Press, P. O. Box 7819, Austin, Texas 78712.

LIGHTED CASES ORDERED FOR MUSEUM SHOW, MAY, 1977

The Houston Conchology Society voted at the August meeting to order twenty-four lighted cases for the major shell exhibit to be staged at the Houston Museum of Natural Science the first two weeks of May, 1977.

As reported before to members, Dick Craven of Seguin has agreed to make the cases. Price for each case will be $40.00, completely finished with lights. The cases will be thirty inches deep by thirty-six inches wide with eight inches in the back and tapering to four inches at the front. Two cases, thus, will fit on a six foot rental table. The cases will be made of three-quarter birch cabinet plywood with a black felt bottom and double strength glass top. Solid brass hasp and hinges will be used. All exposed wood surfaces will be stained inside and out in a dark walnut. Case lighting will consist of two forty watt show case light bulbs at top back of the case with decorative plastic cover, switch, ten foot electrical cord, and plug.

Delivery will be made in Houston by March 1, 1977. The Society has sent in the required down payment of 25% of the order on placement of the order.

Members may purchase the cases and may order these now from the chairman. Most have already been sold, so do call soon. The cases will be assigned to exhibitors and used for the show first. Please do understand this. Individuals who purchase the cases will receive their cases after the show unless they are using them in special exhibits at the show. You must, however, pay for the cases by March 1.

Constance E. Boone, Show Chairman
Telephone: 668-8252

Merle Kleb and Barbara Hudson ask that members who wish to help in cleaning shells, purchased by the Museum for inclusion in the shell packs to be prepared for sale to the Museum and offered the public during the show next May, call them immediately so that the work can be done early during the year. You will be given Philippine mix to clean and clorox at home. Packing of trays will take place next spring. To this material we will add shells from any location, donated by members. We need all kinds and sizes of shells. Please co-operate in this project.

M. Kleb, Tel: 862-4409
B. Hudson, Tel: 469-0620

NEEDS FOR THE EDUCATIONAL PACKS OUTLINED

Margie Woods, chairman of the educational packs for the major show at the Houston Museum of Natural Science the first two weeks of May, 1977, is anxious to get started on her assignment and urges members to provide species of Texas shells for her use in the packs.

We especially need good pairs (especially medium sized pairs of large species) and live-taken or good dead specimens of the following species:

Anadara ovalis, Anomia simplex, Architectonica nobilis, Atrinas, Brachidontes recurvus, Bulla striata, Busycon perversum, Busycon spiratum (Texas ones), Cerithidea pliculosa, Crepidula plana, Dinocardium robustum, Hastula salleana, Janthina janthina, Littorina irrorata, Mercenarias, Murex fulvescens, Noetia ponderosa, Phalium granulatum, Polinices duplicatus, Sinum perspectivum, Spirula spirula, Tellina alternata, Terebra dislocata, and Raeta plicatella.

If you note that some of the species you think we ought to use are missing from this list, it is possible for you to supply other Texas specimens you have. We will not turn any down, but we have a good start for some species already and omit some in this critical list of needs.

You may bring the specimens to any meeting or call any of the committee members listed below for pickup.

Margie Woods, Tel.: 688-3937
Leola Glass, Tel.: 688-6830
Ruby Ray, Tel.: 621-4526

A new club for shellers is organized for the Dallas, Fort Worth, Texas, area. The North Texas Conchology Society had its first meeting July 21, 1976, in Richardson at the public library. Richard Fullington of the Dallas Museum of Natural History talked on shell collecting on the Texas coast. Anyone in that area may contact Mrs. Charles Tatay, 7216 Clearhaven, Dallas, Texas 75248, for information on the meetings.

In reading through some old issues of the Journal de Conchyliologie, I came across some short notes which, I believe, will be of some interest to our readers. The famous journal, which for many decades during the nineteenth century was filled with interesting articles by H. Crosse and P. Fischer, names which should be known to many of our readers, proved so interesting that I almost forgot the article I was looking for. No wonder. I suddenly realized in how direct a style, and in what clear and unambiguous sentences most authors expressed their thoughts. The quality of the articles, due in no small measure to the excellence of its editors, is by no means inferior to what is produced today. Today, although our information about all aspects of conchology may be much more extensive, although the scope of subjects treated may be wider and perhaps often more interesting and although the technical outlay of our publications may be much more sophisticated especially as far as photography and allied techniques are concerned, nevertheless, I feel that sometimes the more serious and often somewhat pedantic tone in modern scientific reporting constitutes a loss in readability. The old journals did not feel the need to employ the heavy professional jargon so often met with the present day professional reporting.

The first note here translated from the original French in the Journ. de Conchyl. Vol. 13, p. 68, 1865, comes from the pen of H. Crosse who reported on "The Intervention of Molluscs and Cirrhipeds in the American Conflict" (cirrhipeds = barnacles). It came to me somewhat as a surprise when reading it to see conchology, which in my mind has somewhat of a timeless nature, so intimately interwoven with the mundane affairs of men. The translation, somewhat freely abbreviated here and there is as follows:

> "The latest American journals have disclosed a rather curious scientific fact, which is sufficiently related to natural history that we may relate it here. One knows that the main passes of Mobile Bay have been reinforced by Confederates by means of destructive devices known as torpedoes (nowadays, we would say mines) and set up in such a way as to explode under vessels which would touch them when passing over. After some time, the metal enclosure of these terrible machines is covered to such a degree and encrusted by sessile molluses and balanoids that the motion of the exterior pin whose sudden release causes the explosion, has in most cases become impossible. This unforseen intervention has greatly facilitated the naval operations of the admiral who commanded the forces of the North in these regions and perhaps saved him from disaster. Thus, also the molluscs give their opinion in the American conflict: they oppose the war. If the members of the congress, now that the war is over, were not so busy quarrelling amongst each other, they would have a fine occasion to bestow some "diplomes d'honneur."

The next article to which I will draw attention is one by P. Fischer entitled "Note sur les faimes Conchyliologiques des deux rivager de l'osthme de Suez" (Note concerning the mollusc faunas of the two sides of the Isthmus of Suez), Journ. de Conchyl., Vol. 13, p. 241-248. When the modern reader persues this paper he must be struck by the forthright manner in which scientists used to give

their opinion about the work of their colleagues. If that work was poor or sloppy, they would not hesitate to say so. Nowdays the method when discussing a poor paper, is either to say nothing or to be extremely brief and noncommittal. This may be political but is is unfair to those whose excellent contributions to science are not reviewed. I cannot imagine that in a critical review nowdays, a previewer would dare to write (p. 242): "Audouin (the name of the author whose work is being discussed) has undertaken to finish the interrupted work of Savigny (who lost his eyesight) and the study that he has produced is an tissue of errors and gross mistakes: Audouin does not recognize even the best characterized species and mixes up quite different forms. Let us hope that Mr. Deshayes soon will repair the damage done to the work of Savigny by his pretended successor."

Concerning the study itself, I may remark that Fischer is one of the first authors to refer explicitly to the occurrence of identical species on both sides of the Isthmus of Panama, (p. 243), although more than a century ago he could have no inkling how many species the Caribbean and Panamanic Province have in common. In consequence, he uses the very low number of common species as an argument to reinforce his thesis that there are no common species in the Eastern Mediterranean fauna and the fauna of the Red Sea. For us, the rather striking equality of Caribbean and Panamanic faunas and the striking inequality of the Mediterranean and Erythrean fauna's is more easily understood having the advantage of a century of geologic insight. The Red Sea is an ocean in its initial stages of formation and which during the recent geological past was not in direct communication with the Mediterranean, whereas the Isthmus of Panama was, geologically speaking, recently formed. Fischer comes to the conclusion that Philippi's comparison of the Red Sea fauna and the Mediterranean fauna which led him to believe that they had about 20% of the mollusc species in common is completely erroneous: "There is in my mind no shadow of a doubt that both faunas have no shell in common," (page 245).

Finally, I may refer to a much later short review of Crosse (Journ. de Conchyl.,Vol. 42, p. 146, 147, 1894, in which he discussed a note by Dall concerning the publication dates of Conrad and of Lea, two well known adversaries in American Conchological history. Although familiar with this scientific controversy, its depth was unknown to me. This was somewhat comparable in its vicious intensity to the fight, fortunately largely ignored in America, over the mechanical causes of salt dome formation, which shook Western European geologists around the beginning of this century and which produced some of the most sarcastic language one may read in a "scientific (?)" paper. Crosse writes: "One of the combattants, more wealthy than the other, abused this advantage to buy up all available copies of the "Fossils of the Tertiary Formation" and to destroy them, which certainly constitutes a very reprehensible behavior, unworthy of a naturalist. In this purely American battle the number of "scalped copies" must have been considerable which contributed in no small measure in making the two works of Conrad very rare and which caused much obscurity over the problem of priority, debated between the two antogonists, whose publications appeared almost at the same time and whose diagnoses often apply to the same species."

SHELLING ON CULEBRA ISLAND by Margaret Baldwin

Having read an article praising the fine beaches and quiet atmosphere of Culebra, a small island off the east coast of Puerto Rico, we decided to try it. We flew to Miami, then to San Juan. From there a sturdy eight seater plane took us low along the northwest coast of Puerto Rico and out past coral-edge islets. We landed neatly on a small air strip close to Dewey, Culebra's only settlement. Met by Jack Vincent, owner of Villa Boheme, we piled luggage and ourselves into his ancient dune buggy and rattled into town to buy supplies from depleted shelves in a small grocery. The ferry had broken down two weeks before, so we had to be content with dry milk, crackers and canned items. Our quarters included a screened kitchen and dining area built on a little dock overlooking the harbor. Jack said we could use the dinghy and a small motorboat - also, the dune buggy and jeep. His wife Matilda loaned me a huge palm-leaf hat which proved a blessing.

The island is only eleven square miles, its hills heavily overgrazed and extremely dry. Somehow the rain often bypasses Culebra. They had to build a desalinization plant and the taps are turned off from midnight to 7:00AM to conserve water. Although the interior leaves something to be desired, Culebra's shoreline indeed is unpopulated, beautiful and clean; the water delightfully clear and warm. The air temperature remained in the mid-80's during our stay, but the humidity never reached that in Houston and the constant trade wind kept us comfortable, even in full sun. We quickly learned to wear shirts, long pants and sneakers everywhere - necessary protection against sunburn, sea urchins, coral and rocks.

That first afternoon we explored the shore of Sardinas Bay near Dewey, finding on the rocks many large chitons, three kinds of Tegula, Leucozonia nassa, L. ocellata and countless Planaxis nucleus.

Next day we drove the dune buggy to Flamingo Bay and walked a good way west over rough rocks splashed with oil, the result of U.S. Navy ships cleaning out their tanks in the open sea. The cliffs in this area were targets for gunnery practice till last year, when the Navy ceased using Culebra and its waters as a training ground. Snorkeling over dead coral rubble proved unrewarding, except for the spiny lobster Lisle caught - a gorgeous creature patterned in black and yellow. So we headed for the other side of Flamingo Bay and discovered enchanting coral gardens there, a fantasy in form and color. Fish with bizarre shapes and markings paid no attention to us. We floated among them till the sun dropped low. I found a perfect Epitonium lamellosum in the rocks and a live Conus mus.

Next day we drove across the island of Playa Largo on the north shore and explored the reef, wading in a few inches of water at low tide. By examining and turning chunks of dead coral, we found lots of Astraea caelata, a few Astraea tuber, young Cittarium pica, Tegula and three kinds of Thais - all live. On the eel grass closer to shore were Cerithium litteratum and Turbo castanea. The rock shelves

near tide line were jeweled with hundreds of brightly-marked Nerita peloronta, N. variegata and N. tesselata. Nowhere else did we find bleeding tooth nerites with such distinct and varied patterns.

Another day we went further down the beach and around a point to the lovely bay of Puerto del Manglar and were thrilled to find two live trumpet tritons and a pretty Fasciolaria tulipa in the warm shallows. Dozens of ugly foot-long sea slugs in morbid shades of red and green lay extended in the eel grass and we saw several sea hares languidly flapping along - such queer creatures. After digging live Heterodonox bimaculatus from a sand slope near tide line and picking up a sack-ful of fresh-dead Codakia orbicularis, we had lunch in a coconut grove and rested in its shade.

One day we took the sailing dinghy to the mouth of Ensenada Honda to experiment with our small dredge and to practice fanning the sand in three to four feet of water. Lisle has good luck with both. He collected a handful of elegant netted olives (O. reticularis), another of large Bulla striata and a couple of Polinices lacteus. We also found Pinna carnea, Vasum muricatum and colorful young Strombus gigas, some with long spines, others only with knobs. We sailed home under a flaming sunset sky and I stayed up till midnight cleaning shells!

One of our favorite beaches was Tamarind Bay. The coral gardens here, though quite different from the ones in other places, were just as fascinating. We saw game fish here and Lisle nearly stepped on a stingray. It was exciting to find flamingo tongues (Cyphoma gibbosum) on searod gorgonians and sometimes on sea fans. Lisle collected two of an uncommon species (Cyphoma signatum), its mantle decorated with crowded black lines. By fanning he uncovered some Linga pensylvanica and a large Tellina fausta. I enjoyed probing coral crevices for Astraea phoebia and Acmaea antillarum. On the rocky shore we collected several kinds of Periwinkle, Purpura patula and most interesting of all, Lima scabra and the more delicate L. scabra tenera. The animals are scarlet, their fringe of tentacles a showy sight. I also picked up a big glossy Tonna maculosa, a fresh-dead Cymatium pileare and a dainty pink Conus jaspideus verrucosus.

On our last day we went out with a driver to find Strombus gigas. Isabello let the boat drift about 100 yards off Zoni Beach while he and Lisle hung on with one arm and looked through their face masks for large conchs. Lisle said the sand 20-30 feet down was littered with conchs of all sizes. Isabello brought up about eight really large specimens and more small ones. We picked three with flaring lips and deep color. The rest he took home or gave to the Vincents. Matilda ground the meat and let us sample some of the tasty fritters she made.

We left Culbera reluctantly, loaded with close to 25 pounds of shells, happy memories and an improved knowledge of how to collect.

In the past several years I have had many dealings with shell dealers locally, throughout the country and many outside the country. I have never had any trouble with any of them as to what I'm ordering, quality, quantity, price, or when the order would be filled.

Recently, (April, 1976), some friends and I ordered several bushels of shell dredgings from an establishment on the East coast of Florida. Upon inquiring, we were told that these dredgings were from the East coast of Florida and we could order from various locations and depths. After paying for the order and sending several letters, (of which none were acknowledged), inquiring as to when the dredgings were to be shipped, several phone calls were made pertaining to this matter. We were told in July, 1976, that they had been shipped the first part of June but no invoice was ever received by us. After another phone call we were assured that the bushels had been shipped. In early September, 1976, the dredgings arrived but again no invoice was ever received by us. After arrival we were surprised to find that absolutely no locailty data or depth was given. To many shell collectors, the lack of locality data makes the material useless.

In the past several years I have gone through many bushels of shell dredgings from both coasts of Florida from depths ranging from 40 feet to 110 fathoms. My bushels on this particular order were to be from 80 fathoms, but from the material found I must say that in my opinion, this dealer has found a very unique area because these deep water dredgings contained many shells from normally shallow water.

I would like to make it clear at this point that I am not seeking restitution or advocating not dealing with this dealer. I am merely stating the facts as I know them and from them any future consumer can make up their own minds.

Anyone wanting further information on this matter, please feel free to contact me.

Frank Petway
2431 Brookmere
Houston, Texas 77008

DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN

THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph)

by H. Ode'

Genus Cyclinella Dall, 1902.
Much like Dosinia, but without anterior lateral teeth and incised lunule (Keen). Smooth margin.

127. Cyclinella tenuis (Recluz, 1852).

Dosinia (Artemis) tenuis Recluz, 1852. Journ. Conch. 3, p. 250, pl. 10, fig. 1, 1a. (4, p. 415, 1853).

This rather thin shell, much like a small Dosinia is fairly common along the Texas coast. It enters the bays (Timbalier Bay, Galveston Bay, Matagorda Bay, Corpus Christi Bay) and also lives on the shallow shelf. Never in large numbers and dredge samples usually yield only a few valves. It has been incorrectly placed in the genus Lucinopsis (=Mysia), which is Petricolid. Andrews cites from Abbott and Warmke a size of up to two inches, but it never reaches so large a size in the N.W. Gulf of Mexico (30 mm.). Beach specimens are somewhat uncommon but have been taken along the entire Texas coast. Although mature specimens resemble Dosinia somewhat in shape, a study of the hinge, especially of juvenile material, discloses that both genera are quite different. Juvenile Cyclinella have a peculiarly unequal "ventral margin" of the hinge plate, quite different from Dosinia.

Previous records for the Texas faunal province are: 19, (as Lucinopsis tenuis Recl.) Gulf beach; 21, (as Lucinopsis tenuis Recl.) listed; 45, listed for Texas; 98, listed for the bays; 110, fresh valves at Port Aransas; 145, listed; 153, listed; 156, Stetson Bank; 160, Matagorda Bay, dead; 164, Rockport area, alive in open bays, Laguna Madre, dead in inlet hypersaline environment; 170, listed for transitional shelf assemblage; 174, listed; 206, beach records in Tex. Conch., Vol. 4 (7), p. 50 (1968); 225, Galveston; 236, Galveston; 261, shallow offshore waters (Galveston); 269 figured on page 208.

Records H.M.N.S.: 43 lots of which two contain live material (Galveston West Bay).

Depth Range: 0-30 fms. (mostly in sandy mud), alive 0-0.5 fms.

Geographical Range: Virginia to Texas and to Brazil (Abbott, 1974). Surinam (Altena, 1971).

Maximum Size: 30 mm.

Eastern Pacific Analogue: Cyclinella singleyi Dall, 1902. "Scannon's Lagoon, Baja California, to the head of the Gulf of California and south to Panama, mostly beyond the low tide level especially in estuaries" (Keen, 1971).

128. Dosina discus (Reeve, 1850).

Artemis discus Reeve, 1850. Conch. Icon., 6, pl. 2, fig. 9.

This is a very common beach species, often washed ashore alive after stormy weather. It often lives near the inlets rather deeply buried in the sand and presumable in the surf zone all along the Louisiana and Texas coastline. Offshore it has been taken in deep dredgings, but I suspect that most of this material is of Pleistocene derivation. The species does rarely reach a size in excess of 80 mm. and thus is about the same as D. elegans Conrad, in size, but is flatter, thinner and much more densely striated. Juvenile specimens are difficult to separate from those of D. elegans. Rarely in the coastal bays.

Previous records for the Texas faunal province are: 7, listed; 15, common at Galveston and Corpus Christi; 18, Galveston and Corpus Christi; 19, Gulf coast from peninsula (Matagorda) to Corpus Pass; 21, listed; 45, Galveston, Corpus Christi, Tex.; 58, Padre Island; 61, listed; 62, Mustang and St. Joseph Island; 65, usually found in pairs, (Port Aransas); 66, Marine Pleistocene of Texas; 67, Port Isabel; 69, listed in Appendix 8; 73, Indianola, Corpus Christi, Port Aransas, Plate 3; 98, Padre Island; 110, in shallow water off all Gulf beaches, Plate 11, figs. 1, 2; 126, listed for Carolinian province; 135, alive in bays, alive in Gulf; 136, dead shells on East Texas beaches, offshore alive in 9, 8 and 6 fms; 143, Matagorda Bay; 145, upper sound, inlets, shallow shelf Mississippi delta; 153, listed in Table 1, 156, common on Stetson Bank (may not be living near bank now); 160, dead in Matagorda Bay; 164, in Rockport area, dead in open bay, bay margins, alive near inlets; 170, alive in shallow shelf environment; 174, listed; 175, listed for inner shelf 2-12 fathoms, common along whole coast; 206, beach records in Texas Conch., Vol 4 (7), p. 50, (1968); 208, listed for "shelf mud and silt","barrier face and bars" and "tidal inlet and influence environment"; 225, Galveston; 236, Galveston; 261, shallow offshore, Galveston; 269, figured on page 207.

Records H.M.N.S.: 33 lots, of which 8 contain live collected material (all from sandy beaches and inlets).

Depth Range: 0-43 fms. (alive: 0-1 fms.) The species is known alive from 9 fms off east Texas, and this is probably its maximum depth.

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

Maximum Size: 85 mm. (beach worn specimen).

Eastern Pacific Analogue: Of the three Panamanic species, none seem close.

129. Dosinia elegans (Conrad, 1844).

Artemis elegans Conrad. Proc. Acad, Nat. Sci., Phila 1, p. 325, 1844.

This species replaces D. discus in offshore waters. It lives along the Texas coast and probably Louisiana, but no material from the latter state is included in the collection of H.M.N.S. It is rare on our beaches except south of Corpus Christi where worn specimens are regularly found. In ref. 136, reported

from east Texas beaches, but the most easterly specimen we have is from Sargent beach. A specimen obtained from between the Freeport jetties is probably a trawler shell. Not in the bays, nor in the inlets.

Previous records from the Texas faunal province are: 7, listed; 21, listed; 32, listed; 45, "Texas"; 61, listed; 62, Mustang Island; 69, listed; 110, a few dead shells from the Gulf beach at Port Isabel; 136, dead on beach of east Texas. Listed "alive" in final list; 170, listed for transitional shelf environment; 175, listed for inner shelf 2-12 fathoms; 206, beach records in Texas Conch., Vol.4, p. 50, 1968; 208, listed for "shelf mud and silt","tidal inlet and influence" (note: identification in error); 269, figured on page 208.

Records H.M.N.S.: 51 lots, no live, but only fresh material seen, (one lot from 51 fms. is probably adventitious).

Depth Range: 0-32 fms.

Geographical Range: North Carolina to Texas; Caribbean (Abbott, 1974).

Maximum Size: 80 mm.

Eastern Pacific Analogue: Dosinia ponderosa Gray, 1838, comes closest but reaches a much larger size. "Baja California to Paitu, Peru, offshore to 60 meters" (Keen, 1971).

Note: In references also D. concentrica Born, 1780, has been listed.

There is hardly any doubt that these reports are in error. Ref. 1 states: very common (at Galveston). Undoubtedly D. discus Reeve is meant. Ref. 67 lists the species for Port Isabel. This must be D. elegans Conrad, because the same reference lists also D. discus Reeve.

Genus Gemma Deshayes, 1853.

Small bivalves with crenulate inner margin. They are probably unrelated to the Veneridae. In Texas a single species of uncertain identity.

130. Gemma purpurea (H.C. Lea, 1842).

Cyrena purpurea Lea, 1842. American Journ. Sci., 41, p. 106, pl. 1, fig. 1.

This small species has been taken at a number of locations along the south Texas coast. One old valve was obtained in offshore dredgings and another derives from 36 fathoms from an algal reef off Louisiana. The Texas form is a rather thick shelled bivalve, with many closely spaced concentric ridges. The marginal crenulations are only visible in very fresh material. Abbott has suggested that this species is distributed by migrating waterfowl, but I believe that it is truly indigenous and probably is a descendant of what Olsson and Harbison have described as Gemma magna floridana ("Monograph 8", Acad. National Sci., Phila, 1953, p. 119, pl. 8, fig. 5). Texas specimens have little color, almost a faint pink bloch near the umbo can be seen. Mrs. C. Boone has collected live specimens at Port Aransas in the very superficial mud layers of mud flats. Dead valves have been collected also in Matagorda Bay (Indianola). The shape of this species is somewhat variable. The figure in ref. 269 shows a somewhat asymmetrical specimen, but usually its shape has the umbo more near the middle of the shell. Further comparison with material from the North Atlantic coastline is necessary and the status of such species as G. gemma Totten, 1834, G. purpurea Lea, 1842, G. manhattensis Prime, 1852, G. fritensis Rehder, 1939, Gemma magna Dall, 1902 and Gemma floridana Olsson and Harbison, 1953 should be evaluated.

Previous records for the Texas faunal province are: 18, Shamrock Cove, Corpus Christi Bay, not common; 32, Pleistocene of the Texas coast at Corpus Christi; 44, repeats 18 and 32; 55, (as G. concentrica Dall, 1889 (nomen nudum), listed; 165, listed; 206, beach records in Texas Conch., Vol. 4 (7), p. 50, (1968); 269, figured on page 209.

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

Depth Range: 0-36 fms. (alive at 9 fms.)

Geographical Range: If there is only a single species in the western Atlantic, then the range is from Nova Scotia to Florida and the Bahamas (Abbott, 1974).

Maximum Size: 3.6 mm. (Lydia Amn Channel near Port Aransas).

Eastern Pacific Analogue: Gemminae do not live in Panamanic Province.

Genus Parastare Conrad, 1862.
Close to Gemma, but more trigonal, higher (vertical dimension longer) ligament under beak.

131. Parastarte triquestra (Conrad, 1835).
Astarte triquetra Conrad, 1845. Proc. Acad. Nat. Sci., Phila. 3, p. 24, pl. 1, fig. 6.

A single valve of this well known Florida species was collected once at San Luis Pass, Galveston Island, from drift. It could be adventitious with waterfowl, because the species has never been dredged or found elsewhere or at other occasions. Abbott mentions the species with a question mark for Texas in his "American Seashells".

Previous records for the Texas faunal province are: 206, Beach records in Texas Conch., Vol. 6 (8), p. 83, (1970).

Records H.M.N.S.: One lot from San Luis Pass, Galveston Island.

Depth Range: 0-1 fms.

Geographical Range: Both sides of Florida (to Texas?) (Abbott, 1974).

Maximum Size: Not measured.

Eastern Pacific Analogue: Not in Panamanic Province.

Remarks:
A number of species has been reported in various sources for the N.W. Gulf of Mexico, which so far have not been found by us:

Chione (Chioniopsis) pubera Valenciennes, 1827. Ref. 56 lists "Texas" and also the new edition of "Tory Peterson's Field Guide" repeats this statement. Pulley (Ref. 110) has already expressed doubt about its occurrence off Texas.

Venus pilua Reeve (Ref. 7) for deep water. I do not know what species is meant (Divaricella?)

Chione pygmaea Lamarck, 1818. Listed for Yucatan (Ref. 214).

Gouldia insularis Dall & Simpson, 1901, listed for Yucatan (Ref. 214).

Pitar aresta Dall & Simpson, 1901, listed in Ref. 174.

Pitar fulminata Menke, 1830, listed for Baker Bank and Big Southern Bank by Ref. 147; for Stetson Bank (common), Ref. 156, and for Yucatan, Ref. 214. This may be the small Pitar helenae of the Pacific.

Pitar (Hysteroconcha) dione Linné, 1758. References to this species keep appearing and cannot be stopped, although I am certain that the species does not live in the N.W. Gulf of Mexico. It was first listed in Ref. 7, then in Ref. 15, repeated in Ref. 45 and finally in Ref. 56; all these are probably copied from the

original guess by Dall. The latest to repeat the reference is Clench in "Peterson's Field Guide" (3rd. edition, 1973).

Pitar albida Gmelin, 1792. Erroneously reported by me (Texas Conch., Vol. 9, (4), p. 80) from a mishappen specimen of P. Agriopoma cordatus Schwengel. Also, Parker (Ref. 175) has reported this species.

FAMILY PETRICOLIDAE

In the Northwest Gulf of Mexico, represented by the genera Petricola and Rupellaria.

Sources: M. Keen in Treat. Inv. Paleont., Part N., p. 688-689. Regteren Altena: Zool. Meded. Nat. Hist. Mus. Ryks University Leider, Decl. 45 (5), p. 75-76, pl. 1, figs. 4-6.

Genus Petricola Lamarck, 1801.
In our area there are two forms, one belonging to the nominate subgenus, characterized by fine devaricate sculpture and the development of a calcareous crust over the valves, the other to the subgenus Petricolaria Stolickaza, 1870, of elongate form with somewhat nodose radial sculpture.

132. Petricola (Petricola) lapicida (Gmelin, 1791).
Venus lapicida Gmelin, 1791, Syst. Nat., 6, p. 3269 (after Chemintz, Conch. Cab., 10, p. 356, pl. 172, figs. 1664-1665).

This small species has been uncommonly collected in the northwestern part of the Gulf of Mexico. A few specimens have been taken from cavities bored in larger shells (Murex fulvescens from Padre Island, coll. Odé) and live specimens were taken from in between byssus attachments of Arca umbonata at South Padre Island, where the latter species lives attached to rocks at the Coast Guard Station. Also at Port Aransas. Offshore P. lapicida lives on the submerged Pleistocene ridges off Freeport. It should be noted that here A. umbonata is living abundantly.

Previous records for the Texas faunal province are: 69, listed in Appendix 8; 192, Campeche Bank (not in our area); 206, Beach Records in Texas Conch., Vol.2, Issue (8).

Records in H.M.N.S.: 8 lots of which 2 contain live collected material.

Depth Range: 0-12 fms.

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

Maximum Size: Not measured.

Eastern Pacific Analogue: Not determined.

133. Petricola (Petricolaria) pholadiformis gracilis Deshayes, 1853.
Petricola gracilis Deshayes, Proc. Zool. Soc. London (no description), pl. 18, figs. 9, 9a. id. Cat. Conch. Brit. Mus., p. 214.

This common species, usually reported as P. pholadiformis Lamarck, lives along the entire Louisiana and Texas coast. In this region most fresh and juvenile valves show a purplish protoconch, which sometimes is abundant in beachdrift.

Specimens are long and thin, almost cigar shaped, and are quite different in appearance from those of colder Atlantic waters on the east coast north of Cape Hatteras. The same slender form apparently lives on the north coast of South America and we have followed Van Regteren Altena in naming the Texas form P. pholadiformis gracilis Deshayes. P. pholadiformis is here considered the cold water form. During the start of this century it was introduced, probably with oyster spat along the western European coast, where it has rapidly spread from France into the North Sea.

P. p. gracilis is a widespread and common burrower in soft muddy substrate and root masses along the bay margins of Louisiana and Texas coastal bays. Also reported from shallow offshore waters (east Texas). Pairs are often found in beachdrift.

Previous records for the Texas faunal province are: (references are all as P. pholadiformis Lamarck) 1, Galveston Island; 7, listed; 15, single valve somewhat common at Galveston and Corpus Christi; 18, listed; 19, Matagorda Bay; 21, listed; 45, repeats 1, 4, 18; 56, listed for Texas; 61, listed; 62, Mustang Island; 67, Port Isabel; 69, common along all the bay shores; 98, bays, beach Padre Island; 110, dead shells common on all Gulf beaches, living in Galveston and Aransas Bays, plate 11, figs. 6-7; 135, dead in bays; 136, in Beaumont Clay, exposed on beach, the most characteristic element, (East Texas fauna); 145, inlets; 146, levee assemblage; 159, Matagorda Bay; 164, dead in Rockport area; 170, shallow shelf assemblage; 174, listed; 175 listed for several assemblages; 206, beach records in Texas Conch,, Vol. 2 (6), (1966); 217, more abundant during spring and summer than during fall and winter (east Texas coast); 225, Galveston; 236, Galveston; 264, cites Galveston; 269, figured on page 214.

Records H.M.N.S.: 20 lots of which 3 contain live collected material.

Depth Range: 0-27 fms. (alive 0-1 fm.) but probably living to 10 fms. one lot from 27 fms. (a single fragmentary shell is probably Pleistocene).

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

Maximum Size: 45 mm. It does not reach the larger size of the cold water form and a size of 2 inches quoted in ref. 269 is not based on N.W. Gulf of Mexico shells.

Eastern Pacific Analogue: Petricola parallela Pilsbry and Lowe, 1932, Gulf of California, south to Corinto, Nicaragua, to 15 m.

Genus Rupellaria Fleuriau, 1802.
A more rounded shell, with strong radial riblets.

134. Rupellaria typica (Jonas, 1844).
Choristodon typicum Jonas. Zeits. Malak. 1, page 185.
Also Beitrage Mollusk., p. 1, pl. 7, fig. 3.
This shallow water species has been found at a number of locations offshore and along the coastal beaches. It is a borer and most occurrences are from rocks, although sometimes loose valves can be found in beach drift (Sargent, Port Port Isabel, Port Aransas). Seldom collected from the bays (Port Aransas). In our collection, no specimens from the Louisiana coast are present.

Previous records for the Texas faunal province are: 69, listed in Appendix 8; 110, "A few specimens were found burrowing in limestone rocks in the Port Aransas jetty", plate 11, figs. 8, 9; 135, alive in the bays (Parker and Lee); 174, listed; 206, beach records in Texas Conch., Vol. 2 (7), (1966); 253, listed; 269, figured on page 214.
Records in H.M.N.S.: 14 lots of which 3 contain live collected material.
Depth Range: 0-21 fms. (alive: 6-12 fms.).
Geographical Range: North Carolina to Florida and to Brazil (Abbott, 1974).
Maximum Size : 28.5 mm.
Eastern Pacific Analogue: Rupellaria robusta Sowerby, 1834. "Puerto Penasco and the Gulf of California south to Guayaquil Ecuador, boring in hard clay", Keen, 1971.

FAMILY COOPERELLIDAE

The simple hinge structure without lateral teeth is characteristic. In the Texas faunal province only a single genus Cooperella.
Sources: M. Keen in Treat. Invert. Paleont., Vol. N, pt. 2, p. 689-690.

Genus Cooperella Carpenter, 1864.
In general, rather thin somewhat quadrate shells.

135. Cooperella c.f. atlantica Rehder, 1943.
The only evidence for this species is a broken valve (ventral margin missing) which clearly shows a Cooperellid hinge. More material is required for confirmation. The remaining surface area is somewhat undulatory.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 1 lot, none alive.
Depth Range: 11 fms.
Geographical Range: Southeast Florida, Greater Antilles, Brazil (Abbott, 1974).
Maximum Size: In excess of 4 mm.
Eastern Pacific Analogue: Cooperella panamensis Olsson, 1961 comes closest. "Guerrero, Mexico to Panama", Keen, 1971.

SUPERFAMILY HIATELLACEA GRAY, 1824

FAMILY HIATELLIDAE

In the northwest Gulf of Mexico, represented by the genera Hiatella, Panopea and Saxicavella.
Sources: M. Keen in Treat. Invert. Paleont., Part N, p. 700-702

Genus Hiatella, Bose, 1801.
Somewhat squarish bivalves, often considerably deformed because of nestling habit.

136. Hiatella arctica (Linné, 1767).

Mya arctica Linné, 1767. Syst. Nat. 12th ed., p. 1113.

This extremely variable species is fairly common in the northwest Gulf of Mexico. As with so many variable species, our material is insufficient to decide whether more than one species is among it. H. azaria Dall has been reported for our area, but we are unable to judge whether this is a valid species. Two lots among our material might be this species but until the matter has been studied in detail we prefer to identify it as H. arctica Linné.

The most common shape of juveniles is elongate, but sometimes other forms are encountered which could be different, but probably are not. Often juveniles show two rows of small spines radiating backwards from the umbo. Its usual mode of life is living embedded in sponges on the coral and algal reefs. Also from shelly mud bottoms. Once found embedded in a nylon rope on Galveston beach.

Previous records for the Texas faunal province are: 56, (as H. azaria Dall) listed for Texas, 13-14 fms.; 147, dead on Baker Bank and Big Southern Bank; 156, (as H. azaria Dall) common on Stetson Bank; 164, Laguna Madre, dead in inlet hypersaline environment; 170, deep shelf assemblage; 206, beach records in Texas Conch., Vol. 5 (7), p. 70, 1969); 236, Galveston; 269, figured on page 219. Note: The record for the Laguna Madre is surprising, as the species does not enter the bays.

Records H.M.N.S.: 29 lots of which 8 contain live collected material.

Depth Range: 0-55 fms. (alive 11-40 fms.).

Geographical Range: Arctic seas to deepwater in the West Indies; Arctic seas to deepwater off Panama (Abbott, 1974).

Maximum Size: 57 mm.

Eastern Pacific Analogue: The species lives also in the Panamanic province.

Genus Saxicavella Fischer, 1878.

A genus of small bivalves with edentulous hinge. A single species in the northwest Gulf of Mexico.

137. Saxicavella sagrinata Dall & Simpson, 1901.

Saxicavella sagrinata Dall & Simpson, 1901. Moll. Puerto Rico, p. 472, plate 55, fig. 16.

Although apparently not noted before in this part of the Gulf of Mexico, (Abbott, 1974) omits the species altogether. This small bivalve is fairly common on sandy mud bottoms below 20 fms. In our material, there are two forms, which probably reflect stages in maturity rather than ecological differences. In one form the hinge line is rather rounded and the shell is thin; in the other, the hinge line is much straighter and in mature shells the valves develop a wing-like projection above it. More material from the Caribbean is needed before the problem can be completely settled.

Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9 (4), p.82, 1973.

Records H.M.N.S.: 22 lots (none alive) in sandy or shelly mud bottoms.

Depth Range: 17-70 fms.

Geographical Range: Puerto Rico.

Maximum Size: 7.4 mm.

Eastern Pacific Analogue: Saxicavella does not live in the Panamanic Province.

Genus Panopea Menard, 1807.
Usually spelled Panope (unjustified), this genus is made up of medium to large sized bivalves.

138. Panopea bitruncata Conrad, 1872.

Panopea bitruncata Conrad, 1872. Proc. Acad. Nat. Sci., Phila., 24, p. 216.

Long considered extinct, a few live specimens are now known from Florida and Texas (see refs. 185, 223). The construction of offshore drilling platforms by the oil industry has shown that dead valves can be common. They are washed out of the mud near the legs of the platforms. In general, the living animal, especially the mature ones burrow so deep in the sediment that no dredges can reach them and dead valves remain buried forever. From the beaches, only dead material is known, mostly immature, and at least one complete specimen is known from the beach at South Padre Island. A live specimen was dug at low tide on the mudflats near Port Aransas. It is probable that the few references to Mya arenaria for our area pertain to this species.

Previous records for the Texas faunal province are: 145, dead on shallow shelf, 156, Stetson Bank; 198, live specimens from 17-25 fms. near oil rig off Galveston; 206, beach records in Texas Conch., Vol. 5 (7), p. 70, (1969); 243, mudlump fauna, Mississippi delta; 269, figured on page 219.

Records H.M.N.S.: 6 lots (none alive).

Depth Range: 0 (beach) - 25 fms. in mud bottoms.

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

Maximum Size: 172 mm. (but reaches to 8 inches).

Eastern Pacific Analogue: Panopea globosa Dall, 1898; Head of Gulf of California to off San Marcos Island; shallow water to 60 meters.

SUPERFAMILY MYACEA LAMARCK, 1809

FAMILY MYIDAE

In the northwest Gulf of Mexico, represented by the genera Paramya and Sphenia.

Sources: M. Keen in Treatise of Invert. Paleont. Part N, Vol. 2, p. 691-692.

The best known Myids are the large shelled clams of the genus Mya known from Japan, the north Pacific and the north Atlantic. In our region these bivalves never lived, although erroneous reports exist (Ref. 69).

Genus Sphenia Turton, 1822.
So far, two species of this genus are known from the northwest part of the Gulf of Mexico, but one is only tentatively assigned to this genus.

139. Sphenia antillensis Dall and Simpson, 1901.

Sphenia antillensis Dall & Simpson, 1901. Bull. U. S. Fish Comm., 20, p. 474, pl. 55, fig. 14.

A number of live specimens has on several occasions been taken in the inlet near the Coast Guard Station at South Padre Island. It is a small, often deformed species, due to its nestling habit, but usually rectangular in outline. As in all Myids, the hinge plate is much reduced and a well developed chondrophore exists. No specimens have been collected by offshore dredgings or are known from the coastal bays.

Previous records for the Texas faunal province are: 206, Beach records in Texas Conch., Vol. 6 (8), p. 82, (1970).

Records H.M.N.S.: 1 lot which contains live collected material.

Depth Range: 0-1 fms. (fresh beachdrift).

Geographical Range: Puerto Rico, Brazil. (Abbott, 1974).

Maximum Size: 3-7 mm.

Eastern Pacific Analogue: Sphenia fragilis H. & A. Adams, 1854. California south to northern Peru. Nestling in cavities.

140. Sphenia tumida Lewis, 1968.

A single specimen of this species was collected once from a ball of clay on Bryan Beach, Freeport. It is possible that this is a Pleistocene fossil. The accompanying fauna of the clay, mainly Macoma mitchelli, indicated a bay fauna. Its classified as a Sphenia appears somewhat uncertain, but I am at a loss to suggest a better arrangement. The species is also known from Florida from where it was first described and the Carolinas, which indicates that it belongs to the northern fringe of the Caribbean faunal province. The lack of even a remote Pacific analogue may signify another affinity for this species.

Previous records for the Texas faunal province are: 206, beach records in Texas Conch., Vol. 7 (7), p. 71, 79, 80 (1971).

Records H.M.N.S.: 1 lot of a single valve from Bryan Beach, Freeport.

Depth Range: 0-1 fm.

Geographical Range: Pleistocene of Florida; Carolinas?

Maximum Size: 12 X 11 mm.

Eastern Pacific Analogue: None.

Genus Paramya Conrad, 1861.

A genus of small bivalves, more regularly formed than Sphenia and with chondrophore in either valve.

141. Paramya subovata (Conrad, 1845).

Myalina subovata Conrad, 1845. Foss. Med. Tert., 65, pl. 36, fig. 4.

This is an uncommon species, rarely found alive on the tidal flats near inlets. Dead valves are occasionally found in beachdrift at Galveston and Port Aransas, but are unknown from the coastal bays. It is seldom dredged in offshore waters and is unknown below 25 fms. It has been found from Louisiana (Isles Dernieres) to Port Aransas in Texas.

Previous records for the Texas faunal province are: 98, listed for the bays; 170, (as Poromya (sic!) subovata Conrad), listed for deep shelf assemblage; 206, beach records in Texas Conch., Vol. 6 (7), p. 71, (1970).
Records H.M.N.S.: 11 lots of which two contain live collected material (beach Galveston Island after hurricane Carla).
Depth Range: 0-25 fms. (alive: beach only).
Geographical Range: Delaware to Florida and Texas (Abbott, 1974).
Maximum Size: 15.6 mm.
Eastern Pacific Analogue: None in the Panamanic Province.
Remarks: Mya arenaria Linné, is reported in Ref. 68. This is probably an error for Panope bitruncata Conrad, which is occasionally found on Texas beaches.

FAMILY SPHENIOPSIDAE

Of this family of small bivalves, no records of recent forms are, as far as I know,, available from the western Atlantic. This is surprising in view of the wide distribution of a single species in the genus Spheniopsis throughout the northwest Gulf of Mexico. Another species is the genus Erodona is much rarer.

Sources: M. Keen in Treat. Invert. Paleont., Part N, Vol. 2, p. 699.

Genus Spheniopsis Sandberger, 1863.
Small, somewhat triangular bivalves, of which the right valve has two highly characteristic hinge teeth. Concentrically sculptured. In the Trans. Wagner Free Inst. Science, (Vol. 3, pt. 6, p. 1508), Dall described a small species from the Florida Chipola formation as Spheniopsis americana. A very similar form, undoubtedly its direct descendant, still can be found widespread over the Texas-Louisiana continental shelf. Although in the H.M.N.S. collection there are pairs, I doubt whether live collected material is present. Differences with the fossils from the Chipola formation appear to be minor; the recent form has a more regularly sculptured exterior and perhaps is overall somewhat sturdier. Usually the small valves have a straight posterior side as is shown by the figure in the "Treatise" (S. scalaris Braun), but in the juvenile valves it is sometimes slightly curved. In our material the strength of development of the hingeline and of the posterior part ("tail") is somewhat variable.

A new name for this recent form could perhaps be defended on these grounds, but unfortunately a figure of another Spheniopid bivalve has been figured by Verrill and Bush, 1889 as Montacuta triquetra from 43 fathoms off Cape Hatteras. The outline given for this species is somewhat different from our material, nor is the exterior figured. It could be a Grippina but this must be checked before one should describe this species as "new".

142. Spheniopsis spec. indet. (A)

Shell closely resembling S. americana Dall from the Chipola formation, of which I believe it is a direct descendant. Somewhat heavier concentric sculpture, rather inflated, with strongly developed posterior end. It might be identical with Montacuta triquetra Verrill and Bush, 1889 (which is not a Montacuta) but verification is required before a name is attached to this species.

Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 82, 1973.
Records H.M.N.S.: 37 lots, none alive.
Depth Range: 17-82 fms. (one lot from 8 fms. doubtful).
Geographical Range: N.W. Gulf of Mexico and also seen in material taken off western Florida.
Maximum Size: 2.3 mm.
Eastern Pacific Analogue: None.

Another quite different s ecies has been obtained from a single location off Texas.

143. Erodona? sp. indet. A.

Although this species in the "Treatise" probably would be classified in the family Erodonidae Winekworth, 1932, I believe it is Spheniodsid. The chondrophore in the left valve is not strongly projecting, but is formed by an infill of the umbonal cavity. Only a single lot of two valves has been taken from the Miocene shale dome clay pile off Louisiana. I have also seen a lot of recent valves of this species taken off Hollandis Cay on the Caribbean side of Panama in 20 fms. of water. They are unmistakeably the same.

Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 1 lot of two valves.
Depth Range: ~ 20 fms.
Geographical Range: Caribbean coast off Panama.
Maximum Size: Not measured.
Eastern Pacific Analogue: None.

FAMILY CORBULIDAE

In the northwest Gulf of Mexico represented by the genera Vericorbula and Corbula.

Sources: M. Keen in Treat. of Invert. Paleont., Vol N, part. 2, p
V. Regteren Altena: The Marine Mullusca of Surinam, (Dutch Guiana) Holocene and Recent, Part II, Bivalvia and Seaphopoda, Zool. Verh. No. 119, p. 73-77, 1971.

At the present time it is impossible to give a reasonable account of this group of bivalves, because the types have to be revalued. From the literature it is readily apparent that the genus Corbula in the western Atlantic is in a confused state. We have seen some of the material in the National Museum at Washington, D.C. and this did not clarify

matters at all. For the time being, we must restrict ourselves to merely making some remarks and tentative (and possibly erroneous) identifications.

Along the Louisiana and Texas coast live two genera: Varicorbula and Corbula, between which there exist clear differences. Much of the confusion in this family is caused by the fact that the animals in the genus Corbula start out as juveniles with fairly thin, regularly formed valves. During their development, however, they increase the thickness of their shell enormously, so that often the shells have a misshapen and somewhat irregular appearance.

Varicorbula is the only N.W. Gulf of Mexico genus in which the shell shape is more or less preserved throughout the entire life span of the animal, so that juveniles resemble closely small specimens of mature ones. In Corbula and more particularly in the subgenera Hexacorbula and Caryocorbula, the juvenile specimens bear little resemblance to their mature counterparts. For this reason alone, Varicorbula must be recognized as a full genus. The two valves in Varicorbula are quite different in sculpture and size, those of Caryocorbula differ only moderately, the right valve showing a clear overlap along the ventral margin.

Genus Varicorbula Grant and Gale, 1931.
Species are characterized by discrepant valves, concentric ribbing on right valve and smaller left valve with radial striae. The relationship between Varicorbula, Notocorbula and Vokesula needs to be clarified.

144. Varicorbula operculata (Philippi), 1849.
Corbula operculata Philippi. Zeits. Malak. V, p. 13, 1845.

The identity of V. krebsiana C.B. Adams, Contr. Conch., 12, p. 234, 1852 and C. disparilis Orbigny 1845 (?) Moll. Cuba, 2, p. 238, pl. 27, figs. 1-4 1845 (?) has to be investigated. Our plentiful Texas material appears to be uniform. It is a very common species in dredge samples, often collected alive. It is known from the more southerly Texas beaches (St. Joseph Island south) to which it is transported on algae and whipcoral, missing in the coastal bays and a single very small juvenile valve from Cold Pass in Galveston West Bay does not furnish proof that the species lives in the bay. A single beach specimen has been collected on McFaddin Beach, Sabine, Texas. Juvenile specimens have a somewhat greenish color and older specimens often show blots of pink color and rarely are entirely pink. The intensity of the ribbing on the right valve varies considerably, but I do not believe that the extremes represent different species. Until the types of the three taxa have been investigated, we have somewhat arbitrarily

selected the name V. operculata for our material. In Ref. 269, figures of V. operculata and V. krebsiana show the same species.

Previous records for the Texas faunal province are: 45, (as Corbula (Aloidis) disparilis Orbigny) well at Saratoga, 940 feet; 66,(as Corbula disparilis Orbigny, 1846) Marine Pleistocene of Texas; 136, (as V. krebsiana C.B. Adams) reported from 8 stations off East Texas at 34-55 feet. Alive; 145, deep shelf; 147, dead on Baker Bank, alive on Big Southern Bank; 170, transitional shelf assemblages; 174, listed; 175, on mud bottom of intermediate shelf, abundant; 201, listed for Mudlump fauna; 206, Beach Records in Texas Conch., Vol. 6 (F), p. 71; 214, listed; 236, (as C. disparilis Orb., 1842) Galveston; 251, Yucatan shelf; 253, uncommon on offshore reef Padre Island; 269, figured on pages 216 (V. krebsiana) and 218 (V. operculata).

Records H.M.N.S.: 98 lots of which 22 contain live collected material.

Depth Range: 0-76 fms. (alive: 9-50 fms.).

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

Eastern Pacific Analogue: Varicorbula speciosa Reeve, 1843. "Santa Inez Bay, Gulf of California to Panama Bay" (Keen, 1971).

Genus Corbula Bruguiere, 1797.
In the western Atlantic, several subgenera of uncertain value live: Juliacorbula Olsson and Harbison, 1953, with one species: J. knoxiana C.B. Adams, 1852 (=J. cubaniana Orb., 1853) which however, so far, has not been found in our area; Hexacorbula Olsson, 1932, which at least two and possibly three species in our area of which only one can be named with some assurance and finally Caryocorbula, with a great variety of forms, but of quite uncertain relationship.

Subgenus Hexacorbula Olsson, 1932.
Some of the characters of this subgenus are: Lunule and escutcheon not evident (Keen). Sculpture coarse, flat undulations. Pimples (see Caryocorbula) not as clearly visible as in Caryocorbula and often with sharp posterior hook in outline. No snout. Overlap small.

Two species, a large and a smaller one, and possibly a third one are known from our area. Only one we can identify. This, the largest one, is almost certainly dietziana. The types of dietziana C.B. Adams and blandiana C.B. Adams have been figured by Clench and Turner. Our material clearly shows that these species are identical. In the mature specimens of dietziana, one often sees a "blandiana" perched on top of the peculiarly misshapen dietziana, which proves that blandiana is the juvenile stage of dietziana before secondary shell thickening occurs. Andrews (Ref. 269) labels one of her figures dietziana, but the figured shell is not dietziana, but another species, common on Texas beaches and in

shallow offshore waters. In the past, I have called this species C. swiftiana C.B. Adams, but this is probably in error, as C. swiftiana is probably a Caryocorbula. It might be C. barrattiana C.B. Adams, but the majority of specimens in the National Museum collection labelled thusly are different.

Subgenus Caryocorbula Gardner, 1926.
This subgenus has valves of unequal size, hence there is considerable overlap at the general margin. In fresh specimens paired rows of small granules are present which form a radial pattern. Often a large snout as in Varicorbula. Probably the most confusing aspect of Corbula is the difference in growth stages which leads to a number of interesting changes in shell morphology. In the subgenera Hexacorbula and Caryocorbula juvenile valves are flattish and thin (not in Varicorbula) and somewhat of the shape of Paramya. Juvenile Hexacorbula valves are only regularly ribbed by growth lines but have some pimples on the posterior dorsal quadrant; those of Caryocorbula show a well defined surface sculpture of radially arranged pimples all over the shell. Juveniles of about 1 mm. size of our most common species of Caryocorbula show a series of small hooks on the posterior dorsal side, a consequence of small concentric ridges on the dorsal quadrant.

Full grown valves of both subgenera are often remarkable by their appearance of being two shells in one. After the animal reaches a critical size, a thick internal layer is deposited inside the entire valve. The subsequent reduction in volume requires an abnormally wide opening of the valve angle to accomodate the living animal and the result is a most peculiarly twisted valve with outspoken "growth" angles. The twist is caused by the fact that the internal thickening is not uniform along the ventrical side. Often one finds this secondary growth layer broken out of the shell as separate entity in dredgings.

After a certain number of these "thickening" stages, this mode of growth becomes impossible because no room for rotation of the umbo is left but the animal still manages to grow by developing a snout. In Varicorbula, the snout is essential for growth because of the initially high inflation of the valves and for this reason, the larger valves of Caryocorbula may be sometimes difficult to separate from Varicorbula.

The entire growth process makes the hinge characters unreliable for the purpose of identification. During growth, the relative position of the resilifer with respect to the shell is changed. Thus, before the first thickening stage specimens of the common beach species of Hexacorbula have a hinge in which the resilifer is hardly visible because it is located almost in the umbonal cavity. But later, after the shell thickens, it becomes clearly visible underneath the umbo.

It is remarkable that nowhere in the literature have I found mentioned the nature of the radial striae. In Hexacorbula and Caryocarbula, under the microscope, these striae turn out to be radially arranged rows of small granular pimples. In older valves these pimples, smaller but of the same character as those in Thracia, are easily

removed by corrosion of the valves. In Hexacorbula, those pimples are less prominent (usually only visible on the posterior slope but occasionally over the entire shell) than in Caryocorbula where they are most clearly arranged.

The nature of the overlap in species of Caryocorbula differs with age. Small juveniles have hardly any and with age develop one because the right valve will grow faster than the left one. Finally a horny extension of the periostracum is formed and in obese shells this horny part, extending from the anterior portion of the right valve, envelopes the left valve and is pressed against it, much in the fashion as is shown in the subgenus Serracorbula (figured in Keen's, Sea Shells of Tropical West America). In our species of Caryocorbula the serrations of this periostracal extension are missing, but this is probably a specific rather than a subgeneric character. Very confusing in Caryocorbula is the often widely dissimilar pattern of subface sculpture. Often intitially rather coarsely ribbed species become finely ribbed or vice versa. It is usual to find a finely ribbed juvenile shell perched on top of the umbonal area of an obese, inflated mature valve, which is much more coarsely ribbed.

The following nomina in Caryocorbula are known: chittyana, C.B. Adams; swiftiana, C.B. Adams; caribaea, Orbigny; kjoeriana, C.B. Adams; lavalleana, Orbigny; barrattiana, C.B. Adams (could be a Hexacorbula). Corbula contracta is different and it is not clear to me where it belongs.

In the very extensive Texas material at least five basic shapes can be distinguished. Because they all seem to merge it is probable that only a single species is involved and I believe that chittyana, swiftiana, caribaea, kjoeriana and lavelleana form one single species. Corbula cymella Dall is quite different, but no material has been found in our area. Corbula aequivalvis Philippi presents difficulties. It is of all forms, the most divergent, but still seems connected with them. Therefore, it is kept separate here.

In Altena's paper on the bivalve fauna of Surinam, similar difficulties as I had are reported. Altena is even more drastic than I was in lumping together several forms. He believes that the small hooked Hexacorbula is the same as the small common Corbulid of our coast (c.f. his figures 23a - b and 23 c-f, which are quite similar to material from the Texas coast, although I have not made comparision between his and my material). I find that in material from the N.W. Gulf of Mexico, the "hooked" Hexacorbula always can be easily differentiated from our common Caryobula. Moreover, in our area both forms appear to live on the whole in different environments (sand versus mud).

Altena shows a figure (pl.-8, figs. 4-5, text page 77) of Corbula (Tennicorbula) aequivalvis Philippi which is indistinguishable from material from Stetson Bank; whether this is a separate species cannot here be determined; it seems connected by intermediates with the general Caryocorbula's of the Texas coast. Neither can I

make judgment about the validity of the subgenus Tenuicorbula. In the opinion of Keen, Tenuicorbula is not the same as Juliacorbula in which one usually places C. knoxiana and C. cubaniana. Altena considers C. knoxiana and C. cubaniana as synonyms of C. aequivalvis although he cites some minor differences. The Stetson Bank material of C. aequivalis Philippi does not agree with specimens of C. knoxiana which I saw in the National Museum in Washington, D.C.

In summary then, we have the following subgenera:

1. Hexacorbula with (a) dietziana C.B. Adams = blandiana, C.B. Adams; (b) an unidentified, but widespread small species; (c) possibly a third species (barrattiana?) but here lumped with dietziana.

2. Caryocorbula with a number of very variable forms among which can be recognized: kjoeriana C.B. Adams; chittyana C.B. Adams, swiftiana C.B. Adams. All these, in my opinion form but a single species. It is possible that Corbula aequivalvis also belongs under Caryocorbula.

3. Corbula contracta. I have not assigned this species to any of the above subgenera. Unfortunately, it is quite rare off the Texas coast so that not enough material is available for study.

145. Corbula (Hexacorbula) dietziana C.B. Adams, 1852.
Corbula dietziana C.B. Adams, 1852. Contrib. Conch., 12, p. 235-236.

The species is mostly dredged, often alive, in calcareous environment and Miocene shale uplifts off the Texas-Louisiana coast. This is a colorful species growing to relatively large size and often misshappen form with strong growth angles. Not on the beaches and not in the bays, but sometimes mistakingly reported from the beaches.

Previous records for the Texas faunal province are: 136, (as C. cymella Dall), "C. blandiana" stage of dietziana taken off East Texas, pl. 7, fig. 3; 145, deep shelf; 147 dead on Flower Gardens; 156, common on Stetson Bank; 170, deep shelf assemblage; 175, abundant in calcareous banks assemblage; 206, Texas Conchologist, Vol. 9 (4), p. 82; 236, Galveston; 251, Yucatan shelf.

Records H.M.N.S.: 36 lots of which 9 contain live material.

Depth Range: 6-55 fms.; alive 8-26 fms.

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

Maximum Size: 17 mm.

Eastern Pacific Analogue: Not determined.

MOLLUSCANA by W.W. Sutow, M.D.

The summer just ending provided several opportunities to see some shell people and also to generate a few thoughts for this section. Fortunately, one can take advantage of a certain amount of editorial leeway in the choice of subjects and manner of presentation since the articles bear the author's name.

In the 1930's when I was an undergraduate and graduate student at Stanford University, Dr. David Starr Jordan was still alive. Dr. Frank Weymouth was Professor of Physiology. Myra Keen had just arrived to begin her doctoral work. Yet, in my daily struggles to subsist and to be educated (The Great Depression was on), I had no thoughts about conchology.

By that time, Dr. Weymouth had completed his many studies on the Pismo clam. He was my advisor while I aimed for admission to the medical school, but I was totally unaware of his contributions to malacology. Ed Ricketts, the Cannery Row at Monterey and the Pacific Grove Marine Station were not too far south. Wonderous opportunities existed, yet in my ignorance, I could not avail myself of them.

I did manage, though, to get away a couple of nights a week (and many weekends) to visit a young friend who then lived on Forest Avenue in Palo Alto. His name was Ormond McGill and our common interest was magic. We attended meetings of the magicians' clubs around the Bay Area, particularly the ones at San Jose and Oakland. We had some grand times. In those days the Stanford Medical School was located in San Francisco so our fun meetings ceased abruptly when I moved to San Francisco.

The war broke out shortly thereafter and I lost all contact with Ormond. Then in the mid-1960's, out of the clear blue, I found Ormond's advertisement as a seashell broker. Through correspondence we renewed acquaintances and eventually, I met Delight, Ormond's beautiful and vivacious wife. She was also a shell collector.

When Delight found out that I was interested in getting information on the mother-of-pearl, she dug into her treasure chest and generously gave me some abalone craft and specimens especially prepared to demonstrate the brilliance and luster of the shells.

I saw Delight again this summer - under more somber circumstances. She was a patient at the Stanford University Hospital, seriously ill. Nonetheless, she roused herself and we had a very nice visit. A few weeks later Ormond wrote and said that Delight had died.

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I had heard of the Conchologists of America (COA) before. When I wrote to Tom Rice telling him that I would be in Seattle in June, he answered that he would miss me. He was the program chairman for the annual COA convention and would be away from Seattle. En route to Seattle we stopped to see my brother-in-law and his family in Portland, Oregon. And I stepped right into the COA convention. They were meeting at the Thunderbird Motor Inn in Portland. I rudely walked out on our relatives (though after a delicious repast of fresh-caught razor-clams) and attended two days of the COA meeting.

The relatively young COA (founded in 1972) is advertised as association for shell collectors and shell clubs. As such, the emphasis was on conchology rather than on malacology and the program was geared to the interests of the amateur and advanced collector. There were several "travelogues" (with witty dialogue between two well-known travelers, Kirk Anders and Tom Rice). Slide presentations of numerous rare species as well as photographs of shell variants (melanistic forms, rostrate forms, anomalies, etc.) were also featured.

Looking back, the talk that impressed me most was given by James White. He filled in for the originally scheduled speaker who had to cancel because of a sudden emergency. The subject was "The Oregon Coast and Some of the Marine Invertebrates There". Authoritatively and with magnificent slide material, White discussed the Pacific Coast of Oregon State - and explained the molluscan faunal distributions in relation to various habitat situations. (Perhaps my interest was stimulated by photographs of the red abalone - Haliotis rufescens - of the size I had not seen in California. They seem abundant along the southern portions of the Oregon coast).

The last program item for the second day was a "symposium" on writing shell books. It was entitled "So You Want to Write a Shell Book?". Unfortunately, we had sparse attendance for the symposium. The main thrust of the discussion was a discourse by James S. White regarding the many problems that he had in preparing the manuscript on "Seashells of the Pacific Northwest" for publication. (Ruth Fair in her article "So You Want to Write a Shell Book" that appears in the August, 1976 issue of Hawaiian Shell News recounts similar headaches in the preparation of her "Murex Book".)

As I listened, it occurred to me that perhaps the reader or the consumer also may have "problems" with shell books. Color photographs are certainly desirable-the larger the better. Yet they progressively increase the cost of the books. And with the current trend toward more and larger books, one might question the publication of numerous treatises whose subject matter repeatedly overlap. For example, do we need to have color pictures of Cypraea tigris, Nautilus pompilius, Conus marmoreus and the like in every book dealing with South Pacific fauna? What is gained? Surely, they all look alike - and one good photograph in a readily available source book should suffice for most purposes.

If memory serves me right, Tom Rice started to gather data regarding reference sources where pictures and photographs of specific species might be found. What a marvelous idea! I would go for a carefully edited compilation of key sources that will provide information such as the original description, the best illustration, the best distribution data, the best discussion of the species, current journal references dealing with unusual aspects and the like.

Many recent books contribute very little new material. There is an inexcusable amount of rehash and overlap. The bibliographic information in many books is unorganized, unselected and inadequate. If the criteria that govern the selection of material for major scientific journals are applied, many shell books will be sadly deficient. Assuredly, the customer need not purchase the book in spite of the blatantly misleading advertising. But equally assuredly the victim can question the motivation, the quality and the value of the marketed item.

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One other good (and unexpected) thing happened in Portland. Fifteen or so years ago, I started to exchange seashells with Mrs. Larson, then living in Alaska. We kept up our sporadic correspondence with occasional exchanges but I had never met Mrs. Larson. She now lives in Portland so I called her.

We made arrangements to chat during one noon-hour break. And what a memorable event that turned out to be! Mrs. Larson said that she was not as physically agile as she used to be. Several hours away from the coast, she could not do much active shelling. She brought with her, however, some seashells from Tristan de Cunha. Knowing of my interest in chitons she thought I might like two specimens from the remote island. She also brought two for Tom Rice.

When I presented the chitons to Tom, he just about screamed. He had just published an article in "OF SEA AND SHORE" (Winter, 1975/1976, Vol. 6, No. 4), entitled "The World's Rarest Chiton". The chitons that Mrs. Larson gave us were that species (Plaxiphora simplex Carpenter). Mrs. Larson was the unnamed lady described in the article. (I have received a promise from Mrs. Larson that she will prepare a report for this publication regarding the fascinating history of these chitons and how they arrived in Portland.)

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It is easier to suggest that something might be useful as an idea than to evaluate the suggestion by actually doing it. But thoughts and hypotheses unexpressed may deteriorate and never surface. All this leads to the comment that someone might write an article on seashell museums. There are a number of private and public museums that house all sorts of seashell collections. Starting in this geographic area, a list of museums could be compiled indicating among

other things the location, availability to visitors, special collections housed therein, and, other unusual aspects. In this day and age with the compelling pervasive mood to travel, individuals from HCS must have visited a great many museums throughout the world. They would be good sources for data from first hand observation. A carefully compiled and systematically organized presentation of the information should be very welcome.

Another thought that might be a project for the library committee is documentation of the availability of malacological journals and serial titles in the various libraries in this area. Surely, within the Houston area, almost all of the major journals would be found in one or more of the libraries. Some inventory of the basic publications should be useful to many. The total number of malacological journals, defunct and current, is not prohibitive. The compilation can include for each journal the back volumes accessible in each library. Rules and regulations regarding the use of each library should be defined.

The listing of books, however, may be more difficult. But by restricting the titles to the "standard" or "classic" often multi-volume references, the job should become manageable. Some concept of the availability of key titles should be valuable to anyone who has to do literature research.

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One of the things I saw for the first time (when I visited the Petits) was called microfiche. This refers to a technique of reproducing photographically books and pages in a small format. The microfilm is a better known process for doing the same thing. But there is a difference.

The microfiche results in a flat transparency, each plate measuring 9 cm X 12 cm. The plate contains many many pages of the original. Reductions in size vary from 12:1 to 150:1. A reader (viewer that magnifies) is necessary. A number of titles concerning malacology and conchology are available in microfiche form. As examples, The American Journal of Conchology, 1865-1872, Vol. 1-7 can be obtained for about $46. Reeve's Conchologia Iconoca, 1843-1878, 20 volumes, can be purchased for about $293. The Manual of Conchology by Tryon and Pilsbry (1879-1898, Vol. 1-17 and 1885-1921, Vol. 1-28) costs about $305. Nautilus Vol. 1-20 (1886-1907) is priced at about $60. The serious shell book collector may find the microfiche collection a satisfactory out in his quest for publications that are practically impossible to find.

Among intriguing monographs also available as microfiche reprints are the classic publications by H. & A. Adams, L.C. Kiener, L.A. Reeve, G.B. Sowerby, J.G. Jeffreys, K.H. Barnard and the like.

Texas CONCHOLOGIST

VOLUME X111, No. 2 DECEMBER 1976

THE WONDERFUL WORLD OF SHELLS

Our Shell Show, an unjudged display for the public, will be held at the Houston Museum of Natural Science May 1-14, 1977, and has been named THE WONDERFUL WORLD OF SHELLS.

Some 33 displays have already been planned, and we have all the cases we are having made sold to members. We do need to have more ideas from you on displays. We need you to come forward with what you can offer from your collections. Frankly, we'd like to make this a real razzle-dazzle show for the public, educational but also eye-popping on the beauty and variety of shells. The idea to have this Museum show was born because we realized how many rare and wonderful shells members of the Houston Conchology Society have, and we want to share them with the Houston area in a proper and safe place.

We hope one of you will volunteer to work up a display on Japanese shells, perhaps one on shells from the East Coast and from the West Coast, U.S.A. We haven't yet asked anyone to do shells especially from Sanibel, still known as an island of shells around the world. We would consider a display of shells from South America or from the Mediterranean. Please help us with your ideas.

We know that we cannot have living shells on display. Would someone undertake the task of getting photos of living shells from members and devising ways of displaying enlargements on the Auditorium walls?

A called special meeting for the purpose of discussing all work and displays for this show is set for Tuesday, January 18, 1977, at 7:30PM in one of the small classrooms downstairs at the Museum. All HCS members are asked to attend.

Constance E. Boone, 688-8252

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The TEXAS CONCHOLOGIST is mailed, postpaid, to regular members of the society, with the exception that only one copy is mailed to a family. Overseas members will be charged the additional postage required at the beginning of each fiscal year (June).

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EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Odé
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

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ANNUAL AUCTION SUCCESSFUL

by Cynthia Biasca,
Chairperson

The November gala was enjoyed by a large turnout of members, including some who joined that evening. Clarice Van Erp was an enthusiastic auctioneer for the variety of shells and craft items being sold. The oral auction was followed by a silent auction, with 15 minutes or so for people to write down bids on the items they wanted. A large bag of surprise boxes, gaily wrapped for the holidays, disappeared quickly when word was given that people could buy them. Finally, the sale table of inexpensive shells was open for business.

The evening netted $560.00 for the Club, some of which will be spent on bringing William Old from New York in March to present a program on cones. The few shells left unsold were given to Constance Boone for the May Shell Show, as well as a few shells which went directly to her because they seemed more suitable for that occasion.

Thanks go to all who donated craft items and shells and especially to Ed Konopka who donated the Murex pele. Ed has recently returned from Hawaii and is living in Portland, Oregon. Thanks to the workers who helped the chairman, Cynthia Biasca, sort and label and package the shells. They are: Ruby Ray, Margaret Baldwin, Helen Eberspacher, Leola Glass, Ruth Goodson and Sam and Fannie Miron. Also, thanks to the cashiers who checked people out: Frank Petway, Jim Sartor and Lloyd Meister.

JANUARY FIELD TRIP

The next field trip for the Club will take place Saturday, January 8, 1977. It is announced here because there will not be a newsletter for members in December.

Meet at the turn-around underneath the bridge at San Luis Pass, West end of Galveston Island at 9:00AM.

Bring a lunch, pail, trowel, small medicine vials for small shells, sieve (optional), waders and dress according to the weather. Shelling in our area is best in the wintertime when a strong north wind is blowing. In this season, the weather is unpredictable, the TV weatherman does not always forecast correctly. We are scheduling this field trip six weeks in advance and we take no responsibility for the weather - don't blame Carol. We suggest prayer. If additional information is needed, call

Carol Courtade, 668-2541

CONES IN MARCH

William E. Olds, Jr., from the Museum of Natural History in New York, where he is curator of mollusks will be program for the meeting, March 23, 1976. He will talk on his specialty, cones. Save the date, invite your friends for this special occasion.

Mr. Olds will visit several other shell clubs in our area on this trip to Texas. He may even get to the beach.

QUOTES WITHOUT COMMENT

14A The Houston Post ★ SUNDAY, NOV. 14, 1976

Spot shelling, sniping empties Beirut streets

BEIRUT (UPI) — Random shelling and sniping emptied the streets of Beirut Saturday in a spate of the bloodiest terror bombardments since the current cease-fire went into effect Oct. 21.

When I learned that I was to attend a medical meeting in North Myrtle Beach, South Carolina, I immediately contacted Dick Petit. I had never been to North Myrtle Beach and I had never met Dick. Yet I knew about Dick since the day that John Q. Burch stated that his entire shell stock had been loaded onto a van headed for South Carolina. Soon Dick was carrying on as the successor to the Burch business (with Mrs. Petit supplying most of the "labor"). As many readers know, Dick eventually sold out the shell business. For a while he was handling seashell stamps but he also retired from that.

Well, I visited the Petits - I and a lady named Dottie. This was something else again. I had arranged to see the Petits on Friday evening after we had completed the medical meetings. But Hurricane Dottie changed all that. On Thursday, our hotel manager warned us that Dottie had stalled off St. Augustine but that she was expected to make landfall in the vicinity of North Myrtle Beach. The sea was getting higher and we were informed that evacuation was a definite possibility. When I called the Petits, Dick came right over to pick me up. We had an abbreviated visit.

And was I impressed! Dick has a marvelous library - very much like the one that John Q. Burch had. Many of the classical conchological publications were there. Complete volumes of most of the major malacological journals lined the shelves. One could spend days browsing through the volumes. But Dick's shell collection took up considerably less space. For someone who had already access to so many species of seashells over the years, Dick has sensibly restricted his conchological activities to the in-depth study of only the Family Cancellariidae. The only specimens I saw were of this family.

Dick collects seashell stamps assiduously - and the stamp collection was really out of this world. The stamps were meticulously and beautifully mounted in impressive albums. Dick had cross-indexed them, too, so he had at his fingertips the necessary information about each stamp. In the brief two hours I absorbed a tremendous lot of philatelic knowledge about items whose existence I had never suspected. My intent is to visit them again at the earliest opportunity. I will take my pen and notebook and I hope to record for this publication much of the material that was crammed into those two short hours.

The Pettits were most gracious and hospitable. The next morning I managed to make the plane and we took off in the torrential rain between wind gusts. Dottie arrived later.

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In this issue, I am chronicling some events that transpired during another visit with Dick Petit and his gracious wife at North Myrtle Beach, South Carolina. Environmental circumstances (cold but clear and no hurricane) permitted a much more leisurely visit this time. As the result, I came away with a pack of notes on things philatelic and conchological. I have deciphered portions of them here to supplement the comments recorded in this issue of Texas Conchologist.

Once again I was able to enjoy the beautifully mounted albums in which Dick keeps his seashell stamps. These albums are made by Lindner (Germany) and are distributed through standard philatelic channels in this country. The "system" utilizes multi-holed loose-leaf album pages with transparent sheets attached thereto. The transparent sheets are available with different sized pockets to hold and protect the stamps. (The album is advertised as the "hingeless concept of the future".) Both sides of the stamps can be examined. Separate inserts (white or black sheets) can be prepared to fit between the transparent sheet and the album page. This permits the typing or drawing of any descriptive material on the inserts that will show through the transparent sheet and provide the background. The album needs to be seen to appreciate the flexibility with which the stamps can be displayed.

I also persuaded Dick to describe some of the philatelic "goodies" that exist in respect to seashell stamps. In addition to the usual mint (unused) and cancelled (used) stamps, there are first day covers (prepared and cancelled on the first day that the stamp is issued by the postal service), the imperforate varieties (unperforated stamps) and souvenir sheets (miniature sheets with one or more stamps often issued as souvenirs of exhibitions or of special occasions of significance and usually containing descriptive printed matter). Those who collect U.S. stamps will remember the so-called Jim Farley issues of 1935 which featured a number of these philatelic forms of the same stamps.

Less commonly, but occasionally issued, are stamps with seashell designs as booklet panes (e.g., Kenya), postal cards, stamped envelopes and letter sheets. Among the unusual items are the tete-beche variety where two stamps are joined together with one design inverted relative to the other (e.g, Morocco) and the tabular or marginal inscriptions where seashell design appear outside the stamps on the marginal tabs of the sheets (e.g., Israel).

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Dick introduced me to a whole new extensive vocabulary that had to do with the processes by which the stamps are made. Since these steps are frequently documented by available philatelic items (officially sanctioned), some of them will be listed below. (Dick took great pains to explain the differences among the various terms. Philatelic references were also consulted. However, without the actual product in hand, it is still a bit difficult to carry out

identification with certainty).

The "die proof sheets" are official and government controlled. They are made in very limited quantity and additional printing is impossible. While they are considerably more costly than the stamps, the presence of representative examples certainly "dresses up" the topical collection a hundred per cent.

Artist's proofs. These are single-color items (but not in the issued color) on very heavy paper. The small block where the artist's name will appear is blank. However, the proof sheet itself is signed by the artist. Usually only one value of a set is issued. Only 15 to 20 copies are prepared for the government to use as "diplomatic gifts".

Essay proof. These designs are either incomplete or are not used for issued stamps. They are prepared officially for the selection of the most appropriate color. Essay proofs have not been issued since 1939.

Plate proofs. Plate proofs are prepared in various colors (but not of the actual color eventually used) and are imperforate. They are available in strips of 5 and 500 to 1000 each are prepared. Ostensible, the proofs are used to select colors most appropriate for bi-color and multi-color stamps. Efforts to gain revenue may be another motive.

Deluxe artist's sheet. All values of the set are usually included. It is similar to the artist's proof, printed on heavy paper, but the sheet is not signed by the artist and the stamp is in the issued color. 135 to 600 of these are prepared "in 8 different shapes". The purpose is the use as diplomatic gifts.

Collective sheet. Occasionally, all stamps of a set are printed together on one sheet in issued color. The sheet is gummed and perforated. Only a limited number is prepared. The sheets are very expensive and difficult to locate.

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In the pages of the Texas Conchologist, there have appeared, in the past, a number of articles regarding seashells on stamps. At times, philatelic conchology was emphasized, at other times, conchological philately. Dick Petit is one of a rarebreed who is a knowledgeable philatelist and also a conchologist respected by the professionals. He is assisting at this time in the preparation of a comprehensive listing of seashell stamps. During my visit I was able to scan the notes that Dick had jotted on the margins of the stamp lists (many pages of computer printouts). Excerpted below are the types of comments that typify the professional competence and meticulous research with which Dick has approached the subject.

New Hebrides (Scott #155, #174). "There is nothing to indicate that the eyes are cowries. However, the pendant on the forehead of the mast appears to be Cypraea moneta. Postal authorities in New Hebrides advise that this is unlikely as the mask is that of the Nambas, a mountain tribe. However, the fact that they are removed from the

coast could justify the use of a seashell on a religious mask."

Mauritania (Scott #298, #308). "This is identified on the stamp simply as a shell ('coquille') and I have been unable to identify it even to family. Scott's (catalog) calls it a 'Gryphaea'which it is not. Letters to postal authorities in Mauritania remain unanswered."

Kenya (Scott #48) "The shell depicted is not West American and appears to be Turbo marmoratus. Although the Kenya Stamp Bureau release states a 'relation of the big green snail shell, the smaller one also has interior coated with Mother of Pearl'. They may be an ecoform of marmoratus. It definitely is not the West American species fluctuosus."

Taiwan (Scott #1454). Are stylized shells depicted on this stamp? Dick comments: "The designer of this stamp, Mr. Wen Hsueh-ju, advises that there are no shells represented on this stamp."

Switzerland (Scott #B274). "This is Lyropecten fimbriatus (J. Sowerby). The specimen depicted is in the collection of the designer, Nacklaus Stoecklin."

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NOVEMBER FIELD TRIP by Constance E. Boone

The field trip to Matagorda in November was limited to exploring the sand bar at the mouth of the Colorado River and a walk down the beach at the three-mile area. Because of the extremely bad weather, the trip across the river by barge was cancelled on Friday night. Linda Serrill says this trip across to the other side of the peninsula can be rescheduled if members wish to try again.

Nine HCS members did pick up shells for the club and got a few things new for their collections. I can report that Ruby Ray and Leola Glass braved the rough seas pouring in on shore and the pelting rain on Friday and that Ruby thinks it was worth it because she found her first live Murex fulvescens,a little beauty.

On Saturday, members present gathered live Ischadium recurvum (Rafinesque, 1820), the hooked mussel, on shucked oyster shells dumped in the roadway at Bailey's Camp. This was oyster season at Matagorda. At the sand bar on the river, HCS members found much debris but not many live shells. A few live Arks, some Dosinias, an occasional Tellin

were collected, and some members got pairs of Pteria colymbus (Roding, 1798). Linda reported she had taken some live ones on Gorgonia the week before.

Down the beach we walked miles and gathered many dead Architectonica nobilis for the educational packs. Matthew Curtis got 17 specimens.

Several of us went to Port O'Connor on Saturday afternoon, I had visions of finding a B. spiratum plagosum, left-handed, of course! We report very few, crabbed or otherwise, of any kind of Busycons there. However, one or two finds are worth reporting. Once I reported in Texas Conchologist about finding Pedipes and Truncatella live under the low jetty rocks near the harbor. They were still living under the rocks and seemed to have multiplied. Along with these species we recovered live specimens of Assiminea succinea (Pfeiffer, 1840). The specimens fit the description and photo in Abbott's Second Edition of American Seashells. This was the first time I had collected these alive in Texas. A check with Helmer Ode' confirms that he had never taken them alive either. Abbott lists this for Texas, but the only ones Helmer and I had ever seen were beach drift specimens, many at Matagorda Beach. Live specimens are light translucent-brown as Abbott describes them, and observation under the microscope revealed that the animals did have eyes on small, stubby peduncles. This species and the two above are almost always found above or at tide line and in bay or brackish water areas. I note for the record that the animal was whitish and that here was a pinkish beating organ in the snout. The gait of this little snail, approximately 2 millimeters, was somewhat unusual. It extended its foot forward and then rocked the shell forward, repeating this in a kind of loping gait, moving rapidly but not gliding.

We investigated a clay and mud beach north of town along the bay and dug live Petricolas, Cyrtopleuras and dug and smashed small, live Pholas campechiensis. A few pairs of dead Barnea truncata showed up in holes. It is just very hard to recover specimens from the hard clay. There are surely hundreds there. In July of this year I broke my new wedding band by leaning on the army surplus sharpshooter shovel trying to dig angel wings at Port Aransas. This time at Port O'Connor, in my efforts to trench out clods of the gooey clay to get unbroken specimens, I bent and broke the shovel. That gives you a pretty good idea of the kind of clay these animals prefer. This area at Port O'Connor reminded me of the clay at Bolivar, Texas City Dike, and at High Island. Pholas campechiensis probably is rather abundant deep in the clay. I have dug live specimens now in three clay areas in Texas.

The coincidence of being able to view and report on another example of "wrong-handedness" of a Busycon, this time from Texas, is mathematically astronomical. In fact, my call from a Houston resident to report the sinistral specimen of Busycon spiratum plagosum (Conrad, 1863) came at a time I had just turned in copy for the September issue of Texas Conchologist in which pictures and the report was made of the dextral specimen of Busycon perversum (Linné, 1758). My caller did not know of this specimen or report.

Mrs. C.W. Hanks of 20 West Broad Oaks in Houston had been given my name to contact concerning her find of a left-handed, or sinistral, Busycon spiratum plagosum. Her question to me was what was the mathematical possibility of finding such a specimen and what was the rarity of such a specimen. She is an amateur collector, not a member of any shell club or malacological organization, but an avid collector who displays many shells in her home. The specimen of B. spiratum plagosum was collected the last week of August, 1976, during low summer tides, at Port O'Connor, Texas, where she has a vacation home.

My first reaction was to question whether she really had such a specimen. My second was to be sure to pin down the chance to see the specimen and to photograph it. Mrs. Hanks was leaving to go to England. I asked to call her about October 1 and did so and set up a date to see the shell. Indeed, it was a left-handed B. spiratum plagosum, approximately a three-inch specimen and a very fresh-looking one even though it had been crabbed. I discovered that Mrs. Hanks had simply gone out to gather Busycon specimens north of the Intracostal Canal at Port O'Connor on the bay area (Matagorda and Lavaca Bays join in this area) to clean and fill a glass lamp base. When she was putting the specimens in the base, she just happened to notice this one Busycon looked different.

This is, I believe, the first report of such a specimen from Texas. I have not seen a sinistral specimen of B. spiratum from anywhere else either but the Second Edition of American Seashells mentions that sinistral specimens of B. spiratum pyruloides (Say, 1822), the subspecies Abbott describes as being from North Carolina to both sides of Florida, are very rare so this does indicate that some specimens are known.

All of this follows right along with Dr. T.E. Pulley's thinking that there can be a sinistral or dextral specimen for any of the species of Busycon. There is no doubt that such specimens are always rare and seldom pictured or authenticated. We feel very fortunate to be able to present to you this report and document it with pictures. We have asked to show the specimen with our Busycon display at next spring's special HCS show at the Houston Museum of Natural Science.

Figure 1. Busycon spiratum plagosum (Conrad, 1863), sinistral and normal dextral specimens, collected crabbed at Port O'Connor, Texas, in August, 1976, by Mrs. C.W. Hanks of Houston, Texas.

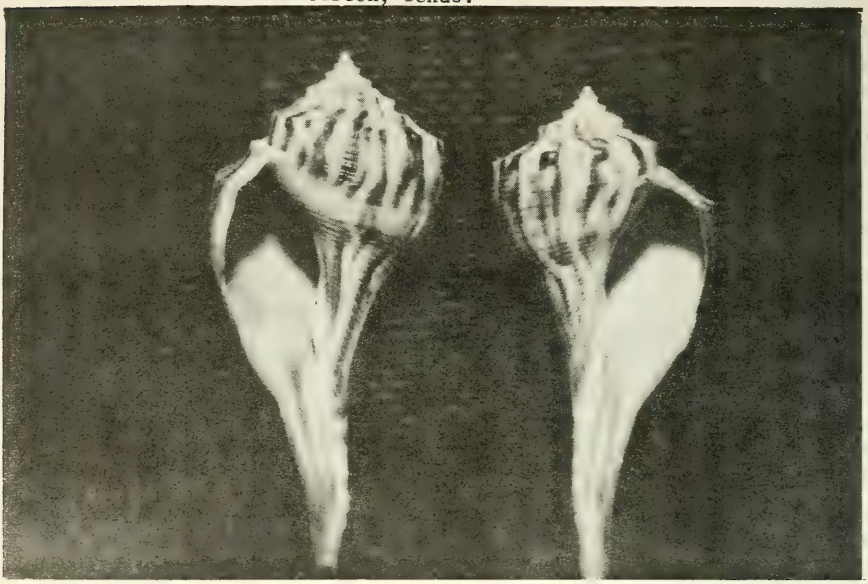
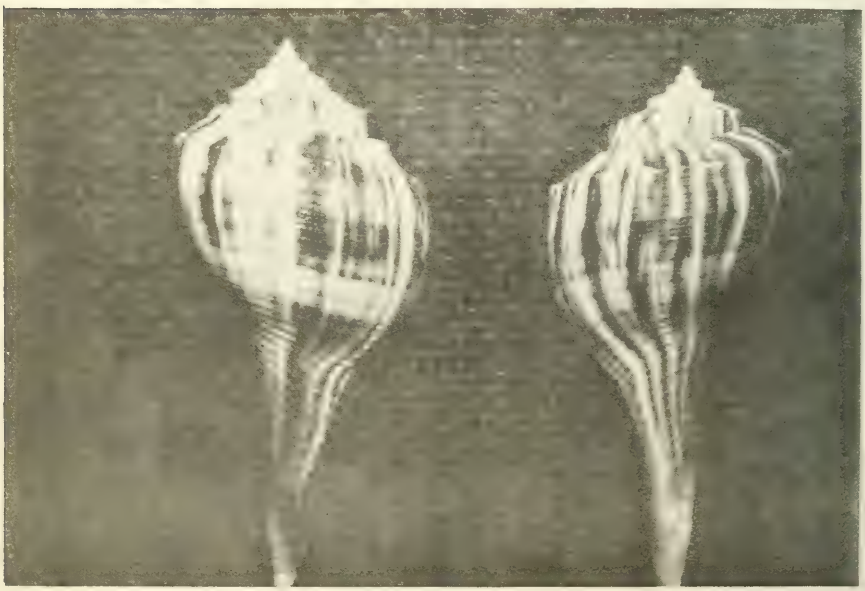


Figure 2. Rich patterns of fresh specimens of Busycon spiratum plagosum (Conrad, 1863), the rare sinistral specimen on left and normal dextral specimen on right, show in this photo the specimens collected at Port O'Connor by Mrs. Hanks.

Photos by Constance Boone



This seems an appropriate time to report and picture the unusual Busycon perversum (Linné, 1758) found by Fannie and Sam Miron live on February 2, 1973, after a hard freeze on a very low morning tide at South Jetties, Galveston, Texas. We remind you that we follow Dr. Pulley's nonenclature on this species of Busycon. We name all left-handed Busycons as perversum even though the common left-handed whelk is often listed as contrarium (Conrad, 1840).

The Miron's Busycon perversum is simply a distortion but one that is known to occur in this species. Several collectors have such specimens that were taken crabbed in the Corpus area some years ago. The specimens were usually in fair condition. This specimen from Galveston collected by the Mirons is the only one I have personally seen from that area and the only one I have seen taken alive, but there may have been live-taken ones from Corpus that I do not know about. I would like to hear from anyone having one and receive data on it to add to the records.

This then is also the time to mention that a similarly-distorted specimen is known for the species B. spiratum plagosum, in the collection of Mildred Tate of Lake Jackson, Texas. It was taken on Bolivar Peninsula by a Beaumont-area collector and traded to Mrs. Tate some years ago.

There have been many studies on the Genus Busycon, and it continues to intrigue many workers. Busycons do not normally occur anywhere except along the Eastern Coast of the U.S., the Gulf States, and along the Mexican coast to the Yucatan. A few reports exist of establishment of the species elsewhere but no colonies seem to last and a few are crabbed specimens riding abroad on boats.

Figure 3. Busycon perversum (Linné, 1758), normal sinistral specimen and distorted sinistral specimen, collected live at South Jetties, Galveston, Texas, February, 1973 by Fannie and Sam Miron.

Photo by Constance Boone

View of the spacious second floor of the Delaware Museum showing part of the 13,000 square feet of storage space for mollusk collections.

DELAWARE MUSEUM OF NATURAL HISTORY by W.W. Sutow, M.D.

A call to the Delaware Museum of Natural History at Greenville, Delaware (302-652-7600) will activate a recording which provides the information that the Museum is open Wednesday through Saturday from 9:00AM to 4:00PM and from 1:00PM to 5:00PM on Sunday. The Museum is closed on Monday and Tuesday.

Going northwest on Highway 52, the Museum is 4 or 5 miles from Exit 7 of the Interstate Highway 95. The low rectangular building is set several hundred feet to the left of the highway, plainly visible on spacious open grounds. It is approximately 20 miles from the Philadelphia airport to Exit 7. Interstate 95 runs along one edge of the airport. The Museum was opened in May, 1972.

In the hallway near the entrance hang a number of paintings. On one wall are nine originals by Louis Menard. These were included in Illustrations Conchyliologiques published by Jean C. Chenu from 1843 to 1853. On the opposite wall hang the six original paintings by Rudolf Freund used to illustrate Sea Treasures (1957) by Kathleen Y. Johnstone.

The spacious "Hall of Shells" houses some 30 exhibits, each a unit in itself . Featured is "Galaxy of Sea Snails", a 5-foot transparent sphere which ingeniously and effectively displays 128 different specimens of seashells (gastropods). The sphere rests on a stand on the floor like a mammoth crystal ball.

Another unusual display is set beneath the floor - and the viewer walks on and over it, looking downward through the transparent floor on the realistically depicted replica of the richly populated coral reef of the South Pacific. Tridacnas and gastropods in awesome sizes and brilliant colors are impressive as is the habitat in which they live.

Close by, occupying the entirety of one wall vertically is another underwater scene - a 14-foot reef canyon from the Bahamas forming the background for many replicas of living West Indian mollusks. A sampling of the varied species of cowries as well as examples of intraspecies variability are shown as another floor display covered by a transparent hemispheric dome. In a special cubicle are shown "Unusual Shells" which include Scaphella junonia (dextral and sinistral specimens), Pleurotomaria adansoniana, Pterynotis phyllopterus, Conus gloriamaris, and Cypraea fultoni.

The wall exhibits extend from floor to ceiling and line both sides of the hall. The titles of the displays are self-explanatory and indicate forcefully the nature and intent of the exhibit; The following were included: Purple Dye - The Legacy of the Murex; Shells Alive; Squids and Octopus; The Arts and Shellcraft; The Use of Shells by North American Indians; Ethno-Conchology; The Mollusk as a Table Delicacy; Nudibranchs; Thorny Oysters; What is a Mollusk?; Shells as a Hobby; Inspiration from Shells; Shells are Everywhere; Shells that Feed us; Mollusk Invaders; The Scallop; Cone Shells; Volutes - Aristocrats of Shells; March of the Giant African Snails.

The second floor of the Museum contains the library, the research laboratories, and 13,000 square feet of storage space for mollusk collections. R. Tucker Abbott, who holds the du Pont Chair of Malacology at the Museum, estimates there are some 200,000 lots already available in the cabinets for study.

R. Tucker Abbott showing the "Galaxy of Sea Snails ", a spherical display of 128 univalves at the Delaware Museum of Natural History.

THE TRISTAN DE CUNHA CHITON

by VyDel Larson

A chiton from the island of Tristan Da Chunha in the South Atlantic Ocean, a seemingly rather nondescript little mollusk, has just been identified for me by Glen and Laura Burghardt.

Since there are scientific descriptions available, I shall limit mine to a general one. It is from one to two inches in length, oblong, with the outer surface smooth, pale gray with a tinge of blue. The interior is bright blue. There are the usual eight valves and the posterior valve has eight slits. Usually the valves are badly eroded, encrusted with lime deposits and the girdle filled with tiny pieces of seaweed and debris.

Although I have been receiving shells from this location since 1964, it sometimes takes a long time to have identification made. The correct name for this chiton is: Plaxiphora simplex Haddon, 1866. Mr. Burghardt indicates this is only one of two species native to the island waters. The other is an Ischnochiton.

Since the people sending the shells are not collectors, it has taken a great deal of time to determine what kind of shells were there and to receive other than beach specimens. I have sent books, illustrations and instructions on how to collect, clean and preserve. Materials for the kill and preservation have also been supplied with one exception. The U.S. Postal Department does not allow the shipping of alchol. A local brew has been the substitute, the name and origin of which is unknown by me, but the aroma is a cross between vinegar and sour mash. The color is brown, which makes cleaning a real job.

All things considered, I think they do remarkably well with the shells and am grateful for whatever I receive. It has been called a "rare" chiton, but I am inclined to disagree.

It is my understanding that a rare shell is one that is seldom found at a point of origin. I would rather apply the term scarce, since they are abundant at the source, but not readily available on the open market. If they were truly rare, it would be unlikely that I would have so many of them.

Patience and preseverance have been justly rewarded by the addition of this little chiton to my collection.

(Editorial Note: This same chiton was described under the title "The World's Rarest Chiton"in the Winter, 1975/76 issue of "Of Sea and Shore").

146. Corbula (Hexacorbula) sp. indet. A.

This smaller species lives in shallower water than C. dietziana. It is common in beachdrift along the Texas coast and enters some of the coastal bays. In contrast to C. dietziana, it is never colored, but is always a drab white, except one slightly pinkish specimen in the H.M.N.S. collection. Because of the confusion in this genus it appears to have escaped being named properly. Figures of this species have appeared in various publications always named inappropriately. The latest of these is reference 269, where it appeared as Corbula dietziana. This figure shows the characteristic shape of the species in the N.W. Gulf of Mexico. Previously I reported the species as Corbula swiftiana C.B. Adams, but because the majority of specimens so labeled in the National Museum in Washington are different, I report the species here as spec. indet. A. I have not seen the type of C. swiftiana figured by Clench and Turner, a figure which resembles C. spec. indet. A. Until a critical study of the types of all western Atlantic recent and late Neocene Corbula's has been made, it will be impossible to name the species.

Previous records for the Texas faunal province are: 136, (as C. swiftiana) at many stations off East Texas. Often alive, pl. 7, fig. 1; 145, (as C. contracta) upper sound assemblage, Pl. 3, figs, 13 A, B; 164, (as C. contracta) Rockport and Laguna Madre; 175, as C. contracta Say, common in sandy sediments; 202, as C. contracta Say, listed; 206, (as C. swiftiana) Texas Conch., Vol. 6 (7), p. 70, Beach Records; 269, (as C. dietziana), figured on page 216.

Records H.M.N.S.: 69 lots of which 7 contain live collected material (Heald Bank; 8 miles south of Freeport; Christmas Bay, Galveston).

Depth Range: 0-27 fms.; alive 1-8 fms., mostly on sandy bottoms.

Geographical Range: Unknown.

Maximum Size: 9.3 mm.

Eastern Pacific Analogue: Unknown.

147. Corbula (Tenuicorbula?) aequivalvis Philippi, 1836.
Arch. Naturgesch., Vol. 2 (1), p. 227, pl. 7, figs. 4a, b, c. (Havana, Cuba).
Only a few valves very closely resembling Altena's figure (pl. 8, fig. 4, 5) were taken on Stetson Bank.
Previous references for the Texas Faunal Province are: 147, dead on Big Southern Bank.
Records H.M.N.S.: 1 lot, no live material.
Depth Range: ± 30 fms.
Geographical Range: Texas, Cuba, Surinam (only localities known to me).
Maximum Size: Not measured.
Eastern Pacific Analogue: None

148. Corbula contracta Say, 1832.
Corbula contracta Say, 1832. J. Acad. Nat. Sci. Phila., 2, p. 312.
This very rare species has only been taken in two lots, one of a single valve in 63 fathoms and another three valves on Stetson Bank. Both lots are probably fossils. The species is quite different in shape and sculpture from the other Texas Corbulids and the only reasonably good figure known to me is that in Perry and Schwengel's text on Florida shells. The figure in Abbott and Warmke is not this species. neither is the one in Ref. 269 which is Caryocorbula caribaea. I do not believe that C. contracta is a Caryocorbula.
Previous references for the Texas faunal province are: 45, listed; 66, marine Pleistocene of Texas; 160, Matagorda Bay; 174, listed; 208, open bay center; 251, Yucatan Shelf; 253, common offshore Padre Island. All of these references, except perhaps that of 251 appear to be in error.
Records H.M.N.S.: 2 lots of dead shells (off Louisiana and Stetson Bank).
Depth Range: 20-63 fms.
Geographical Range: Cape Cod to Florida and the West Indies, Brazil (Abbott, 1974).
Maximum Size: Not measured.
Eastern Pacific Analogue: ?

149. Corbula (Caryocorbula) c.f. caribaea d'Orbigny, 1842.
Corbula caribaea Orbigny, 1842. In Sagra: Mollusque. Atlas, pl. 27, figs. 5, 8.
This is the most puzzling, most common and most variable complex of bivalve forms along the Texas-Louisiana coast. Many of our specimens agree quite well with C. kjoeriana C.B. Adams as figured by Clench and Turner, but this is only one of the many morphs which is found. Small, obese, heavy set specimens have a snout resembling C. chittyana C.B. Adams, others are more regularly formed and may be C. swiftiana C.B. Adams. Along the Texas coast at least five different morphological types can be collected, which

when seen apart from one another, almost certainly would be considered "different species". However, they all merge imperceptibly into one another and often two morphs live in the same population. In the past I have called this species C. barrattiana C.B. Adams, but in the National Museum in Washington the majority of C. barrattiana is something different. A number of almost identical bivalves have been figured under various names by Andrews (Ref. 269) These are all C. caribaea. These figures give, although some are immature, at least some impression of the variability before the secondary growth state. C. barrattiana (p. 215) shows a specimen which has completed its secondary growth and is beginning to develop a snout. The figure of "C. contracta" (p. 215) shows valves just starting the secondary growth stage, but which has not yet thickened its hinge. The figure of C. swiftiana (p. 217) show a specimen that has not quite completed its first growth stage.

The species lives in a wide range of environments, mostly in the mud bottoms in the coastal bays (Galveston Bay, Matagorda Bay) and offshore to fairly deep water. It is perhaps somewhat unlikely that a single species has such an extended depth range, and it therefore is possible that our material is really a mixture of two species. However, I cannot with any justification make a separation.

Previous records for the Texas faunal province are: 15, (as C. nasuta Say, which is Pacific) a single valve at Galveston; 66, Marine Pleistocene of Texas; 170, (as C. contracta) listed for deep shelf assemblage; 206, Beach Records in Texas Conch., (as C. barrattiana); 269, under many names figured on p. 215, 216, 217.

Records H.M.N.S.: 144 lots of which 33 contain live collected material. Thus it is the most widespread offshore bivalve off Texas.

Depth Range: 0-75 fms.; alive: 0-50 fms., in muddy bottoms.

Geographical Range: North Carolina, Florida, West Indies, Surinam to Brazil.

Maximum Size: Not measured.

Eastern Pacific Analogue: Caryocorbula nasuta Say.

Remarks: A number of other species has been reported. They are: 147, Corbula cymella Dall, 1881 (Bull. M.C.Z. 9 115). Dead on Baker Bank, alive on Big Southern Bank. 45, Corbula conradi Dall, 1898. (Tr. W. Fr. Inst. Sci. Vol. 3, pt. 4, p. 842) new name for Corbula nasuta Conrad, 1857, not Sowerby, 1833). Some workers credit C. nasuta to Say (see Abbott, American Sea Shells) and as such C. nasuta is referred to in most references to the fauna of the N.W. Gulf of Mexico. The matter needs to be clarified. Corbula sp. has been mentioned in Reference 150 for Stetson Bank; in Reference 170 as Periploma sp. (sic!), in Reference 201 (two species from the Mudlump fauna; and in Reference 253 from the reef off Padre Island.

SUPERFAMILY GASTROCHAENACEA, GRAY, 1840

FAMILY GASTROCHAENIDAE

To this family belong a number of very widely gaping rather small bivalves with edentulous hinge line. In the northwest Gulf of Mexico represented by the genus Gastrochaena. According to Keen, Rocellaria is the same.

Sources: M. Keen in Treat. Invert. Paleont., Part N, p. 699-700.

Genus Gastrochaena Spengler, 1783.
In the Northwest Gulf of Mexico live two species, one in the shallow, one in deep water. Both species can make the characteristic burrows of this genus; they construct a calcareous flask like protusion on the surface of the solid in which they bore, when they grow too large to be protected by the embedding solid. Our identifications are based on Perry and Schwengel, "Marine Shells of the Western Coast of Florida", 1955, p. 93, pl. 19, fig. 123 a, b and plate 44, figs. 311 a, b. Because there is some confusion about these species some discussion here is necessary. Careful comparison of both species shows two important differences: 1) the wing like projection anterior to the umbo is larger and longer in the deep water form and the umbo is less elevated above the hinge line; 2) the deep water form has lamellar ridges instead of very fine to somewhat coarse growth lines of the shallow water form.

I doubt that these are merely ecological differences because both species occasionally live together. However, it is possible that these differences arise in response to the hardness of the substrate in which the animals bore. The deep water form is here called hians based on the figure in Abbott and Warmke which is very close to it. The shallow water form I have designated as G. stimpsoni, based on Perry and Schwengel's figure. A study of the types, if still extent, is obviously necessary.

The slenderness of these two species does not appear a reliable character. As is usual with boring mollusks, their shape is variable. In general, G. hians, the lamellose form, appears to be more slender in its juvenile stages. Mature specimens, however, tend to be broader than specimens of comparable size of G. stimpsoni.

150. Gastrochaena stimpsoni Tryon, 1856.
This species is fairly commonly found in old shells such as Mercenaria and Crassostrea in which it bores. This is what ref. 206 and 269 erroneously have called Gastrochaena hians Gmelin. The species is distributed along the entire northwestern coastline from the Mississippi Delta, where it has also been taken from the Mudlump Clay, to South Padre Island. It invades the coastal bays (Galveston West Bay, Matagorda Bay) and can also be collected from borings in large shells along the outer beaches. As stated above, its incremental growth lines are finer and never lamellar as in G. hians, and its snout is much shorter. Once (Sargent Beach) found alive in driftwood.

Previous records from the Texas faunal province are: 206, (as G. hians Gmelin), Beach Records in Texas Conch., Vol. 2 (1), (1965) and as sp. A ibid, Vol. 9, (4), p. 82, (1973; 236, (as G. sp.) Galveston; 269, (as G. hians Gmelin) figured on page 218.
Records H.M.N.S.: 62 lots of which 21 contain live collected material.
Depth Range: 0-55 fms. (alive 0-40 fms.).
Geographical Range: Until the identity of both species in definitely settled it is impossible to specify their ranges.
Maximum Size: 13 mm.
Eastern Pacific Analogue: Gastrochaena ovata Sowerby, 1834. "San Diego, California to Ecuador", Keen, 1971.

151. Gastrochaena hians (Gmelin), 1790.
Pholas hians Gmelin. System Nat., 12th ed., p. 3217.
There is some confusion about this species, which has often been reported as G. cuneiformis Spengler, 1793, (N. Saml. K. Dansk. Skrifter 2, p. 180) which apparently is a Pacific species although McLean, 1951 and Olsson and Harbison, 1953, both use this name. Perry and Schwengel, 1955 use G. ovata Sowerby, which, according to Keen, also is an eastern Pacific species. However, their figure, plate 19, fig. 123 a, b, is precisely our species. Without further justification, we shall use here G. hians Gmelin, until the matter can be settled by a study of types.

On the average, this is a deeper water species than the previously one, more strongly ribbed at it's posterior part and in possession of a much more elongate snout anterior to the umbo. It does not invade the bays and is unknown from the beaches.

In the following listing of records, it is uncertain whether they refer to G. hians as defined here:
Previous records for the Texas faunal province are: 136, alive and boring in rock off east Texas in 70 feet of water; 147, dead on Baker Bank and Big Southern Bank; 253, 5 pairs taken from rock samples off Padre Island, rare.
Records H.M.N.S.: 16 lots of which 4 contain live collected material.
Depth Range: 12-55 fms. One lot of doubtful identity, which may be this species, came from 3-4 feet in West Galveston Bay. If this proves to be correct, this species would have a range identical to that of G. stimpsoni Tryon.
Geographical Range: Unknown.
Maximum Size: 22 mm.
Eastern Pacific Analogue: ?Gastrochaena rugulosa Sowerby, 1834. "Galapogos Islands", Keen, 1971.

FAMILY PHOLADIDAE

A family of elongate to globular shells, usually with strong surface sculpture. Species possess a varying nunber of accessory plates and a large apophysis is present. Pholads bore in shale mud, soft rocks and wood.

In the northwest Gulf of Mexico, represented by the subfamily Pholadinae with genera Pholas, Cyrtopleura and Barnea; the subfamily Jouannetiinae with genus Jounnetia and subfamily Martesiinae with genera Martesia and Diplothyra.

Sources: R.D. Turner in Treat. of Invert. Paleont., Part N., Vol. 2, p. 702-722 and R.D. Turner, Johnsonia, Vol. 3, p. 1-160.

Genus Pholas Linné, 1758.
Characterized by the separate umbonal reflection of the dorsal margin. In the northwest Gulf of Mexico, a single species, rarely collected alive, but common on all beaches.

152. Pholas (Thovana) campechiensis Gmelin, 1790.

Pholas campechiensis Gmelin, 1790. Syst. Nat., 13th ed., (1), p. 3216.

This is a quite common beach shell, common in drift along the entire Louisiana and Texas coast, but rarely collected alive and seldom dredged in offshore waters. It does not invade the coastal bays. Live specimens have been collected in wood and dense clay. Two lots of live collected specimens in our collection consist of small juveniles (Freeport, Bryan Beach and Port Aransas) picked from wood and a third lot of a single live specimen was obtained from beachdrift at San Luis Pass, but had already lost its mesoplax. The species lives according to my information (Shell Oil Company geological staff), in the dense clay just offshore McFaddin Beach near Sabine, Texas.

Previous records for the Texas faunal province are: 7 listed; 19, dead valves, Matagorda Bay beach; 21, listed; 45, listed; 110, dead valves occasional at Galveston, common on Bolivar Peninsula, St. Joseph, Mustang and Padre Islands, Pl. 13, fig. 20; 129, 10 miles south off Sabine, Galveston, Port Aransas, Mustang Islands, Port Isabel, High Island, Brownsville; 135, dead in Gulf (Parker and Lee); 174, listed; 206, Beach Records in Texas Conch., Vol. 3 (7), (1967); 225, Galveston; 236, Galveston; 269, figured on page 221.

Records H.M.N.S.: 13 lots of which 3 contain live collected material.

Depth Range: 0-5 fms. (alive only on beach).

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

Maximum Size: 110 mm.

Eastern Pacific Analogue: Pholas (Thovana) chiloensis Molina, 1782. "Gulf of California to Chiloe Island, Chile", Keen, 1971.

Genus Cyrtopleura Tryon, 1862.
Large shells with chitinous protoplax and calcareous mesoplax. Large spoonshaped apophysis.

153. Cyrtopleura (Scobinopholas) costata (Linné), 1758.

Pholas costatus Linné, 1758. Syst. Nat., 10th ed., p. 669.

The angelwing is often found alive in large populations in the sandy mudflats near the inlets. It does not enter the bays of low salinity, but has been found in the south Texas

bays (Port Aransas) and Galveston West Bay and Matagorda Bay. It is not dredged offshore, and the few fragments obtained by dredging are probably Pleistocene fragments. The species is common in beachdrift along the entire Louisiana and Texas coast. Long exposure to cold weather during extended low tides in winter time can kill the animals.

Previous records for the Texas faunal province are: 1, Galveston, common; 7, listed; 15, single valves common at Galveston and Corpus Christi; 18, single valves abundant at Galveston and Corpus Christi; 19, Matagorda Bay, Carancahua Bay, alive at 16-24 inches; 21, listed; 45, Galveston, Corpus Christi, Matagorda Bay; 58, Padre Island; 61, listed; 62, Flour Bluff and Oso Flat (Corpus Christi Area); listed, (makes delicious chowder); 66, marine Pleistocene of Texas; 67, Port Isabel; 69, abundant although perfect, large shells are rare; 98, (as Barnea costata), dead in San Antonio Bay, Padre Island; 110, (as Barnea costata) dead shells common on all Gulf beaches, living in Offats Bayou, Galveston, Pl. 13, fig. 2; 123, in trynet 6½ fms., off Sabine, Texas; 126, listed for Carolinian province; 129, Matagorda Bay, Keller Bay, Carancahua Bay, High Island, Bolivar Peninsula, Boca Chica, Port Isabel; 135, as Barnea costata, dead in Gulf and bays; 136, as Barnea costata, listed; 139, beach and surfzone; 145, Lower sound, inlets, shallow shelf (Mississippi Delta); 156, as Barnea costata, Stetson Bank; 164, Rockport area,in several environments; 174, listed; 193, Port Isabel; 206, Beach Records in Texas Conch. Vol. 3 (7), 1967; 208, bay margin and "grass flats"; 225, Galveston; 236, Galveston; 261, offshore Galveston; 267, Pleistocene Chambers County; 269, figured on page 220.

Records H.M.N.S.: 21 lots of which 7 contain live collected material.

Depth Range: 0-27 fms. (alive 0-1 fms.).

Geographical Range: South Massachusetts to Texas and to Brazil (Abbott, 1974).

Maximum Size: 173 mm. (chipped).

Eastern Pacific Analogue: None

Genus Barnea Leach (in Risso, 1826).
Smaller than Cyrtopleura, somewhat pointed in front and with large pedal gape.

154. Barnea (Anchomasa) truncata (Say,)1822.
Pholas truncata Say, 1822. Journ. Acad. Nat. Sci., Phila. 2, p. 321.

This species has very much the same distribution as the previous one, but is far less common, but occasionally large populations are locally found living in the mudflats, f.i., Bolivar Peninsula. Dead valves have been taken on the beaches, along the entire Texas coast, but the species has never been dredged offshore.

Previous records for the Texas faunal province are: 15, Corpus

Christi; 18, Corpus Christi, not common; 19, dead in Matagorda Bay and Espiritu Santo Bay; 21, listed; 45, repeats 14, 17, 18; 74, loose valves in beachdrift, Timbalier Is. and Caminada, Louisiana; 129, Sand Point, Calhoun Co., Caranchua Bay, Matagorda Bay. These are probably the specimens sent by Mitchell to Dall upon which the Texas reference in Johnsonia is based; 174, listed; 206, Beach Records in Texas Conch., Vol. 3 (7), 1967; 225, Galveston; 236, Galveston; 269, figured on page 220.

Records H.M.N.S.: 15 lots of which 3 contain live collected material.

Depth Range: 0-1 fms. (alive from Bolivar Peninsula, Galveston (West Bay and Port Aransas).

Geographical Range: Massachusetts to Texas, Brazil. Also Sengal to Salt Coast (Abbott, 1974).

Maximum Size: 62.5 mm. (alive from Galveston West Bay).

Eastern Pacific Analogue: Barnea (Anchomesa) subtruncata Sowerby, 1834. "May be found in mud, clay, peat or even soft rock or wood from Southern Oregon to Chili", Keen, 1971.

Genus Jouannetia des Moulins, 1828.
A single widespread nonlittoral species boring in soft rock in the subgenus Pholadopsis Conrad, 1849.

155. Jouannetia (Pholadopsis) quillingi Turner, 1955.
(Johnsonia, Vol. 3, (34), p. 139-140, pl. 84).

The northwest Gulf of Mexico apparently is the true center of this species. It lives by the millions on Stetson Bank and other Miocene shale uplifts and loose valves have been taken at several other dredge locations and even from wood or rocks along our beaches. To the excellent description by Turner, we may add a number of our observations on this fairly common species.

The two valves are discrepant in sculpture. The right valve has the laminations at a strong angle at the sulcus but the left valve has a kind of horizontal interval in the lamination near the sulcus. The figure of the holotype does not show the most common type of sculpture. In the common form the laminations are much closer together and the shell is not particularly thin (those with widely interspaced laminations are thinner). A feature already noted by Turner deserves extra emphasis. This species has an enormous callum. The dorsal part of this structure (broken in the figure of the holotype) shows opposite the umbo, a structure resembling a third valve. This is the mesoplax which became included in the callum. These pieces, when broken out of the callum and found separately are at first quite puzzling and could easily be mistaken for a true valve of a bivalve, which they are not. We cannot measure the meximum size of this species. With the enormous callum, some specimens must reach well over 30 mm. Our largest specimen which is considerably broken,

measures 27 mm.
Previous records for the Texas faunal province are: 140, 40 miles north of Port Isabel in 11-14 fms.; east southeast of Port Isabel in 10-20 fms.; 156, common on Stetson Bank; 206, Beach records in Texas Conch., Vol. 3, (7) (Sargent, Port Aransas, South Padre Island); 269, figured on page 224.
Records in H.M.N.S.: 20 lots of which 3 contain live collected material.
Depth Range: 0-37 fms. (alive 11-25 fms.).
Geographical Range: North Carolina to Florida and Texas, (Abbott, 1974).
Maximum Size: 27 mm. broken (if reconstructed, well over 30 mm.).
Eastern Pacific Analogue: Jouannetia pectinata Conrad. Baja California to Peru, Keen, 1971.

Genus Martesia Sowerby, 1824.
Slightly elongate, woodboring bivalves. In Texas-Louisiana two subgenera, Martesia and Particoma, which have a differently shaped mesoplax.

156. Martesia (Martesia) fragilis Verrill and Bush, 1890.
Martesia (Martesiella) fragilis Verrill and Bush, 1890. Proc. U.S. Nat. Mus., Vol. 20, (1139), p. 777; fig. 10.
This is by far the most common Martesia in the northwest Gulf of Mexico, often found alive in driftwood. Loose valves are not rarely picked from beachdrift. Mostly in floating driftwood (Louisiana and Texas) and one lot from 25 fms. (dead valves) comes from a submerged log.
Previous records for the Texas faunal province are: 140, Sabine, Galveston, Matagorda Island, Port Aransas, Rockport, St. Joseph Island, Corpus Christi, p. 111-114, plates 65-66; 206, beach records in Texas Conch., Vol. 3, (7), 1967; 225, Galveston; 236, Galveston; 269, figured on page 222.
Records H.M.N.S.: 14 lots of which 3 contain live collected material.
Depth Range: 0-28 fms. (living 0-1 fms.).
Geographical Range: Off Virginia to Texas, Brazil, Bermuda, (Abbott, 1974).
Maximum Size: 23.5 mm.
Eastern Pacific Analogue: This species also lives in the Panamanic Province; Sonora, Mexico to Panama; Indo Pacific.

157. Martesia (Martesia) striata (Linné), 1758.
Pholas striata Linné, 1758. Syst. Nat., 10th ed., p. 669. Sny. M. pusilla Linné, 1758.
This species is mentioned here because R.D. Turner in her treatment in "Johnsonia" reports the species from Port Isabel. The main point of difference with respect to M. fragilis is the shape of the mesoplax, which may not be a sufficient character to make specific distinction. At least Harry in reference 236 apparently considers the two species to be identical. In the past, most occurrences of M. fragilis have been reported as M. striata in faunal

lists, and we shall make here no effort to trace the precise species referred to in these reports. This species also lives in floating wood.

Previous records for the Texas faunal province are: 1, (as M. pusilla Linne) in driftwood (Galveston); 7, listed; 21, listed; 45, Galveston, Texas; 58, Gulf of Mexico, off Matagorda Peninsula on floating seaweed; 91, found boring into a piling near the jetties but not a rock boring form; 140, Port Isabel; 174, listed; 225, Galveston; 236, Galveston.

Records H.M.N.S.: None

Eastern Pacific Analogue: The species also occurs in the Panamanic Province, Baja California to Peru.

Additional Range Data: Reported by Altena (1971) from Surinam.

158. Martesia (Particoma) cuneiformis (Say), 1822.
Pholas cuneiformis Say, 1822. Journ. Acad. Nat. Sci., Phila., 2, p. 322.

Widespread and sometimes alive in driftwood, but is not common as M. fragilis. Lots obtained from depth all derived from submerged logs and even though the animals were sometimes collected alive in the submerged wood, I do not believe that deep water is the natural habitat.

Synonym: Pholas caribaea d'Orbigny, 1842.

Previous records for the Texas faunal province are: 7, listed; 21, listed; 45, listed; 56, as Martesia caribaea d'Orbigny, 1845, listed; 140, Galveston; Harbor Island, Port Aransas, Cameron Co., La., p. 114-118, pls. 67, 68; 160, Matagorda Bay (taken alive in 1956); 174, listed; 206, beach records in Texas Conch., Vol. 3 (7), (1967); 225, Galveston; 236, Galveston; 269, figured on page 222.

Records H.M.N.S.: 8 lots of which 4 contain live collected material.

Depth Range: 0-20 fms. (alive 0-20 fms.).

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

Maximum Size: 20 mm.

Eastern Pacific Analogue: Known from Balboa, Panama, but perhaps fortuitously introduced.

Genus Diplothyra Tryon, 1862.

Differences in mesoplax, callum and umbonal reflection, set this genus apart from Martesia, (reference 140). It lives in different substrates: shell or soft rock instead of wood. The single northwest Gulf of Mexico species is a common borer of oyster shells and is often found in the coastal bays.

159. Diplothyra smithii Tryon, 1862.
Diplothyra smithii Tryon, 1872. Proc. Acad. Nat. Sci., Phila., 14, p. 450.

This is the most common boring mollusk of the coastal bays of the entire Texas-Louisiana coast, often found alive in old oyster shells. It also attacks soft rocks, such as sand concretions and although once found in wood (Ode', Texas Conch., Vol. 2 (9), 1966); such occurrences are extremely rare. In all probability, it is a bay species and the few offshore

valves from deeper water are either old Pleistocene specimens or displaced ones.

Previous records for the Texas faunal province are: 21, listed; 45, listed; 58, Matagorda Bay, in oyster shell; 69, as Martesia caribaea d'Orbigny and Martesia cuneiformis Say (from the text it clearly follows that these are misidentifications for D. Smithii); 98, as Martesia sp., listed for bays, "boring alive in oyster shell in upper Aransas Bay"; 114, extremely common as borer in oyster shells in Copano Bay, also Aransas Bay, San Antonio Bay; 135, alive in bays; 141, Port Lavaca, Matagorda Bay, Keller Bay, Port Aransas, Grand Isle, La.; 164, abundantly alive on hypersaline oyster reef, Rockport; 174, listed; 175, High salinity oyster or mollusk reef; 206, beach records in Texas. Conch., Vol. 3 (7), (1967); 225, Galveston; 236, Galveston; 267, listed for marine Pleistocene Chambers Co., Texas; 269, figured on page 223.

Records H.M.N.S.: 28 lots of which 10 contain live collected material.

Depth Range: 0-23 fms.

Geographical Range: Massachusetts to Texas (Abbott, 1974).

Maximum Size: 13.5 mm. (alive, Galveston, West Bay).

Eastern Pacific Analogue: Diplothyra curta Sowerby, 1834. Gulf of California to Ecuador (may be the same species according to Turner).

Other listings in various references are: 7, Pholas maritima Orbigny, 56, Barnea maritima Orbigny, 1845; listed for Texas; 69, Barnea maritima Orbigny, listed. According to Turner in "Johnsonia", Barnea maritima is a nomennudum and the identity of this material must remain uncertain; 61, Xylophaga dorsalis Turton, listed for Corpus Christi area; 62, Xylophaga dorsalis Turton, listed for Mustang Island. Both these references are almost certainly in error (Teredinids).

FAMILY TEREDINIDAE

In the Northwest Gulf of Mexico, represented by the subfamilies Teredininae with genera Teredo, Lyrodus, Teredothyra and Uperotus and Bankiinae with genera Bankia and Nausitora.

In this family belong a number of very specialized small bivalves. Woodboring in habit, they construct long calcareous tubes in wood, which contain the animals body which is much larger than can be contained within the shells. For the purpose of identification, the organs serving to close off these tubes when the animal is retracted are absolutely essential. These so called pallets are simple calcareous objects for the Teredininae, but composite chitinous, calcareous objects for the Bankiinae. Many species are widespread throughout the oceans because they inhabit floating wood. Occasionally, these logs, boards, etc., sink when the animals replace a sufficient volume of wood by calcareous material.

Sources: R.D. Turner, 1966 A Survey and Illustrated Catalogue of the Teredinidae. MCZ, 265 pages.

Before discussing the various species encountered along the Texas-Louisiana coast, the difficulties in arriving at the reliable identification should be pointed out. Since Teredinids are often distributed over wide areas by floating timbers it is not even known with certainty which of the following species are truly indigenous to the N.W. Gulf of Mexico. Of the several species listed below, only Teredothyra dominicensis and Bankia gouldi should be considered a real component of the N.W. Gulf of Mexico fauna. The others are probably adventitious. But until textboard experiments have been made, it remains useless to speculate. Most of the material in the H.M.N.S. collection cannot be identified because either the pallets are missing or they are exfoliating so badly that they have lost their characteristic shape. Often two or more species prove to be infesting the same log. Hardly any differences can be seen between the shells and thus pallets remain the only certain mode of distinction. The following species are identified on the basis of the structure of the pallets only.

Genus Teredo Linné, 1758.
Pallets with a brown periostracum on distal portion, whose margin is somewhat "U" or "V" shaped.

160. Teredo bartschi Clapp, 1923.
(Proc. Bost. Soc. Nat. Hist., 37, p. 33, pl. 34)
A single lot of pallets was obtained from a log on Timblier Is., La. together with those of Bankia gouldi. Since the pallets are old and begin to enfoliate, it is not completely certain that this is T. bartschi and not T. navalis Linne, 1758, a species reported previously from the Northwest Gulf of Mexico.
Previous records for the Texas faunal province are: 56, listed; 69, listed; 110, living from Sabine Pass to Port Isabel.
Records H.M.N.S.: A single lot of dead shells from Timbalier Is., La.
Geographical Range: South Carolina to Texas, Bermuda. Worldwide, introduced to California, (Abbott, 1974).
Eastern Pacific Analogue: This species has been reported at La Paz, Baja, California (see Keen).
Remarks: Teredo navalis Linne, 1758 is the species usually reported: 1, listed for Galveston in driftwood (error for Bankia?); 7, listed; 15, common species and very destructive to pilings of bridges and warves (error for Bankia?); 19, plentiful in drift timber everywhere where I collected (Mitchell) (error for Bankia?); 21, listed; 44, Galveston and the entire Texas coast; 61, listed; 62, listed; 65, listed; 269, pallets shown on page 225.

Genus Teredothyra Bartsch, 1921.
This genus is characterized by a second medially divided cup inserted in the basal cup.

161. Teredothyra dominicensis (Bartsch, 1921).
Teredo Teredothyras dominisensis, Bartsch;
Proc. Biol. Soc., Washington, Vol. 34, p. 30.
This easily recognized species (pallets with two inserted cones) has been taken in 3 lots offshore, two of which

contain live collected material. Although no material in the Museum collection has been taken along the beaches, it is quite probable that it will be collected along the beaches of Texas and Louisiana.

Previous references for the Texas faunal province are: None.

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

Geographical range: Cuba, Dominica, Lesser Antilles (Abbott, 1974).

Depth Range: 11-28 fms.; alive: 11-22 fms.

Eastern Pacific Analogue: None

Genus Lyrodus

Pallets are more club-shaped than those of Teredo with thin periostracal covering.

162. Lyrodus pedicellatus (Quatrefages, 1849).
Teredo pedicellatus Quatrefages, 1849. Am. Sci. Nat. Zool. (3), 11, p. 26, pl. 1, fig. 2.

Only a single lot of this species was obtained from a piece of wood on Bryan Beach, Freeport. The single retrieved pallet is old and the identification must remain somewhat doubtful.

Previous records for the Texas faunal province are: None, Although ref. 269 mentions its possible occurrence along the Texas coast.

Records H.M.N.S.: One lot from Bryan Beach, Freeport.

Geographical Range: Worldwide.

Eastern Pacific Analogue: The species is widespread throughout the oceans of the world, but is not mentioned by Keen in her book (1971) on the Panamanic Province.

Genus Uperotus Guettard, 1770.

This very characteristic genus possesses shells which are slightly different in form than those of all other genera. The pallets possess on their distal end pronounced radiating ribs.

163. Uperotus panamensis (Bartsch, 1922).
Teredo (Teredora panamensis Bartsch, Bull. U.S. Nat. Mus. 122, p. 34, pl. 27, figs. 3-4; pl. 35, fig. 2).

Seven valves together with two pallets were obtained from Mustang Island Beach in wood. This is an extremely interesting find since U. panamensis is as far as I know, only known from the Panamanic province of the eastern Pacific. Its occurrence along the Texas coast presumably indicates that it may live further south either along the Yucatan platform or along the mid American Atlantic coast.

Previous references for the Texas faunal province are: None

Records H.M.N.S.: Only dead material.

Eastern Pacific Analogue: Only known from the eastern Pacific (Panama in 93 meters, Keen, 1971), although according to Turner, possibly Teredo lieberkindi Roch, 1931 from Rio de Oro, Africa is the same.

Genus Nausitora Wright, 1864.
Pallets are elongate with closely packed cones forming almost a single mass. The stalk can be seen extending inside the blade in our specimens.

164. Nausitora fusticola (Jeffreys, 1860).
Teredo fusticola Jeffreys, Ann. Mag. Nat. Hist. (3), Vol. 6, 125,
A single lot of this interesting species was dredged in a depth of 40 fms. in wood. Unfortunately, all material is juvenile, but there were live specimens. The small pallets are quite different from those of Teredo and show clearly under the microscope the almost fused cones and the continuation of the stalk into the blade. Both Keen and Turner mention that Nausitora excolpa Bartsch, 1922 (Bull. U.S.N.M., 122, p. 13, 8, fig. 2; 31, fig. 4) from the Panamania Province is probably identical with it.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: A single lot from 40 fms. ($28^{o}01'$ - 94^{o} 40') with live material.
Geographical Range: Brazil, Scotland.
Eastern Pacific Analogue: Nausitora excolpa Bartsch, 1922, Mazatlan, Mexico to Ecuator. (Acc. to Turner, 1966, possibly the same).

Genus Bankia Gray, 1842.
The pallets of this genus are elongate, with calcareous base and horny cones, which are clearly separate. In the N.W. Gulf of Mexico, two species which are differentiated by means of the shape of the cones. Turner suggests that proposed subgenera are of little significance.

165. Bankia (Bankiella) gouldi (Bartsch, 1908).
Xylotrya gouldi Bartsch, 1908. Proc. Biol. Soc. Wash. 21, p. 211.
This is probably one of the few true indigenous Teredinids of the N.W. Gulf of Mexico. It lives in all bays where it attaches to wooden objects. On the beaches it is the species most often found in driftwood, log, timbers, etc. It ranges from Timbalier Island, La. to South Padre Island and is often found together with other species. We have found it infesting the same wood with Teredo bartschi and Teredothyra dominicensis.
Previous references for the Texas faunal province are: 39, (originally description) Galveston; 56, listed; 69, listed; 83, Sabine Pass, Port Bolivar, Galveston, Rockport, Port Aransas, Corpus Christi, Port Isabel; 110, Sabine Pass to Port Isabel; 225, Galveston; 236, Galveston; 269, pallets figured on page 224.
Records H.M.N.S.: 7 lots, (no live material, although I have seen the species alive).
Depth Range: 0-11 fms.
Geographical Range: New Jersey to Florida, Texas and to Brazil.
Eastern Pacific Analogue: The same species lives in the Panamanic province. Sinaloa, Mexico (Keen) 1971, p. 294.

166. Bankia (Bankiopsis) carinata (Gray, 1827).
Teredo carinata Gray, 1827. Phil. Mag. (N.S.), 2, 411.
Syn.: Bankia caribbea Clench and Turner, 1946.
Of this species, whose cones are wider apart than in the previous ones, two lots were obtained, one from High Island beach, the other from 28 fms. mixed with Teredothyra dominicensis.
Previous records for the Texas faunal province are: 83, listed for Texas, "Gulfport". This locality may be in error.
H.M.N.S. Records: 2 lots (only dead material).
Depth Range: 0-28 fms.
Geographical Range: Indo Pacific, Europe, West Indies, Brazil, (Abbott, 1974).
Eastern Pacific Analogue: None.
Finally, there exist references to other species. These are: Teredora malleolus Turton, 1822 (as Teredo thompsoni Tryon, 1863). Listed in 236 for Galveston. Psiloteredo megotara Hanley, 1848. Listed by Ref. 45 for Cameron, La. Bankia (Plumulella) fimbriatula Moll and Roch., 1931. Listed as Xylotrya fimbriata Jeffreys, 1860 in Ref. 7 and repeated as such in Ref. 45, 56 and listed in Ref. 69.
Although we have not identified these species among our scant material, it is not impossible that they eventually will be found along the Louisiana and Texas coasts.

ORDER PHOLADOMYOIDEA

SUPERFAMILY PANDORACEA

FAMILY LYONSIIDAE

Thin shelled bivalves with strongly reduced hinge with a small calcareous piece (ossicle) inside under the anteriorly pointing beaks. Pearly interior and well developed periostracum. Represented in the N.W. Gulf of Mexico by the genera Lyonsia and Entodesma.
Sources: M. Keen in Treat. Invert. Paleont., Vol. N. part 2, p. 845-847.

Genus Lyonsia Turton, 1822.
Thin white shells, with brownish periostracum, radial sculpture.

167. Lyonsia floridana Conrad, 1849.
Of the two closely related species of Lyonsia in the N.W. Gulf of Mexico this is the species occasionally found in the shallow coastal bays. We do not have material from Louisiana, although it probably also lives there, it is fairly common from Galveston southwestward (Galveston West Bay, Matagorda Bay, Aransas Bay, Laguna Madre). Another superficially similar species lives in offshore waters, which upon closer inspection, does not appear to me to be

an ecological variant of L. floridana. Both species are separated by a depth zone in which the genus is not found.

L. floridana Conrad is a rather elongate species which has, when collected alive, often sand grains attached to it. Juvenile specimens look considerably different from full grown material. When two to three milimeters in size, they have a straight dorsal slope, are strongly radially striated by very close and evenly spaced striae and have not yet developed the snout like posterior of full grown specimens. The ventral margin does not sag as in the next species. This species has been often reported as L. hyalina floridana. The figure of L. hyalina floridana Conrad in Abbott and Warmke: "Caribbean Seashells" (plate 44, fig. F) shows little resemblance with this species, but may be L. hyalina as we defined.

Previous records for the Texas faunal province are: 7, listed; 15, dredged in Corpus Christi Bay, rare; 21, listed; 45, Corpus Christi, Texas; 56, listed; 58, Matagorda Bay; 98, listed for the bays; 110, found living in Aransas Bay; 164, alive in inlet influenced environment and open bay margin at Rockport, alive in Laguna Madre; 174, listed; 206, Beach Notes Texas Conch., Vol. 2 (8); 236 (Lyonsia sp.) Galveston; 269, figured on p. 227.

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

Depth Range: 0-1 fms. (bays and beaches only).

Geographical Range: West Coast of Florida to Texas

Maximum Size: 18 mm.

Eastern Pacific Analogue: None.

168. Lyonsia c.f. hyalina (Conrad, 1834).

Mya hyalina Conrad, J. Acad. Nat. Sci., 6, p. 261, pl. 11, fig. 2.

This species about whose identification exists some uncertainty, shows several points of considerable difference with the bay species. In the first place, it is less elongate than L. floridana, its "snout" terminates more abruptly and is broader. In the second place, the structure and shape of the umbo is quite different in that it points sharply forward, whereas in L. floridana it is more folded inward. The umbo also is sharper and more prominent in L. hyalina. Lastly, the anterior part of the shell is less swollen than in L. floridana. As a consequence of all these differences, the species is closer in shape and appearance to the genus Entodesma off the Texas coast.

Previous records for the Texas faunal province are: 7, listed; 44, Nova Scotia to Texas, 0-30 fms.; 56, listed; 174 listed.

Records H.M.N.S.: 6 lots of which 3 contain live collected material.

Depth Range: 11-28 fms.; alive; 12-28 fms.

Geographical Range: Abbott, 1974, gives Nova Scotia to South Carolina, but until the genus has been carefully reviewed, no geographical range can be specified.

Maximum Size: 12 mm.
Eastern Pacific Analogue: Possibly Lyonsia gouldii Dall, 1915.
"San Diego, California to Acapulco, Mexico, mainly taken by dredging in 7-73 m." (Keen, 1971).

Genus Entodesma Philippi, 1845.
This genus differs from Lyonsia by the presence of color in the shell, **more** irregular shape, thicker periostracum and lack of radials in **full** grown shells. The single Texas species was assigned by Dall and **Simpson**, 1901, to the subgenus Philippina, which is not recognized **by** Keen in the "Treatise".

169. Entodesma (Philippina) beana (Orbigny, 1846).
Lyonsia beana Orbigny. Moll. Cubana 2, p. 225, pl. 25, figs. 26-28.
This often, quite irregular shell used to be known as Lyonsia beana Orbigny. It is colored a greenish brown, its radial sculpture is quite suppressed and its shape is somewhat like a Pteria without the "wing". Radial sculpture is only clearly visible in juvenile specimens of 1-2 mm. size, but does not continue on the shell when it grows to larger size. It consists of very fine closely spaced radials with a number of more pronounced ridges. These radials are formed by rows of small circular pimples. In the genus Lyonsia, the radials are formed by much smaller pustules. Off the Texas coast.
Previous records for the Texas faunal province are: 206, listed in Vol. 9, Texas Conch., p. 83, 1971; 253, attached to algae on reef off Padre Island.
Records H.N.M.S.: 7 lots of which 4 contain live collected material.
Depth Range: 20-30 fms.; alive, 25-30 fms.
Geographical Range: North Carolina to Florida, West Indies, Bermuda, Brazil (Abbott, 1974).
Maximum Size: 21 mm.
Eastern Pacific Analogue: Entodesma (Agriodesma) beviforms Sowerby, 1834. "Santa Elena, Ecuador, depth 11-15 m." (Keen, 1971).

170. Lyonsia? Spec. Indet.
A valve, unfortunately broken, represents a quite different species. The hinge structure is somewhat different and may turn out to be more Thraciid. However, the fragment (ventral part of the margin is missing) should be possible to be identified as the hinge is completely intact. The surface sculpture is typically Lyonsiid with thin radials.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 1 lot, none alive (perhaps our specimen was collected alive and broken by the dredge).
Depth Range: 32 fms. in shelly mud.
Geographical Range: Unknown
Maximum Size: When complete in excess of 7 mm.
Eastern Pacific Ana gue: Unknown.

Texas CONCHOLOGIST

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WONDERFUL WORLD OF SHELLING

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EDITORIAL STAFF

EDITOR
William R. Keeler
729-6958
5827 Braesheather
Houston, Texas 77035

CIRCULATION
Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL BOARD

Mrs. Hollis Q. Boone
668-8252
3706 Rice Boulevard
Houston, Texas 77005

Helmer Odé
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 North MacGregor Way
Houston, Texas 77004

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THE WONDERFUL WORLD OF SHELLING

Margie Woods spent approximately thirty minutes digging an eighteen inch deep hole in the mud at San Luis Pass, Galveston, Texas, one very cold day in February, to retrieve her first angel wing --- Cyrtopleura costata, (Linne, 1758).

Margie is chairman of the educational packs for the May show at the Museum and has spent many hours this winter at the Pass gathering specimens for the Society. One day when the weather was freezing, she collected pairs of frozen angel wings, but the specimen she is shown digging above is the first one she has really dug "all the way" herself. If you think she looks too pretty, the picture was not staged. She had on her stocking-foot waders, but she did remove her all-weather coat and dug with bare arms even though it was in the teens in temperature! Her prize was a five-inch specimen.

Photo by Constance Boone

EDITOR RETIRES

The Editor of the Texas Conchologist since September, 1974, W.R. Keeler, will give up the post with this issue. His orbituary follows:

"As I read my beginning statement, I have kept my promises. I have tried to publish material which would be of interest to members while maintaining technical standards. I have made errors and readers have called these errors to my attention. I have not been able to broaden our stable of authors as I would have liked and the Conchologist still depends upon three of our members for material. Perhaps I have not been aggressive enough when seeking material for publication. It has been interesting, I have learned much and I will remember my association with the publication and with those persons who have helped me during the last three years.

THE WONDERFUL WORLD OF SHELLS

You and all your friends are invited to our Wonderful World of Shells which will open to the public May 2 and last through May 14 at the Houston Museum of Natural Science.

The special opening for members and their families, the Museum staff, board and Guild, and special guests will be held on Sunday, May 1, from 6 to 9 p.m. Invitations will be issued for this event.

Displays will fill Herman Brown Auditorium and be featured in two bronze and glass cases in the James S. Abercrombie entrance of the Museum.

Museum hours are as follows: Tuesday through Saturday 9 to 5 p.m.; Sunday and Monday, Noon to 5 p.m., and Friday and Saturday nights 7:30 to 9 p.m.

Exhibits and exhibitors are as follows:

Texas Shells -- Leola Glass and Constance Boone
Northwest Gulf of Mexico -- From Museum research collection
Texas Freshwater and Land Shells -- Constance Boone
Sanibel -- Helen Eberspacher, Mildred Elkins, Carlos Cardeza
East Coast, U.S.A. -- Margie and Wilbur Woods
Busycons - Houston Conchology Society members, especially Mrs. Howard K. Hanks and Sandy Clark
Caribbean -- Helen and Charlie Doh
West Coast, U.S.A. -- Ruby Ray
Panamic Province -- Audrey and Wayne Holiman
Central Pacific -- Ruth Fair
Philippines -- Cynthia Biasca
Japan -- Rosemary Habermacher
Australia -- Ruth Goodson
Africa -- Several H.C.S. members
Europe -- Helen and Charlie Doh
South America -- Constance Boone
Conidae -- Tina Petway
Cypraeidae -- Wilson Ward
Strombidae -- Lloyd Meister
Lambis -- Laura Montgomery
Pectinidae -- Fannie and Sam Miron
Lyropecten nodosus (Lion's Paw) -- Larry and Betty Allen
Olividae -- Lucy Clampit
Tree and land snails -- Barbara and Jim Hudson
Minute Shells -- Jim Sartor
Chitons -- W.W. Sutow
Bivalves -- Rosemary Habermacher
Growth Series -- Mary Lee Bivona
Fossils -- Laura and Hugo Bauer
Haliotidae -- Rosemary Habermacher
Recent Gift of Shells - From Museum Collection

Mollusks as Food - W.W. Sutow
Educational -- Merle Kleb
Early Uses of Shells -- Anne Spears
Mollusks in Literature Through the Ages -- with assistance from Dr. T.E. Pulley
Artistic Uses of Mollusks Today -- Barbara Hudson
Shells Inside and Out -- Margaret Baldwin
Spondylus -- Carole Courtade
Volutidae -- Frank Petway
Albinos -- Mildred Tate from Brazosport Museum of Natural Science
Corals - Charlie Doh
Echinoderms -- Leola Glass
Beachcombing -- Hershel and Kaye Sands, Mary Jane Williams
Children's Table -- Maria Carpenter and Mary Edna Ragland
Texas Conchologist -- Bill Keeler
Micro-Mollusks in Photos -- Frank Van Morkhoven
Gem Shells of the World - Mary Myers
Largest Shells of the World -- Clarice Van Erp
Muricidae -- Merle Kleb
Matagorda Beach -- Linda Serrill
Evolution of a Shell Collector -- Betty Allen
Stamps and Shells -- Mary Myers

Chairmen are as follows:

General Chairman -- Constance Boone
Advisor---------- Dr. T.E. Pulley, Director of the Houston Museum of Natural Science
Shell Packages----- Merle Kleb and Barbara Hudson
Educational Packs-- Margie Woods, Leola Glass, Ruby Ray
Hospitality-------- Carole Courtade
Publicity --------- Constance Boone, Wilson Ward, Carl Aiken, Clarice Van Erp
Workers for Show and Sales------- Cynthia Biasca and Margaret Baldwin
Cases-------------- Frank Petway, Fritz Lang
Typists------------ Ruby Ray and Mary Lynn Parke

Since this issue of the Conchologist will come out before the show in May, your chairmen urge all of you to continue to help and to give generously of your time to manage the show.

The April meeting has been set aside to get the Museum cases in shape and to talk over any final details. We will place the exhibits in the cases in the Auditorium on Friday and Saturday, April 29 and 30. There will be a few hours available for you to work on displays on Sunday, May 1, but we hope you'll finish Friday and Saturday and be ready to participate in the opening party on Sunday night.

We will need some help on Friday to arrange the rental tables and get

them skirted. We will put the cases we have ordered from Dick Craven in place on Friday. The cases will be delivered to the Museum and held there until we use them in the show. After the show, those of you who have purchased cases may then take possession of the cases.

Take-down for the show will be Sunday, May 15, and on Monday, May 16.

The two special cases of Gem Shells and Molluscan Giants will be arranged a week or so before the opening of the show. The Museum is happy to have these in place earlier and this will help us advertise the show.

We need all of you to help advise the public of this show. If any of you can assist with ideas to pursue special ways to publicize the event, please call a member of the publicity committee.

Thanks to many, many members who have given so generously of their shells and their time, the WONDERFUL WORLD OF SHELLS is well on its way to being a major event for Houston and a triumph for our club.

Again we wish to emphasize that this show will aid the Museum and will also aid in publicizing our club and announce to one and all that HCS is open to anyone interested in shells.

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"BOTTOMS UP COOKERY" by Robert B. Leamer, Wilfred H. Shaw and Charles F. Ulrich (1975) is another book which provides a good assortment of recipes for cooking shellfish. The authors are scuba buffs and accordingly, first-hand information on various aspects of acquiring the shellfish (and other sea foods) is included. The manual is called a "unique sea hunters guide".

Among the dishes described in the book, "ceriche" is mentioned in relation to marinated fish salad. In Ecuador, "ceriche de concha" appears on the restaurant menus. The "concha" in many cases is Anadara tuberculosa. Squids, too, are advertised as "ceriche de camarones".

This book contains three pages of bibliographic material. Among the 42 items listed, the majority of the publications were issued by the U.S. Department of Interior, Fish and Wildlife Service or by the State of California Department of Fish and Game. The photo credits too reflect the contributions of the national and state services.

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In Bulletin No. 5 of the Conchologists of America, Frank J. Nelson discusses the responsibilities (and the problems) of a book reviewer. (In reviewing books and manuscripts for publication, the reviewer must constantly fight his own prejudices and it is often difficult to feel satisfied that he has been completely impartial). Nelson emphasizes that "the reviewer's responsibility is to the reader and not to the The comments preface a blunt review of one book in which the editor "tried to find one redeeming feature for the book's ever having been written.

DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN

THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph)

by H. Ode'

FAMILY PERIPLOMATIDAE

Rather small nacreous shells with internal ligaments lodged in a spoon shaped resilifer. Only the genus Periploma in the N.W. Gulf of Mexico.

Sources: M. Keen in Treat. Invert. Paleont., Vol. N, p. 849-850.

Genus Periploma Schumacher, 1817.
Strongly inaequivalve, nacreous, with slits on umbo. In the N.W. Gulf of Mexico, they are probably species all in the nominate subgenus Periploma. This genus is in need of revision as it is practically impossible to evaluate the status of various "species" from the scattered literature.

171. Periploma (Periploma) margaritaceum Lamarck, 1801.
Along the beaches of Texas and Louisiana, this is an abundant bivalve in beachdrift, often washed ashore in pairs. It is seldom dredged in offshore waters so that I conclude that it primarily lives in the surf zone along the coast and near the inlets. The few bay specimens dredged from Galveston Bay probably have lived there. It appears to be more common in the southern coastal bays of Texas than in Galveston Bay. Periploma margaritaceum has been reported under a great many names: P. angulifera Philippi, 1847; P. inaequivalvis Schumacher, 1817; P. inequale C.B. Adams, 1842. P. angulifera and P. inequale are probably full synonyms. Also, one encounters references to P. papyratium Say, and P. fragile Totten, 1835. The latter name was used by Parker for shells from the Mississippi delta and the Rockport area, which appears slightly different from P. margaritaceum Lam. Characteristic for Periploma is the disparity between right (inflated) and left valve (much flatter and smaller). In P. margaritaceum, the right valve overlaps the left and has an anterior sulcus much more pronounced than the left valve. The anterior part of both valves, when viewed under the microscope, is strongly pustulose.

Previous records for the Texas faunal province are: 1, "Ziets. Malskos", 1847 for p. 73, common; 4, listed on p. 306; 7, listed; 15, Galveston; 19, single valves on Gulf beach Peninsula and Matagorda Island, 21, listed; 32, lists Texas; 45, Galveston from Matagorda; 56, lists Texas; 58, listed; 66, (Periploma sp.) marine Pleistocene of Texas; 69, listed P. inequale); 98, listed for the bays and the beaches; 110, fresh dead shells are found on all the Texas beaches, pl. 13, figs. 14, 15; 135, alive in Gulf, alive in bays; 136, in final list; 143, Matagorda Bay; 145, upper sound Mississippi delta, dead; 160, Matagorda Bay; 164, Rockport area, dead in inlet influenced environment and alive in open bay margin; 174, listed; 206, Beach Notes, Texas Conch., Vol. 7, p. 46, 225, Galveston; 261, Galveston; figured on p. 226.

Records H.M.N.S.: 11 lots of which 4 contain live collected material.

Depth Range: 0-7½ fms., alive 0-5 fms., in mud or fine sand
Geographical Range: Carolinas, Texas, Honduras, Brazil (Rios).
Maximum Size: 20 mm.
Eastern Pacific Analogue: None.

172. Periploma (Periploma?) orbiculare Guppy, 1882.

This species is much more rounded than P. margaritaceum and can be distinguished from it at a glance. It was first identified by Dr. Rosewater from a specimen collected by Dr. Harry in Galveston West Bay (see also Ann. Rep. of Amer. Union for 1968, p. 37-39). Since then, little more material has come to light; only a single live collected specimen in mud at the western end of Christmas Bay. Another specimen which may be this species is illustrated in Ref. 170, dredged alive offshore East Texas in 26 fms. and is labelled P. paypratium Say. The H.M.N.S. collection specimen (Christmas Bay) is strongly pustulose and on the disc of the shell one can discern with the microscope, fine radial rows of small pustules. P. orbiculare Guppy is different but closely related to Periploma coquettae Altena, 1968, described from Surinam. (identical?)

Previous records for the Texas faunal province: 206, Beach Notes, Texas Conch., Vol. 7, p. 46; first reported in a paper by Dr. Rosewater at an annual convention of A.M.U., 1968; 236, Galveston (reported as P. sp., but later identified by Dr. Rosewater as P. orbiculare Guppy).

Records H.M.N.S.: A single live collected specimen from Christmas Bay in 2-3 feet in mud.

Geographical Range: Unknown to me.
Maximum Size: Not Measured.
Eastern Pacific Analogue: Unknown.

173. Periploma spec. indet. ("fragile" of Parker).
Possibly a third species was obtained in a single lot of a single live collected species in Chocolate Bay (Galveston). It has a much sharper anterior part and the posterior side of the shell is much broader than in both other species. It is possible that it is a morph of P. margaritaceum, although I consider this unlikely. It is closely similar to the shells Parker collected in the Mississippi delta and at Rockport, Texas (ref. 175, pl. 2, fig. 13). Until more material comes to hand, little can be said about it.
Previous records for the Texas faunal province: (all reported as P. fragile Totten, 1835) 143, Matagorda Bay; 145, upper sound Mississippi delta; 160, Matagorda Bay; 164, alive in open bay center at Rockport; 175, few, in sandy sediments.
Records H.M.N.S.: 1 lot of a single live collected specimen in mud Chocolate Bay (Galveston).
Maximum Size: Not measured.
Geographical Range: Texas.
Eastern Pacific Analogue: ?

174. Periploma spec. indet.
Still a fourth species is present in our material. It must be much larger than any of the other three species, but unfortunately, we have only fragmentary material in the collection, mostly fragments with the chondrophore. This part is preserved in the dredge samples because the chondrophore is buttressed by a strong internal ridge, reinforcing the shell. The orientation of buttress and chondrophore with respect to the shell is quite different from the one in P. margaritaceum and the other unidentified species. More material must be collected before we can identify our material. Also known from mudlump fauna.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 83, 1973 (as P. sp. B. (exparte).
Records H.M.N.S.: 13 lots, no live material.
Depth Range: 13½-40 fms., in sandy mud.
Geographical Range: Unknown.
Maximum Size: Probably over one inch.
Eastern Pacific Analogue: Unknown.

Remarks: Other references to species in the genus Periploma are: Ref. 21, Periploma trapezoides Lam.;
Refs. 170 and 174, Periploma papyratium Say.

FAMILY PANDORIDAE

White, often quite flat, bivalves with nacreous interior. In the N.W. Gulf of Mexico, only three species.

Sources: M. Keen in Treat. Invert. Paleont., Vol. N, pt. 2, p. 843-844.
H.J. Boss and A.S. Merrill: Johnsonia, Vol. 4, (44), p. 181-215.

Genus Pandora Bruguiere, 1797.
The only genus in this family is inaequivalve, the right valve being flat, left valve slightly inflated. Space for the soft parts of the animal is very small. The hinge plate is missing but instead, a number of buttresses (crurae) are called teeth. The arrangement of these serves to differentiate the several subgenera of which only two live in the N.W. Gulf of Mexico.

175. Pandora (Clidiophora) trilineata Say, 1822.

Pandora trilineata Say, Journ. Acad. Nat. Sci., Phila., 1st. Ser., 2, p. 261.

This common bay dweller is rarely collected offshore. A number of live specimens was dredged from Ship Shoal, La., in between 25-45 feet of water. This location off the mouth of the Atchafalaya River is remarkable by the occurrence of many living bay forms. A number of old fragmental valves has been obtained at several locations in water depths to 28 fms.; they are probably fossil.

P. trilineata lives in most of the coastal bays of Texas and Louisiana (Trimbalier Bay, Galveston Bay, Matagorda Bay, Aransas Bay). It is also often collected from beachdrift along the entire Texas-Louisiana coast. Juveniles are seldom seen.

Previous records for the Texas Faunal province are: 1, Galveston Island; 7, listed; 15, Galveston Beach; 21, listed; 45, Galveston; 56, listed; 61, Corpus Christi area; 62, Corpus Christi area; 69, listed; 98, alive in lower Aransas Bay; 110, dead shells at Galveston and Port Aransas; 135, dead in Gulf, alive in bays; 136, listed (not in text); 139, listed for "inlets", pl. 39, fig. 22; 143, Matagorda Bay; 145, upper sound and inlets, pl. 4, figs. 18A, B; 160, alive at many locations in Matagorda Bay; 164, alive in Rockport area, in open bays centers, margins and inlet influenced areas; 170, off East Texas; 174, listed; 175, listed for open sound assemblage, few in mixed sediment, pl. 2, fig. 12; 206, Texas Conch., Vol. 2 (5); 208, listed for tidal inlet and influence, open bay centers, and bay margin, adapted to soft sediment; 219, Galveston, Matagorda Bay, Carancahua Bay, Pass Caballo, Matagorda Island, Port Aransas; 225, Galveston; 236, Galveston; 261, shallow offshore Galveston; 269, figured on page 226.

Records H.M.N.S.: 47 lots of which 29 contain live collected material.
Depth Range: 0-28 fms.; alive: 0-6 fms., but usually not deeper than 1-2 fms.
Geographical Range: From Chesapeake Bay to Florida to Texas.
Maximum Size: 23 mm.
Eastern Pacific Analogue: The only Chidiophora of the Panamanic Province does not resemble P. trilineata.

176. Pandora (Pandorella) inflata, (Boss and Merrill, 1965).
Kennerlia brevis Verrill and Bush. Proc. U.S.N.M., 20, p. 821, pl. 88, fig. 7a-b. (not Sowerby, 1829), 1898.
The previous species is replaced by P. inflata in the offshore waters where it is widespread along the Texas-Louisiana coast. It is a shorter more inflated species than P. trilineata. Surprisingly, this species has seldom been reported, but I believe some records of P. arenosa Conrad have been misidentified. Sometimes juvenile specimens of P. inflata are difficult to distinguish from those of P. bushiana Dall. The flat right valve of this species is conspicuously marked by slightly curved radial lines. Beach records are rare: South Padre Island, Freeport, Timbalier Bay.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 8, p. 395, Vol. 9, p. 83, 1973, 236, Galveston.
Records H.M.N.S.: 51 lots, of which 6 contain live collected material.
Depth Range: 0-50 fms.; alive: 10-50 fms. in sandy mud bottoms. Beach specimens are probably rafted ashore by whipcoral.
Geographical Range: New Jersey to both sides of Florida. The N.W. Gulf of Mexico may be its principal region.
Maximum Size: 13 mm.
Eastern Pacific Analogue: Pandora (Pandorella) radiata Sowerby, 1835, Baja California to Mazatlan, Mexico in depths to 140 m. (Keen, 1971).

177. Pandora (Pandorella) bushiana Dall, 1886.
Pandora (Kennerlia) bushiana Dall. Bull. MCZ, 12 (6), p. 312.
The last common species in the N.W. Gulf of Mexico occurs sparingly in sand bottoms between 10 and 25 fms. It is a very flat, small species, which has only rarely been taken on our beaches, mostly rafted ashore by whipcoral. Juveniles of this species are sometimes quite close to those of P. inflata. The dentition of this species is more developed than in P. inflata. In the N.W. Gulf, the species does not reach the size of 16 mm. quoted by Boss and Verrill.
Previous references for the Texas faunal province are: Very rare on our beaches (Lydia Ann Channel near Port Aransas, South Padre Island 145, deep shelf, dead, pl. 7, fig. 22 A-B (is possibly P. inflata); 175, listed for intermediate shelf on mud bottoms, common; 206, Beach Records in Texas Conch., Vol. 2, (5), 1965; 236, Galveston.
Records H.M.N.S.: 25 lots of which 5 contain live collected material.

Depth Range: 0-30 fms.; alive: 10-25 fms.
Geographical Range: Florida and Antilles. Poorly known.
Maximum Size: 12.5 mm.
Eastern Pacific Analogue: Pandora (Pandorella) granulata Dall, 1915, appears close. "Southern California to Guaymas, Mexico on muddy bottoms to depths of 33 m" (Keen, 1971).

Remarks: Pandora (Pandorella) arenosa Conrad, 1834, has several times been recorded: 7, listed; 15, listed (P. carolinensis Bush); 170, listed for transitional shelf assemblage off East Texas, pl. 12, fig. 2 (probably P. inflata); 219, "Reported by Singley in 1893 and Pulley in 1952" (Note: this statement is incorrect, Pulley only refers to Dall's reference). In all probability, Pandora arenosa does not live in the N.W. Gulf of Mexico.

FAMILY THRACIIDAE

Represented in the Gulf of Mexico by the genera Thracia, Bushia, Asthenothaerus and Cyathodonata. This family presents difficulties, especially for juvenile material.

Sources: M. Keen in Treat. Invert. Paleont., Vol. N, p. 850, 852, 1969.

Genus Thracia Sowerby, 1823.
Large to small bivalves with pustulose exterior and edentulous hinge. In Texas-Louisiana, the subgenera Thracia and Ixartia.

178. Thracia (Thracia) conradi Courthouy, 1838.
Thracia conradi Couthouy. Bost. Journ. Nat. Sci., 2, pl. 183, pl. 4, fig. 2.
Fragments of this very large bivalve are common over the Texas-Louisiana shelf, but complete valves are quite rare; probably they are broken in the dredge. The umbonal area is apparently easily broken (in the right valve the beak is always perforated) and our material is insufficient to study the properties of the hinge. Our fragments and the complete material shows the typical pustulose punctations of the genus.

We assume that a number of very small valves (1-2 mm) represent the juveniles of this species. They are uniformly pitted and have an appearance different from all other species in this family, except perhaps the next one, of which no juvenile material is present. In these very small specimens there is an extremely narrow, somewhat curved open sinus in the umbo referred to by Keen as "the fissure in the cardinal plate occupied by the lithodesma". (Treat. Invert. Paleont.). What is troublesome however, is that some of these minute valves seem to possess a kind of lateral tooth or some structure thickening the dorsal slope of the hinge line.
Previous records of the Texas faunal province are: 206, listed in Texas Conch., Vol. 9, p. 83, 1973, (as T. conradi and and T. sp. C. juv.).
Records H.M.N.S.: 22 lots, none alive.
Depth Range: 11-60 fms. in sandy and shelly mud.

Geographical Range:
Maximum Size: 90 mm.
Eastern Pacific Analogue: None

179. Thracia stimpsoni Dall, 1886.
Thracia stimpsoni Dall, 1886, BMCZ, 12, (6), p. 307; P.U.S. N.M., 12, No 173, pl. 13, fig. 2.
Fragments of this large Thracia are common in dredged material. It is in my opinion probable that this is not a separate species but immature T. conradi.

180. Thracia spec. indet. A
A single dead collected pair of a third Thracia has so far not been identified. In shape, the species resemble Basterotia newtoniana, but the surface is pimpled and the hinge is clearly Thraciid. More material must be obtained before I can say more about this species.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: A single pair (now disarticulate), dead.
Depth Range: Unknown.
Maximum Size: 9.7 mm.
Eastern Pacific Analogue: None.

181. Thracia (Ixartia) morrisoni Petit, 1964.
Thracia morrisoni Petit, Proc. Biol. Soc. Wash., Vol. 77, p. 157, figs. 1-6.
This is a much smaller and thicker shelled bivalve than T. conradi, and also much rarer. Only a single lot (a complete pair) is present in the H.M.N.S. collection. The pallial sinus is large. The specimen agrees fairly well with Petit's figures and description.
Previous records for the Texas faunal province are: none.
Records H.M.N.S.: A single pair, collected dead.
Depth range: 4-8 fms., on limestone outcrop.
Geographical Range: South Carolina, N.W. Gulf of Mexico.
Maximum Size: 13.5 X 10.1 mm.
Eastern Pacific Analogue: Unknown.

Genus Asthenothaerus, Carpenter, 1864.
Small Macoma-like shells, with a Thraciid hinge.

182. Asthenothaerus spec. indet. (probably balesi Rehder, 1943).
This small Macoma-like shell has all the characters of the genus; the hinge and the fine pustulosity on the blunted posterior end. Dall has described A. hemphilli, Rehder a somewhat more elongate species from shallow water of west Florida and in all probability, this is the same species, but since Keen states that there are two Caribbean species, we will hold a definite identification until we have checked the other species. In all likelihood, both species will turn out to be identical, but our specimens agree better with A. balesi.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 83 as Thracia sp. A.

Records H.M.N.S.: 5 lots, no live material.
Depth Range: 40 feet - 26 fms. in shelly sand and mud (probably alive at 26 fms.)
Remarks: Also reported are the following species:
Thracia phaseolina Kiener, 1834 (ref. 7)
Thracia distorta Montagu, 1808 (refs. 7, 45)
Thracia sp. (ref. 156), "common".
Geographical Range:
Eastern Pacific Analogue: A. villosior Carpenter, 1864, "San Pedro, California to Cape San Lucas" (Keen, 1971).

Genus Bushia Dall, 1886.
Close to Asthenothaerus, no granulations and external ligaments.

183. Bushia spec. indet.
Only two lots of very small valves are in the H.M.N.S. collection; they are completely different from any other Thraciids and have as far as I am able to see, the character and shape of Bushia, in particular B. elegans Dall, which is known from the West Indies. Final identification must await comparison with juvenile material of that species.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 83, 1973. (as Thracia sp. B).
Records H.M.N.S.: 4 lots, no live material.
Depth Range: 14-23 fms., in mud.
Geographical Range: West Indies.
Maximum Size: 1.5 mm. (juvenile material only).
Eastern Pacific Analogue: ?

184. Bushia spec. indet. B.
A single fragment of a much larger species was obtained at one location. It might be Bushia elegans Dall, but no certain identification will be possible from our material.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: A single lot (one broken valve).
Depth Range: Unknown.
Maximum Size: If complete, in excess of 10 mm.
Eastern Pacific Analogue: Bushia panamensis Dall, 1890, is not unlike it. "Panama Bay, 93 m. in mud" (Keen, 1971).

Genus Cyathodonta Conrad, 1849.
Shell with undulating sculpture and pustulose granulations. Juveniles of the only Texas species are different from all other Thraciids.

185. Cyathodonta semirugosa Reeve, 1859.
This species is difficult to understand. Juvenile specimens do not appear to be Thraciids. Their shape is completely different, more like Astarte. They have strong parallel ribbing and no pustulosity. The undulating waviness and granules appear much later when the shell has reached a size in excess of several millimeters. In fact, the very small shells appear almost as Myadora of the family Myochamidae: they possess a blade-like ridge in the cavity of the umbo from which apparently later the structure of the chondrophora will grow. In Thracia this structure is absent. Cyathodonta is fairly common in the N.W.

VOLUTES

MUS. COLL.

SPONDYLUS

IN + OUT

ARTISTIC

BOOKS

EARLY USES

MOLLUSKS AS FOOD	CORALS	ECHINOD

MINUTE	CHITONS	OLIVES	FOSSIL
MUREX	CYPRAEA	CONES	STROMB

AUSTRALIA	PHILIPPINES	JAPAN	AFRIC
TEXAS	N.W. GULF	FRESH WATER	SANIBI

THE WONDERFUL WORL

MAY 1 - 14, 197

LS	EVOLUTION OF A SHELL COLLECTOR	EDUCATIONAL

DOOR

S	BEACHCOMBING	CHILDREN'S TABLE

CONCHOLOGIST

SHOP
MUSEUM GIFTS ANNEX
(HCS SHELL PACKS)

REE + AND SNAILS	BIVALVES	GROWTH SERIES	ANTIQUES
AMBIS	PECTENS	LION'S PAW	HALIOTIS

IROPE	S. AMERICA	CENTRAL PACIFIC	BUSYCONS
S. EAST COAST	CARIBBEAN	U.S. WEST COAST	PANAMIC

OF SHELLS

HOUSTON, TEXAS

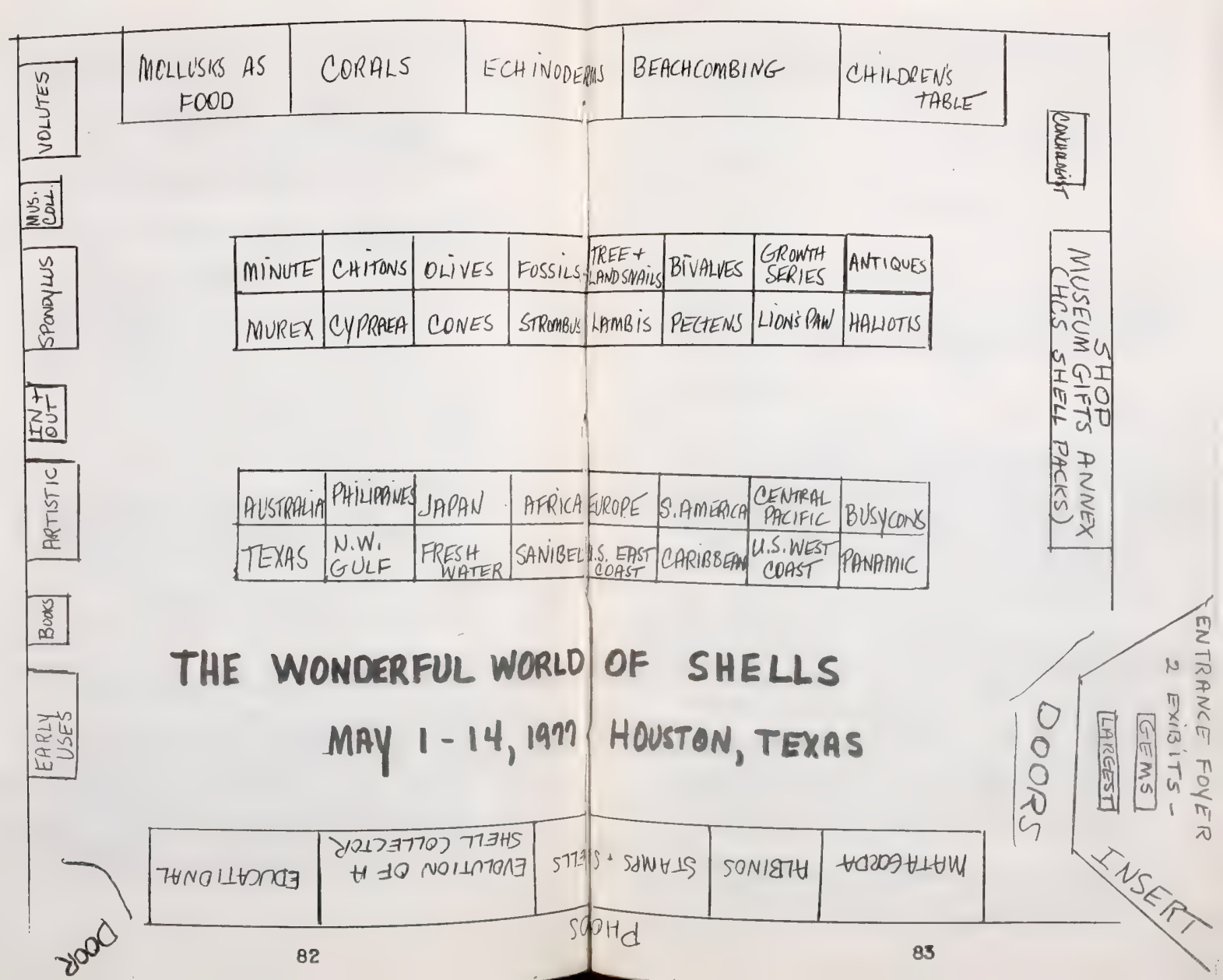
ENTRANCE FOYER
2 EXIBITS -
GEMS
LARGEST

DOORS

INSERT

MATAGORDA	ALBINOS	STAMPS

PH


MOLLUSKS AS FOOD
CORALS
ECHINODERMS
BEACHCOMBING
CHILDREN'S TABLE
VOLUTES
MUS. COLL.
SPONDYLUS
IN + OUT
ARTISTIC
BOOKS
EARLY USES
CONCHOLOGIST
SHOP GIFTS ANNEX (HCS SHELL PACKS)
MINUTE
CHITONS
OLIVES
FOSSILS
TREE + LAND SNAILS
BIVALVES
GROWTH SERIES
ANTIQUES
MUREX
CYPRAEA
CONES
STROMBUS
LAMBIS
PECTENS
LION'S PAW
HALIOTIS
AUSTRALIA
PHILIPPINES
JAPAN
AFRICA
EUROPE
S. AMERICA
CENTRAL PACIFIC
BUSYCONS
TEXAS
N.W. GULF
FRESH WATER
SANIBEL
U.S. EAST COAST
CARIBBEAN
U.S. WEST COAST
PANAMIC
THE WONDERFUL WORLD OF SHELLS
MAY 1 - 14, 1977 HOUSTON, TEXAS
ENTRANCE FOYER
2 EXHIBITS -
GEMS
LARGEST
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INSERT
MATTAGORDA
ALBINOS
STAMPS + SHELLS
EVOLUTION OF A SHELL COLLECTOR
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PHOOS
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lithodesma clings to the shell. More material must be obtained before it can be identified.

Previous records for the Texas faunal province are: 206, the same specimen reported as Cetoconcha sp. A. in Texas Conch., Vol. 9, p. 83, 1973.

Records H.M.N.S.: One lot (live collected?).

Depth Range: 110 fms., in mud bottom.

Geographical Range: Unknown

Maximum Size: 2.2 mm.

Eastern Pacific Analogue: None.

FAMILY CUSPIDARIIDAE

Small, ovate and sometimes costate, but always rostrate bivalves which are carnivorous. Hinge with small resilifer. Although not rare in the N.W. Gulf of Mexico, many specimens are exceedingly difficult to classify because as yet, no clear summary for western Atlantic species has been written. I believe that many variable species in the genera Cuspidaria and Cardiomya have received unnecessary names. In the N.W. Gulf of Mexico the genera Cuspidaria, Cardiomya, Myonera and Plectodon.

Sources: M. Keen in Treat. Invert. Paleont., Vol. N, p. 854.

Genus Plectodon Carpenter, 1864.

Surface densely covered with upstanding scales.

188. Plectodon granulatus Dall, 1881.

Neaera granulata (Dall), Bull. Am. Comp. Zool., Vol. 9, p. 111, 1881, fig. ibid, Vol. 18, p. 300, pl. 3, fig. 8.

Widespread throughout the entire Texas-Louisiana shelf area and sometimes in large numbers. Juveniles start out closely resembling Cuspidaria (smooth), but upon growth immediately form scales, which are somewhat elongate in the direction of the growth lines and densely cover the entire surface. Usually not larger than 10 mm. but the species can reach twice that size. Also taken from the mudlump fauna.

Previous records for the Texas faunal province are: 145, deep-shelf, dead; 156, Stetson Bank; 170, listed for deep-shelf assemblage, pl. 11, fig. 3; 175, upper continental slope, common, many dead in shallower water, living in deeper water than 65 fms., pl. 6, fig. 16; 201, listed for Mudlump fauna; 206, Texas Conch., Vol. 9, p. 83; 214, Yucatan; 225, Galveston; 236, Galveston; 251, Yucatan.

Records H.M.N.S.: 40 lots of which 1 contains live collected material.

Depth Range: 14-70 fms.; alive at 25 fms. in shelly mud.

Geographical Range: Florida Keys, Gulf of Mexico, Caribbean.

Maximum Size: 19.8 mm.

Eastern Pacific Analogue: Plectodon scaber Carpenter, 1864. "Catalina Island, California, through the Gulf of California and south to Panama and the Galapagos Islands, in 20 to 250 m." (Keen, 1971).

Gulf of Mexico but due to its fragility, completely undamaged material is rarely collected.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 83, 1973.
Records H.M.N.S.: 11 lots, of which 2 contain live collected material.
Depth Range: 17-75 fms.; alive 17-24 fms. (Miocene shale outcrop and in sandy mud).
Geographical Range:
Maximum Size: Fragment of ± 20 mm. (complete shell larger than 1")
Eastern Pacific Analogue: C. dubiosa Dall, 1915, "San Pedro, California to Champerico, Guatemala in depths to 26 m." (Keen, 1971).

FAMILY POROMYIDAE

Small rounded shells, which in the Texas faunal province are distinctly granular. Internally nacreous. In Texas, only the genus Poromya.
Sources: M. Keen in Treat. Invert. Paleont., Vol. N, part 2, p. 852-853.

Genus Poromya Forbes, 1844.
Nacreous, with granular surface.

186. Poromya (Poromya) rostrata Rehder, 1943.
Proc. U.S.N.M., Vol. 93, (3161), p. 189, pl. 19, figs. 11-12.
This strongly granular species is common in water below 30 fms., although it has been taken at shallow as 20 fms. Rarely alive (50 fms.) but juveniles are not rare. These are thin-shelled and finely and densely pimpled. Older valves are more coarsely pimpled and often lose the granulation on the disc of the shell. The degree to which this species is rostrate is variable and it is debatable whether this is not merely a "race" or subspecies of granulata. Some deep-water forms in the collection of the H.M.N.S. have hardly any, but shallow water forms are strongly rostrate. The only live collected specimens show a very slight gape at the rostrum.
Previous records for the Texas faunal province are: 170, deep shelf assemblage off the East Texas coast, plate 15, fig. 2; 175, listed for outer shelf, 40-65 fms., common mud bottoms. Figure 20, plate 5 is labelled P. rostrata, but text says P. granulata Nyst and Westendorp, 1839; 201, listed for mud-lump fauna (as P. granulata); 206, Texas Conch., Vol. 9, p. 83, 1973; 236, Galveston.
Records H.M.N.S.: 33 lots of which 1 contains live collected material.
Depth Range: 20-110 fms.; alive: 50 fms., in shelly mud.
Geographical Range: "North Carolina to the West Indies", Abbott, 1974.
Maximum Size: 9.2 mm. (at 110 fms.) normally about ± 7 mm.
Eastern Pacific Analogue: None

187. Poromya (Cetomya?) sp. indet. A.
A single juvenile specimen from 110 fathoms is obviously different from the previous species. It was probably live collected because in the single remaining valve a small

Genus Myonera Dall, 1886.
A single species with a sculpture of strong concentric lamellae.

189. Myonera lamellifera Dall, 1881.
Neaera lamellifera (Dall), Bull. Mus. Comp. Zool., Vol. 9, p. 113, 1881.
Only a few valves and some fragments of this deep-water species have been taken offshore. Our material is immature except for a single fragment.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 83.
Records H.M.N.S.: 4 lots, none alive.
Depth Range: 51-110 fms. in mud.
Geographical Range: "Off Cedar Keys to the West Indies", Abbott, 1974.
Maximum Size: Not measured.
Eastern Pacific Analogue: None

Genus Cuspidaria Nardo, 1840.
A number of species of this genus live in the N.W. Gulf of Mexico. Most are smooth and small. In this genus and the genus Cardiomya, certain identification is almost impossible because of the large number of described species of questionable status. A systematic revision is sorely needed.

190. Cuspidaria (Cuspidaria) sp. ident. A.
A single live collected pair of this species is the only material in the H.M.N.S. collection. It belongs to the group of C. obesa Loven, 1846, C. fraterna Verrill and Bush, 1898 and C. formosa Verrill and Bush, 1898, but comes closest to last cited species. The latter is known from over 1000 fms. depth (1,188 fms.), while our specimen comes from only 170 fms. Direct comparison with type material is necessary before a name can be assigned to this shell.
Previous references for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 83. (as Cuspidaria sp. A)
Records H.M.N.S.: 1 lot of one live collected specimen.
Depth Range: 170 fms. in mud.
Geographical Range: Unknown to me.
Maximum Size: 9.6 X 6.7 mm.
Eastern Pacific Analogue: ?

191. Cuspidaria (Cuspidaria?) c.f. jeffreysi Dall, 1881.
Neaera jeffreysi (Dall), Bull. Mus. Comp. Zool., Vol. 9, (2), p. 111.
This small species is in our material easily separated by the very fine vertical line which runs from the umbo to the ventral margin, about in the middle of the valve. There is also a strongly developed oblique buttress under the hinge plate. Our identification does not amount to more than a suggestion and

comparison with type material is necessary. It is a fairly common species along the Texas-Louisiana coast and it is also known from the mudlump fauna.
Previous records for the Texas faunal province are: 145, listed; 201, listed for mudlump fauna; 206, Texas Conch., Vol. 9, p. 83; 214, Campeche Bank.
Records H.M.N.S.: 11 lots of which one contains live collected material.
Depth Range: 40-76 fms., and, if a small fragment proves to be this species 40-110 fms., alive at 70 fms.
Geographical Range: Western Atlantic.
Maximum Size: 8.8 mm., but probably over 1 cm.
Eastern Pacific Analogue: None.

192. Cuspidaria (Cuspidaria) c.f. microrhina Dall, 1886.
Cuspidaria rostrata microrhina Dall. Bull. Mus. Com. Zool., Vol. 12, (6), p. 295. Ibid: Vol. 18, p. 440, figs. 2, 3, 1889.
Of this very large species, only a single fragment, badly broken, can be identified with reasonable certainty. The rostrum, which is much shortened by fracture is about 10 mm. The entire fragment is 24 mm., but probably about 16 mm. of the entire shell is gone. It was taken together with another rostral fragment and two juvenile shells. These are remarkable for the fact that they look quite as normal Cuspidarias. In fact, I had previously identified one lot of these shells previously as C. glacialis Sars. (Texas Conch., Vol. 9, p. 83). There can be hardly any doubt that the enormously extended rostrum is only developed in mature specimens. These smaller specimens are coarsely sculptured by incremental growth lines and the internal buttress is quite different from that in the previous species. Fairly rare along the Texas-Louisiana coast.
Previous records for the Texas faunal province: 206, (as C. glacialis) Texas Conch., Vol. 9, p. 83.
Records H.M.N.S.: 4 lots, no live material.
Depth Range: 50-110 fms.
Geographical Range: Florida, N.W. Gulf of Mexico.
Maximum Size: Far in excess of 24 mm.
Eastern Pacific Analogue: None

193. Cuspidaria spec. indet. B.
A single, very small valve of a species with very pointed umbo is in the collection and remains so far, unidentified.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 83.
Records H.M.N.S.: 1 lot (no live material).
Depth Range: 167 fms.
Geographical Range: Unknown
Maximum Size: 3.4 mm.
Eastern Pacific Analogue: None

194. Cuspidaria spec. indet. C.
This small species is very close in shape and appearance to juvenile specimens of C. microrhina Dall. It, however, differs the quality of the surface sculpture which is extremely fine, in fact so fine that several specimen acquire an irridescent sheen. For the time being, I can add little by way of characters which could make identification of this species possible.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 83.
Records H.M.N.S.: 8 lots, of which 1 contains live collected material.
Depth Range: 23-70 fms.; alive at 50 fms.
Geographical Range: Unknown.
Maximum Size: In excess of 8.2 mm. (slightly broken).
Eastern Pacific Analogue: None.

DOCTOR VAN REGTEREN ALTENA DEAD AT 69 by H. Ode'

During February of this year, Dr. C.O. Van Regteren Altena died in the Nederlands. Although to most of our readers, he was only known by name, it is fitting that I memoralize this somewhat shy and extremely competent Dutch Malacologist here.

During my high school days, some biology students of Leyden University introduced me to the method of sieving and picking beachdrift under the microscope. See Basteria, Vol. 1, p. 23-30). In this manner, rapidly a number of very small species can be collected. Most of them proved to be unidentifiable to me. Fortunately, I was told that "there is an expert who will be quite interested in your shells". Some letters were written and in this manner I made my acquaintance with Van Regteren Altena. In those days the "Nederlandsche Malacologische Vereeniging" was founded and started publishing its journal "Basteria". On the advice of Van Regteren Altena, I became a member and as a consequence, forever addicted to the hobby of malacology. Van Regteren Altena was most kind to me, gave generously of his time and advice and guided my first steps in the field of shell study. Some of my material was eventually published by Van Regteren Altena in his still up-to-date study: "Bydrage to de kennis der fossiele, sub-fossiele en recente mollusken, die de Nederlandsche shranden aanspollen, en hunner ver spreiding".

After the war was over, our paths diverged but once in a while I would write him apropos of some of my findings concerning the Texas fauna. It gave me great pleasure, that in spite of his frail health, he was able to complete, after his retirement from Ryks Museum, Van Naturirlyke Historie at Leyden, his thorough study of the marine molluscan fauna of Surinam, which in many respects, resembles that of offshore Texas.

STROMBUS CANARIUM LINNE' 1758, CONTROVERSY

by Lloyd Meister

Strombus canarium Linne', 1758, is a very common Indo-Pacific shell. Where it occurs; it is usually found in abundance according to R. Tucker Abbott. It is so common that most shell shops retail them as "basket shells" for ten to twenty-five cents each. They are frequently used as flower buds in shell-craft flower arrangements.

The controversy arises as to whether the subgenus Laevistrombus contains the one species S. canarium two: the other being Strombus isabella Lamark, 1822. In addition, the question arises as to what to do about Strombus turturella (Roding, 1798). I believe that all three of these are a single species.

Original references which relate to this question are for S. canarium: Linne, Systema Natural, 10th Ed., p. 745, No. 438 (in Latin). Röding's Lambis turtarella is described in Museum Boltenanum, Pt. 2, p. 65, 1798 (German). (Refers to an illustration in Concholein Cabinet, Vol. 3, Fig. 817). The Museum Boltenanum was a sales catalog compiled by A.A.H. Lichtenstein and Peter Friedrich Röding for the Bolten family and published in 1798. Lamark's description of Strombus isabella: Lamark's "Natural History of Animals Without Vertebra" Vol. 7, p. 207, (1822) (translated from French). This reference also refers to the same picture in Concholein Cabinet, Vol. 3, Fig. 817. Since I do not read Latin, German, nor French, I have worked with translations and secondary references.

A "typical" S. canarium, Linne', may be described as follows: The shell is solid, heavy for its size and strongly humped on the dorsal part of the body whorl. Base color is white overlaid with light tan to very dark, red brown axial streaks. These often form a melted pattern and sometimes merge to form large patches of solid color. Outer lip thickened and swollen at the upper end in the older adults. The operature, columella and outer lip are white except for a glaze which may appear on the outer part of the columella and the edge of outer lip and which varies in color from light tan to almost black. The outer lower two-thirds of the columella is swollen to varying degrees. The parietal wall may or may not have the axial coloration. The spire may or may not be shouldered.

The first few post-nuclear whorls may have a cancelate sculpture because of axial and spiral ridges crossing each other. The axial ridges begin to disappear in about the third of fourth whorl leaving what appears to be deeply incised spiral lines which, in turn, begin to disappear in the penultimate whorl and remain only at the base of the body whorl. There is a weak to strong substural band which usually begins to disappear in the penultimate whorl. There may or may not be former varicies on the post-nuclear whorls and the spire usually has a concave appearance. I have seen specimens from 1-inch to 4 inches (25 mm. to 100 mm.). The range of canarium is from

southern India to Australia and eastward to Melanesia then northward to Japan. These areas represent the outside limits.

Dr. Abbott's description, Indo-Pacific Mollusca, Vol. 1, No. 2, pp. 48-49, (1960) is necessarily more broad because he feels that there is only one species, as do I.

Enrico Romangna-Manoja, in La Conchiglia, November-December, 1973, p. 15, 16 and figures p. 16 and 17, states that Röding's description of turturella differs from canarium only that turturella is more slender.

He also writes "in our opinion, the specimen shown on Plate 38 of Indo-Pacific Mollusca (Abbott's article) as turturella is not this variety because of the outer lip". I can only assume that this is a typographical error as Plate 38 in the Strombus section is a Miocene fossil, Strombus (Tricornis) merkranicus Verndenberg, 1928. I suspect that he meant Plate 17, Fig. 16, which is the only shell identified as turturella in the Strombus section. The shell in the plate fits only partially the description of isabella (below) because neither the columella nor the outer lip edge are completely white.

According to R. Manoja, Lamark's description of S. isabella shows many differences from S. canarium. I will take these differences individually and try to show that they also occur in various combinations in typical canarium and this way to cause the two species to merge into one.

1. "Longer, up to 95 mm., and lighter in weight"

As I stated in my description, I have seen specimens of typical canarium to 100 mm. As for being lighter in weight, this can be found in young adult canarium whatever its size.

2. "A more globular and humped dorsum".

I fail to see the importance of this feature since there seems to be little, if any, difference between isabella, turturella, and canarium.

3. "A much thinner lip, the upper part of which is more deeply slit in a slanting direction not perpendicular to the axis of the shell as in canarium".

A thinner lip can be found in any young adult, in all sizes and in all species of the entire genus Strombus. Most species of Strombus, if left to their own devices, will thicken the outer lip until it becomes grotesque in some cases. The very thickened and the thin lip have been responsible for several misidentifications within the genus. The "deeper slit" is a probable reference to the posterior canal and is present in the young adult of canarium but tends to

diminish as the upper part of the lip is thickened where it joins the body whorl. It is not stated whether the slanting direction is toward the ventral or dorsal side of the shell. As far as I can determine, this is variable.

4. "Whorls are more widely spaced and there are usually light tubercules along their shoulders".

It takes widely spaced whorls to produce well shouldered specimens and this is not uncommon in typical canarium. The use of the phrase, "usually light tubercules" would indicate that the tubercules are not always present. This is borne out in the photos of isabella which are used in R. Manoja's article pp. 16-17. The specimen in these photos does not appear to have tubercules.

5. "Very marked subsutural groove and whorls above it are rounder".

As stated in my description of typical canarium, the subsutural groove (band) is a variable character, sometimes weak--sometimes strong. The groove causes the band to be formed since it, the band, is the area between the groove and the suture above. As for the whorls being rounder, if the whorls are more widely spaced and the shape of the whorls are rather round to begin with, then it follows that the area exposed below the shoulder will appear rounder. If, however, the whorls below come up to the edge of the shoulder above, then the area exposed will be somewhat more flat which makes the spire appear very concave, virtually shoulderless and relatively smooth.

6. "More extensive and thicker columellar swelling".

This is a variable character in canarium and is more dependent upon age than anything else and is, I am sure, equally so in the turturella-isabella forms.

7. "Fewer varicies on the first whorls".

It is not stated how many fewer. Within the typical canarium in my own collection, the varicies range in number from none to 16. How many fewer can you have?

8. "Decidely different colors: completely white peristoma without the silvery-gray of canarium; outer part of lip completely white; golden dorsum with slight axial darker streaks (no black zig-zag lines) and a white columella, whereas in canarium, the dorsal pattern extends to the ventral side as well".

The peristoma (peristome) is defined as the margin of the aperture. This would indicate to me that what is meant is the columella and the

outer lip. However, Mr. R. Manoja seems not to agree. I suspect that he is confusing the definitions of peristome and parietal, the latter being the ventral part of the shell just to the left of the columella. As has been previously stated, the columella, aperture, and outer lip are white, except for the aluminum-like glaze which occurs in older specimens of canarium. The golden dorsum with slight darker axial streaks can also be found in typical canarium. I have not seen any specimens with "black" axial lines, however, those from the Australian (Queensland) coast are for some reason, probably ecological, a very dark red-brown but not black. Most, but not all, typical canarium have the parietal area covered with the dorsal coloration as do some of the golden color forms. This appears to be an individual rather than a general characteristic. Typical canarium may have the dorsal, or outer part of the outer lip white, although this feature does not occur too often.

Despite the fact that R. Manoja says that he would accept S. isabella Lamarck, 1822, as a valid species and S. turturella (Röding, 1798) as a synonym of that species, it cannot be. It would require a decision to that effect from the Commission on Zoological Nomenclature, which seems to be unlikely since both Röding and Lamarck referred to the same illustration (Concholien Cabinet, vol. 3, fig. 817), a fact that seems to have been ignored by or was unknown to Mr. R. Manoja. He did, however, mention that Röding's was the earlier name. When all is said and done, if Strombus isabella Lamarck is ever accepted as a valid species or subspecies, it would have to take the earlier name of Strombus turturella (Röding, 1798) and the former would become a synonym of the latter.

I do not have in my collection any specimens that would fit that description of isabella without having some features of typical canarium intermingled which, I suppose, would tend to uphold Mr. R. Manoja's contention that S. isabella is quite rare. I have not, to my knowledge, ever seen a specimen that would fit precisely Lamarck's description.

The golden color form is simply a phase that the shell goes through as it grows, according to Dr. Abbott. This is something that I cannot accept. I have studied the spires of all the specimens of canarium in my collection and others as well, and can find no evidence to support his contention. Any time I have noticed a change in color, it has been marked by an obvious break in the shell, following which the color was usually either a little lighter or darker and in one case almost completely white. Any color changes I have noticed could therefore be considered pathological in nature, including those with the white, dorsal, outer lip. As happens in several different families, the animal reaches a point when they stop producing color in the shell, which makes that amount of shell produced white in color.

In summary, it would seem that there is no need for S. turturella as a species; for S. isabella the case is not quite so clear. I agree with Abbott that S. canarium Linne is the only valid species, but if a subspecies exists it would have to be named S. turturella because of priority.

SEARCH AND SEIZURE by Constance Boone

This has been a fantastic winter for low tides and good collecting, despite the fact that the field trip dates triggered rain and blustery weather with resultant high tides.

While it was probably wiser to stay in and run up heating bills, many of us watched the weather reports and chose to go shelling. I almost brought out the army because I got stubborn and insisted on going shelling one morning I KNEW would be good and went alone.

Since we were collecting material for the educational packs, we were delighted that the tides were especially low at San Luis Pass, Galveston, in the bay because we were able to gather big Mercenarias and a number of Dinocardium. The Mercenarias provided food for a number of families. The shells have been delivered to Margie Woods for the educational packs. Some of the Mercenarias had beautiful purple borders, rarely so in our Mercenarias.

One January day on the sand bars out in Galveston West Bay near the pass, Margie called to me and said she wanted to know what shell she had. I almost flipped, because it was a large and perfect Tellidora cristata, not often found in our area live. A later day (my day out alone) I, too, found one dug in and happily added it to my collection.

A number of Pandoras were in the sand out on the bars. Busycons, both spiratum plagosum and perversum, were everywhere, luckily for HCS needs.

If you think you are down at the Pass unnoticed by the law, think again, folks. That day I insisted on going alone (husband had cold) was such a beautiful one. The traffic going out of Houston wasn't too bad; the sun shone brightly, so even though it was 19 degrees, it was great to be out; the tide was the lowest I had ever seen it at the Pass. I was all alone on the sand bars, going, going and going out as far as I could go. I filled the bucket brimful and dragged along a sack of Mercenarias. Imagine my excitement as I collected my very first live, somewhat-dug-in Anatina anitana, and somebody really should have been there to hear me shout with glee when I found two little live Tonnas. Anyway, I reached my car with two loads of shells about 4 p.m. and started home, reaching there about 5:30 p.m. after encountering no special traffic problem. I walked in, still so exhilarated over the day's events that I rather floated in and announced my satisfaction with the day, and met a husband looking a bit upset. It seems that about 1:30 p.m. that day he had received a call from a LaMarque "policeman" who asked if he knew where his Buick, license number so and so, was. Visions of kidnapping or wreck filled his mind. Informed that the car had been spotted "abandoned" at the Pass by Texas Parks and Wildlife rangers, he told them his wife was somewhere

out on the sand bars collecting, he thought. Would they go check out the car and let him know if everything was all right? About an hour later they called to say it was locked and all seemed secure. The rangers never did seem to see me. But that day I do remember a helicopter flew over and around while I was out on the sand bars.

About 4 p.m. when I still wasn't home, Hollis called the Galveston Sheriff's Office and got a number for the bridge toll booth. The man on duty had just come on the bridge but said he didn't see any car on the bay area of the Pass. Hollis then assumed I must be on my way home. Wonder if I'll ever get to go off on such a jaunt again without company??

During January and February we found live Raeta plicatella among the many dead valves we picked up for the club. Many other shells showed up in the drift. Other collecting notes include Margie Woods digging her first angel wing, Leola Glass collecting a live Turbonilla at the Pass, Gene Courtade getting some really huge Busycons, a hinged-but-broken, but of very good color, pair of Macrocallista nimbosa found by Dorothy Torrence on that January field trip at San Luis, and a hinged-but-broken Agriopoma texasiana by C. Boone. This latter species was also found at Surfside this winter, a good pair and another fresh valve.

Cynthia Biasca collected some live Rangias at the Wildlife Refuge near Rockport. Bill Keeler retrieved a slightly broken Amaea mitchelli from the sand at St. Joseph's Island. Mildred Tate collected a nice large specimen of this last-named species at Surfside Beach recently.

Going back to last November, Anne Speers collected a live Lysonsia beana at South Padre Island. Sandy Clark collected a live Tonna there, and a Cymatium was collected by Mildred Elkins.

Now if just we could have a bonus of Epitoniums again this May and if the Janthinas would float in, we would all certain this year was a good one for collecting shells. It will be our luck that these two species will show up in reports about the time of the show. Don't you dare go collecting and forget to mind the store!

MOLLUSCANA

by W.W. Sutow, M.D.

Since I picked up a copy of Edwin Newman's book, "A CIVIL TONGUE", a short time ago, I have been trying to digest its contents piecemeal. Some of the Newmanian message must have been absorbed. Now, as I put down these words, I feel apprehensive that I, too, am murdering the English language. But the deadline is here and the Editor's patience is wearing thin. So whether or not these sentences contain jargon, redundancies, trite phrases and cliches, the material for this issue must be manuscriptized.

Recently, I have been scouting around for books that describe the cooking of mollusks. Since reading Eurell Gibbons' classic "STALKING THE BLUE-EYED SCALLOP" many years ago, I had not kept up with that particular subject matter. So, I experienced a sense of real discovery when I came across a publication called "THE EDIBLE SEA." The authors are a couple: Paul and Mavis Hill. The book is solid, in hard cover, 276 pages, published in 1975 (price $15). A large chunk of the book deals with the cookery of mollusks.

What sold me on the book was the picture of the abalone and the bamboo rice paddle. It takes an old-time abalone buff to understand the connection. This is the traditional oriental technique and it works neatly and efficiently to separate the mollusks from their shells. (Take it from someone who has used it hundreds of times over the past half a century).

The authors go into the abalone recipes in a thorough manner and describes a number of ways to prepare this delicious (in my opinion, the numero uno) seafood. The gourmet qualities of the abalone "steak" receive proper emphasis. But, as far as I am concerned, there is only one way to eat abalone and that is as "sashimi" (raw). The authors call this "hors d'oeuvres of sliced abalone" and recommend teriyaki sauce. I prefer straight shoyu (soysauce of the Kikkoman brand) with either hot mustard or the Japanese horse radish. Lemon juice will add to its taste. This is truly a king's dish in flavor.

Abalone can be fried without pounding. (Pounding takes something away.) The meat must be sliced thin and the heat of the oil as well as the timing of the cooking must be just right. It is really quick-fried. The mollusk will cook tender and tasty. Overcooked, the muscle fibers harden.

There is another dish (not included in the book) that the orientals prepare. That is sliced cucumber salad containing diced or thin-sliced uncooked abalone. The dressing is the sweetened Japanese vinegar which firms up (but not harden) the abalone to a delectable consistency.

There is no question that I am biased when it comes to talk of molluscan gastronomics. But I like this book. Skimming through its pages provides a lot of informational tidbits that can fascinate the reader. A few can be mentioned. Ordinary cooking does not destroy all toxins as those found in the whelk Neptunea and the Japanese clam Callista brevisiphonata during spawning season (May to September). Diflagellate

poisoning of mussels is well known. Quahogs are called cherrystones little necks, and, chowders, depending on their size. Clams that need to be "purged" include mud clams and the soft shell clams. In my experience the surf clams (Spisula) seem to contain inordinate amounts of sand, and do not purge easily. Even the coquinas need purging which can be done readily.

The Pismo clam comes in for some space which pleases me no end. Not because I grew up in the real Pismo clam country (I spent many a weekend plowing up the sands of Pismo Beach, Oceano, Oso Flaco, and Morro Bay) but because I believe that Tivela stultorum is the best tasting clam there is in the whole world.

Here again chowders are prominently mentioned. But how about the straight clam soup oriental style - just the clam and the soup and some chopped onion. And for both the abalone and the Pismo clam eaten raw, the venturesome might try the authentic Japanese dressing - made from soybean paste ("miso") and sweetened vinegar (Japanese variety) ground together into a thin sauce. It's the real thing and a real treat!

One could mention several other things about abalone cookery. For example, the dark, frilly mantle of the animal (usually discarded) is edible. Uncooked, this part is gristly and chewy. Cooked, this part becomes soft. In fact, the viscera too can be cooked and eaten. (After all, in the meat eating culture, the brain, liver, kidney and the like are consumed). The authors, however, caution that there is such a thing as abalone poisoning. Only the Japanese species, Haliotis discus and H. sieboldi appear to be implicated. In both, the toxin originates from the Desmarestia seaweed which concentrates in the liver. If the liver is consumed, poisoning can occur. The white muscularture of the abalone is completely unaffected and is safe.

Among the mouth-watering abalone dishes that are reciped are: abalone relleno, tortilla abalone sandwiches, ab-burger, abalone hamburger, abalone roast, abalone tacos, smoked abalone, abalone fondue, abalone appetizers and abalone chowder. Not mentioned, probably because of its scarcity, is dried abalone. As a youngster, we used to carry around the rock hard dessicated mollusk and a pocket-knife. One simple shaved off thin slab and chewed on them - the same as jerked meat. In some stores, these shavings are available in high-priced plastic bags.

An interesting bit of information noted in the book is the "abalone tenderness scale". According to the authors, the white abalone (H. sorenseni) is the tenderest and the black abalone (H. cracherodi) the toughest. Pink (H. corrugata) red (H. rufescens)and the green (H. fulgrens) increase in toughness in that order.

Among the other mollusk recipes in the book are conchs, scallops, mussels, oysters, octopus, squid (such as "squidicious"), limpets, chitons, periwinkles, moon snails, and sea hares.

Incidentally the section on mollusks is only one-fourth of the book. There are chapters on cookery of crustaceans, fishes, marine reptiles, mammals, echinoderms, seaweeds and even sea water. All in all, this book is unusual - and a good one. It is recommended. The only drawback (not serious) is the lack of any bibliography. Surely there are other publications which the reader may consult for additional information.

Texas CONCHOLOGIST

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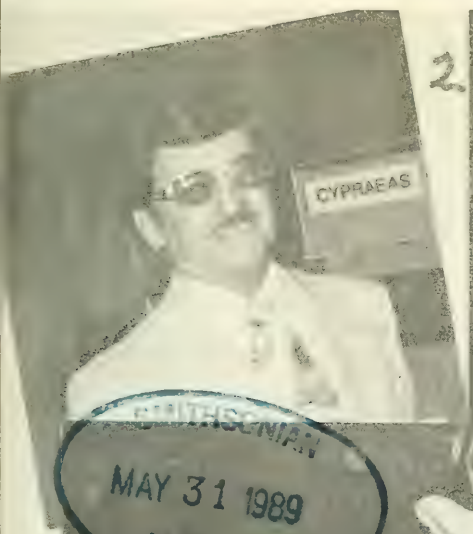

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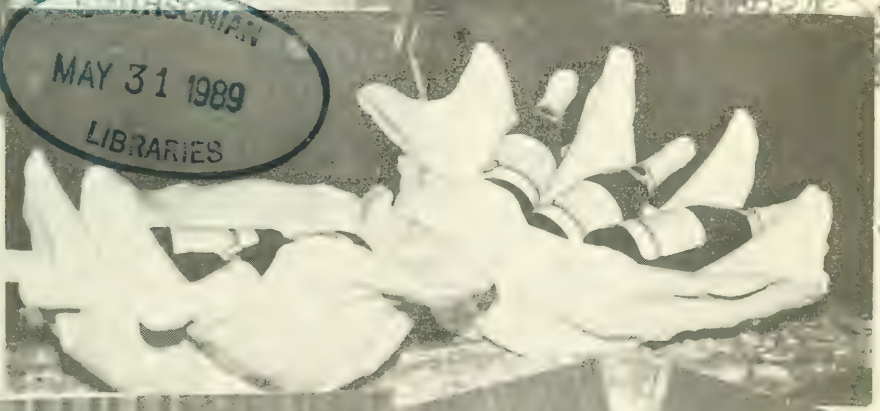

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CIRCULATION

Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL STAFF

Helmer Ode, Editor
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 N. MacGregor Way
Houston, Texas 77004

Constance E. Boone
668-8252
3706 Rice Blvd.
Houston, Texas 77005

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double spaced and should be submitted to the editorial staff.

PREVIEW CHAMPAGNE PARTY

On Sunday, May 1, from 6:00 to 9:00PM, we celebrated our opening of THE WONDERFUL WORLD OF SHELLS at the Houston Museum of Natural Science with a champagne party for members and guests, museum staff, board and guests. The front page of this issue reflects the spirit of the evening. You'll note wide smiles and pleasant sipping. Identifications are as follows:

1. Wilson Ward, President of the Houston Conchology Society, wearing his shell necktie and hovering near his Cypraea exhibit.
2. Dr. and Mrs. T.E. Pulley (he's our honorary member, advisor to our show committee and Director of the Houston Museum of Natural Science) talking to one of the Museum guests.
3. Our big Tridacna held bottles of champagne for the opening. During the rest of the show it attracted continual attention from the children who visited the show.
4. Kaye and Herschel Sands stand in front of their beachcomber's exhibit. Note Kaye's shells in her hair!
5. Chairman of the show, Constance Boone, wearing a carnation corsage embellished with tiny shells, a gift from the Bivonas.
6. Member Rosemary Habermacher, smiling now that her three fine exhibits are all safely and beautifully in place.

Chairman for the opening party was Carol Courtade who did a magnificent job of arranging a good event with plenty of food and drink. In fact, we've been asked to write up the recipes by guests!

ROUNDUP FROM THE CHAIRMAN

For the record, I repeat much of what you have heard at the May meeting and in the May Newsletter. THE WONDERFUL WORLD OF SHELLS was very much a hit show and could have made a much longer run. It was even suggested that it go on the road!

For our readers worldwide, we wish to emphasize that this major Museum exhibit was a planned event, not a judged show set up according to specific entry categories. The two-week extravaganza was designed to educate and entertain the public. Several hundred school children from Houston and many other Texas cities visited the show every day. With some good advertising, we also drew an audience of many audlts each day, and had huge groups of them on week-ends and evenings. This show was completely free. No donations for viewing were solicited.

Exhibits were invited from members. Each member who planned a specific display worked very hard on his display and presented a fine array of shells to fit the billing. Members borrowed shells from each other; members asked advice and worked hard on nomenclature. The spirit of co-operation was one I'll always remember.

The shells and buckets of Texas Shells we offered at the Museum gift store annex we maintained during the show were all donated for this event. All through the year members collected and cleaned shells to make the packets worthwhile. The tremendous efforts put forth helped us to execute the projects and also helped cement friendships in the membership. I note that many, many members paid for materials from their own pockets. This helped to boost our net income. You recall that the club was not promised much net income. The sales were to benefit the Museum and to pay for the show expenses. We have been able to present a nice amount to the Museum, from which the Museum's show expenses will be subtracted. We estimate the Museum's net will be about our net.

The March issue of Texas Conchologist listed all exhibits and exhibitors. After that went to press, we did add one more I wish to acknowledge. Mrs. L.A.M. Barnette offered some of her shell paintings, and we had a nice arrangement of them.

We have gained some fifteen new members from visitors to the show. We will mail newsletters to the many other visitors who indicated they were interested in membership. We hope they will come to the August meeting and join the club in a new year of fun activities and programs.

Opening with our show was the new permanent display of TEXAS SHELLS on the second floor of the Museum in the Hall of Texas Wildlife. The display has mostly marine shells, many from the Northwest Gulf Survey members have worked on and some others from members of the club as donations. Land, fresh water, and fossil shells are also exhibited to round out the picture of Texas shells. The label for the exhibit explains that it is a gift of the Houston Conchology Society and announces that we meet at the Museum. This will be permanent reminder to visitors that our Society exists and should bring us more members.

At the May meeting, members were asked to shake hands with each other for their wonderful efforts in making this show a success. If you weren't there, this is the time to receive a note of thanks from your chairman. LOVE AND KISSES FROM ME!

Constance Boone

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TOTAL FINANCIAL REPORT
"THE WONDERFUL WORLD OF SHELLS"

INCOME		
One-half of Total of All Sales Income		$1,851.97
EXPENSES		
Opening Event		
Postage and Printing of Invitations	$112.83	
Guard Service	18.00	
Refreshments and Supplies	106.48	
Donations by Members	(60.00)	
Sub-total	$177.31	
Displays		
Signs and Lettering	68.25	
Locks for Display Cases	31.68	
Insurance	55.00	
Materials and Supplies	50.00	
Sale of Locks to Members	(22.94)	
Sub-total	181.99	
Shell Shop		
Materials and Supplies	203.17	($ 562.47)
NET TO CLUB TREASURY		$1,289.50

Explanation of Income:
One-half of total of all sales income given to Houston Museum of Natural Science. $1,851.97

James C. Sartor, Treasurer, Houston Conchology Society, Inc.
June 17, 1977

SUGGESTIONS FOR SHELLING ON TEXAS BEACHES

By Constance Boone,
Chairman of the WONDERFUL WORLD OF SHELLS

(NOTE: These suggestions were added to the buckets of Texas Shells and reprinted here by request from members of HCS).

1. Buy a simple shell identification guide book. Recommended is "Identification Guide to Seashells of North America" by R. Tucker Abbott, available in both paperback ($3.95) and hardback. Also recommended for the beginner, who often does not know which is a shell and which is another kind of sea animal, is the inexpensive Zim's "Seashore Life", available for $1.95. Both are in the Museum's Gift Store, in most book stores and even toy stores.

2. The tidal differences in Texas are not great, but it is helpful to purchase a Tide Book for the U.S. East Coast each year. (Available from U.S. Department of Commerce and from Baker, Lyman & Co., in Houston for less than $5.00). Usually there are a few days around full moon time when tides are low. Check the book for minus tide days. Tides are lowest during the winter months, November through February.

3. Since Texas tides are tied to wind and weather, check the sport page for the Fishing Weather box where tides are listed at various Texas beaches. Fishermen would rather go when tides are high. The sheller goes when the tide is low.

4. It is best to think of shelling a day or so after a hard norther when winds have calmed but tides are still low. Sand bars are exposed then and shells are easier to find.

5. It is good also to think of going to beaches a day or several days after storms, because shells are torn loose from substrates and are dumped on beaches. None of these would get back to normal habitat so you can feel free to collect many.

6. The beginning sheller should pick up dead and even broken shells to start his study of shells. He tries to identify these and to learn what is available. He hopes to discover living shells "at home" in surf and bay as he pursues his hobby. He learns about the specific trails and holes different animals make. He learns where he is likely to find shells, in sand or on pilings or under rocks. (Always turn back rocks in original place so that the living animals who find their homes there can survive).

7. A sheller carefully records where he goes to collect, dates the collection and keeps this separate from other collections at other beaches. He learns to add notes on habitat observations about the animal to add to his collection and to make it more scientifically important.

8. The sheller who is disturbed about collecting a live animal may wish to simply watch the animal a while at the beach and satisfy his collection with a good empty shell. However, the live shell is usually the more accurate in color and the more clearly patterned. The shells are houses of very unique animals who design marvelous forms. In today's world of concern for animals in nature, the sheller will limit his collection to a series of each species which shows size range and pattern range, or geographical range differences.

9. The sheller soon thinks of learning more about shells and seeks others to help him. The Houston Conchology Society, Inc., is open to anyone -- families, students, adults -- interested in collecting on field trips and in hearing programs designed to help the sheller. This Society meets nine times a year at the Houston Museum of Natural Science, publishes a quarterly, Texas Conchologist, and maintains a fine library housed at the Museum. For information, write Sam Miron, 5238 Sanford, Houston, Texas 77035, or register during the show at the sales desk. Dues are $6.00 for families, $5.00 single membership, $2.00 student membership, including all mailings and the quarterly.

10. Tools for shelling include simple items such as garden trowels, pen knife, vials for small shells, bucket, sieve for small shells, plastic bags for specimens larger than the vials. Attire depends on the weather. Since many HCS members trudge the flats on days when the thermometer registers in the thirties, we have learned to wear stocking-foot waders over which high top tennis shoes are worn (these waders are lighter weight and easier to wear in sand and mud than the boot kind). We wear several layers of clothing under a wind breaker, the better to peel off as the Texas sun comes out during the day's collecting period. Summer presents the opposite picture, of course, but we still recommend long pants and long-sleeved shirts. Add a hat! We've seen a lot of "burned" beginners who didn't believe us. Once the sheller knows he needs to collect small shells to complete his collection from Texas, he will acquire a good lens (some inexpensive ones are available) of 10 or better power.

11. Cleaning your take is another story, and advice is wide ranged. Generally, however, you will boil your live shell a few minutes when you get home and extract the animal with a hook, bent pin or dental tool. You will then help nature a bit by brushing off the shell to remove dirt and some algae. Often you will be required to work a little more than this to pick off barnacles and worm tubes with dental picks. A brief soaking in a household bleach helps. Then oil with light weight oil a bit to bring out the colors. Never use shellac and never, never, never use muriatic acid on a shell you want to be of scientific value. Many shells in gift shops are acid cleaned. Some of us prefer to clean one shell and leave the other as it is after removing the animal. Shells have "skins" called periostracum. Shells also have "trap doors" (or operculums)

sometimes on the bottom of the foot of the animal and these need to be kept with the shell for your specimen to be scientifically complete. Some shells with high polish, like Olives and Cypraea, probably should not be boiled. Cleaning is accomplished by freezing and thawing to remove animals, and sometimes shellers prefer to drop these in alcohol a few days and then clean.

12. We remind beach walkers and collectors that many of the shells are edible. The surf zone Conquinas, the small "butterfly" shells uncovered by the waves, are Donax and make good chowder. Texas has fine Mercenarias (Quahogs) for chowder and fritters. Almost all mollusks are edible, but some are better tasting.

"COME JOIN THE FUN"

Robert Louis Stevenson once wrote: "It is perhaps a more fortunate destiny to have a taste for collecting shells than to be born a millionaire."

HELPING OUR CLUB

We are getting more and more requests for talks to schools and clubs, and we are getting more requests for displays or help with depicting mollusks. When we can fulfill such assignments we help to publicize our Society also. We also meet the requirements of our stated constitutional provisions of being a non-profit, scientific and educational society. Sometimes we also gain donations for the treasury as gifts are made for our efforts, but we do not require this. It helps to augment our funds for books.

This summer, several club members have had displays in four Joske stores as part of a promotion on "The Deep" movie and Charlie cosmetics. The shells were just to add to their theme on the sea and weren't part of advertising. Fannie and Sam Miron had their shells at Joske's on Westheimer; Maria Carpenter exhibited at Town and Country; Fritz Lang prepared a display at Gulfgate; and Lloyd Meister had his shells at Northwest Mall.

Margie Woods will have an exhibit on shells and activities of our Society at The Woodlands this summer in the hobby-leisure time day for residents.

Fannie and Sam talked to a school during our May exhibit where they had the delightful experience of finding the teacher had already been to our show and had our bucket of Texas shells!

Constance Boone provided shells for an advertising calendar project, with a benefit coming to the club.

SEARCH AND SEIZURE by Constance Boone

This column exists to report on the finding of shells and to give you information on shells. Many reports on Texas are made, but we will be happy to report on special collections or interesting notes from any shelling areas. However, we would also like you to know that the TEXAS CONCHOLOGIST solicits separate articles by members and readers elsewhere. Our masthead gives you information on presenting material to the Editor or any Editorial Staff member. The Editor, now Helmer Ode, reserves the right to edit or to ask you to expand or to work more on nomenclature on articles submitted.

Several publications in this country have fallen from the rank of listings available because there were not enough articles submitted. Sometimes it seems that one or two persons end up writing all the material, and then it begins to be boring to readers. We do not want this to happen to TEXAS CONCHOLOGIST. Please send in your notes and material.

Most of our club members headed out to search and seize after our May show. A party of sixteen, led by member Ruth Fair, went to two islands in the Fiji chain. Reports trickling in at this time are fantastic. We expect to hear from this group at a coming fall program. It should be a great evening. Members on this trip were Cynthia Biasca, Margaret Baldwin, Ann Gibson, Marjorie and Wilbur Woods, Ruth Goodson, Barbara and Jim Hudson, Jim Keeler, Clarie Van Erp, Mary Jane and Grytch Williams and Ruth Fair. Spouses going included Frank Biasca, Lisle Baldwin and Mrs. Keeler. The Biasca's daughter from England joined the group. Maybe this year all the spouses will be members. Some may be, but I'm quoting from the Membership List.

Others who traveled afar were the Jim Clarks who went to Can Cun, Mexico, the Holimans who went to Mexico (again!) (remember their very fine Panamic exhibit?), the Boones and Courtades to Harbour Island, North Eleuthera and the Florida Keys. The Courtades went to Sanibel and had a collecting day with member Carlos Cardeza in the bay, going out in his new boat. Helen Eberspacher and a group are probably at Sanibel and the Florida Keys now. Leola Glass spent the month of June at Port Aransas. And, locally, a group of members decided to go to the Stone City fossil beds on the river near Bryan, Texas.

Well, there is no better time than now to point out to you that you will have a winter of work on naming your catch and that the Houston Conchology Society maintains a very fine library at the Houston Museum of Natural Science. The books are available for checkout two weeks at a time, and we give you the privilege of calling in and reserving the books for another two-week period. Call the Information Desk. The books are housed in the Information Desk library area. You may take out three books at one time for general use. Should you need everything you can find on a specific subject for research or report, contact a member of the library committee for special permission to take the books for a short term. We need to have the books used as much as possible. Also, we note that we saw we needed some books to round out requests for information and by the August Meeting we will have in an order of books on Europe, another on

CORBICULA SYMPOSIUM

by Constance E. Boone

The First International Corbicula Symposium will be sponsored by Texas Christian University Research Foundation October 13, 14, 15, 1977 at Holiday Inn North near the Dallas-Fort Worth International Airport. Registration deadline is October 1, 1977. Pre-registration fee is $40.00. Registration at the meeting is $52.00. This fee includes admission to all sessions and a copy of the Proceedings of the Symposium.

Note to members: If you are interested in this Symposium on the populations and environmental importance of this species of fresh water clam that has invaded our streams, you may contact Constance Boone for a look at the program and symposium plans. Or you may write directly to Dr. Joseph Britton, Department of Biology, T.C.U., Fort Worth, Texas 76129. Several of you will recall that you have collected small ridged clams with purplish interiors in beach drift, especially near rivers, and others of you have collected specimens of Corbicula in lakes and rivers in Texas and Louisiana bayous. Corbicula is now rather widespread in Texas. In October, 1975, Dr. Britton and Dr. C.E. Murphy, both professors of biology at T.C.U., and a graduate student came to the Houston area to do some work on Unionids with me. On a visit to Lake Houston at Atascocita we discovered that there were many, many Corbicula in the shallows. These two biologists had just turned in a population study on Corbicula in Texas for publication (now published) and this information on the San Jacinto River was not included. Also, I was able to give them information on Corbicula in the Brazos River drainage.

For a number of years, a number of professionals have been concerned with Corbicula's spread in the United States. It is from Asia. It would be helpful if you will report your finds of this species to me. A sample was displayed in the fresh water shells of Texas during the Museum show.

SEARCH AND SEIZURE (Continued)

the Pacific, and on Echinoderms. Note to new member who asked about a Thais (yes, it was a Thais, a guess I made at the May meeting.). Your African shell is Thais cingulata (Linné). If you had had the operculum, identification would have been made easier. Identification from Marine Shells of Southern Africa by D.H. Kennelly. For library checkout, use your membership card or be sure your name is on the list at the Museum.

Genus Cardiomya A. Adams, 1864.
A number of bivalves, all having this same characters, belong to this genus (strong radial sculpture). Many species of uncertain status having been described and a critical revision of the genus will undoubtedly reduce their number. All our identifications are doubtful and will remain so until the range of variability of all species has been more reliably evaluated.

195. Cardiomya ornatissima Orbigny, 1846.
Sphena ornatissima Orbigny. Moll. Cuba, 2, p. 286; atlas, pl. 27, figs. 13-16.
Synonyms: Cardiomya glypta Verrill & Bush, 1898 and Cardiomya costata Bush, 1885 and probably this species.

The main criterion for recognition of this abundant species is provided by a few but enormously elevated fence-like radial costae on the shell. Some specimens have hardly any secondary riblets in between these main costae; in others the number is quite large, and increases with age. On the inside of the shell are grooves where the large ridges radiate toward the ventral margin, especially in the still rather thin juvenile material. Another character of this species is the somewhat flattened umbonal area which is lacking in the other species enumerated here and which gives juveniles a very flat appearance.

It is probably that this species, as so many others of this genus, has been described under a variety of names, the reason being the variability of the appearance of the shell with age. It is surprising that beach records for this species are quite rare (Galveston, Freeport, Aransas Pass, South Padre Island, Matagorda Bay - all mostly juveniles). Rare in the mudlump fauna.

As in all Cardiomyas, the valves are inequilateral, the right valve being larger and more inflated and having a considerable ventral overlap. Many Texas specimens resemble closely Cardiomya orbignyi Olson and Harbison, 1953, described from the Pliocene of southern Florida which is probably the same.

Previous records for the Texas faunal provice are: 139, listed for "outer shelf", pl. 39, fig. 48; 145, deep shelf, dead, pl. 8, figs. 2 a-b; 147, dead on Baker Bank; 156, Stetson Bank; 175, listed for outer shelf, 40-65 fms., common, mud bottom, rarely alive, pl. 5, fig. 18; 201, listed for mudlump fauna; 206, Texas Conch., Vol. 7, p. 59, 1971; 225, Galveston; 236,

Galveston; 251, Yucatan shelf.
Records H.M.N.S.: 42 lots, of which 2 contain live collected material.
Depth Range: 0-50 fms., optimal: 10-25 fms.; alive 8½-20 fms.
Geographical Range: North Carolina to Yucatan, and the West Indies and Brazil (Abbott, 1974).
Maximum Size: 9.3 mm.
Eastern Pacific Analogue: ?

196. Cardiomya perrostrata Dall, 1881.
Neaera (ornatissima d'Orb. var?) perrostrata Dall. Bull. M.C.Z. 9, p. 110.
This much smaller, more elongate species is the second most common species along the Texas-Louisiana coast in the genus. It never develops the fence like ribs as does C. ornatissima and its juveniles are never as flat. It also lives on the average in deeper water.
Previous records for the Texas faunal province: 145, deep shelf, dead; 147, dead on Big Southern Bank; 214, Yucatan Shelf.
Records H.M.N.S.: 27 lots of which 1 contains live collected material.
Depth Range: 20 fms. - 85 fms.; alive: 24 fms. one lot from Clay Pile Shale dome at 17 fms. may be artificially shallow.
Geographical Range: "Massachusetts to the West Indies" and Brazil. (Abbott, 1974).
Maximum Size: 5.5 mm.
Eastern Pacific Analogue: ?

197. Cardiomya spec. indet. (A).
A number of valves of a deep water species with different structure of costae was obtained at several locations. For the time being we can state very little about this species.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 3 lots, of which one was possibly live collected.
Depth Range: 55-167 fms. in mud (alive? at 167 fms.).
Geographical Range: Unknown.
Maximum Size: 9.4 mm.
Eastern Pacific Analogue: ?

198. Cardiomya spec. indet. (B).
A most puzzling extremely small bivalve was dredged off the Louisiana coast from an algal bioherm at 215 feet. It is a minute Cardiomya without the "spoon structure". Its size is about .8 mm. and it is apparent that the shell has already developed substantially from a much smaller prodissoconch. The radial structure practically covers the entire disc except for a minute part near the umbo. Conventional microscopy probably will not be sufficient to elucidate all details of this interesting bivalve.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 1 lot off Louisiana in 215 feet.


COUNTRIES ISSUING SHELL STAMPS
9
10
PLEASE HANDLE
11
13

7. A glimpse of the fine posters accompanying the fabulous display of shell stamps with the shells by Mary K. Myers.
8. The Giants of the Seven Seas display in the entrance foyer drew continuous attention during the three weeks in place. Prepared by Clarie Van Erp.
9. Charlie Doh's Caribbean display, one of three he did for the show. His corals mounted on marble stands was extremely popular with the public.
10. Merle Kleb's award-winning educational exhibit on mollusks was a major part of the show.
11. There is no doubt at all about which exhibit was the most popular with the children. Most of them could not believe they would be allowed to handle the shells. At the last minute it was decided not to label this the children's table, and adults handled the shells as eagerly as the children. This exhibit was prepared by Mary Edna Ragland and Maria Carpenter.
12. W. W. Sutow's display of edible mollusks was a delight. Wat did one long ago at Sharpstown Mall during one of our shows there, and Dr. Pulley requested he do one for the Museum show. Both these fellows eat just about every kind of mollusk, and it is important to stress that many edible mollusks are available here in our waters.
13. Next to the shells to be handled, the Beachcombing table was almost as popular with everyone. We cleaned up sand every day, rearranged the "water" area and replaced the items, but the display was a really fun one. Prepared by the Herschel Sands and the Grytch Williams.
14. We were very proud to display one of the authentic Sailor's Valentine's, an antique much sought by museums and shell collectors.
15. A slice of the interesting display of cut shells which Margaret Baldwin arranged. We are very grateful to Mr. Goodwin for his beautiful cutting of the shells.


JEWELS OF THE SEVEN SEAS
16
17
19
LION'S PAWS
20
22


THINK SMALL
GROWTH SERIES
18
PECTENS
21
24
TEXAS MARINE


16
17
THINK SMALL
18
GROWTH SERIES
19
LION'S PAWS
20
PECTENS
21
22
23
24
TEXAS MARINE SHE

16. The outstanding display of Jewels of the Seven Seas prepared by Mary K. Myers stayed in the foyer area for three weeks and could have remained much longer! The array of rare and gem shells sometimes caused a traffic jam in the Museum hall.
17. Jim Sartor's Think Small exhibit brought to the public's attention most graphically that many, many mollusks are very tiny. Jim showed the tools to use and the results, complete with some photos from Texas Conchologist.
18. Mary Lee Bivona's growth series of species of the Genus Tonna turned out to be very exciting. It all started with her offer to the chairman to show her growth series of Tonna galea from the Gulf of Mexico and expanded to include other species, some rare.
19. Betty Allen brought her magnificent Lyropecten nodosus (Lion's Paws) for our show as well as her delightful story in shells of the "Evolution of a Shell Collector".
20. A view of Herman Brown Auditorium at the Museum during our show to give you an idea of arrangement of the show. In order to show live shells and impart the fact to students and adults that the marvelous houses of mollusks were made by living animals, slides of animals were shown, as well as slides of habitats and shelling areas visited by HCS members, on the wall continuously during the show.
21. Fannie and Sam Miron's Pectens were certainly attractive.
22. This is a small segment of Frank Petway's extensive collection of Volutes shown during the show.
23. A bit of the extravagantly digitated Lambis prepared for display by Laura Montgomery.
24. Texas Marine Shells prepared by Leola Glass and Constance Boone gave many visitors the chance to check out names of their finds.

We are just sorry we don't have pictures to offer of every exhibit. Each and every display was done so superbly for this show, your show chairman is humbly saying THANK YOU FOR MAKING THIS A SMASH HIT.

25. BUCKET OF SHELLS from Texas was a special project prepared for sale through the Museum gift store annex maintained during "The Wonderful World of Shells" May 1-14, 1977. Under the chairmanship of Margie Woods, the project grew as it was executed until each bucket had 42 species of Texas shells and Echinoderms, all scientifically named, complete with authors and dates, with the common name given also and with some discussion on habitat, geographical range or some interesting fact. This educational packet was initiated to benefit the Museum, and buckets remaining are available through the Museum's gift store. Some buckets have been retained by the Houston Conchology Society to be used in talks to schools. They make ideal gifts to students, teachers, or owners of beach homes. The Museum also has books that go well with the buckets.

Photo by Constance Boone


CARIBBEAN
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199. Cardiomya striata Jeffreys, 1876.

Neaera striata Jeffreys. Valorous Moll., Amer. Nat. Hist., Dec. 1876, p. 495; P.Z.S., Nov. 1881, p. 944, pl. 71, fig. 11, 1882.

This large species belongs in the costellata, curta, corpulenta group of Dall, (see Blake Report), species which all might turn out to be the same. Our material is quite insufficient to settle this matter. I only will note here that the costae in this species are closely and evenly spaced and where crossed by equally spaced concentric lines have developed scaly protuberances, giving the shell a somewhat nodulose appearance.

Previous records for the Texas faunal province: 206, Texas Conch., Vol. 9, p. 83, 1973.
Records H.M.N.S.: 2 lots, none alive.
Depth Range: 60-70 fms.
Geographical Range: "Arctic Ocean to Florida Strait, Gulf of Mexico" Abbott, 1974.
Maximum Size: 13.7 X 9.5 mm.
Eastern Pacific Analogue: ?

200. Cardiomya c. f. costellata Deshayes, 1837.

Corbula costellata Deshayes. Expl. Sci. Morea, Geol., p. 86, pl. 7, figs. 1-3, 1837.

Because of the lack of sufficient material to form a firm opinion about this species, it is impossible to identify this species with sufficient certainty. Our two lots resemble somewhat, Dall's figure of C. costellata corpulenta Dall (Blake Report, 1886), but the rostrum is longer. The species has many points of similarity with C. perrostrata, but is much larger. It could be a full grown deep water form of that species. More material should settle the question.

Previous records for the Texas faunal province are: 145, listed; 170, transitional shelf assemblage off East Texas, pl. 14, fig. 3; 206, Texas Conch., Vol. 9, p. 83, 1973 (as Cuspidaria costellata corpulenta).
Records H.M.N.S.: 3 lots, none alive.
Depth Range: 50-51 fms.
Geographical Range: "North Carolina to Florida and the West Indies", Abbott, 1974.
Maximum Size: 10.8 mm.
Eastern Pacific Analogue: ?

201. Cardiomya spec. indet. C.

A single beach collected valve (Aransas Pass Causeway) is the only specimen of this "species". I have separated this form from C. ornatissima for the following reasons: 1) its ribs are much lower than those of C. ornatissima; 2) the umbonal area is not flattened giving the shell a distinctly different appearance. If comparison with similar material should prove these differences to be constant some confidence may be felt in the assignment as a different species. Probably it has been given a name already: Cardiomya gemma Verrill and Bush, 1898, comes close, but differs somewhat in the details of the

hinge line (see Verrill and Bush, Proc. U.S.N.M., Vol. 20, pl. 74, fig. 11). Also, C. mansfieldi Olsson and Harbison, 1953, described from the pliocene of southern Florida appears very similar.

Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 1 lot from beachdrift.
Depth Range: Unknown.
Geographical Range: Unknown.
Maximum Size: 6.2 mm.
Eastern Pacific Analogue: None.

Remarks: Other species in the records are:
Ref. 7: Cuspidaria arcuata Dall, 1881.
Ref. 145: Cuspidaria media Verrill and Bush, 1889.

FAMILY VERTICORDIIDAE

In the N.W. Gulf of Mexico, represented by several genera and subgenera, including some which so far as I know have not been reported for the Western Atlantic. Verticordiids often have strongly cordate, nacreous shells, frequently with a strong radial twist.

Sources: M. Keen in Treat, Invert. Paleont., Vol. N, p. 854-857.

Genus Verticordia Sowerby, 1844.
In the Gulf of Mexico there are several species which possess quite different surface sculpture and form. There are probably several different subgenera in this material, but more work is necessary to identify these. They are all rather small cordate shells with strong pustulosity. A particular feature is that the pointed marginal end of the cords of each valve do not line up, but are alternating at the margin. We believe that the subgenera Verticordia, Trigonulina, Spinosipella and Vertambitus are present in our material.

202. Verticordia (Trigonulina) ornata Orbigny, 1846.
Trigonulina ornata Orbigny. Moll. Cub. 2, p. 292, pl. 27, figs. 30-33.

This common species is quite different in form from all others of the genus in the N.W. Gulf of Mexico. The valves are considerably flattened, locally thickened and quite inequilateral. This species, which, as we interpret it, is in many respects quite different from the figure given by Keen (1971, #789, p. 301), resembles much more the figure of the smaller eastern Pacific V. hancocki, Bernard. I believe, contrary to Keen, that Trigonulina Orbigny, 1846 is a valid subgenus. On the anterior part of the valve of our material are invariably only 6 ribs (Keen's figure shows 8, but it is unfortunately a drawing) and the flat part on the right valve is much more extensive. Opposite this part a high crest of the left valve ends. I believe that in most publications the figures of V. ornata that I have seen are not this species, but are figures of the species

I have left unidentified (spec. A) f.i. Abbott and Warmke, Abbott, American Seashells 1st and 2nd editions; ref. 170. The latter is definitely not V. ornata. Study of the type will be necessary to settle the problem. Common along the Texas-Louisiana coast in sandy mud bottoms.

Previous records for the Texas faunal province are: (none of these appears reliable): 139, listed for "outer shelf", pl. 39, fig. 45; 145, deep shelf (alive), pl. 8, fig. 1 A-B; 175, listed for outer shelf, 40-65 fms., "common", whole coast, sand bottom, pl. 5, fig. 19; 201, listed for mudlump fauna; 214, Campeche Bank, pl. 16, figs. 3, 4; 225, listed for Galveston; 236, Galveston; 251, listed for Yucatan shelf.

Records H.M.N.S.: 39 lots, none alive, but some fresh material.

Depth Range: 13½-60 fms., but optimally at 25-30 fms. in sandy mud bottom.

Geographical Range: Unknown due to the confusion of species.

Maximum Size: 5.0 mm.

Eastern Pacific Analogue: Keen cites V. ornata from the Panamanic Province, but it does not seem to me a Trigonulina. V. hancocki Bernard is probably closer.

203. Verticordia (Verticordia) spec. indet. A.

I believe that this much more symmetric and equilateral species has often been mistaken for V. ornata Orbigny, 1846. It is fairly common along the Texas-Louisiana coast, but lives in deeper water. The flat part on the right valve is less wide and the number of cords on the anterior part is about 8. Also the thickening of the valve and its flattening are missing.

Previous records for the Texas faunal province are: 170, plate 16, fig. 5 (as V. ornata); 206, Texas Conch., Vol. 9, p. 83 (Verticordia spec. A.).

Records H.M.N.S.: 20 lots, of which 1 was collected live.

Depth Range: 40-167 fms.; alive: 70 fms. in mud.

Geographical Range: unknown due to the confusion of species.

Maximum Size: 3.9 mm.

Eastern Pacific Analogue: What Keen designates as V. ornata.

SUPERFAMILY LUCINACEA

FAMILY LUCINIDAE

The classification of this large family of bivalves ranging in size from extremely minute to quite large is still much discussed today. The arrangement offered here differs somewhat from the one given in Abbott (1974). Except for the very minute species most Lucinids are somewhat chalky, often inflated, sometimes internally colored, and possess a characteristic hinge whose dentition may be reduced substantially. Species live in the coastal bays and descend offshore into deep water. In the N.W. Gulf of Mexico one finds all four presently accepted subfamilies:

1) Lucininae with genera: Lucina, Linga, Parvilucina, Pleurolucina, Codakia, Ctena, Microloripes and Megaxinus.
2) Myrteinae with genera: Lucinoma and Myrtea.
3) Milthinae with genus: Anodontia.
4) Divaricellinae with genus: Divaricella.

Especially the arrangement of genera and the assignment of species to these genera in the Lucininae is much debated at present. In previous classifications hardly any use has been made of small juvenile material. But precisely on the basis of shape and sculpture of juvenile material (<2 mm.), I believe it is possible to distinguish between two "lineages" of species in the H.M.N.S. collection:

1) Lucina - Megaxinus
2) Parvilucina - Microloripes - (?) Codakia - ?Linga

Linga and Codakia are here questionably assigned because I have not seen small enough material of the species Linga pensylvanica and Codakia orbicularis which are both rare in the N.W. Gulf of Mexico.

These differences can be briefly summarized as follows:

Juveniles of the Lucina-Megaxinus lineage are circular and possess relatively few concentric ridges; juveniles of the Parvilucina lineage are highly excentric, skewed and have densely spaced concentric ridges.

I believe that Megaxinus should be placed in the Lucininae and that M. floridanus is not a Pseudomiltha as some workers believe. Codakis is close to Parvilucina and some of the small species in Ctena are almost indistinguishable from Parvilucina as in Microloripes. Pleurolucina is here interpreted as a full genus to which is here assigned a single species usually not placed in that genus. About the status of Bellucina, opinions are divided and I believe B. amianta Dall is closely allied with Ctena.

The Myrteinae appear to be, considering juvenile shells, closely related to the Lucina-Megaxinus lineage and could be interpreted as a related deep water group of species. Thus a separation into subfamilies could be made by separation of the Lucina-Megaximus-Myrtea group of genera from the Codakia-Ctena-Parvilucina group, with equally compelling arguments as the ones based on hinge structure used in present classifications. However, to avoid more confusion in an already quite confused arrangement, I shall follow here the subfamilial arrangement of Chavan as given in the Treat. of Invert. Paleont.

Sources: Chavan in Treat. of Invert. Paleont.

Genus Lucina Bruguere, 1797.
Fairly flat, rounded bivalves with concentric or reticulate surface sculpture. In the N.W. Gulf of Mexico, two subgenera: Lucina and Lucinisca Dall, 1901.

204. Lucina (Lucina) pectinata (Gmelin, 1791).

Tellina pectinata Gmelin, Syst. Nat., 6, p. 3236, N 41.
A synonym is Venus jamaicensis "Spengler" Chemnitz 1784.
This widespread bay species lives in all coastal bays of the Texas coast and presumably also in Louisiana although we have no live collected material from Louisiana. Worn beach shells are common in beachdrift along the entire Louisiana-Texas coast, but most abundant toward the south. Small live collected

juveniles are flat, circular and orange in color. In rare populations, this color persists but in some specimens, at best, only traces of color persist internally, and in the majority of mature live specimens from Texas, no trace of color is retained at all. The species is missing in offshore waters and the few specimens obtained there presumably are pleistocene fossils.

References for the Texas faunal province are: 7, listed; 15, Mustang Island, Corpus Christi; 19, alive in Keller's Bay and dead shells in Lavaca Bay and Matagorda Bay; 21, listed; 45, lists previous data; 58, Aransas Bay, Padre Island; 67, Port Isabel; 69, listed in appendix 8; 98, alive in lower San Antonio Bay; 110, Galveston, St. Joseph Island, alive in Aransas Bay, plate 9, figs. 9-10; 131, dead in Gulf; 153, listed; 160, dead in Matagorda Bay; 164, alive at Rockport and in Laguna Madre in several types of environment; 174, listed; 175, listed for shallow hypersaline lagoon near inlet assemblage, plate 3, fig. 7; 178, listed for upper extremity of Northern Laguna Madre, abundant vegetation, sand and clayey bottom; 206, Beach records in Texas Conch., Vol. 3 (6); 208, listed for several environments; 225, listed; 236, listed; 260, listed for Texas; 269, figured on page 176.

Records H.M.N.S.: 25 lots of which 8 contain live collected material.

Depth Range: 0-12 fms.; alive: 0-1 fms. in sandy mudflats.

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

Maximum Size: 51 mm.

Eastern Pacific Analogue: Lucina s.s. does not occur in the Panamanic Province.

205. Lucina (Lucinisca) nassula (Conrad, 1846).

Lucina nassula Conrad. Amer. J. Sci., 2, p. 394; Proc. Acad. Nat. Sci., Phila., 3, p. 24.

Only a few valves of this small reticulate species have been obtained in offshore calcareous environments. Apparently the offshore coral reefs off the Louisiana coast are its most northwesterly outpost and the species is rare and probably remains dwarfed. It has been mentioned by Abbott (1974) for Texas, but I do not know on what evidence.

Previous records for the Texas faunal province are: 145, listed.

Records H.M.N.S.: 4 lots, of which one contains a fresh valve.

Depth Range: 14-31 fms.

Geographical Range: North Carolina to Florida, Texas and the Bahamas (Abbott, 1974).

Maximum Size: 7.5 mm.

Eastern Pacific Analogue: ?Lucina centrifuga (Dall, 1901) Gulf of California to Panama intertidally and offshore to a depth of 82 m. (Keen, 1971).

Genus Megaxinus Brugnone, 1880.
Rather chalky, flat somewhat irregularly sculptured bivalves, with deeply excavated lunule and much reduced hinge.

206. Megaxinus floridanus (Conrad, 1833).
Lucina floridana Conrad. Amer. Journ. Sci., 23, p. 344.
Although several authorities have assigned this species to the genus Pseudomiltha Fisher, I prefer, as Britton did (see Ref. 260) to place it in the genus Megaxinus. Pseudomiltha is a genus in the Milthinae and thus more closely related to Anodontia than to Lucina. In spite of its reduced hinge Megaxinus appears on the basis of overall characters quite close to Lucina.

The species lives in most coastal bays from Galveston West Bay (rare) to the Laguna Madre, but is most abundant along the southern part of the Texas coast (Aransas Bay, Laguna Madre). Dead valves are found in beachdrift along the entire Texas coast, but live specimens have never been dredged in offshore waters. Some dredged dead shells are probably fossils of Pleistocene age.
Previous records for the Texas faunal province are: 32, p. 1378, living on the shore of the Gulf of Mexico from Charlotte Harbour, Florida to Corpus Christi; 45, Corpus Christi, Texas; 69, listed in appendix 8; 98, listed for the bays; 110, dead shells occasional at Galveston, but more common from St. Joseph Isl. to Port Isabel; 135, dead in Gulf, dead in bays; 153, listed in Table 1; 160, dead in Matagorda Bay; 174, listed; 206, Beach records in Texas Conch., Vol. 3 (6); 260, mentioned for Texas; 269, figured on page 175.
Records H.M.N.S.: 8 lots, of which 2 contain live material.
Depth Range: 0-25 fms.; alive: 0-1 fms. (Galveston San Luis Pass, Laguna Madre).
Geographical Range: West Coast to Florida to Texas (Abbott, 1974).
Maximum Size: 38 mm.
Eastern Pacific Analogue: None.

Genus Myrtea Turton, 1822.
To this genus, several thin shelled, deep water species are assigned, which are separated on the basis of shape, sculpture and minor differences in hinge structure into the subgenera Myrtea, Myrteopsis Sacco, 1901 and Gonimyrtea, Marwick, 1929. These subgenera appear in need of further justification. Eulopia, Dall 1909, according to Chavan, is a synonym of Myrtea. All are noticeable by the lamellar ridges which produce spiny elevations on the dorsal edge of the valve. Whereas in Lucina, the cardinal teeth are obsolete, in Myrtea they are not. Myrtea and Myrteopsis are somewhat more oval in shape than Gonimyrtea, and Myrtea shows in contrast to Myrteopsis, irregular furrows between the concentric ridges. The Myrteinae, to which the genera Myrtea and Lucinoma belong, appear to me deep water species closely related to Lucina.

207. Myrtea (Myrtea) sagrinata (Dall, 1886).
Lucina sagrinata, Dall. B.M.C.Z., Vol. 12, (6), p. 265.
Only a few lots of this deep water species have been obtained.

However, the number of samples obtained in this depth range is unfortunately small and it is to be expected that the species is more widespread than our records indicate. In outward appearance, the species resemble to a surprising degree, juvenile specimens of Semele proficua from calcareous environments which also possess radial furrows, but of course, the hinges are quite different.

Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 78 (erroneously given as M. pristophora (sic))

Records H.M.N.S.: 3 lots, none alive.

Depth Range: 51-110 fms. in sandy mud.

Geographical Range: Florida Keys and westward to Yucatan Strait (Abbott, 1974).

Maximum Size: 8.4 mm.

Eastern Pacific Analogue: None

208. Myrtea (Myrteopsis) compressa (Dall, 1881).

Loripes compressa Dall. B.M.C.Z., Vol. 9, (2), p. 135.

Only a single lot of this deep water species was obtained off Louisiana in 140 fathoms depth in mud bottom. The two valves are quite flat but differ quite in intensity of concentric ribbing. They are also oval in shape.

Previous records for the Texas faunal province are: 7 (Loripes compressa Dall), listed; 206, Texas Conch., Vol. 9, p. 78 (as Myrtea sp. A).

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

Depth Range: 140 fms.

Geographical Range: Gulf of Mexico, and the West Indies.

Maximum Size: 11.8 mm.

Eastern Pacific Analogue: None.

209. Myrtea (Gonimyrtea) pristiphora Dall and Simpson, 1901.

Myrtea prestiphora Dall and Simpson. Moll. Porto Rico, B.U.S.F.C., Vol. 20, pt. 1, p. 493, pl. 55, figs. 4, 6.

This quite variable, rather circular bivalve with a slight angularity in the posterior slope is the most common species of Myrtea in the N.W. Gulf of Mexico. It is remarkable for the extreme variation displayed in the intensity and number of lamellar ridges on the shell surface. In some specimens, quite elevated ridges cover the entire shell surface, whereas in others only slight ridges are present near the posterior slope of the shell so that the main part of the disc remains almost smooth and shiny. Sometimes spelled erroneously "pristophora".

Previous records for the Texas faunal province: 206, Texas Conch., Vol. 9, p. 78 (as Myrtea sp. B.).

Records H.M.N.S.: 7 lots, one containing two fresh pairs.

Depth Range: 133-228 fms., in mud bottoms; fresh pairs at 200 fms.

Geographical Range: Puerto Rico (Abbott, 1974).
Maximum Size: 10.5 mm.
Eastern Pacific Analogue: None.

Genus Lucinoma Dall, 1901.
Very chalky, with conspicuous periostracum. Resembles Lucina, but has cardinal teeth, and strong concentric ridges.

210. Lucinoma filosa (Stimpson, 1851).
Only meager material and mostly juvenile, of this species has been collected. Like other Myrteids, it is a deep water species, living below 100 fathoms along the Louisiana-Texas coast, in mud bottoms.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 78; 260, mentioned for offshore Texas waters.
Records H.M.N.S.: 6 lots, no live material.
Depth Range: 110-228 fms.
Maximum Size: 21 mm. (broken valve).
Geographical Range: New Foundland to North Florida and the Gulf States (Abbott, 1974).
Eastern Pacific Analogue: ? Lucinoma annulata (Reeve, 1850).
"Essentially a northern species, this form reaches its southern limit in the Gulf of California", 55-90 m. (Keen, 1971).

Genus Codakia Scopoli, 1777.
Of this large genus, of almost circular shape, two species have been collected, one of which at this time cannot be identified.

211. Codakia (Codakia) orbicularis (Linné, 1758).
Venus orbicularis Linné. Syst. Nat., 10th ed., p. 688.
Of this well known tropical Atlantic species, several lots of dead shells have been collected (algal reef, shell bottom and beaches). Beach material is all old and worn, and can be found from Port Aransas southward. It is probably Pleistocene fossils.
Previous records for the Texas faunal province are: 7, listed as Lucina tigrina Linné; 15, listed as Lucina tigrina L., 3 specimens from Galveston West Beach; 45, listed for Galveston; 61, listed for Rockport area; 62, listed for Mustang Island, Flour Bluff; 110, a few shells dredged from Aransas Pass boat channel, Pleistocene?; 174, listed; 192, figured, plate 6, figs. 2A, B from Alacran Reef; 206, Beach records in Texas Conch., Vol. 3 (6), Vol. 9, p. 78; 214, listed for Campeche Bank; 260, listed for Texas; 269, figured on p. 174.
Records H.M.N.S.: 7 lots, no live material.
Depth Range: 0 (beach) to 28 fms. (algal reef). Also on shell bottoms (12 fms.).
Geographical Range: Florida to Texas and the West Indies, Bermuda, Brazil (Abbott, 1974).
Maximum Size: 88 mm.
Eastern Pacific Analogue: Codakia distinguenda (Tryon, 1872) "Magdalena Bay, Baja California, to Panama in shallow water" (Keen, 1971).

212. Codakia spec. indet. A.

Four lots of a very curious small Codakia defy identification. One lot of 15 valves was taken from an old reef off the Louisiana coast. These rather thin valves (maximum size 19.6 mm.) resemble in shape closely, Parvilucina tenuisculpta (see fig. Abbott, 1974). They do not appear to be juveniles of C. orbicularis and at this moment I am at a complete loss what they are. The surface is somewhat uneven and bumpy as if they grew in unfavorable conditions. Two other lots each of a single valve come from off the Texas coast.

Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 78 as Codakia spec. C.
Records H.M.N.S.: 4 lots, no live material.
Depth Range: 10-28 fms.
Geographical Range: Unknown.
Maximum Size: 19.6 mm.
Eastern Pacific Analogue: Unknown.

Genus Ctena Mörch, 1861.

Rather small to medium sized shell, skew in outline, with the anterior part enlarged and stronger laterals than Codakia. The Texas material is hard or impossible to identify and I am not able to name any of the still living species on the Texas coast. Jagonia Recluz is a synonym.

213. Ctena orbiculata (Montagu, 1808).

Venus orbiculata Montagu. Test. Brit., Suppl., p. 42, pl. 12, fig. 7.

A single lot of two old and worn valves was dredged off Louisiana together with specimens of Codakia orbicularis, on a shale dome. These shells are quite different from the following two species which could be Codakia orbiculata filiata Dall, 1901.

Previous Records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 78 (#805) is in error; this is probably not C. orbiculata; 260, listed for Texas.
Records H.M.N.S.: A single lot of two valves taken off Louisiana.
Depth Range: 50-60 feet.
Geographical Range: North Carolina to Florida, West Indies to Brazil; Bermuda.
Maximum Size: 27.6 mm.
Eastern Pacific Analogue: Unknown.

"To Be Continued"

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DUES NOTICE

Our membership year runs from June to June. If you have not paid your dues, please check the rates in the front of Texas Conchologist and mail your check now to Jim Sartor, 5606 Duxbury, Houston, Texas 77035. A new membership list will be prepared immediately after the August 24th meeting and will be mailed to members. It is important that you are in good standing and have your name on the list so that you may be contacted throughout the year for special events.

SPECIAL BONUS OFFER ON BACK ISSUES

Because our Circulation Chairmen, Sam and Fannie Miron, are being pushed out of living space in their home after years of accumulating extra issues of Texas Conchologist, we are prompted to make a very special offer for a limited time. Issues of Volume 4 through Volume 11 are available for the low price of $10.00. Call the Mirons at 723-3628 to have your sets delivered at the August meeting. If you wish the copies mailed, send your check to the Houston Conchology Society, care of the Mirons, 5238 Sanford Street, Houston, Texas 77035. Add $100 for mailing anywhere in the U.S.A. Add $1.00 for mailing anywhere in the U.S.A. Add $2.00 for sea mail for any foreign mailing.

25. BUCKET OF SHELLS from Texas was a special project prepared for sale through the Museum gift store annex maintained during "The Wonderful World of Shells" May 1-14, 1977. Under the chairmanship of Margie Woods, the project grew as it was executed until each bucket had 42 species of Texas shells and Echinoderms, all scientifically named, complete with authors and dates, with the common name given also and with some discussion on habitat, geographical range or some interesting fact. This educational packet was initiated to benefit the Museum, and buckets remaining are available through the Museum's gift store. Some buckets have been retained by the Houston Conchology Society to be used in talks to schools. They make ideal gifts to students, teachers, or owners of beach homes. The Museum also has books that go well with the buckets.

Photo by Constance Boone

Texas CONCHOLOGIST

VOLUME XIV NO. 1 SEPTEMBER, 1977

Notes and News

"Underwater Photography" will be the subject of discussion on the program for the September 28th meeting of the Houston Conchology Society. Jesse Cancelmo, an oil company engineer, has such photography as an avocation and will be speaker for the evening, showing slides of general marine life. Come at 7:30PM, downstairs classroom at the Museum, for refreshments and fellowship.

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The program in August by the members of the "Tex-Levu Expedition" was terrific! One hundred and nine members of the Society and guests attended. Invitational letters and Newsletters had been sent to "signed-up" visitors to the May show at the Museum, and many attended this meeting and joined the club. We welcome all of you and promise to ask for more chairs for the meetings this year.

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A field trip to collect fossil shells on the Brazos River near Bryan, Texas, will be held October 8th. Jim Sartor will lead this event. It is suggested that you meet at 7:00AM in the parking lot of the theatre at Northwest Mall to follow the leader to the collecting area which is on Texas 21 west of Bryan. Bring your lunch and drinks. Call Jim at 723-5796 for other information. More details will be given in the Newsletter and at the September meeting. Several members made trips to this area this summer and found a great deal of interesting material in the famous "Stone City beds."

(continued on Page 2)

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The TEXAS CONCHOLOGIST is the official publication of the Houston Conchology Society, Inc. and is published quarterly at Houston, Texas and is included in the membership dues.

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CIRCULATION

Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL STAFF

Helmer Ode, Editor
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 N. MacGregor Way
Houston, Texas 77004

Constance E. Boone
668-8252
3706 Rice Blvd.
Houston, Texas 77005

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double spaced and should be submitted to the editorial staff.

NOTES AND NEWS (continued)

Sam Miron reports that sets of the Texas Conchologist, Volume IV through Volume XI, are still available for the special price of $10.00 delivered at meetings to members. Add $1.00 for U.S. mailing, and $2.00 for foreign sea mail. Sam also announces that new members may wish to purchase back copies of Helmer Odé's Continuing Monograph "Distribution and Records of the Marine Mullusca in the Northwest Gulf of Mexico" which began in Volume XI, No. 2, December, 1974. Each issue purchased separately is $1.50 postpaid. To purchase the entire set of published Continuing Monograph, December, 1974 through June, 1977, send $14.50 to Sam Miron, 5238 Sanford Street, Houston, Texas 77035. This Monograph was recently included in the report of systematic studies of the Gulf of Mexico and Caribbean marine mollusk fauna made at the July annual meeting of the American Malacological Union at Naples, Florida. Dr. Donald R. Moore of the Rosenstiel School of Marine and Atmospheric Sciences of the University of Miami, Miami, Florida, spoke of 100 years of progress in such studies, beginning with the first cruise of the "Blake" to present day work. His report will be published in the AMU Bulletin of 1977. Please call Sam at 723-3628 if you wish him to deliver the T.C. Monograph issues at our meeting. Mail delivery in U.S. will add $1.00 to price above. Sea Mail delivery outside U.S. costs $2.00. If you wish to continue the receipt of published Monograph, inquire about membership. This entitles you to Texas Conchologist, a quarterly distributed to members.

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SEARCH AND SEIZURE by Constance Boone

After a summer of collecting and coming home with various lots of shells, many of which I already possess, the thought is once again on personal collections and eventual disposition of such collections.

Much has been written about this subject. I don't think that I can really add much new to what has already been said, but I would like to point out to our many new members that this is a problem that they will have to solve, too, someday, and, as they begin their collections, they may want to consider the facts. What to do with one's much-prized and much-loved shells someday should be in mind early in the game, though it seldom is.

So many times in the past I have spouted out the confident formula that "my shells are going to go to a Museum." I'm not so sure that this will happen at all, and certainly it will not happen if I don't make specific provisions with a specific museum and maybe provide the money for these provisions to be carried out.

Some of my self-collected fresh water material, and much of my Texas self-collected material should be able to find homes in Museums. Some of my self-collected material from other parts of the world will find a home, especially the small and micro material with top quality data. This might happen if I start giving it away now to Museums requesting such material, and I should begin to send it now while I really have the material in good shape and with data intact.

Some of the world's most valuable shells today that I've managed to purchase probably aren't valuable to most big museums. They usually can be obtained by those museums much more easily and much more cheaply than I did. Museums probably wouldn't turn down such shells if they were offered. But they would not tell you specifically what they would do with them. No museum will promise to display your shells or collection permanently. Well, maybe, you could find some museum which might be inclined to display your collection if your gift was accompanied by a huge gift of money with no strings attached on use of the money.

Giving shells to a Museum works best when you are able to supply shells for special needs and studies during your collecting years, not after you are gone. There are always <u>some</u> fine personal collections that are bought by Mollusk Departments, or acquired through will or gift, which are of use to those departments, but these are not common.

Many collectors face the fact eventually that they are no longer able to collect or even to purchase shells. A while goes by as they unhappily wonder what to do with all those shells that brought such joy. Sometimes they find they would do best to sell their shells to others who would have the chance to enjoy those shells. It has been this way since the early days of shell collecting. It most certainly is better to do this than to let the shells gather dust, get shoved from closet to attic and then forgotten completely. The labels get bug eaten; the catalogue gets lost, if you even had one.

It is considerably easier to continue to acquire shells and blind one's intellect to the need to make a decision regarding your collection. Some of us hope an offspring will want our shells. But I have had a goodly share of letters from sons, daughters, and grandchildren of collectors seeking information on evaluation of family collections left them and seeking advice on disposition. Usually they remember someone's great love for the collections and remember they heard huge prices mentioned for some of the shells. They are usually dismayed to learn that some of the prices have changed drastically. They are hurt to think that no Museum really wants their collections, and they admit often they have no room or interest in them either. Beyond that, they reach a point when they also know that not much is going to be paid for that collection en toto. Selling it piece by piece is a job for the knowledgeable. It is also the job for someone able to find buyers. Consequently, you see such collections offered by a dealer who may take it on consignment. Some dealers will not do this at all, and others will not buy collections at all.

If you want your shells sold, leave some price reference and leave good instructions on how to secure current price lists. The dealers today may not be around when you leave this world. Give general information on how to secure lists of dealers. Make it easy to do.

If you know a Museum NOW that wants some of the material you have, think long and hard about sending it NOW. Then don't go check up and worry about what happens to that material you send. It may be WANTED by that Museum you send it to, but it may sit on a shelf for years before it gets catalogued. Many old collections by professionals on expeditions are still in storage waiting to be assessed and studied! Many collections by today's professionals are stored waiting for money to hire more sorters or curators -- or money simply for the purchase of supplies needed in curating.

You will find it best to inquire if a Museum wants your shells and the conditions of acceptance. The more complete your data is for the shells the more interested a Museum will be. Naming the shells is not the most important feature; collecting data with exactness and detail is the prime concern of a Museum Malacology Department.

Our Editor, Helmer Odé, gave his land snail collection in Holland to a Museum there before coming to Texas to live. He has now given most of his material collected on Texas beaches to the Northwest Gulf Survey at the Houston Museum of Natural Science. Other members of our club have given shells to this survey and also to other museums.

It isn't easy to pack up material and mail it at your own expense, but often this is what you must do. Most Museums will present you with a letter acknowledging your gift. Almost no Museum will offer specific appraisals. Some Museums offer a sum on paper for each lot given to the Museum which can be used for income tax deduction, like $1.00 or $2.00 for a shell or a "lot" of species of common shells.

In today's world of the study of mollusks, many Museum Mollusk Departments are really interested in live material for study which eventually becomes "wet" (preserved) material for storage.

I expect the bottom line to all of this is to collect what you can really truthfully use, for your collection or to share and trade, and to leave the rest alone --- to enjoy your shells to the fullest but know when to give them up for others to enjoy or to use for knowledge for the future.

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NOTES AND NEWS (continued)

We are completely depleted of Texas shells to be used for our educational purposes. Margie Woods, Fannie and Sam Miron, Constance Boone and other members continue to offer talks to schools and clubs. We especially like to leave shells with schools, and we like to have many common Texas shells on hand to distribute to children. You must remember your delight in first seeing a bright and shiny Olive or your first perfect ear shell (Sinum) and carry that thought with you the next time you are beach picking. We do ask that you wash, Clorox where necessary, and oil the shells, pack them dry in a cardboard box, label the contents on the outside, and bring this to the meeting for storage and use during the year. Dosinias, Dinocardiums, Tellins, Busycons, Epitoniums, etc., are all welcomed. They need not be live-taken shells, just clean and in good shape.

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NEW FEATURE PLANNED

Sometime last year Tina Petway started on a project to find out members' interests in mollusks. This was never completed, but we announce that Tina has agreed to begin a feature, starting with the December, 1977, quarterly of Texas Conchologist, designed to introduce our members and their interests and collections of mollusks. She may expand this to include your desire to trade. The new membership list will be completed soon, and she will use this list to contact you for information to be published. Several members will be starred each issue.

MOLLUSCANA

by W.W. Sutow, M.D.

From time to time we have extolled in these pages the gastronomic qualities of the mollusks. Over the world, millions of tons of mollusks are harvested and consumed as food each year. In the Orient particularly but also in other areas the custom of eating a great deal of the mollusks in the raw state prevails. Therein lies the danger of disease transmission should the mollusks themselves be contaminated.

"The Safety of Eating Shellfish" is the title of an article appearing in the May 2, 1977 (237: 1980-1981) issue of the Journal of the American Medical Association. The article was written by Drs. James M. Hughes, Michael H. Merson and Eugene J. Gangarosa and was published from the Bacterial Diseases Division, Bureau of Epidemiology, Center for Disease Control, Public Health Service, U.S. Department of Health, Education and Welfare, Atlanta, Georgia.

The communication discusses succinctly several aspects of contamination, the diseases transmitted and the epidemics that have occurred. The diseases associated with eating contaminated shellfish include hepatitis A, typhoid fever, cholera, other diseases caused by vibrios, paralytic and neurotoxic shellfish poisoning, and gastrointestinal illnesses. Some of the comments of the authors have been extracted from the article and are summarized below.

Vibrio parahemolyticus is a bacteria that causes gastroenteritis. It is considered to be responsible for over 50% of all foodborne outbreaks in Japan. In the United States 16 reported outbreaks have occurred. Most outbreaks have been traced to inadequate cooking and refrigeration of crustaceans. However, the organism has been recovered from surfaces and alimentary tracts of mollusks.

In 1973, an outbreak of hepatitis involved over 280 persons who ate raw oysters distributed from Louisiana. At low cooking temperatures the hepatitis A virus is not inactivated. For example, clams are commonly steamed just until the shells open. This temperature is not high enough to kill the virus. Thoroughly cooked shellfish has not caused hepatitis A outbreaks.

Paralytic shellfish poisoning (PSP) is caused by eating bivalves that have ingested toxic dinoflagellates. These dinoflagellates are often recognized as the cause of "red tide". But cases of PSP can occur in the absence of any visible red tide. Since 1969, eight outbreaks have been reported. The outbreak in 1973 affected 33 people. Toxin causing PSP is relatively heat-stable; cooking does not always inactivate the toxin.

Although written for the physician, the subject matter is presented in easily understood phraseology. Those interested in obtaining a reprint of this article should send a request to Enteric Diseases Branch, Bacterial Diseases Division, Bureau of Epidemiology, Center for Disease Control, 1600 Clifton Road, Atlanta, Georgia 30333.

When outbreaks of disease occur that threaten the health of many people, such as oyster-associated hepatitis, national facilities for the detection and control of the outbreak are mobilized on a massive scale. The story of the activities generated rivals the grimness of an unrelenting manhunt in murder mystery or spy novels. A retrospective summary of the experiences associated with the outbreak of hepatitis that occurred in Texas, Georgia and Louisiana in October and November 1973 is presented in the article "Oyster-associated hepatitis: lessons from the Louisiana experience." The article was published in the American Journal of Epidemiology, 103: 181-191, 1976. The authors are Philip A. Mackowiak, Charles T. Caraway and Benjamin Portnoy. Drs. Mackowiak and Portnoy were Epidemic Intelligence Officers associated with the Center for Disease Control. Dr. Caraway is Chief, Section of Epidemiology, Louisiana Health and Social and Rehabilitation Services Administration, Department of Health Maintenance and Ambulatory Patient Services, New Orleans.

These authors with others published earlier the details of this outbreak in the medical report: "Oyster-associated hepatitis - failure of shellfish certification program to prevent outbreaks" by B.L. Portnoy, P.A. Mackowiak, C.T. Caraway, J.A. Walker, T.W. McKinney and C.A. Klein, Jr. This report appeared in the Journal of American Medical Association 233:1065-1068, September 8, 1975. It described the outbreak that occurred in Houston and Georgia during October and November, 1973. The report was annotated in the Texas Conchologist (12:35, December, 1975), under the heading "Oyster and Hepatitis."

In the new report, a final reconstruction of the sequence of events has been done based on analyses of available epidemiologic and environmental information. The scope of this reconstruction is impressive.

1. From April to August, 1973, much of the Mississippi valley experienced one of the worst floods in recent times. Pollution closed 85 percent of Louisiana oyster-growing waters.

2. Salinity data indicated that the greatest degree of fresh water intrusion occurred in the bays of the East Louisiana Salt Marshes (designated as Area II by the Louisiana Wildlife and Fisheries Commission) closest to the Mississippi River.

3. Much of the fresh water which escaped into Area II remained "bottled up" in the region of American Bay and Bay Crabe because of the prevailing wind direction.

4. Bay Crabe was opened to oystermen on September 1, 1973. The initial catches from the wild reefs were replanted as "seed oysters" in private beds. Sale of Area II oysters began about September 16, 1973.

5. It is postulated that exposure of oysters to the hepatitis virus occurred at the height of the flooding. It is further postulated that the oysters concentrated the virus in their tissues, retaining the virus from one to two months subsequently. The authors cite evidence that mollusks can do this.

6. Oysters from these waters did not reach the consumers until the last of August. Assuming an average incubation period of one month for hepatitis A infection, the hepatitis cases would not be seen until early October.

The potential magnitude of this type of health problem is suggested by the statistics of oyster fishery in Louisiana. The state produces 500,000 barrels of oysters per year (1 barrel = 3 bushels = 2 sacks = 40 dozen oysters). Also chilling is the fact that countless towns and cities along the Mississippi empty untreated sewage directly into the river. Study of local environmental factors indicate that no major source of human pollution exists in the area itself or among the oystermen.

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BOOK REVIEWS by W.W. Sutow

Our recent acquisition for my conchological library is a book entitled "PSEUDOTHECOSOMATA, GYMNOSOMATA AND HETEROPODA" by S. van der Spoel. This 484-page work was printed in 1976 by Bohn, Scheltema and Holtema in Utrecht but the text is written in English. This book completes the set, the first volume of which was published by an author in 1967 with the title "EUTHECOSOMATA- A GROUP WITH REMARKABLE DEVELOPMENTAL STAGES."

The author has included only the "basic information for the correct approach of the groups". These are the "holoplanktonic molluscs" which have been classified under the ORDERS: THECOSOMATA, GYMNOSOMATA, and HETEROPODA. In the ORDER THECOSOMATA are two Sub-Orders: EUTHECOSOMATA and PSEUDOTHECOSOMATA. A separate volume is promised to cover the biology of the planktonic molluscs. The literature references are intended to be comprehensive and include those that were listed in the previous volume.

The book is a scientific treatise, written for the highly professional. Nonetheless, it appears useful for the amateur, providing him with information that is difficult to obtain.

The text is divided into 7 parts. In the introductory section, the phylogeny and classification of the HETEROPODA are discussed as well as aspects of speciation and distribution of the orders. Then systematic indices of the THECOSOMATA, GYMNOSOMATA and HETEROPODA are given. The indices also indicate the page where a given species is pictured.

The second section (144 pages) provides data on taxonomy. The general morphology of the order as well as the identifying features of individual species are given. Information on each species consists of synonymy and description of all species as well as other information (such as anatomy, reproduction, remarks, etc.) on some.

The third section (24 pages) discusses the distribution of the species. The text is supplemented by a number of global maps (80 pages) graphically depicting the distribution of individual species. Concentrations of pelagic animals are difficult to quantify but the density gradient on the maps is indicated in terms of the degree of certainty of the records of the taxon.

The fourth section (21 pages) lists the type specimens and the locations from which they were collected. The place where the type specimen is kept and the state of the specimen (e.g. "mounted dry", "alcohol collection", etc.) are also documented. The appendices constitute the fifth section (17 pages). Diagrams of the dispersal over the faunal centers provide easy determination of the species to be expected in a special area or fauna. The diagrams include all the taxa discussed.

The references (83 pages) are alphabetically arranged by author. Each reference is characterized as to its subject matter, such as, paper on a general topic, paper on GYMNOSOMATA, paper on THECOSOMATA, paper on HETEROPODA, paper on PTEROPODA in general and paper on fossils or subfossils. The references are as current as 1975.

Then, there are 80 pages of pen and ink drawings illustrating the various species as well as characteristics of the animal for many species. The illustrations depict the shells with sufficient magnification so that identification from the figures should be facilitated.

The book should prove to be useful and informative library addition for most serious shell collectors. It is recommended. For orientation, some of the genera covered in this book are: Limacina, Peraclis, Atlanta, Carinaria, Cavolinia, Clio and Curierina.

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A compact paper-back, regionally oriented, entitled "SEASHELLS OF THE PACIFIC NORTHWEST" was published in late 1976. The author is James Seeley White, the training officer and diving safety chairman of the Oregon Department of Fish and Wildlife. The price is $6.50.

In its content (and intent) the book is very reminiscent of Tom Rice's "MARINE SHELLS OF THE PACIFIC NORTHWEST" which was published in 1972. A comparison of the two books is inevitable. Both are of the same size (5½ X 8½ inches). Both are soft-cover issues. The Rice book has 102 pages, the new one 127 pages.

There are several differences. Tom describes 254 species whereas the new book limits itself to 83 ("most available") shells. White has up-

(Continued on Page 13)

214. Ctena Spec. Indet. B.

A very similar shell, but much more regularly sculptured living in precisely the same environment. Probably the same species as the previous one, although this is difficult to see when considering extremes of both forms.

Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 78 (as Codakia sp. B.).

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

Depth Range: 10-28 fms., in calcareous environment or on Miocene shale domes.

Geographical Range: Unknown.

Maximum Size: 11.3 mm.

Eastern Pacific Analogue: Ctena mexicana (Dall, 1901) seems very close. "California to Ecuador, intertidally and to depths of 80 m. (Keen, 1971).

215. Ctena Spec. Indet. C.

A third species of Ctena was obtained in a single lot of seven valves from Heald Bank. They are in outward appearance surprisingly close to Linga amianta Dall, with which they were confused and mixed up. Most remarkable is the radial row of imbrications along the posterior slope of some of these valves. The hinge however, is much less massive than that of Linga amianta. These shells appear different from those of Ctena Spec. A. and B, and although its outward sculpture shows some correspondence with that of Codakia costata (Orbigny, 1842) I do not believe it to be that species, because of its well developed laterals.

Previous records of the Texas faunal province are: None.

Records H.M.N.S.: Two lots, one from Heald Bank (fossil?), one from the "18" fathom lump.

Depth Range: 6 fathoms in shelly muddy sand and 30 fathom in calcareous algae.

Geographical Range: Unknown.

Maximum Size: 5.7 mm.

Eastern Pacific Analogue: Unknown.

Genus Pleurolucina Dall, 1901.

Considering the evidence available to me it seems most logical to place here in Pleurolucina a species usually not assigned to this genus. Pleurolucina contains rather thick shelled small lucinids with strong, often undulating radial sculpture. There is little doubt that

P. sombrerensis is a Pleurolucina. About the status of Bellucina amianta, Dall, I am much less certain, but after studying all material available to me I believe that Bellucina is close to Ctena and not a Pleurolucina as Britton believes. Opinions about the interpretation of Bellucina,to which it has been usually assigned, differ. In hinge topology P. leucocyma, Dall of Florida and P. sombrerensis of the entire Gulf of Mexico and Caribbean are quite close, but the hinge of P. amianta, Dall is closer to that of the unidentified species of Ctena. I must leave the matter to the experts.

216. Pleurolucina sombrerensis (Dall, 1886).

Lucina sombrerensis, Dall. B.M.C.Z., Vol. 12, (6), p. 264.

This common species usually assigned to the subgenus Here Gabb, 1866 of Linga can sometimes be collected in great numbers in depths between 20 and 30 fathoms. Live specimens are quite rare. I have only seen a single live collected juvenile specimen in the H.M.N.S. collection. The species is somewhat variable in several characters, expecially in the spacing of the strong lamellar ridges, which varies between densely and widely spaced and in the development of these ridges which rarely become reflected at their crests. The crenulations of the ventral margin apparently are developed periodically. In most juveniles and sometimes in mature specimens, they are lacking. In a fully grown but broken specimen where part of the ventral margin was missing, crenulations were missing on the most recent part of the margin, but had become visible along that part of the break which followed an old incremental growth line.

Radial undulations are present at the anterior and posterior area close to the umbo and can be especially well observed in fairly juvenile specimens but are lacking in very small (<1 mm.) material. The species is quite rare in beachdrift. We have only a single worn valve from Port Aransas, which could be fossil. Abbott (1974) has figured this species twice (5283 and 5294) but labels the latter mistakingly Cavilinga blanda, which is quite different.

Previous records for the Texas faunal province are: 145, dead on deep shelf, Mississippi Delta; 156, Stetson Bank; 175, listed; 206, Beach Notes, Texas Conch., Vol. 7, p. 94, also listed Vol. 9, p. 78, (No. 813); 214, Campeche Bank; 251, Yucatan Shelf; 260, listed for Texas.

Records H.M.N.S.: 34 lots, of which 1 contains live collected material.

Depth Range: 16-75 fms.; optimal 20-35 fms.; alive: 26 fms. in sandy shelly mud. One specimen from beachdrift at Port Aransas.

Geographical Range: Entire Gulf of Mexico, into Caribbean.

Maximum Size: 7.2 mm.

Eastern Pacific Analogue: Pleurolucina leucocymoides (Lowe, 1935) Gulf of California to Manzanillo and Tres Marias Island, Mexico, in 37 to 110 m. (Keen, 1971).

(Continued on Page 14)


Land
Fossils

TEXAS SHELLS

This is a view of the new case of Texas Shells on display permanently at the Houston Museum of Natural Science. It is located in the Hall of Texas Wildlife on the second floor of the Museum. Not every Texas shell, not even all the common ones, are displayed, but the exhibit will be very helpful in assisting you to determine your finds on the beach, in the fields, and in the streams and bayous.

A panel of small shells, a panel of fresh water shells, a small display of land snails, a few fossil shells and a great wealth of marine shells should at least give you a glimpse of the many shells from the Texas scene.

A color coding for the ranges of marine shells should be studied carefully. It will help you to understand geographic patterns of marine mollusks.

Some of the most unusual shells from the Northwest Gulf of Mexico Survey are now displayed. You will see one of the finest specimens of Spondylus americanus in star position on the top of the revolving pyramid. Taken by a diver on one of the trips to offshore reefs, this bright lemon-yellow specimen is superb. There's a gorgeous winged Siratus beauii. There are hugh Lyropecten nodosus. The comments from visitors and classes of children all express amazement that Texas has these shells.

Photo by Don Williams, Museum Exhibits Department

BOOK REVIEWS (continued)

dated the names of several species. For example, the genus Acmaea is now mostly Collisella or Notoacmaea and Hinites multirugosus is again H. giganteus.

Tom has prominently numbered each species for easy reference, both in the text and on the photographs. In the new book, the items are not numbered and the association between text and figure becomes clumsy. Tom indexed the shells by both generic and specific names. The new book is indexed only by generic designation. The one problem with the Rice book was the small pictures of the minute shells but the new publication has omitted most of these. The photographs that are present in the new book are magnified to provide details of the smaller shells. However, the concept of the relative sizes of the shells is harder to derive. White provides considerably more detail and more information on individual species. The new book has no list of references.

After comparing the two booklets side by side, I believe that the beginning collector will profit from either if collecting in that geographic area. If one has the book by Rice, one will not need the book by White. If one has only the latter, one will eventually require the book by Rice. But if one has the more complete treatise by Abbott, one probably does not need to have either of the smaller publications.

Genus Linga deGregorio, 1884.

Strong, thick shelled, concentrically lamellated bibalves often with well developed posterior sulcus. Abbott (1974) considers Bellucina, Pleurolucina and Here as subgenera, an arrangement largely taken from Chaven (1969). Bellucina Dall, 1901, is undoubtedly close to Linga, but still differs substantially in many respects and by the study of whatever material I have available, I believe that Bellucina amianta Dall is close to Ctena.

217. Linga pensylvanica (Linné, 1758).

Venus pensylvanica Linné. Syst. Nat., 10th Ed., p. 688.

In the N.W. Gulf of Mexico, this is an extremely rare species. I have seen some quite large live collected specimens dredged in waters off Louisiana, west of the Mississippi delta. In the H.M.N.S. collection only a single valve, somewhat worn, dredged south of Galveston. Most records for this species for the Texas coast must be considered unreliable.

Previous records for the Texas faunal province are: 61, listed for Corpus Christi area (error for L. pectinata); 62, listed for Mustang Island (error for L. pectinata); 145, listed; 192, listed for Yucatan platform; 225, listed as Lucina c.f. pensylvanica Linné, 1758 for Galveston; 236, similarly listed for Galveston; 260, listed for offshore waters south of Sabine, Texas.

Records H.M.N.S.: 1 lot, contsisting of a single worn valve.

Depth Range: 30 fms., in shelly sandy mud (fossil shell?).

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

Maximum Size: 36 mm.

Eastern Pacific Analogue: None.

218. Linga (Bellucina) amianta (Dall, 1901).

Phacoides (Bellucina) amiantus Dall, 1901. P.U.S.N.M., Vol. 23, No. 1237, pp. 810, 826, pl. 39, fig. 10. New name for Lucina costata Dall, 1889; not Orbigny, nor Tuomey and Holmes.

The ending of amiantus, because it is an adjective, should conform to Linga, but most authors don't follow the rule (see Abbott, 1974). Although, as stated, I believe that this species is close to Ctena, I report the species here in the conventional arrangement (see also Keen about Bellucina). Along the Louisiana and Texas coast the species is widespread and common in shallow offshore waters and in the bays, where it lives in sandy mudbottoms (Timbalier, Christmas Bay (Galveston), Matagorda Bay, becoming gradually more common further south. Also common as dead valves in beachdrift and probably living also in calcareous environment. It is (only dead valves available) a quite variable species which is already strongly costate when quite immature (1-2 mm.) and thus differs considerably from Parvilucina. When mature, the surface sculpture is quite variable and the strong cancellate sculpture of juveniles assumes more and more a concentric appearance. On the posterior side, there are two rows of strong

imbrications which are also present but to a lesser degree in some of our unidentified Ctena Spec. Indet. Compared to Ctena the hinge of Bellucina is much more massive but topologically very much the same. Worn, beach material often displays close radial furrows as some Ctena have. Except for some different material from Heald Bank, I believe that in spite of the diversity in shape, inflation and surface sculpture, all Texas-Louisiana material should be labelled Linga amianta Dall.

Previous records for the Texas faunal province are: 15, listed as L. costata, Tuomey and Holmes, for Galveston, beachdrift; 21, listed as L. costata Conr.; 45, Galveston; 66, Marine Pleistocene of Texas; 110, rare at Galveston, common at Port Aransas; 135, alive in Gulf, alive in bays; 136, reported for many locations off East Texas in 33-54 feet, alive; 145, Mississippi delta region, upper sounds, inlets, shallow shelf, deep shelf, plate 4, figs. 16A, B, 153, listed; 156, Stetson Bank; 160, Matagorda Bay, dead; 164, alive at Rockport, dead in Laguna Madre; 170, alive off East Texas; 174, listed; 175, listed for inlet and deep channel assemblage, common on salty sands, pl. 3, fig. 19; 206, Beach Records, Texas Conch., Vol. 3, No. 6; 225, Galveston; 236, Galveston; 253, common in mud samples on reef off Padre Island; 260, listed for Texas; 261, listed for shallow offshore Galveston; 269, figured on page 174.

Records H.M.N.S.: 86 lots of which 13 contain live collected material.

Depth Range: 0-62 fms. (optimal 0-25 fms.); alive at 9-15 fms. in sandy, shelly mudbottoms.

Geographical Range: North Carolina, Gulf of Mexico to Brazil.

Maximum Size: 8.4 mm., but usually about 6 mm.

Eastern Pacific Analogue: Bellucina cancellaris (Phillippi, 1846) (assigned by Keen to Pleurolucina) "Cedros Island, Maja California, to Panama in 7-70 m.".

219. Linga (Bellucina) c.f. waccamawensis (Dall, 1903).
Phacoides (Bellucina) waccamawensis Dall. T.W.F.I.S., Vol. 3, pt. 6, p. 1386, pl. 52, fig. 2.

Some specimens which resemble this Pliocene species were dredged from Heald Bank. They appear more inflated and more reticulate and smaller than comparable specimens of L. amianta. It is probably that these specimens are fossils. The species has also been mentioned by Smith (Ref. 196) from Louisiana. It is possible that this species is merely the precursor of the recent amianta.

Previous records for the Texas faunal province are: 196, listed for the Pliocene of Louisiana.

Records H.M.N.S.: A single lot of dead shells from Heald Bank.

Depth Range: 34-40 feet, in shelly muddy sand.

Geographical Range: Described as fossil (Pliocene) from the S.E. United States.

Maximum Size: 3.8 mm.

Eastern Pacific Analogue: Same as above.

220. Linga (Bellucina) Sp. Indet. A.
From the same location (Heald Bank) a completely different species in the same subgenus was obtained. It is old and weathered and for the time being it is not possible to identify it. The radials are much less developed and the shell is much more ovate. Probably also fossil.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: A single lot of a single valve.
Depth Range: 34-40 feet in shelly muddy sand.
Geographical Range: Unknown.
Maximum Size: 5.5 mm.
Eastern Pacific Analogue: Unknown.

Genus Parvilucina Dall, 1901.
Small, rather inflated shells, with closely spaced concentric sculpture, and crenulations on the ventral margin. In the N.W. Gulf of Mexico, the genera Parvilucina and Cavilinga, Chavan, 1937.

221. Parvilucina (Cavilinga) blanda (Dall & Simpson, 1901).
Phacoides trisulcatus blandus, Dall & Simpson, 1901.
B.U.S.F.C.,Vol. 20, pt. 1, p. 493, pl. 58, fig. 13.
This small species with a range from N. Carolina to Brazil (Abbott, 1974) is quite rare off Louisiana but does not reach the Texas offshore area. In the H.M.N.S., are only two lots from western Louisiana. The species is probably a direct descendant of the Miocene P. trisulcata (Conrad, 1814). Abbott, 1974 by mistake figures P. sombrerensis instead of P. blanda.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 2 lots.
Depth Range: 30-40 fms., in calcareous environment off western Louisiana.
Geographical Range: North Carolina to Brazil (Abbott, 1974).
Maximum Size: 7.0 mm.
Eastern Pacific Analogue: ? Cavilinga prolongata Carpenter, 1857. Baja California to Mazatlan, Mexico (Keen, 1971).

222. Parvilucina (Parvilucina) multilineata (Tuomey and Holmes, 1857).
Lucina multilineata, Tuomey and Holmes. Pleist. Foss., S. Carolina, p. 61, p. 18, figs. 16-17.
Syn. Phacoides (Parvilucina) crenella Dall, 1901.
P.U.S.N.M., Vol. 23, No. 1237, p. 810, 825, pl. 39, fig. 2.
This very common species is taken in beachdrift along the entire Texas coast from Galveston to the Rio Grande, but while rare at Galveston, it becomes gradually more abundant to the south. It lives also commonly in offshore waters less than 15 fathoms, (off Galveston-Freeport and Louisiana, Isles Dernieres, Ship Shoal) and probably in Galveston West Bay, although we have no live material. Dead shells are not uncommon in Matagorda Bay but in the southern Texas bays (Aransas Bay, Corpus Christi Bay, Laguna Madre) it has been taken alive. It is a quite variable shell, usually orbicular, fairly thick shelled and with varying intensity of radial sculpture. In some valves, no radial lines can be seen at all, in others, they become outspoken. From three locations, we have another form, which

is so out spokenly costate, and different in outline that we believe it to be a different species. The ventral crenulations of P. multilineata are, apparently, as in Bellucina amianta, during periods of growth covered but formed anew periodically. Very small juveniles are often collected, but among them two different forms can be discerned. One is exceedingly small and finely concentrically ribbed and is provisionally assigned to the subgenus Microloripes, already reported by Altena from Surinam (1968). The other is perhaps somewhat larger and ribbed by lamellar ridges, which are wider apart. It could belong in another genus. The maximum size of Parvilucina multilineata in Texas never reaches 10 mm. as stated in Ref. 269, but stays below 7 mm. The species is quite rare on the offshore reefs.

Previous records for the Texas faunal province are: 15, (as L. crenulata Con.) common at Corpus Christi, not at Galveston; 18 (as L. crenulata Con.) Corpus Christi; 45, listed for Galveston and Corpus Christi; 61, Rockport area; 62, Mustang Island; 66, Marine Pleistocene of Texas; 98, listed for the bays; 110, dead shells rare at Galveston, common at Port Aransas; 135, dead in the bays; 132, at many stations (33-48 feet depth) off East Texas, alive; 145, Lower Sound, Upper Sound, inlets, deep shelf, Mississippi delta (all dead), pl. 3, figs. 4A, B; 160, Matagorda Bay, dead; 164, dead in bay of Rockport area Texas, and Laguna Madre; 170, listed for transitional shelf-assemblage off East Texas; 174, listed; 175, listed for inlet and deep channel assemblage, common on silty sands, pl. 3, fig. 21; 206, Beach Records in Texas Conch., Vol. 3 (6); 225, Galveston; 236, Galveston; 251, Yucatan shelf; 253, common on offshore reef Padre Island; 260, listed for Texas; 269, figured on page 175.

Records H.M.N.S.: 80 lots of which 8 contain live collected material.

Depth Range: 0-40 fms. (optimal 0-15 fms.) in sandy mud bottoms. Alive: 0 (South Padre Island - 12 fms. in muddy sand.

Geographical Range: North Carolina to both sides of Florida; Brazil (Abbott, 1974).

Maximum Size: 6.9 mm.

Eastern Pacific Analogue: Parvilucina mazatlanica, (Carpenter, 1857) Gulf of California to Panama in depths of 4 to 1024 m. Keen, 1971).

223. Parvilucina (Parvilucina) Spec. Indet. A.

Three lots of a quite costate somewhat skew and very inflated species were collected on Heald Bank, Stetson Bank and the Flower Gardens. Those from Heald Bank show intermediates with P. multilineata, but in the normal habitus I do not hesitate to consider these shells specifically different. Those from the Flower Gardens are recent, those from Heald Bank and Stetson Bank could be fossils. The species is much smaller than P. multilineata and also differs from this species in that the concentric ribbing is considerably coarser.

Previous records for Texas faunal province are: None.

Records H.M.N.S.: 3 lots, none alive.

Depth Range: 6-25 fms.

Geographical Range: Unknown.

Eastern Pacific Analogue:

224. Parvilucina (Microloripes?) Spec. Indet. A.
Altena (1968) has reported this subgenus for the first time for the western Atlantic. The Surinam species is exceedingly small (± 1. mm.) and resembles quite closely, juveniles of Parvilucina multilineata, except for the much finer ventral crenulations shown in Altena's figure of M. clenchi. Gulf of Mexico juveniles of P. multilineata would be indistinguishable from Microloripes. However, in our material are two different microscopic species which appear different from juvenile P. multilineata. Our material is too insufficient to draw any definite conclusions and it is always possible that they are pathological specimens. The difference between both species is in the outline of the shell and in the density of the concentric ridges. In Spec. A., they are quite densely packed, in the other there are fewer rather lamellar ridges. The prodissoconch of these species is quite small.
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: 22½-28 fms.; alive at 28 fms. on algal reef.
Geographical Range: Unknown.
Maximum Size: .8 mm.
Eastern Pacific Analogue: Unknown in Panamanic Province.

225. Microloripes Spec. Indet. B.
Previous records for the Texas faunal province are: None.
Records H.M.N.S.: 2 lots.
Depth Range: 4-11 fms. in sandy shelly mud.
Geographical Range: Unknown.
Maximum Size: 0.9 mm.
Eastern Pacific Analogue: Unknown in Panamanic Province.

Genus Anodontia Link, 1807.
Large chalky and orbicular shells with a reduced hinge. It is not certain that the first species, in the subgenus Pegophysema Howard, 1930, still lives along the Texas coast.

226. Anodontia (Pegophysema) philippiana (Reeve, 1850).
Lucina philippiana Reeve. Conch. Icon., Lucina, 5 (49), pl. 5, figs. 23 a, b.
According to Abbott (1974) this is the same as Lucina schrammi Crosse, Journ. d. Conchyl., 24, p. 166, an opinion not shared by Britton, (Ref. 260), who believes the correct name of this species is A. schrammi (Crosse, 1876). Whatever the truth of the matter will be, it is a fairly common species, sometimes dredged in pairs. So far, we have not seen live specimens of this, the largest Lucinid in the N.W. Gulf of Mexico. The H.M.N.S. collection lacks truly juvenile material. Locally not rare in dredged offshore material to a depth of 70 fms., and occasionally collected on Texas beaches west of Galveston. At Galveston it is quite rare (San Luis Pass), but increases in frequency towards the south. Our smallest material is flatter and thinner and more angulate at the posterior side than equal sized material of A. alba, but distinction is not always easy.
Previous records for the Texas faunal province are: 45, Matagorda

and Corpus Christi, Texas; 69. listed in Appendix 8; 110, (as Loripinus schrammi Crosse, 1876) occasional on Gulf beaches from Matagorda Island to Port Isabel. Plate 9, fig. 6; 135, dead in Gulf, dead in bays; 156, Stetson Bank; 206, Beach Records in Texas Conch., Vol. 3 (6); 260, listed for Texas; 269, figured on page 173.

Records H.M.N.S.: 20 lots, no live material.

Depth Range: 0-70 fms. mostly in shelly mud bottom, or on the beach optimal 20-30 fms.

Geographical Range: North Carolina to east Florida, Cuba and Bermuda (Abbott, 1974).

Maximum Size: > 92 mm. (broken), beach shell from Padre Island.

Eastern Pacific Analogue: Anodontia (Pegophysema) spherica Dall and Ochsner, 1928. Fossil on Galapagos Island and Ecuador (see Keen, 1971).

227. Anodontia (Pegophysema) alba Link, 1807.

Anodontia alba Link. Beschreib, Nat. Samml., Univ. Rostock, 3, p. 156. Syn.: Lucina chrysostoma Philippi, 1847. Abb. Beschr. n. Conchyl. 2, p. 206, pl. 1, fig. 3.

It is regrettable that Meuschen's very appropriate name "chrysostoma" of 1787, first validated by Philippi in 1847, cannot be used. However, to Texas material, the name "alba" is perhaps better applied because seldom, traces of the vivid yellow internal coloration remain after the animal dies. Occasionally dead shells of this species are found on Matagorda Beach and further south, few of which show traces of coloration. Rarely dredged in offshore waters in contrast to the previous species. So far, I have not seen any juvenile material and the smallest material studied was about 1-inch in largest dimension. It is more rounded, more inflated and thicker shelled and the muscular impressions are slightly different from those in A. philippiana Reeve. The scant material dredged offshore Galveston may be fossil (Pleistocene?). Live specimens have been reported from Rockport and Port Aransas.

Previous records for the Texas faunal province are: 7, listed as Loripes edentula Linné; 15, (as Lorpies edentla), Corpus Christi Bay; 19, (as Loripes edentual) Matagorda Bay, dead; 21, listed as Loripes endentula Lamarck; 61, Corpus Christi area; 62, Corpus Christi area; 65, Corpus Christi area; 66, Port Isabel; 98, Padre Island; 110, dead shells on St. Joseph Island, Mustang Island and Padre Isl., pl. 9, fig. 5; 135, alive in bay, dead in Gulf; 160, dead in Matagorda Bay; 164, Rockport area, dead in various types of environment, alive in shallow hypersaline; 174, listed; 206, Beach Records in Texas Conch., Vol. 3 (6); 214, pl. 12, figs. 9, 10; 260, listed; 269, figured on page 173.

Records H.M.N.S.: 9 lots, no live material.

Depth Range: 0-12 fms.

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

Maximum Size: 54 mm.

Eastern Pacific Analogue: ?Pegophysema edentuloides (Verrill, 1870). "Cedros Island, Baja California and through the Gulf of California to Tenacatita Bay Mexico in 33 to 165 m. (Keen, 1971).

Genus Divaricella von Martens, 1880.
Inflated, rather circular valves with deeply incised grooves crossing the growth increments at an angle. In Texas a single species in the subgenus Divalinga Chavan, 1951.

228. Divaricella (Divalinga) quadrisulcata (Orbigny, 1842).
Only a few lots in the H.M.N.S. collection of this widespread western Atlantic species have been collected in the N.W. Gulf of Mexico. Five come from offshore Galveston locations and from South Padre Island where they were collected in beach-drift. The species may no longer live offshore Galveston, but South Padre Island may be the northerly limit of the species which becomes more common on Mexican beaches. Also reported as a fossil from East Texas (ref. 45).
Previous records for the Texas faunal province are: 45, well at Saratoga, Tex., at 940 feet; 66, Marine Pleistocene of Texas; 145, deepshelf, dead (Mississippi delta); 180, Alacran reef, Yucatan shelf; 206, Beach Records in Texas Conch., Vol. 3 (6); 253, dead in reef offshore Padre Island; 260, listed for Texas.
Records H.M.N.S.: 8 lots, none alive.
Depth Range: 0-25 fms.
Geographical Range: Massachusetts to south half of Florida and the West Indies to Brazil (Abbott, 1974).
Maximum Size: 16.0 mm.
Eastern Pacific Analogue: Divalinga eburnea (Reeve 1850), Baja California to Peru, intertidally and to depths of 55 m. (Keen, 1971).

FAMILY THYASIRIDAE DALL, 1901

A family of thin, somewhat trigonal often inflated small bivalves, mainly living in deep water. The hinge is thinly developed. Many species of uncertain status have been described and a critical review of all Atlantic species is needed before the N.W. Gulf of Mexico species can be assigned their proper labels. In the Texas faunal province, the genera Thyasira, Axinulus and Leptaxinus. Sources: Chavan in Treatise of Invert. Paleont., Vol. N. p. 508-511.

Genus Thyasira Leach in Lamarck, 1818.
Thin, white rather inflated, with well developed dorsal fold. In the N.W. Gulf of Mexico, live several species of uncertain status which for the most part I cannot assign to any of the subgenera currently recognized. Only two species of the genus Thyasira and none in other genera are cited by Keen, 1971 for the Panamanic Province.

229. Thyasira trinsinuata Orbigny, 1842.
Lucina trisinuata Orbigny. Mol. Cub., 2, p. 300; pl. 37, figs. 46-49, 1846.
This is a rather common species in a depth range of 7½-140 fms. No live material is present in the H.M.N.S. collection. The

species confirms fairly well with figures and descriptions available to me.

Previous references for the Texas faunal province are: 140, listed dead for Baker Bank; 166, listed for upper continental slope, 65-600 fms., few, ranges shallower to the south, pl. 6, fig. 12; 206, Texas Conch., Vol. 9, (4), p. 78.

Records H.M.N.S.: 26 lots, no live taken material.

Depth Range: 7½-140 fms.; optimal 25-50 fms.

Geographical Range: "Nova Scotia to Florida, Gulf of Mexico and West Indies".

Maximum Size: 9.8 mm.

Eastern Pacific Analogue: Acc. to Abbott (1974) also in the eastern Pacific.

230. Thyasira (Conchocele) bisecta Conrad, 1849.

This by far the largest Thyasirid species of the N.W. Gulf of Mexico, but the species is uncommon and has only been obtained in a depth range of 110-167 fathoms. Its rarity is probably due to poor collecting. Like the other species of the genus, it is inflated, white and thin, but its shape is quite different: very oblique and backwardly enlarged, so that the shells have a somewhat quadrate appearance.

Previous references for the Texas faunal province are: 206, (as Thyasira sp. C), listed on p. 78, Vol., Texas Conch.

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

Depth Range: 110-167 fms. in mud bottoms.

Geographical Range: Caribbean and northern Pacific (Abbott, 1974).

Maximum Size: 19 mm. for a complete shell; fragments indicate a much larger size.

Eastern Pacific Analogue: The same species also lives in the northern Pacific (Oregon-Japan, according to Abbott, 1974).

231. Thyasira Sp. Indet. A.

This rather small species differs from T. trinsinuata by its much less pronounced development of the dorsal ridge. Its surface is often somewhat granular, but on such tenuous grounds it can hardly be assigned to T. granulosa Monterosato, 1875, listed by Abbott, 1974 for the Gulf of Mexico and the West Indies. It also resembles T. conia Dall and Simpson, 1901, rather closely (not listed in Abbott, 1974).

Previous references for the Texas faunal province are: 206, Texas Conch., Vol. 9 (4), p. 78 (as Thyasira Sp. G).

Records H.M.N.S.: 10 lots (no live material).

Depth Range: 14-140 fms. on sandy mud bottoms.

Geographical Range: Unknown.

Maximum Size: 4.6 mm., but fragments indicate a size of 6-7 mm.

Eastern Pacific Analogue: Not determined.

232. Thyasira Sp. Indet. B.

Some very minute Thyasirids without dorsal ridge are here without further annotation reported as Thyasira Sp. B. They probably are juveniles and will be difficult to identify. Also taken from the mudlump fauna.

Previous references for the Texas faunal province are: 206, (as Thyasira Sp. D), Texas Conch., Vol. 9 (4), p. 78.
Records H.M.N.S.: 3 lots, no live material taken.
Depth Range: 150-170 fms.
Geographical Range: Unknown.
Maximum Size: 1.3 mm.
Eastern Pacific Analogue: Not determined.

233. Thyasira Sp. Indet. C.
Only one small valve, broken during photography, probably represents another minute species, which from the material at hand probably will remain unidentifiable.
Previous records for the Texas faunal province are: 206, (as Thyasira Sp. C), Texas Conch., Vol. 9 (4), p. 78.
Records H.M.N.S.: 1 lot, no live material.
Depth Range: 110 fms.
Geographical Range: Unknown.
Maximum Size: Broken (± 1.2 mm.).
Eastern Pacific Analogue: Not determined.

Genus Axinulus Verrill and Bush, 1898.
The shape of the minute shells of this genus is so clearly different from Thyasira that I consider this, as does Chavan, as a full genus. It is characterized by a somewhat ovate shape and an angle on the posterior side. In the N.W. Gulf of Mexico, a single minute species.

234. Axinulus c.f. pygmaeus Verrill and Bush 1898.
Quite different in shape from minute species in the genus Thyasira. Their shape is more or less oval with a pronounced angulosity on the posterior margin. There is no dorsal ridge. Only a few lots of this interesting but minute bivalve has been collected so far. In outline it comes close to a species described from the New England coast, but so far we have not made a direct comparison. Also known from the mudlump fauna.
Previous references for the Texas faunal province are: 206, (as Thyasira Sp. F), Texas Conch., Vol. 9 (4), p. 78.
Records H.M.N.S.: 6 lots, no live material taken.
Depth Range: 63-110 fms.; also collected in mudlump fauna off the Mississippi delta.
Geographical Range: Northern Atlantic.
Maximum Size: 2.1 mm.
Eastern Pacific Analogue: Unknown.

Genus Leptaxinus Verrill and Bush, 1898.
Minute bivalves, quite inequilateral with almost opisthogyrate beaks. The hinge is characteristic for the genus and possesses as Chavan terms it, "tuberosities". These are a series of bumps which sometimes give the impression that the hinge is similar to that of Isognomon. In the N.W. Gulf of Mexico two species, of which one is quite widespread and common.

235. Leptaxinus Sp. Indet. A.
A quite widespread and common species, usually associated with Vesicomya pilula and collected in a range of 20-170 fathoms. The only live specimens came from an anomalous location of 8 feet depth (Timbalier Bay, mouth of channel near Timbalier Island). Although always the greatest care was taken during our collection trips, contamination with another sample cannot be excluded here. The species occurs, sometimes, numerously in sandy mud bottoms. It could be very well L. minutus Verrill and Bush 1898, but so far no comparison with type material has been made. Also in the mudlump fauna.
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 78. (as Thyasira Sp. A).
Records H.M.N.S.: 23 lots, of which one contains live collected material.
Depth Range: 20-170 fms.; live material: 8 feet, Timbalier Island, (doubtful locality data).
Geographical Range: Unknown, probably north Atlantic.
Maximum Size: 1.3 mm.
Eastern Pacific Analogue: Not determined.

FAMILY DIPLODONTIDAE

The western Atlantic species of this family have never been adequately described, figured and compared, and are in need of a critical revision. In it are brought together a group of small to medium sized bivalves, without color but with a characteristic hinge. The laterals are much reduced or missing and one of the cardinals is bifid. In the N.W. Gulf of Mexico, the genera Diplodonta, Felaniella, Phlyctiderma and Timothynus can be distinguished on the basis of minor differences in the hinge structure and surface sculpture. A study of juvenile material shows that the generic distinction is significant because this very minute material can be easily split into different species.

A summary of the N.W. Gulf of Mexico genera is as follows:

Diplodonta
Form: Depressed, subquadrate when mature, blunted triangular when juvenile.
Sculpture: Irregular radial pattern, as if water ran along the surface and left traces.
Hinge: Very short posterior part, with a simple, not grooved area for attachment of ligament.

Felaniella
Form: Somewhat depressed, circular with slight sinuosity in the ventral margin when mature, slightly triangular when juvenile.
Sculpture: Regular growth lines, rougher on anterior and posterior sides; irregularly spaced circular pits.
Hinge: Very short posterior part, with short deep groove.

Phlyctiderma

Form: Inflated, circular when mature; much more depressed, with prominent umbo when juvenile.
Sculpture: Rather coarse growth lines and with pustules or lamellar ridges when mature (missing in juvenile material).
Hinge: Rather heavy, with a long posterior part. Narrow and long attachment area for ligament, bordered by a flange-like ridge.

Timothynus

Form: Very inflated, often more oval than Phlyctiderma.
Sculpture: Rather regularly spaced growth lines, no pattern of grooves and pustules.
Hinge: Long posterior part, with wide shelf for ligament.

Sources: Chavan in Treat. Invert. Paleont., Vol. N, p. 514-517, Keen.

Genus Diplodonta Brown, 1831.
Inequilateral, medium sized, colorless bivalves. Only one species in the N.W. Gulf of Mexico.

(to be continued)

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A current story in the newspapers detailed the fabulous collection of gifts housed by GSA at Washington, D.C., gifts from all over the world given to dignitaries of the nation and not kept because the law prohibits such individuals from retaining gifts over $50.00. Among the gifts sitting in the vaults quoted as "not coveted" and wanting for a home was a three foot long and two foot wide shell from the Philippines. I can only guess it must have been a Tridacna. GSA tries to farm out the gifts to suitable Museums. Judging from the delight of children and adults visiting our show at the Museum last May and touching the Tridacna display, surely some kind of Museum would welcome that shell!

oooooooooooooo0oooooooo0ooooo

This summer the newspapers carried stories about the recent radio carbon dating of living clams from off the New England coast, deep water clams used for food. They were aged at 100 years! Can you imagine eating a 100-year-old animal! This really makes one wonder just how old one of the big Mercenarias from West Bay, Galveston, might be. They are probably much older than you think. Certainly, we do know that they must be ground up to make fit-to-chew chowder.

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CIRCULATION

Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL STAFF

Helmer Ode, Editor
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 N. MacGregor Way
Houston, Texas 77004

Constance E. Boone
668-8252
3706 Rice Blvd.
Houston, Texas 77005

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double spaced and should be submitted to the editorial staff.

EIGHTY YEARS YOUNG --- Dr. William J. Clench, a much-loved and an outstanding malacologist in our country, was eighty years old on October 24, 1977. Having been in the field with this gentleman several times in recent years, including this last summer on the St. John's River in Florida, it seems appropriate to publish this picture of Bill rigged out for a "lig" hunt on the field trip into the Everglades in Florida during the annual meeting of the American Malacological Union at Naples, Florida. Co-founder and past editor of Johnsonia and Occasional Papers on Mollusks, Harvard University, and curator of the Department of Mollusks of the Museum of Comparative Zoology of Harvard from 1926-1966, this man has a long and wonderful history of working with mollusks and teaching others about them. Still hard at work on current studies, a recent letter revealed the following: "I have finished working up the Watanga River material ..... I am working up the Florida material which I collected last May ....." We are looking forward to having you back in Texas, Bill!

Photo and Story by Constance Boone

BEACH SAMPLE FROM CORPUS CHRISTI

by Peggy Jehn

(From the Editor: This example of working a sample of beach drift by our member from Austin, Texas, is printed with pleasure to show all our members the value of examining and researching such shells. The nomenclature is the author's except for the notes in the Addendum.)

On July 16, 1977, I had the opportunity to go shelling on North Beach, Corpus Christi Bay, where there had been some offshore dredging and because the beach drift taken from the intertidal zone at low tide was so rich I decided to make a count. Approximately 3½ pounds of drift was taken from the North end of the beach (near the picnic tables), and the same amount was taken from the South end. I went through the beach drift by spreading 2 tablespoons out on a paper towel, letting it dry and then inspecting it with a 5X loupe bit by bit, and taking the shells out with tweezers. The total number of shells taken is 16,976 - 4,858 GASTROPODA and 12,078 PELECYPODA (mostly single valves) and 40 SCAPHOPODA. It did take a long time, and the enclosed table is the result of this work.[1]

For convenience the families in each class have been put in alphabetical order. In many cases identification was difficult as can be seen by the question marks. I would attribute this to possibly a poor specimen, a juvenile, and certainly to my lack of experience. If anyone is so inclined and has the time, I would like to show them the shells and have them answer some of the questions that came up. For instance: Lucina nassula have not yet been reported off the Texas Coast, yet these valves were suspiciously like L. nassula. They may be Parvilucina multilineata with strong radial lines.[2] I don't know?! Also, have Astarte nana ever been reported in Texas?[3] The VITRINELLIDAE, I did not try to classify, needing better magnification. There are at least 5 different species.

Many of the shells were surprisingly fresh specimens; however, I did not separate the fresh from the beach-worn, and therefore, cannot say what percentage is fresh. The North end of the beach produced a greater number of shells totally, but not necessarily more in each species. It may be noted that there are no Mulinia lateralis listed for the North end - this is because I did not decide to collect them until going through the South end drift. My reasoning was that they are so very common, and nearly always present in beach drift from our Texas Coast.

Hopefully, there is some small scientific value in this collection; and if not, it was a most enjoyable experience.

GASTROPODA

	North End	South End
ACLIDIDAE		
Henrya goldmani Bartsch (?)		1
ACTEOCINIDAE		
Acteocina canaliculata Say	148	177
Rictaxis punctostriatus C.B. Adams	5	4
CAECIDAE		
Caecum nitidum Stimpson	1	
Caecum pulchellum Stimpson	435	48
CERITHIIDAE		
Alabina cerithidioides Dall	1936	417
Cerithiopsis greeni C.B. Adams	2	28
Diastoma varium Pfeiffer	72	733
Seila adamsi H.C. Lea	4	10
Triphora perversa nigrocinta C.B. Adams	1	30
COLUMBELLIDAE		
Anachis obesa C. B. Adams	1	11
Anachis semiplicata Stearns		1
Mitrella lunata Say	8	17
CREPIDULIDAE		
Crepidula fornicata Linne	50*	
Crepidula convexa Say	42	72
EULIMIDAE		
Balcis cf. jamaicensis C.B. Adams		2
Melanella sp. (?)		21
ELLOBIIDAE		
Melampus bidentatus Say	1	
EPITONIIDAE		
Epitonium rupicola Kurtz	1	1
Epitonium apiculatum Dall	1	
Epitonium albidum Orbigny		1
Epitonium sericifilum Dall (?)	1	
juveniles (?)	5	
FISSURELLIDAE		
Diodora cayenensis Lamarck	2	3
LAMELLARIIDAE		
Lamellaria cf. L. leucosphaera Schwengel (?)		1
LITTORIDINIDAE		
Texadina barretti Morrison	16	33

	North End	South End
LITTORINIDAE		
Littorina sp.		1
MELONGENIDAE		
Busycon contrarium Conrad	9*	9
" " (Juveniles)	6	
NASSARIIDAE		
Nassarius acutus Say	6	4
Nassarius vibex Say	1	3
NATICIDAE		
Natica pusilla Say	9	
Polinices duplicatus Say		7*
PYRAMIDELLIDAE		
Eulimastoma sp.		15
Odostomia dux Dall & Bartsch	7	2
Odostomia gibbosa Bush	1	4
Odostomia impressa Say	9	105
Odostomia laevigata Orbigny (?)		15
Odostomia seminuda C.B. Adams	3	
Pyamidella crenulata Holmes	3	3
Turbonilla sp.	124	34
RISSOINIDAE		
Rissoina catesbyana Orbigny	5	41
Zebina browniana Orbigny	1	
TEREBRIDAE		
Terebra protexta Conrad	5	3
TURRIDAE		
Pyrgocythara plicosa C.B. Adams		1
VITRINELLIDAE		
Vitrinella sp.	26	40
UNIDENTIFIED		
A.		14
B.		33
C.		1
D.		7

PELECYPODA

	North End	South End
ANOMIIDAE		
Anomia simplex Orbigny	11	24
ARCIDAE		
Anadara transversa Say	113	111
ASTARTIDAE		
Astarte nana Dall (?) (See 3.)		4
CARDIIDAE		
Laevicardium mortoni Conrad	2*	
Trachycardium muricatum Linné	19*	
Juveniles	9	23
CHAMIDAE		
Arcinella cornuta Conrad	10*	
CORBULIDAE		
Corbula swiftiana C.B. Adams	27 1 dbl. valve	14
CRASSATELLIDAE		
Crassinella lunulata Conrad	1897	157
LUCINIDAE		
Anodontia alba Link	4*	
Linga amiantus Dall	2134	176 1 dlb. valve
Lucina nassula Conrad (?) (See 2.)	35	53
Parvilucina multilineata Holmes	3773	1088
MACTRIDAE		
Mulinia lateralis Say		877 1 dbl. valve
Spisula solidissima similis Say (Juvenile) (?)	1	
MYIDAE		
Paramya subovata Conrad (?)		1
MYTILIDAE		
Geukensia demissa granosissima C.B. Adams	10	37 1 dbl. valve
NUCULANIDAE		
Nuculana acuta Conrad	406 11 dbl. valves	64
Nuculana concentrica Say	10	26

PELECYPODA - 2

	North End	South End
PECTINIDAE		
Argopecten irradians amplicostatus Dall	4*	2
PSAMMOBIIDAE		
Abra aequalis Say	68	313
SEMELIDAE		
Semele bellastriata Conrad	2	4
Semele proficua Pulteney	1	
SOLECURTIDAE		
Tagelus divisus Spengler		10
TELLINIDAE		
Strigilla mirabilis Philippi		3
Tellina sp.	10	71
UNGULINIDAE		
Diplodonta soror C.B. Adams	1	13
VENERIDAE		
Callista nimbosa Lightfoot	2*	
Chione cancellata Linné	96*	
" " (Juveniles)	68	112
		1 dbl. valve
Mercenaria campechiensis texana Dall (Juveniles)	117	119
Dosinia discus Reeve (Juveniles)	35	31
SCAPHOPODA		
DENTALIIDAE		
Dentalium texasianum Philippi	21	19

Shells were collected from approximately seven (7) pounds of beach drift (3½ lbs. from the north end of the beach and 3½ lbs. from the south end) taken at low tide, North Beach, Corpus Christi Bay, Texas on July 16, 1977. The numbers that are starred did not come from the drift, but were just picked up in the intertidal zone.

1. Mrs. Jehn has now reported that the dredging was bay sand and mud from the bay to enrich the beach area and that in November, there were not as many drift shells as river sand is also being used now.
2. Lucina nassula has been reported in offshore waters in Texas; however, Dr. Odé has checked two samples from Mrs. Jehn and reports the specimens are Parvilucina multilineata.
3. Astarte nana is reported offshore Texas; Dr. Odé reports Mrs. Jehn's specimens, however, are young Anomalocardia auberiana.

SEARCH AND SEIZURE by Constance E. Boone

This column was originated to report on a continuing basis the collection of mollusks in Texas, although from time to time, the author does digress to discuss collections elsewhere and to relate news about mollusks in the literature. This issue I dwell on several species collected in recent years that need to be included in mollusks available to Texas collectors and to discuss probabilities of collecting success of other species you read about and want to add to your local collection.

Marginella (Prunum) apicina Menke, 1828, the beautiful little ivory, or orangish, Marginella so common on the grasses in Florida and Caribbean areas, has been collected in Texas. I have two adult specimens, with animals still dried in, collected in May, 1971, on the grasses near the Coast Guard Station, channel area at South Padre Island, Texas. I was sieving with my long-handled large fish net (which I fill in with nylon netting or similar material such as the plastic netting available in hardware stores) and recovered these specimens from the muddy area, in about four feet of water, where Argopectens have been available recently.

In a discussion with Betty Allen of Port Isabel, Texas, recently, I learned that other live specimens have been taken from the South Padre Island jetties.

A species I reported as having collected live near Palacios, Texas, one recent winter, Polymesoda caroliniana (Bosc, 1801), is currently being sought by Dr. Clifford E. Murphy of the Department of Biology of Texas Christian University at Fort Worth, Texas, for research with the live animals. Dr. Murphy and his students made a trip to this area recently to seek help in collecting in the Galveston Bay area. Dr. T.E. Pulley, Director of the Houston Museum of Natural Science, had collected specimens in this bay and bayou area. He had taken live specimens in Dickinson Bayou, Mustang Bayou and Kemah areas of Galveston Bay in the 1950s. Reports have been made of shells from the Lavaca Bay area, but I do not know of live beds. Efforts of Dr. Murphy and Dr. Pulley failed to discover live specimens although many dead and some seemingly fresh specimens were taken. Dr. Helmer Odé reports that through the years he remembers seeing only one specimen taken live by another collector. Please report your experiences in collecting live specimens in Texas. There may be good live beds in the Palacios area we don't know about. My live specimens (two) were taken with Rangias in the mud near shore. The species prefers brackish or less saline waters. Expect to find it in bayous dug in the muddy banks or bottoms.

On a recent trip to the Port Aransas area and North Padre Island Seashore area, collecting was rather slim with little drift line. This made me work harder to find something to "crow" about. While Anomia simplex Orbigny, 1845, is certainly reported live in Texas bays and rocky areas, it hasn't seemed to be very common live in recent years. It has always seemed to be more available in the southern Texas beach and bay areas. I used to find nice specimens on the rocks and old shells around Rockport and Aransas Pass. Many of you may not have this species live-taken yet from Texas. My recovery of six live

specimens came from diligent look inside every old pen shell at North Padre, all inside one Atrina. I spent a lot of time searching in old shells, shaking bamboo and Sargassum and peering into old beer cans. Another member of the Seminar field trip (U. of Houston and Houston Museum Continuing Education) began to follow my lead and came up with a number of live Cantharus cancellarius (Conrad, 1846) in an old beer can. It reminds me that Dr. Pulley once told one of the biology Continuing Education classes that we should throw the cans in the Texas waters since they made such excellent habitats for a number of mollusks. Texas has so few rocks for mollusks to cling to. (Now don't go write me letters about littering the beach. Dr. Pulley was simply making the point of what Texas sandy beaches are like for mollusks to trying to eek out a living.)

If you want to pick up a handful easily of the jingle shell valves, the shell bank along the beach at Indianola is a good place to try.

Leola Glass spent a month at Port Aransas this last June. Pickings were not fabulous until you realize that modestly she reports she collected over 200 Janthina exigua Lamarck, 1816. She took as many juvenile Janthina janthina also, but it is J. exigua that continues to be on Mustang Island in such great abundance. I reported taking some both springs of the last two years. I report this so that you will examine the small Janthinas. You may be missing collecting this deep purple one-fourth inch shell with a prominent notch in the outer lip. I have only a small number taken on immediate area beaches and prized getting every one. It seems hard to believe so many have been available at Mustang.

By the way, you new collectors in the Club, have you bought your field lens yet? By now you probably realize that many, many shells in the books from Texas are small or tiny or micro. The Museum carries inexpensive 10-power lens that are good to carry on the beach. It won't upset you if you get them in salt water or lose them in the sand like it would if you did that to a good Bausch and Lomb lens.

I bring to your attention the publication of Part IIa of Dr. George Radwin's systematic discussion of Columbellidae of the Western Atlantic in The Veliger, Vol. 20; No. 2, Pages 119-133 (we have this in our library). Most of what is available to us for collection live in our beach and bay areas is discussed in this report. Dr. Helmer Odé will report offshore material and include other species, I am sure, but what Dr. Radwin records as full species for Texas beach area is the following list: Costoanachis floridana (Rehder, 1939), Costoanachis lafresnayi (Fischer and Bernardi, 1856), Costoanachis semiplicata (Stearns, 1873), Parvanachis obesa (C.B. Adams, 1845), and Parvanachis ostreicola (Sowerby, 1882).

You may find the most common of the larger species, C. semiplicata, in algal mats on jetty rocks, more commonly from Freeport south, especially at Port Aransas and South Padre Island, and also in algae on rocks in those area bays. I have a few also from around the pilings at San Luis Pass, Galveston Island, and an occasional one from the Galveston and Bolivar jetties. At South Padre Island on the jetties I have more often encountered the species I have wondered about and recognize that Radwin regards these as C. floridana. Our specimens vary and seem very close to C. avara but are probably morphological forms of floridana. What I see is that sometimes the silky periostracum covering the shells exhibits somewhat wavy horizontal almost micro lines and sometimes has these finely and closely set. After cleaning off the periostracum to see if the lines are still on the shell, I see really micro suggestions of such lines there but not much incised at all. The vertical ribbing is not consistent either. Some of the shells seem fatter in the body whorl also.

My specimens of C. lafresnayi have been found at inlet areas on Galveston Island and farther south and almost always in old Thais shells. It is slender and very ribbed and not hard to determine.

Last year in the spring I happened to be on the beach at Galveston near the jetties when seiners were harvesting fish. I always like to see what the haul is like. This time the nets brought in many, many strings of Busycon egg cases, all fresh. Living on these, I saw many, many "Anachis" (Radwin says we have only one recent Anachis s.s. in the Western Atlantic and none appears in our beach areas) on the egg capsules. At home, I carefully collected these from the capsules and observed them under a microscope. They hung by threads from the capsules and were depositing egg capsules on the Busycon egg capsules. I observed two forms of what I now know are Parvanachis obesa, some ivory with brown markings and some all purplish brown. Radwin makes these both obesa. However, I also noted that the purplish brown ones sometimes also had a different initial whorl after the protochonch, having both axial and horizontal ribbing. Most of the obesa only had the vertical ribbing. I also observed a capsule hatching out complete minute shelled, veligers which resemble micro Naticas to my unprofessional eye.

P. ostreicola is a different shell now that I realize once and for all that there are forms of P. obesa. P. ostreicola can be taken in our bays at Galveston and all down the coast inside old shells and in bay algal mats on rocks and debris. They are tiny, dark, much-ribbed, crossed with ribs also, barrel-like shells.

1. It is with deep regret I report that Dr. George E. Radwin died of an apparent heart attack in San Diego on September 30, 1977. He had been curator of marine invertebrates at the San Diego Natural History Museum and was only thirty-seven years old. Most of you know him from his papers on Murex and his recently-issued (co-authored) book on Murex. We hope that his work on Columbellidae will be published to conclusion.

From the Fall Newsletter of the American Malacological Union I read that Dr. Myra Keen, professor emeritus of Stanford University, gave a preliminary report on the spectacular modern find of mollusks by the submersible craft Alvin or dives along a rift zone northeast of the Galapagos Islands at the recent meeting of the Western Society of Malacologists. Many of you may have seen the article on the Alvin dives in the fall issue of National Geographic. The largest clam specimen brought back was 250 mm. in length and the shell alone weighs 18 ounces. Dr. Keen reports this seems to be an undescribed species of Calyptogena. Photographs of the bottom showed limpet-like snails in abundance, large mussels and crabs, and numbers of other invertebrates.

Whelk soup on the menu at Harbour Island, North Eleuthera, Bahamas, puzzled me since I didn't think Busycons were found there. On inquiry, I discovered the shells used for this dish are Cittarium pica (Linne, 1758), the West Indian top shell. This brought back the memory that these shells are more highly prized for food on the island of Isla Mujeres, Quintana Roo, Yucatan, Mexico, than Strombus gigas.

This summer I was told of a successful method of cleaning Helmet shells. It seeme that one pours a small amount of oil (like baby oil, mineral oil or cooking oil) in the aperture and sloshes it around with the animal. Then the shell is turned down from a perch. The animal is not able to maintain its attachment because of the oil and finally slips completely out. Hope it works!

Sea Grant Field Guide Series #6 of the University of Miami Sea Grant Program is titled "Commoner Shallow Water Gorgonians of Florida, Gulf of Mexico and the Caribbean." Published in March, 1977, the author is Stephen Cairns. Order it for $1.25 from Information Services, University of Miami, P. O. Box 248106, Coral Gables, Florida 33124. A copy has been ordered for the Houston Conchology Society's library.

by Tina Petway

MEET ME UNDER THE MICROSCOPE

BY TINA PETWAY

As most of you are aware, our Club membership has nearly doubled in the past two years. With so many comparatively new members, it is difficult to get acquainted with everyone. So in this continuing article I hope to introduce members and give a little background about them to help us to know each other better. In each issue of The Texas Conchologist, five or six members will be spot-lighted. I hope this will help you to make some new friends.

For more than twelve years Mrs. Betty Allen has been a member of our Houston Conchology Society. She and her husband, Larry, own and run a lovely shell shop called Shop of the Seven Seas in Port Isabel, Texas. Betty belongs to several other shell clubs, among them, South Padre Island Shell Club (of which she was shell show chairwoman for eight years), Hawaiian Malachological Society, Keppel Bay Shell Club and New York Shell Club. Mrs. Allen became interested in shells in 1949 when she and a friend saw an issue of National Geographic Magazine, of that year, which was devoted to shells. She and her friend were bitten!

Larry, on the other hand, was interested in Horticulture until he met Betty. He was on an exploratory vessel out of California, working Mexico and Central America. This vessel put in at Port Isabel, where Larry soon met a reporter for the weekly newspaper who was anxious to do an article about him. That reporter was Betty, and she says it was almost love at first sight. After they were married, Larry went into shrimping and would bring shells to Betty. And in 1956, they opened their Shop of the Seven Seas. They will greet you most happily if ever you are in Port Isabel; so stop in and get acquainted. (Most of you "met" Betty through her delightful display, "Evolution of a Shell Collector", at our Museum show last May.

Mrs. Ruth Goodson is an enthusiastic member of H.C.S. and has been for the last eight years. She became interested in shelling in a most unusual way nine years ago. She had been in an accident, and while recuperating, a friend asked her to go on a trip to Baja, Mexico. So off they went. They found live Olives, pink-mouthed Murex, Murex nigritus and many others. That did it for Ruth! Her next trip was to Tahiti and Australia where she also became interested in scuba diving.

Her favorite families of shells are the Pectens, Cypraea, Murex, and Cones in that order. But she says she loves them all. Her husband, Charley, enjoys looking at the shells but he prefers hunting.

Ruth lived in Mississippi for eighteen years and also in Alabama. She has been here in Houston for ten years. Although shelling has become a passion, she still has time for other varied interests - among them, making oriental rugs by hand, quilting, making silk flowers, needlepoint, original design shell pillows and creative stitchery, are only a few.

Ruth has a fine shell collection and welcomes anyone to come visit her and see her shells any Sunday afternoon.

One of our newer members is Ms. Betty Andrews. She has been a member of our Club for less than a year, though she has been interested in shells for several years. Betty says she has always loved walking on the beaches and that her curiosity about the little she found washed up there was all it took. She thinks the Olividae family is her favorite; and she was lucky enough to find quite a few live Oliva sayana on the November field trip. Betty would be interested in trading shells with anyone who also had that interest.

Betty is a secretary for a drilling contractor here in Houston. She was born in Illinois but has lived in Houston for the past twenty-seven years. Besides shelling, she also enjoys bicycling. Betty says she has really enjoyed being a member of our group and feels happy to be associated with a group of people which she says is the most wonderful and helpful ever.

A little over a year ago the members of H.C.S. welcomed to Houston Mr. and Mrs. Jim Fair and family. Mrs. Ruth Fair is well-known to most older members as the author of two books and numerous papers on shells. Her Murex Book has proved invaluable to collectors. Her other book, Shell Collector's Guide, has been well received and enjoyed by all. Ruth was also awarded the Smithsonian Institute Award for her study and research into the migratory movements of shell populations of Oahu, Hawaii, from shallow to deep water. This research in shell migrations and the family of the Murex are her favorites.

Ruth became interested in shells some thirteen years ago when she and her family moved to Kwajalein Atoll in the Marshall Islands. Her fourth son, Tom, got both his parents into collecting shells there. They continued to enjoy their new hobby in San Diego, California; Manilla, Philippines, and Hawaii where they also lived. While in Hawaii, Ruth was an active member of the Hawaiian Malacology Society, and I know they were sorry to see her leave.

Jim is also an avid collector and seems to have the luck of the family because he somehow always finds the best "goodies". Jim's other favorite things include golfing and photography in general.

Ruth has other interests too. She is an excellent watercolorist. And she enjoys making pottery by hand in imitation of the American Indian's. Shell craft and other hand crafts are some of her favorites too.

Ruth recently led a group of our Club members to Fiji, where shelling was fantastic and the scenery was fabulous. Those of us who didn't get to go with them hope Ruth will be going again before very long and will take the rest of us along.

This year the Houston Conchology Society was invited to give a shell show at the Houston Museum of Natural Science. It was a huge success, especially in the number of new members it brought us. One of these new members was Martin Miller. Martin says he has always been interested in shells and, like a lot of us, collected his first shells from the beaches. In high school Martin took several oceanography courses to learn more about the seas and the life that inhabits them.

Martin does not have a favorite area of interest, but he really likes all shells. He would like to trade shells with someone either locally or world-wide and would really enjoy corresponding with someone from another country.

A medical technologist, Martin works at Baylor College of Medicine. He has lived here in Houston for ten years, and lived in San Antonio, Texas, before coming here.

Besides collecting shells, he also likes stamps. Being on the beaches or in the Gulf has another interest for Martin because he loves salt-water fishing. Ane come November you can find Martin sitting in a cold wet blind waiting to get a shot at a flock of ducks. This pastime seems to rob many of us of our shelling partners.

MOLLUSCANA by W.W. Sutow, M.D.

The discussion this month will focus on books - some recent publications of conchological interest.

The first one represents the all too few books that deal not with shells but with the animals living within them. The book is entitled LIVING MARINE MOLLUSCS and is authored by C.M. Yonge and T.E. Thompson (London. William Collins & Company, ltd., 1976, 288 pages).

The book is very reminiscent of the American publication "THE SHELL MAKERS" that was written by G. Alan Solem (1974). The emphasis is on the animal - how they achieve locomotion, how they function, etc. In some ways the new compact book serves as a synopsis of the much more detailed dissertations that appeared in two volumes as "THE PHYSIOLOGY OF MOLLUSCA"edited by K.M. Wilbur and C.M. Yonge in 1966.

The print is small (and hard on the eyes of those in the older age brackets) but the pages are packed with information concerning the "extraordinarily diverse results of molluscan evolution". The chapter headings give a good perspective of the contents:

1. Historical
2. The nature of molluscs
3. Classification
4. Chitons
5. The first gastropods
6. Limpets and top shells
7. Mesogastropods
8. Mesogastropods - burrowers and drifters
9. Neogastropods - scavengers and predators
10. Opisthobranch sea-snails
11. Sea-slugs
12. Origin and nature of bivalves
13. Evolution and adaptation of bivalves
14. Ark shells, mussels, fan and file shells, scallops and oysters
15. Shallow and deep burrowing bivalves
16. Borers in rock and timber
17. Anomalous bivalves and scaphopods
18. Cuttlefish, squids and octopods

To top off the informative text in the chapters, the authors have added an unusually meaty epilogue (7pages) which summarizes the various chapters and puts them into context - one in relation to another. The bibliography appears to be short but the titles are well selected. Most of the books listed, however, are well known and provide only general discussions. (Surprisingly, the two-volume PHYSIOLOGY OF MOLLUSCA is not included.)

While there is a definite British flavor with descriptions of many species from the British and North Atlantic shores, the handling of the text provides information applicable to similar species elsewhere. In tune with the title, the photographs (including the pecten on the jacket cover) emphasize the living creatures. Eight of the plates are in color and the photograph of the Janthina is particularly striking.

Of the eighteen numbered chapters, C.M. Yonge has written 16; the contributions of T.E. Thompson are the chapters on opisthobranch sea-snails and sea-slugs. In typical expressive British style of writing (for example, in discussing opisthobranchs the authors say "they are to molluscs what the butterflies are to arthropods, or orchids to other flowering plants") the general areas are well covered. Little bits of information are tucked away in the paragraphs such as the statement that carnivorous gymnosomes are "the only molluscs other than cephalopods to possess tentacles armed with suckers".

The book is highly recommended. It is well-written, interesting and authoriative - from the historical narrative about Lister and Linnaeus in the first chapter to a short but fascinating discourse on the habits of the cephalopods in Chapter 18. The authors truly bring the marine molluscs to life in these pages.

The second book is entitled "THE PLEASURES OF SEAFOOD", a 376-page hard-backed publication by Rima and Richard Collins (New York. Holt, Rinehart and Winston. 1976. $12.95.) This well-known twosome, authors of "NEW ORLEANS COOKBOOK" and "NEW ORLEANS RESTAURANT GUIDE" presents a personally tested variety of seafood recipes.

The bulk of the dishes described in this "basic practical guide for the kitchen" concerns fish and crustaceans. But the mollusks are not neglected. In the main, the mollusks are characterized simply as "soft-shell clams", "hard shell clams", "conch", "oyster", "scallops", "squid" and "mussels". Somehow the reviewer senses a strong creole and southern flavor to most of the dishes - even though recipes for such regionally oriented favorites as "New England clam chowder" and "Manhattan clam chowder" are included.

The authors very deliberately indicate that the selections are based on personal preferences and experiences. Understandably, therefore, the major molluscan "goodies" of the U.S. Pacific Coast (such as the abalone, Pismo clam, geoduck, and the razor clam) are not mentioned. While a number of squid dishes are described, the octopus is omitted.

One interesting feature of the book is a short list of "Seafood Markets" in the various cities of the United States. For Houston, two are mentioned: The Fishery and Bill's Fresh Fish Market. Two items are missing from this book. One is a bibliography of other books dealing with the subject of seafood cooking. The second is the absence of photographs. (The small black and white illustrations seem to be almost all decorative and incidental.) .. Visual stimulation would have added greatly to the gastronomic anticipation engendered by the written text.

The third book is only indirectly concerned with conchology. Nonetheless, the publication is thoroughly enjoyable and should be useful in most libraries. This is the "NATIONAL GEOGRAPHICAL INDEX 1974-1976" published by the National Geographic Society this year (1977) (451 pages

$8.95). Of particular interest to the conchologist is the comprehensive index to the various articles on mollusks that have appeared in the National Geographic during the past 30 years. Since the National Geographic articles are almost always illustrated in impressive color, a listing of the articles on mollusks should be of interest to the shell collector. (It would seem prudent to seek out and purchase some of these back issues of the National Geographic for one's own library while such copies are readily available.)

(1). SHELLS TAKE YOU OVER WORLD HORIZONS by Rutherford Platt. 96:33-84, July, 1949. This is perhaps the most well-known article on seashells to appear in this magazine. Since its publication, this lengthy and beautifully illustrated article has had a tremendous impact on numerous shell-collectors. Preceding by many years even R. Tucker Abbott's first edition of American Seashells, the dazzling display of United States mollusks provided considerable stimulus to the hobby of shell collecting. (And certainly, the pictures and text did a supercolossal public relations job for Sanibel Island in Florida).

The U.S. shells are prominently pictured starting with the "stern and rockbound coast" of New England. The abundance of seashell treasures in Florida is definitely emphasized. (Five full pages in color portray a fine selection of the dazzling beauties). Of particular note is the great number of bivalves that are included in the photographs. There follows a page full of coquinas (Florida) one page of pectens (world-wide), and one page of thorny oysters (world-wide). In addition, the volutes, terebra and turritella shells, and cones each occupy full pages. The chitons are displayed separately. Full pages showing a collector by a tide pool (Maine), miscellaneous mollusks, and abalone (California) complete the first section of 16 pages of color photos.

The second section (also 16 pages of color photos) include the chambered nautilus, South Pacific shells, Philippine shells, "wonder shells" from New Caledonia, shells from the Molluccas (East Indies), "fantastic shells", some of the rarest shells from the U.S. National Museum, "tiny shells", highlights of the Frederick A. Constable collection at the American Museum of Natural History, colorful univalves, bivalves, Florida tree snails, Cuban tree snails, Cuban land snails, Philippine tree and land snails, and cross-sectional views of some large gastropods. Each one of these color pages has a descriptive legend at the bottom. Additionally, information regarding each of these pages is given in the text. (It might be pointed out that copies of this particular issue of the magazine are increasingly difficult to locate. One dealer has priced it at $10.00 per copy when available.)

(2). THE MAGIC LURE OF SEA SHELLS by Paul A. Zahl. 135:386-429, March, 1969. Twenty years after the appearance of the previous article, another major contribution to popular conchological literature was published. Here, the pictorial representations emphasize the living animal. For example, the cannibalistic feat of Conus striatus attacking and ingesting a small fish is photographically recorded. Many of the shells are shown in geographic groupings under such intriguing headings as "Caribbean cornucopia", "East Coast bounty", "Pacific largess", "Indo-Pacific:paradise of shells", "Australia's reef treasures", "Gifts of the Mediterranean" and Philippine gallery".

The text is non-technical but informative. This article clearly supplements the earlier publication. It is highly recommended.

(3). X-RAYS REVEAL THE INNER BEAUTY OF SHELLS by Hillary B. Moore. 107;427-434. March, 1955. In a non-technical pictorial dissertation, the author provides a sampling of the shell structures revealed by radiographic techniques. The X-ray photographs were prepared by Dr. Charles E. Lane at the University of Miami Marine Laboratory. The photographic reproductions are marvelous and the beautiful hidden designs of such shells as the nautilus, volute, cowry, marginella, bailer shell, telescope shell, Scotch bonnet and spindle shell are displayed.

(4). BLUE-WATER PLANKTON: GHOSTS OF THE GULF STREAM by William M. Hammer, Ph.D. 146:530-545. October, 1974. This fascinating article deals, in part, with some strange planktonic mollusks. One, Gleba cordata, feeds on organisms trapped in a six-foot-wide webb of secreted mucus. The Gleba draws most of the web to its proboscis "and consumes it along with the food". Another mollusk, Corolla spectabilis, spins a web which floats in the water like a lace hankerchief. Descriptions of these unusual feeding behaviors form a part of the discussion of the living food chain as seen 80 feet below the surface of the Gulf Stream off the Bahamas. Incredible photographs of living Corolla spectabilis, Gleba cordata and the pteropod Cavolinia tridentata are reproduced.

(5). SHIPWORMS, SABOTEURS OF THE SEA by F.G. Walton Smith. 110:559-566. October, 1966. The author describes research aspects of the war against these wood-boring mollusks "that topple wharves and sink ships." Some interesting information is packed into this short article. For instance, borers cannot enter wood unless the current of water passing across the wood is moving relatively slowly, less than 1½ knots.

The Dicyathifer species in Australia exceed an inch in diameter and six feet in length. Pictures show Australian aborigines harvesting these shipworms and downing them raw. (Perhaps the designation "shipworm" instills a wrong connotation. Teredos are not "worms". They are as much mollusk as the oyster.) In Thailand, it is reported, pieces of wood are planted at mouths of rivers to cultivate these bivalves.

(6). TREE SNAILS, GEMS OF THE EVERGLADES by Treat Davidson. 127:372-387. March, 1965. This is another issue of the National Geographic that most collectors probably should own. Here is a pictorial atlas of the color variations of Liguus fasciatus found in Florida. In addition, there is a personalized description of the life style of these banded creatures. Along with the several pages of photographs provided in the 1949 articles by Platt (see above) one will have a good set of photographs of the tree snails of Florida and Cuba.

(7). UNSUNG BEAUTIES OF HAWAIIAN CORAL REEFS by Paul A. Zahl, Pld.D. 116:510-525. October, 1959. Among other enticing color photographs of the reef life of the Coconut Islands lagoons off Kaneohe Bay of Oaha, Hawaii, are nudibranchs in all their glorious color. Shown are Hexabranchus, Glossodoris species, Glossodoris lineolata, Cyerce nigra, Glossodoris festiva, Pteraeolidia semperi, and Aeolidiella species. This is one group of mollusks where the camera is the best way of "preserving" the specimens.

(8). THE CHAMBERED NAUTILUS - EXQUISITE LIVING FOSSIL by Douglas Faulkner. 149:38-41. January, 1976. Some of the most stunning and unusual pictures of the living cephalopods - commonly known as the chambered nautilus - are reproduced in this article. The photographs were taken by Douglas Faulkner over a period of eight years. (Those who have been fortunate enough to get to Palau Islands will remember that some of the Faulkner photographs are shown there at the Continental Hotel.).

(to be continued)

ANNOUNCEMENT OF AUCTION DATE

Ruth Goodson and Lloyd Meister will co-chair an auction of shells and shell-related items donated by members at the April meeting, 1978.

This kind of event usually gives members the chance to purchase shells for small sums, and it affords us the opportunity to help the Houston Conchology Society maintain the library and support the Texas Conchologist. Plans include a silent auction, sale table and the regular special auction.

To make this evening a success for you and for the Club, you are urged to give specimen shells, with data as complete as possible, to either of the chairmen at one of the coming meetings. You may call either chairman for pickup of material you wish to donate. You are asked to bring home extra shells for the Club if you are shelling out of Texas before April. The Club will appreciate gifts of shells for the auction from our correspondents anywhere in the world.

The auction is for MEMBERS ONLY. This is a policy in accord with rules set by the Houston Museum of Natural Science.

With so many new members, it is hoped that long-time members will present shells from Texas for the auction. A good Murex fulvescens, some beautiful Epitonium angulatum, a Sinum with operculum ----we think these would be in demand! You think of others you have to spare.

236. Diplondonta (Diplodonta) punctata Say, 1822.
Amphidesma punctata Say. Journ. Acad. Nat. Sci., Phila., p. 308.

This species differs from the abundant Felaniella soror by its strongly prosogyrous umbos. In my opinion, there is a difficulty about the identification of the two species. I have no doubt that the most abundant of the Texas Diplodontas is identical with Adams' Diplodonta soror, which is quite differently shaped and which is minutely pitted by irregularly placed circular pits. The species commonly figured and described as D. punctata - the name also chosen here - is not pitted but somewhat radially sculptured. Under certain illuminations this might give the effect of being minutely pitted. Because these pits are often cited as a character for D. punctata there is some contradiction. If it is still in existence, Say's type specimen should be re-examined. I do not think it impossible that Say's D. punctata were identical with Adam's D. soror or perhaps another species of that group (Felaniella). In that case, the species named here D. punctata Say should be assigned one of the many synonyms in existence.

Diplodonta punctata Say, is a fairly widespread species all along the coast of the N.W. Gulf of Mexico, where it lives in water of 5-26 fms. depth. Dead specimens are uncommon in beachdrift (Galveston, Matagorda, Port Aransas). This species is usually dredged from sandy bottoms and from the Miocene shale uplifts (Stetson Bank, Clay Pile Dome). Juvenile material already possesses the peculiar surface sculpture. It is quite triangular in shape and strongly blunted on the posterior side thus resembling the Diplodentid genus Microstagon Cossmann closely.

Previous records for the Texas faunal province are: 45, Galveston?; 69, listed; 110, dead shells are rare at Port Aransas; 156, common on Stetson Bank; 206, Texas Conch., Vol. 3 (5), 1966; 253, rare, off Padre Island; 170, listed for deep shelf assemblage off East Texas 168, fig. 3.

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

Depth Range: 0-51 fms.; alive: 5-26 fms.

Geographical Range: Uncertain.

Maximum Size: 18.3 mm.

Eastern Pacific Analogue: Diplodonta subquadrata (Carpenter, 1856). "San Ignacio Lagoon, Baja California, through the Gulf and south to the Galapagos Islands on mud flats and offshore to depths of 137 m. (Keen, 1971).

Genus Felaniella Dall, 1899.
A single, abundant species, which might be placed in the subgenus Zemysia Finlay.

237. Felaniella (Zemysia?) soror C.B. Adams, 1852.
Lucina soror C.B. Adams. Contr. Conch., 7, p. 247.
I report this species as a Felaniella because its hinge characters are closest to those of this genus as defined by Chavan in the Treatise and I disagree with its assignment to Phlyctiderma by Olsson and Harbison (1953). The species is widespread in shallow coastal waters along the Louisiana and Texas coast. On rare occasions it has been dredged from the coastal bays (Christmas Bay, Aransas Bay). Dead shells are often taken from beachdrift, especially along the south Texas coastline and live beach material is known from San Luis Pass and St. Joseph Island. From its distribution, I infer that it prefers sandy bottoms. The figure in Clench and Turner (Occ. Pap. Moll., Vol. 1 (15), pl. 45, figs. 11-12) shows the Texas form very closely. Although taken from the mudlump fauna, I suspect that the scant material is recent and mixed in. It was also reported as Lucina kiawahensis Holmes from the post Pliocene of South Carolina and a single valve was reported from the Pliocene of St. Petersburg, Florida by Olsson and Harbison (1953) as Phlyctiderma soror (C.B. Adams). A specimen figured as D. soror by Usticke from St. Croix does not appear to be this species. Presently the species (D. soror) appears to be restricted largely to the Texas faunal province and the western Caribbean (Jamaica).
Previous records for the Texas faunal province are: 27, living at Jamaica, in the Antilles and on the coast of Texas (p. 1188); 45, Texas to Jamaica; 56, "North Carolina to Texas and Jamaica"; 145, (as D. punctata Say), upper sound, Mississippi delta (dead), pl. 3, figs. 2, A, B; 160, (as D. punctata), dead at several locations in Matagorda Bay; 164, (as D. punctata), alive in open bay center and open bay margin environment at Rockport, Texas; 175, (as D. punctata), listed for open sound or open lagoon assemblage, few in mixed sediments, pl. 2, fig. 10; 206, Texas Conch., Vol. 3 (5), 1966, Beach Records; 208, (as D. punctata), listed for open bay center and bay margin environments; 269, figured on p. 177.
Records H.M.N.S.: 82 lots, of which 8 contain live collected material.
Depth Range: 0-50 fms.; alive 0-32 fms. (optimal 6-28 fms.).
Geographical Range: Western Gulf of Mexico, Jamaica, North Carolina (fossil).
Maximum Size: 17.2 mm.
Eastern Pacific Analogue: ?Felaniella sericata (Reeve, 1850) Baja California to Northern Peru. Intertidally but more commonly dredged in depths to 75 m. on sand and mud bottoms (Keen, 1971).

Genus Phlyctiderma Dall, 1899.
Very globose, somewhat pustulose or lamellar bivalves, often found encased in rocks or old shells (oysters).

238. Phlyctiderma semiasperum Philippi, 1836.

Diplodonta semiaspera Philippi. Wiegman Arch., Vol. 1, p. 225, pl. 7, figs. 2 a-d.

Syn: Lucina granulosa C.B. Adams. Proc. Bost. Soc. Nat. Hist., 2, p. 9.

Lucina semireticulata Orbigny. Voy. Am. Merid., p. 585, pl. 84, figs. 7-9.

The very inflated and almost spherical shape of this species, together with the pustulosity of mature specimens is characteristic. The pustules appear to be local thickenings in the growth lines and often have a somewhat elongated shape. In some specimens, the growth lines have become strong lamellar ridges. The species is remarkable for living within rocks or old oyster shells. How it manages to grow at all, I do not understand. Specimens collected from rocks or shells are never as big as those that can, although rarely, be collected alive from local mudflats or sandbars. A population of large living specimens was once found at Port O'Connor and similar large-but-dead valves are occasionally found at San Luis Pass. I have erroneously reported these specimens as Diplodonta turgida (Tex. Conch., Vol. 7, 83, 1971), which is a deeper water species, much larger, and which belongs in the genus Timothynus. Phlyctiderma semiasperum is widespread along the Texas coast and enters the coastal bays as a borer (?) of old oyster shells.

Previous records for the Texas faunal province are: 21, listed; 40, listed; 66, listed for the marine Pleistocene of Texas; 143, listed for Matagorda Bay; 145, Mississippi delta, pl. 3, figs. 3 A-B; 160, alive in Matagorda Bay; 164, alive in Rockport area and dead in Laguna Madre.

Records H.M.N.S.: 29 lots, of which 4 contain live collected material.

Depth Range: 0-40 fms. (normal 0-5 fms.); alive 0-1 fms.

Geographical Range: North Carolina, Gulf of Mexico to Brazil.

Maximum Size: 14.1 mm.

Eastern Pacific Analogue: Also Ecuador to Peru (Abbott, 1974). Keen cites (1971) Phlyctiderma discrepans, Gulf of California to Panama (to 18 meters) as very similar.

Genus Timothynus Harris and Palmer, 1946.

Very globose, small to medium sized shells, with a wide shelf area for ligament attachment.

239. Timothynus c.f. verrilli, Dall, 1899.

Diplodonta verrilli Dall. Journ. Conch., Vol. 9, p. 45. New name for Diplodonta turgida Verrill and Smith, 1881 (not Conrad, 1848).

This, by far the largest Diplodonta of the Texas coast, is widespread in waters between 20-30 fms., although it has been found as shallow as 8 feet and as deep as 70 fathoms. The original name, under which I reported it, is Diplodonta turgida Verrill and Smith, 1881. Outwardly it resembles a thin blown up Pitar, but of course,

its hinge is that of a Diplodonta with a hook-like bifid cardinal in the left valve. It is mostly dredged from shelly sandy mud bottoms. A figure of the species is in Bull. 37 (Dall, 1889), and in Reference 170, plate 8, fig. 2 (labelled Diplodonta Sp. B.)

Previous records for the Texas faunal province are: 170, (as Diplodonta Sp. B.), pl. 8, fig. 2; 206, Texas Conch., Vol 9, p. 278, 1973;.

Records H.M.N.S.: 23 lots, of which one contains live collected material;

Depth Range: 8 feet - 70 fms.; optimal 20-30 fms.; alive 25 fms.

Geographical Range: Massachusetts to North Carolina.

Maximum Size: In excess of 32 mm. (slightly broken).

Eastern Pacific Analogue: ? Diplodonta suprema Olsson, 1961. "Panama" (Keen, 1971).

240. Timothymus Sp. Indet. A.

A much smaller species, much more round and mainly differing in the sculpture of the early shells has been sparsely collected along the Louisiana and Texas coast. In contrast to the previous species this one has some ribs on the initial shell. Otherwise, it is mainly a much smaller and much rounder version of the previous species. Comparison with the recently described T. rehderi Altena and possibly Diplodonta nucleiformis Wagner is necessary.

Previous records for the Texas faunal province are: 206, (as Diplodonta Spec. A), Texas Conch., Vol. 9, p. 78.

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

Depth Range: 15-37 fms.

Geographical Range: Unknown.

Maximum Size: 13.0 mm.

Eastern Pacific Analogue: Perhaps Diplodonta mirae (Hertlein & Strong 1947). "Gulf of California to Panama in depths of 11-64 m. (Keen, 1971)".

SUPERFAMILY CHAMACEA

FAMILY CHAMIDAE

This is the only family in this group of remarkable bivalves and it is characterized by strong torsion of the shell experienced during growth. In a sense, these bivalves are analogous to the now extinct Hippuritoidea, which developed strongly discrepant valves and bizarrly contorted shapes in the Cretaceous.

In the Chamidae, one valve, the deeply cupped one, is attached to a hard substrate and is closed off by a much flatter valve. Some species can form clumps of a large number of specimens (C. congregata). The strong rotation causes the hinge line to shift continually during

growth with the result that the chitinous ligamental material is progressively covered by new calcareous material. In Texas and Louisiana the genera Chama, Pseudochama and Arcinella.

Sources: Keen, M. in Treat. Invert. Pal., Vol. N, p. 518.

Before we discuss the separate genera and their species, it will be necessary to review some fundamental data about these remarkable bivalves. Most literature available to me is not too helpful in understanding the relationship of the genera and as is so often the case, no data are available about juvenile material, which, I believe, in this family is of paramount importance for the classification. Chamas are, as many bivalves related to the Lucinacea, difficult to classify and the extensive material available to me does often not allow a clearcut separation into species to be made. The presence of full grown specimens of certain species is proof that those species live in the N.W. Gulf of Mexico (or lived), but most material up to ½-inch and even larger is so similar in appearance, it hardly can be separated. The situation is further aggravated because from the earliest moment the attached and the unattached valve develop differently. The attached valve develops strong lamellae which buttress this valve against the substrate so that both valves when seen separately and carefully cleaned from substrate material appear quite different.

On the basis of the superficial likeness of Chama and Pseudochama (Chama is attached by the left valve, Pseudochama by the right valve) it has been suggested that the genus Pseudochama might not be a valid genus, implying that individuals in this genus merely represent bivalves in which the rotation took place in the opposite sense to the usual one of Chama. According to this view Chama would be comparable to those gastropod genera in which the torsion can produce either left handed or right handed spirals. From a study of the material available to me from the N.W. Gulf of Mexico, this theory can be proven to be untenable. The prodissoconch of Pseudochama is completely different from that of Chama and in fact appears much closer to that of Arcinella than that of Chama. In Chama, the prodissoconch is smooth and quite small (on the order of .1 mm.) and the nepionic shell immediately develops a crinkled, corrugated appearance, which, without discontinuity, develops into the mature bivalve. In Arcinella however, the prodissoconch is larger but the nepionic shell is larger and smooth with a few concentric fence-like ridges. This development is quite discontinuously stopped and the "normal" spiny and scaly development of Arcinella begins. In Pseudochama the development of a large nepionic shell also can be seen with concentric sculpture, but the strong discontinuity between mature and nepionic stage is less outspoken than in Arcinella. Thus Pseudochama is somewhere inbetween Chama and Arcinella. In mature specimens of Pseudochama, these facts can be seldom observed because mature valves corrode strongly.

Remarkable is the strong disparity between right and left valve in Chama and Pseudochama. To some extent this is due to the three dimensional torsion in the attached valve which is as it were a tubular spiral as in a gastropod shell, whereas the torsion in the

unattached valve is mainly expressed as a rotation in a single plane. Also the sculpture of both valves becomes from the earliest stages strongly discrepant. The attached valve develops strong lamellar scales which serve as attaching mechanisms and buttressing reinforcements. These are lacking in the unattached valve. In Arcinella, the discrepancy between the valves is much less than Chama or Pseudochama. The reason for this is that although Arcinella goes through an attached phase during a short period in its juvenile life it soon becomes unattached (it also starts unattached).

Genus Chama Linné, 1758.
Medium sized, strongly sculptured bivalves, attached by left valve. The N.W. Gulf of Mexico species are often difficult to identify because juvenile shells of most species appear to be very similar. In the N.W. Gulf of Mexico five (5) different species.

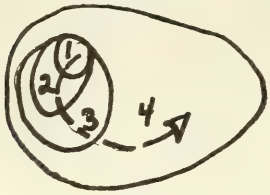
241. Chama congregata Conrad, 1833.
Chama congregata Conrad. Am. Journ. Sci., Vol. 23, p. 341.

This bivalve is one of the most common species on the Texas offshore shelf where it is found alive, attached to shells, rocks, pebbles, etc. Although seldom mentioned in faunal lists, beach worn specimens are not rare in beachdrift and have been taken along the entire Texas coast, but almost never in the bays (Matagorda Bay). Beach specimens probably derive either from deeper water in the inlets and thus may be of Pleistocene age or are derived from the jetties or other man made structures. Here they live at the deepest submerged parts. The species is rare on the coral reefs.

It is by no means certain that our material is uniform and it may include another species. Some lots contain rather round shells in contrast to the somewhat oval normal shaped ones. A different and much smaller form inhabits the coral reefs and is also different in color. The round, small form from sandy mud bottoms, I have not separated out, but the small, whitish form with a scarlet streak in it is here classified separately, although ultimately it may turn out to be only a morph of C. congregata.

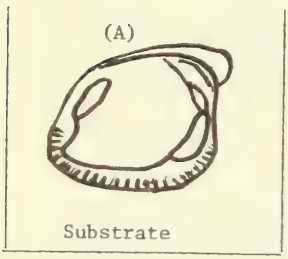
As can be expected with an attaching species, its shape is somewhat variable, but its surface foliations are quite changing from specimen to specimen. For that reason perhaps few of the figures I have seen labeled C. congregata resemble the Texas specimens closely. One of the confusing aspects of Chama, (this and probably all other species) is the rotation as seen in the flat valve. This rotation is best observed in juvenile specimens when they still are quite flat, and it appears to occur in discontinuous steps.

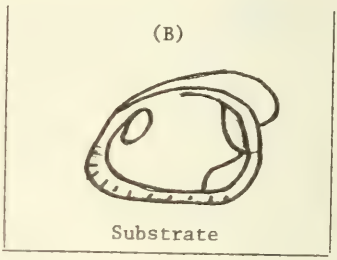
In a small sketch I have indicated this process in a small valve of Chama congregata. 1 is the small protochonch, 2 3 and 4 are various



stages of growth and the arrow indicates the direction of rotation. (Total size of figure about 4 mm.). Often one sees in the early growth stages changes in direction much larger than sketched here, occasionally even as large as 180° mainly for stage 1 (with respect to 2). In Chama congregata stage 1 is completely smooth, stage 2 and most of stage 3 are crinkled, but in stage 3 appear the first somewhat pipe-like scales. Some of our species can be differentiated by their muscular impressions. Unfortunately C. congregata is similar in this respect to 2 other species which I cannot name yet. Only C. macerophylla and C. sinuosa can be fairly easily differentiated.

In the figures A and B, a quick sketch is given of Chama congregata (A) and Chama macerophylla (B), looking into the cavity of the deep valve, to show the difference in muscular





impressions. This difference is almost the only way to distinguish 1-inch sized specimens. Chama macerophylla may be on the average somewhat more strongly foliaceous. The coloration of C. congregata in Texas is brownish-orange, either as large blobs or streaks on a grayish-white background or almost completely of that color. Internally there are reddish-purple spots of color. Spines are developed in juveniles as small strongly curved foliae, so that they resemble pipe-like tubes. In older specimens these corrode to a certain extent and the surface of the unattached valves becomes irregularly corrugated. Often in mature specimens, the middle part of the disc from umbo to ventral margin is smoother and flatter than the anterior and posterior ends. Only rarely one finds on mature, unattached valves, a few large spondyloid spines. In the H.M.N.S. collection there

is one lot of a few valves in which the color of the shell is even greenish-gray. On the Texas coast, this modification is quite rare.

Previous records for the Texas faunal province are: 136, reported from 13 stations off East Texas in depths between 33-54 feet, plate 6, fig. 5; 139, outer shelf, pl. 39, fig. 47; 147, alive on Baker Bank, dead in Big Southern Bank, alive on West Flower Garden (this may be another species all to me); 156, common on Stetson Bank; 152, alive at Port Aransas in 1955; 170, off East Texas; 174, listed; 175, listed for calcareous banks assemblage, pl. 6, fig. 25; 201, mudlump fauna; 206, Beach Records in Texas Conch., Vol. 3(1); 225, Galveston; 236, Galveston; 251, Yucatan Shelf 253, reef offshore Padre Island; 269, figured on page 171, (very typical Texas specimen).

Records H.M.N.S.: 100 lots of which 43 contain live collected material.

Depth Range: 0-55 fms.; alive: 6-43 fms., always attached to hard substrate.

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

Maximum Size: 32.6 mm.

Eastern Pacific Analogue: ?

242. Chama Spec. Indet. A.

A species basically very similar to C. congregata has been collected in a few lots off Louisiana, unfortunately not alive. It is rounder in shape, reaches a larger size, and most importantly is quite differently sculptured. It is crowded, somewhat ruffled ridges and the only small spines formed are some lamellar extensions of these ridges close to the umbo on the anterior part of the valves. In spite of a large number of unattached valves we do not possess a single attached valve indicating that this species may no longer live off the Mississippi Delta. This might be Chama lactuca Dall, but until I have seen authentic material of this species, I prefer to leave this species unnamed. As with all Chamas, juvenile specimens become practically indistinguishable from C. congregata. What remains of the color pattern is different from C. congregata, but resembles the next, much smaller species: there is in some specimens, a radial color band radiating downward from the umbo to the ventral margin. The ventral crunulations in this species are much shorter than in Chama congregata and consequently appear somewhat "knobby".

Previous records from the Texas faunal province are: None.

Records H.M.N.S.: 6 lots, none alive.

Depth Range: 51-85 fms.

Geographical Range: Unknown.

Maximum Size: 40.5 mm. (unattached valve) so that the species probably reaches larger sizes.

Eastern Pacific Analogue: Undoubtedly close to Chama corallina Olsson, 1971 Gulf of Panama (Keen, 1971).

243. Chama c.f. floridana Lamarch, 1819.

A number of lots of a small white, rather thick shelled Chama are here provisionally named as Chama floridana Lamarck. They live exclusively in carbonate environment. Usually round in circumference, many valves are quite irregular in outline, and most miss the somewhat diamond shaped outline of Chama congregata. Very young material is indistinguishable from that species. Chama floridana often has a vivid scarlet color streak, and probably never is blotched by orange. The interior is often blotched by scarlet. C. congregata lives on the Texas reefs (rare) and because its juveniles are often also reddish colored, there is considerable occasion for confusion. On the whole C. floridana is coarser, its foliae are more irregular and species might well turn out to be a morph of C. congregata, to which it was assigned in a previous listing (Texas Conch., Vol. 9, p. 79, 1973).

Previous records for Texas are: None.

Records H.M.N.S.: 9 lots, of which 3 contain live collected material.

Depth Range: 9-55 fms.; alive: 10-28 fms., calcareous environment.

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

Maximum Size: 13.0 mm.

Eastern Pacific Analogue: ?

244. Chama sinuosa Broderip, 1835.

Never in large numbers and rare throughout the calcareous environment along the Texas and Louisiana coast. The color pattern of the species is different. Internally the N.W. Gulf of Mexico species have a dark brownish margin, while in the middle of the valve there are spots and suffusions of yellow. There are often no ventral crenulations, although occasionally minor to faint crenulations can be seen, in contrast to all other species of Chama. This species comes closest to being the mirror image of Pseudochama.

Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 79.

Records H.M.N.S.: 6 lots of which 3 contain live collected material.

Depth Range: 8-15 fms., alive 10-11 fms., in coral environment.

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

Maximum Size: 48-0 mm.

Eastern Pacific Analogue: ?

(to be continued)

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CIRCULATION

Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL STAFF

Helmer Ode, Editor
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 N. MacGregor Way
Houston, Texas 77004

Constance E. Boone
668-8252
3706 Rice Blvd.
Houston, Texas 77005

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double spaced and should be submitted to the editorial staff.

At San Felipe, Baja California, on the Gulf of California, last December, collection was made of the pictured hermit crab occupying an adult Muricanthus radix (Gmelin, 1791) (or M. nigritus Philippi, 1845, the name given the northernmost form of this Panamic black Murex). The unusual part of this hermit crab story is the attachment of five juvenile M. radix hitching rides. Removed from the water and retained for photography, the crab and all five Murex specimens remained firmly "at home" for two days. Whether the hitchhikers derived some benefit from the association is not known.

The March, 1978, issue of Hawaiian Shell News also pictures a hermit crab, with the title "Hermit Crabs Are Not Welcome!". Hawaii does not permit the importation of pet land-dwelling hermit crabs from the Caribbean; the state fears such introductions would upset the balance of nature. Other immigrants have become serious pests, like the giant African snail. Hawaiian hermit crabs are all marine, the article notes. HSN also reported that two experts from California are working on a monograph on hermit crabs.

Photo and story by Constance E. Boone

MOLLUSCANA by W.W. Sutow, M.D.

(continued from previous issue)

Comments on various publications will be continued from the previous issue of TEXAS CONCHOLOGIST starting with reviews of additional articles that have appeared in the NATIONAL GEOGRAPHIC magazine.

(9). Squids - Jet Powered Torpedoes of the Deep by Gilbert L. Voss. Photographs by Robert F. Sisson. 131:386-411 (March) 1967. In this article, Voss (from Miami's Institute of Marine Science) presents some fascinating information on the squid, called "the virtuoso of the invertebrates". Although these mollusks teem in the oceans, they apparently do not survive well in captivity.

These creatures vary tremendously in size. One caught in 1958 measured 47 feet long. The author thinks that the largest squids can weigh about 2 tons and reach an overall length of 60 feet. The eyes of some squids can be a foot in diameter.

The life span of the squids may extend to several years but their existence is obviously precarious. Squids constitute a popular food source not only of the larger creatures of the seas by also of man. At the time of writing, Voss estimated that the United States harvested about 10,000 tons annually. Japan, on the other hand, took in 650,000 tons of one species alone (Todarodes pacifica).

Interesting descriptions about the squids are presented concerning such aspects as reproduction, growth, eye, camouflage and jet propulsion. And as usual, the article is superbly illustrated by numerous color photographs plus a two-page panoramic drawing of the squids in the ocean environment.

(10). Shy Monster, the Octopus by Gilbert L. Voss. Photographs by Robert F. Sisson. 140:776-799 (December) 1971. One of the authorities in the field has prepared another informative dissertation on the cephalopods - this time concentrating on the octopus. Dr. Voss provides a personalized description of the fascinating behavior of this animal. An exceptional series of photographs graphically supplement the narrative.

(11). Nature's Night Lights: Probing the Secrets of Bioluminescence by Paul A. Zahl. 140:45-69 (July) 1971. Although this particular article is concerned with the general subject of bioluminescence, a large portion discusses one species of small squids, Watasenia scintillans. These finger-length cephalopods swirl up by the billions near the surface of the sea in Japan during spawning season and provide one of nature's awesome fireworks. (This is the species pictured on a Japanese stamp, Scott #883.) Some remarkable color photographs emphasize the brilliance and the mystery of the phenomenon.

(12). The Sailing Oystermen of Chesapeake Bay by Luis Marden. 132:367-369 (December) 1967. This is an illustrated story of the skipjacks - the intrepid men who work under sail to dredge molluscan goodies - the oysters - from the Chesapeake Bay. As such, the text is primarily concerned with the industry and the men and ships that are part of it.

(13). Twenty Fathoms Down for Mother-of-Pearl by Winston Williams. Photographs by Bates Littlehales. 121:512-529 (April) 1962. This narrative was published more than 15 years ago. The time when the events actually occurred is unknown. The place was the Tuamotsus of the French Polynesia in the South Pacific. The central subject is the "pearl-shell" - the shell of the bivalve and not the mollusk itself or the pearl it may produce. In fact, it is stated that gem pearls are found only rarely. The species are not identified although the shells are shown in the photographs.

The large oyster shells from French Polynesia have "black lips". Similar shells from the Indian Ocean have "yellow edges". The Australian counterparts are "pure white". The black-edged shells at the time of the writing was selling for about $1.20 per pound in New York. The price had been as high as $1.70 per pound. With the expansion of the synthetics industry, the demand for the natural "mother-of-pearl" has become uncertain.

The story is interesting. The photographs, both underwater and above, provide the atmosphere for an informative and enjoyable article.

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THE MUSSEL COOKBOOK by Sarah Hurlburt. Cambridge, Mass., Harvard University Press. 1977. 169 pages. $8.95.

In the short foreword, Dr. Frederick J. Stare, Professor of Nutrition, Harvard University School of Public Health, summarizes the nutritional qualities of the mussels as being: low in fat, particularly saturated fat; an excellent source of high-quality protein; and, good sources of minerals. The author underscores this by writing: "No shellfish is substantially more nutritious than mussels and no other shellfish gives such a high yield of meat".

The recipes are divided into 8 sections: simple dishes to enjoy indoors and out; appetizers, many doubling as main dishes; soups and stews, both light and main dish; salad or as a meal; down-home, everyday main dishes; casseroles American style; main dishes with a foreign accent; and, elegant party entrees. Each section contains 8 to 22 different recipes all utilizing, as the main ingredient, the mussel.

The author does a masterful and convincing job of selling the mussel to the reader. The directions are clear, concise, meaningful. The feeling of authenticity is imparted by short hints and comments that indicate that the author speaks from experience.

The first 34 pages discuss the mollusks, chiefly the "edible blue mussel" or Mytilus edulis. Two other mussels, namely, the California mussel (Mytilus californianus) and the horse mussel (Modiolus modiolus) are mentioned. Descriptions of the history of mussels in North America and of the farming or culture of mussels for eating purposes are most informative and interesting.

The only criticism that the reviewer has concerning the book is the inadequacy of the discussions of shellfish poisoning or Gonyaulax intoxication. The toxin from the dinoglagellate may be lethal. For situations

where many deaths have been recorded over the years, much more detailed information should have been given to the reader - the potential consumer of mussel cookery.

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SYSTEMATICS OF MOLLUSCA IN JAPAN. BIVALVIA AND SCAPHOPODA by Tadashige Habe. Zukan-no-Hokuryukan, Japan. 1977. 372 pages. 4800 Yen.

This is a hardback publication. The text is Japanese but the scientific names are printed in Latin. The volume represents a long-time effort by the author to provide a multi-volume "Systematics of Mollusca in Japan". Between 1951 and 1953 Dr. Habe published a monograph incorporating his many publications from 1949-1950. This work was entitled "Genera of Japanese Shells". The current volume includes material from the monograph in much more comprehensive treatise. The new publication also contains the information that appeared (in English) in the Fauna Japonica series from the Biogeographical Society of Japan. The latter book was entitled "SCAPHOPODA (MOLLUSCA)" and was published in 1964.

The major problems with this book for the usual collector (apart from the language) are: first, the absence of color photographs, and second, the relative lack of discussions at the species level. At the generic and subgeneric levels, there are both written and pictured (line drawings) information but only selected species have been shown. The text mentions only the geographic distribution and the habitats of some of the species. Although all books specializing in bivalves are welcome, this scholarly volume appears too basic for most practical purposes.

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THE FREE FOOD SEAFOOD BOOK by Peggy Ann Hardigree. Harrisburg, Pa. Stachpole Books. 1977. 228 pages. $6.95.

Here is a find!

Every so often those who review books will come across a publication that is uniquely attractive and satisfying. The above soft-cover book impressed this reviewer just that way. The style is very reminiscent of Euell Gibbons.

It is obvious that the book was not written for the shell collector. There are passages such as "lay each whelk on a firm surface and break the shell by striking it sharply with a hammer" and "use the sharp blow of a hammer to shatter the shell (moonsnail)" which clearly indicate that the intent of the maneuvers was not exactly preservation of the shell. The book was written to describe "how to find, gather and cook ....clams....and....other delicacies from the sea". The book does these things well.

Yet a considerable portion of the book should be very informative for the conchologist. In describing the American seacoast where molluscan goodies can be gathered, the author very capably provides a panoramic view of the distributions of edible mollusks. And a lot of edible mollusks are included: native oyster, Pacific oyster, Olympia oyster, mangrove clam, quahog, surf clam, butter clam, scallops, pen shells, cockles, wedge shells, geoduck, horse clam, razor and jackknife clams,

bent-nose clam, white sand clam, and purple clam. In another section entitled "Exotic food from the edge of the sea" 11 of the 12 chapters (52 pages) discuss mollusks: abalone, whelks, periwinkles, dog whelks, moon shells, turban shells, conch, limpets, chitons, octopus and squid.

The pages contain a surprising amount of scientific information. Although the common names are used as chapter headings, the species are also identified by scientific nomenclature. Both the animal and shell are concisely but accurately described. Even more important, the living habits of the mollusks are mentioned.

And for those who seek the mollusks to eat - there are paragraphs of specific instructions on how best to capture them. Yes, the recipes are there too - as part of the text - spiced with personal experience. The author does a good job of whetting the appetites of the reader. The book is recommended. (The reviewer is going to take his copy along with his gear the next time he spends a few days at the seashore.)

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AMU PLANS SUMMER MEETING AT NORTH CAROLINA

A workshop on "The Hows, Whys and Wherefores of Building a Scientifically Valuable Shell Collection" will highlight the 44th Annual Meeting of the American Malacological Union July 16-21, 1978, on the campus of the University of North Carolina at Wilmington, N.C. Specialists will tell of various techniques used in curating marine, freshwater and land mollusks collections, and examples of museum labels, cards, catalogs, etc., will be displayed.

Scientific paper sessions will be held throughout the week. Representatives of all member shell clubs are invited to tell about their organization's activities and show slides at Shell Club Night. The Houston Conchology Society is affiliated with AMU, and we have a number of members of AMU.

Field trips will be available to those members and visitors attending and paying the registration fee. They will include a choice of one of several trips, including a Naiad collecting trip to Lake Waccamaw, a canoe trip to the Green Swamp area of Waccamaw River, a boat trip to an island containing an undisturbed deposit of Eocene fossils and a marine trip. Housing will be on the campus at $15.00 per day per person in air-conditioned dormitories and including food at the university cafeteria. Registration will probably be $12.50 before the mid-June deadline and $15.00 thereafter. If you need details, please call Constance E. Boone, 668-8252.

The winter months this year proved to be especially good for collecting, according to several reports along the coast. I am grateful to members and friends who take the time to call or write and help continue current news on collecting in Texas.

In late February, Mildred Tate called and told about the great finds being made at Surfside between the fishing pier and jetties. Every Texas shell collector is weaned on the search for Amaea mitchelli (Dall, 1896), named for an early Texas conchologist. This large brown-banded wentletrap lives offshore but washes in occasionally and is always prized even when broken. Mildred reported that "about eighteen" had been found, large two-inch specimens in good shape for the most part. She surmised that these shells and the other species being collected were being disturbed offshore by either dredging at the end of the channel at the jetties or some other adverse condition offshore. Collectors were finding nice pairs, some live, of the rarish Agriopoma texasiana (Dall, 1892), and there have been live Phalium granulatum, Architectonica nobilis, and Pholas campechiensis.

A live Phalium was collected by a member's sister on the ast HCS field trip to San Luis Pass, Galveston Island.

From Linda Serrill, our member at Matagorda, comes a note that she, too, collected a live Architectonica nobilis on her beach this winter, as well as many other shells.

Betty Allen, member from Port Isabel, Texas, reported that hundreds of Architectonica nobilis were collected this winter on the South Padre Island beaches, most moribund but intact. This brought forth a discussion with her that through the years of collecting on her home beaches, she recalls that most of the Architectonicas that washed in were moribund. The animals might be still active but not really lively. They are apparently torn out of habitat and tossed inshore from offshore sand bars. Architectonicas are dredged by shrimpers, and on the east coast they are brought in with scallops. The only ones I have collected that seemed to be in their natural habitat and very lively were the two I captured from receding intertidal waves at Venado Island, Panama Bay, Pacific coast area. It is the same species but always seems to be smaller in the Panamic region. They were in sand near the rocky areas of the island and were "swimming" out with the waves.

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Members might like to know about the formation of another area shell club. Collectors in Brazoria County have formed "Sea Shell Searchers", meeting at the sponsoring institution, the Brazosport Museum. A publication, "The Searcher", is being distributed to members. Delores English, president for 1978, reports that the club has over fifty members, over one-half are beginning collectors. The newsletters I have received reflect the enthusiasm of field collectors, and I am sure that there will be many field trips since they are so close to beaches. If you are interested in information, contact Delores English, 311 N. Yaupon, Richwood-Clute, Texas 77531.

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On March 14, 1978, Ruby McConnell, our member now from Austin, and I

made one last trip driving the beaches of Galveston Island before the regulation forbidding vehicle traffic went into effect. At the present time, the new law from Galveston states there will be no traffic on the beaches from March 15 to September 15 each year. I have not been able to determine the fine points of this law. For instance, new posts are sunk in at the beach line at the beach area at the "winding road" entrance from off the sea wall some distance south toward Stewart's Beach from north jetties. I do not know if there will be a way to drive to the jetties or if the area on the channel will be closed to cars. I suppose so. I understand the law means no traffic all the way to the Pass. The bridge authority retains control of 60 feet on either side. I presume that the beach front side will be closed to traffic. "Rooster" Collins has informed me that he has a "100 year lease" on all the bay side to the Pass itself. He has the bait camp, camping space, and pier at the bay side of the Pass, you recall. He says that he had never fenced off the area from the lagoon to the Pass. This area is subject to change, we know. However, he has now erected signs of "No Trespassing" at the knoll or dune area where we have been parking to enter the bay flats. He says he wishes to protect nesting gulls and encourage gulls to return to nest here, and he also is thinking of the new summer restrictions on the beach front and does not want campers on the bay side since he is actually in business to supply camping space. He has been generous to shellers, as you know. We usually go to the area when very few other visitors are there. However, he is anxious to protect his pier area. He remarked that some shellers have walked right around the pier while there were "paid customers" there. I have to admit this has been true. Once last winter, I was merrily collecting Busycons and Mercenarias in the mud near the pier when a customer pointed out that the people on the pier had paid to be there. I did move on away from there.

Club members have reported that February tides were extremely low at the Pass and collections of the edible Mercenarias (the Baldwins, Keelers and Biascas had a big pot of clam chowder), Busycons and other usual shells were very, very good. Margaret says the Pass was reported to be as low as ever known.

Ruby and I did very well on our "last hurrah" collecting day. At the Galveston jetties we encountered masses of worm tubes and debris washing in and spent a couple of hours patiently digging through it and dodging the waves as they rolled in with more "goop". We collected the usual Epitonium angulatum but were more delighted with some unusual finds.

There were many large, live Cantharus cancellarius and a few Trachycardium muricatum. However, I was most pleased to collect a nice, shining fresh pair of Lioberus castaneus which I usually find farther south along the coast. Perhaps the best find were the good pairs of Diplodonta (Phlyctiderma) soror C. B. Adams, 1852, including my one live, big specimen. I remind you that Dr. Helmer Odé discussed Diplodontas in the September and December, 1977, issues of Texas Conchologist. Dr. Odé disagrees with the Abbott (1974) designation of soror as Phlyctiderma and places soror in Felaniella because he feels the hinge line places it in this genus. There has been some confusion on this species. Consequently, I was delighted to get a fresh, live pair, in measurements of height 19 mm, length 19 mm, and breadth 10 mm. My specimen is grayish with a silky periostracum. The minute pitting which has posed a problem in identification with this and Diplodonta punctata is present, especially at one umbonal area. Dr. Odé suggests it is not impossible to think the two may be the same. The pitting may very well be part

of the periostracum. Where the periostracum has been smoothed away, the shell seems smoother with less pits.

Ruby collected a very fresh, hinged pair of Mytilus edulis Linne, 1758. This species is the edible blue mussel from New England and has been known from other coasts where it has been either introduced or established otherwise. If shouldn't be here. It likes cold water, but we have had that this year!

(Now confirmed by Dr. T. E. Pulley.)

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We are now receiving Malacologia again for our library. Our issues begin with Volume 16, No. 1 and No. 2 of 1977.

Vol. 16, No. 2 contains a comprehensive report by K. Elaine Hoaglund Davis of the Department of Biology, Lehigh University, and Research Associate, The Academy of Natural Sciences of Philadelphia, on Crepidula.

Titled "Systematic Review of Fossil and Recent Crepidula and Discussion of Evolution of the CALYPRAEIDAE", this study of the "boat shells" and "slipper shells" presents a review and revision of the systematics of the genus in the Northern Atlantic and Eastern Pacific, with special attention to the fossil forms, as quoted in the introduction. Therefore, species in the Texas area and in our general region are discussed.

Since samples of brown streaked Crepidula plana have been consistently noted by this columnist, and since such specimens had been sent to the author, the article does relate that some specimens from Texas have the brown pigment.

After reading the paper, confusion arose in my mind about the Crepidulas we find on Argopecten irradians amplicostatus in Texas. Samples were sent to Dr. Hoaglund. Correspondence indicates that further study needs to be made. They may not be C. convexa.

FILLERS NEEDED

One of the greatest needs we have for the Texas Conchologist is small articles that can be used as fillers. We hate to waste space on pages where longer articles end. Shellers always have stories to tell about the "ones that got away", and you certainly encounter "shelly" stories on your vacations. Share them with us, please.

MEET ME UNDER THE MICROSCOPE

BY TINA PETWAY

We in our club have a really super group of people with many varied interests besides shells. Here are a few more friends for you to get to know better.

Our out-of-town friends will be receiving by mail a questionaire which will enable me to include you in this column. Please fill them out and return them to: Tina Petway, 2431 Brookmere, Houston, Texas 77008, USA.

Two of the first members of the Houston Conchology Society were Admiral Carlos Cardeza and his wife Mary Elizabeth. And Admiral Cardeza was a member of the first Board of Directors.

During World War II Carlos was stationed at Ulithi Lagoon with the Navy. He says during those days the only beer available was very bad. So while his buddies were relaxing with their beer, he was walking the beaches and reefs looking for shells. He soon became very unpopular with the others because, not knowing how to clean the shells, he would leave them on the deck of his ship.

Mary Lou was also in the Navy at that time and was stationed in Harrisburg, Penn. At the end of the war she got a new Commanding Officer who turned out to be Carlos.

Mary Lou is now a Management Consultant and author. She has a book coming out this Spring titled How To Be A Financially Secure Woman, published by Rawson, Inc.

After retiring from the Navy they moved to Houston in 1951. But Admiral Cardeza had become such a shelling enthusiast that in 1964 they built a second home on Sanibel Island, Forida. (Author's note: Sanibel Island is well known as one of the best shelling spots in this country.) Here you will find the Cardezas five months of the year. They enjoy showing others how to find and clean shells there.

Carlos and Mary Lou also enjoy boating in Florida. Another hobby of theirs is searching shops for antiques.

Mr. and Mrs. Jerry Johnson are very new members of HCS, joining in October of last year. Jerry has been interested in shells since 1972 when he was stationed on Guam in the Pacific. Walking on the reefs there he found many beautiful shells and he was hooked.

The Air Force also sent Jerry to Udorn, Thailand where he met and married his lovely wife, Trayong. They have a daughter, Jennifer, who is five years old. The Johnsons now live in Channelview, Texas.

Jerry's favorite shell family is Murex; Cones are his second favorite. But he also likes the "Thorny Oysters" (Spondylus americanus). Jerry would be interested in trading shells with others with those same interests.

Jerry is an electrician with Exxon Research and Engineering. He also enjoys "Birding" as a hobby. And hunting, especially for deer, also takes some of Jerry's and Trayong's free time.

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As it happens with so many of our club members, Fanny and Sam Miron first became interested in shells while walking our beaches and picking up the shells they found. Fanny found a live Oliva sayana on the beach near Lake Jackson, Texas. She went to the library to find out what it was and began reading all she could find on sea shells. Then Sam and Fanny saw our club's display at a local department store and met some members of HCS. They promptly joined the club. That was 9 years ago.

Fanny's favorites are Murex, while Sam favors Pectins and Olives. But they like everything else really. They also seem to have fantastic luck beach collecting too. Five years ago Houston had three snows in one winter. After one of these they went to the beaches at Galveston. Fanny calls it the "bonanza" because they found hundreds of Busycon, many very large Oliva sayana, two or three species of Epitonium in large numbers, plus many others. They have also collected the beautiful lemon yellow Neosimnia uniplicata live. Sam and Fanny would like to trade shells, so if interested contact them.

They have two children and two young grandchildren. Sam was a geologist with Shell Oil Company before retiring. Fanny taught nursery school before becoming a fulltime housewife. They are both native Houstonians.

Fanny also enjoys bowling, walking, stitchery and needlepoint. She collects recipes and loves to cook. Sam collects stamps and loves sifting through bushels of shell dredgings. He also raises Cactus and succulent plants as a hobby.

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About two years ago Vesta and Al Mohle became aware of the world of shells. Vesta says she had quit working and was awaiting the birth of their daughter, Angela. She began going to the Public Library and getting books about shells just to have something to do. Then, in the local paper, she saw an announcement of an up-coming seashell exhibit at the Houston Museum of Natural Science. So she and Al came to see the shells and stayed to talk to some of the members of the club who were helping out there, and shortly became members themselves.

See page 64

DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN

THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph) By H. Odé

(In order to understand and fully use the material presented in this Continuing Monograph, new members and others who do not have the reference issue should purchase the September, 1974, (Volume XI. No. 1) issue of Texas Conchologist in which Dr. Odé numbers and lists the 272 references he uses in his monograph on Northwest Gulf mollusks. Since that issue, no numbered references have been added, although Dr. Odé may list by complete reference others he may use. You may purchase the September, 1974, issue from the Circulation Chairmen, Mr. and Mrs. Sam Miron. 5238 Sanford Street, Houston, Texas. 77035, (telephone 723-3628) for $1.50.)

FAMILY CHAMIDAE (continued)

245. Chama macerophylla Gmelin 1791.
Syst. Nat., p. 3304.
This, the largest of the N.W. Gulf of Mexico species of Chama, is seldom collected in large specimens. These are probably mostly fossil and have lost their foliage. Most specimens are small and resemble Chama congregata closely, but differ in the muscular impressions from that species. However, I am not convinced that some of these lots are correctly identified,

continued page 65

Al has become another "cone nut", while Vesta's interest has turned to land snails. Vesta would like to talk to others also interested in land snails. They would both like to talk about trading shells with others of our club.

Al and Vesta have a carpet cleaning business by the name of Host Carpet Cleaning of Houston. Vesta taught Home Economics at the Junior High level for several years. She was born in Louisiana and lived there till she was 14, when her family moved to Houston. Al has lived here nearly all his life. They love driving and exploring in their 4-wheel vehicle. They also like fresh water fishing and deer hunting. Vesta raises African Violets and shows them at exhibits much like our shell shows.

and the separation of both species at an early stage remains difficult.

The species has been reported from the banks. In the H.M.N.S. collection is no live material from these locations. Only one of two doubtfully identified live collected rather juvenile specimens comes from Stetson Bank, the other from a shelly bottom. The strongly frondose specimens usually figured in conchological texts I have never seen for the N.W. Gulf of Mexico and the figured specimen, Ref. 269, probably does not derive from the Texas coast. Some larger, but completely worn Chamas collected on beaches of Padre Island probably are fossils of this species.

Previous records for the Texas faunal provice are: 144, reported offshore at location 1801; 147, dead on Baker Bank, Big Southern Bank and west Flower Garden; 156, Stetson Bank; 175, listed for calcareous banks assemblage, common mostly on deeper banks; 192, Alacran Reef, Yucatan, plate 6, figs, 5 A, B; 269, figured on p. 171.

Records H.M.N.S.: 10 lots, of which 2 contain live collected material.

Depth Range: 15-55 fms., alive: 25 fms., beachdrift (?).

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

Maximum Size: In excess of 84 mm. (broken) (Stetson Bank).

Eastern Pacific Analogue: ? Chama frondosa Broderip, 1835. "La Paz. intertidally on rocks and offshore to depths of a few meters" (Keen, 1971).

Genus Pseudochama Odhner, 1917.
Immediately separated from Chama by the fact that the animal is attached by the right valve. In the N.W. Gulf of Mexico, there are at least two species.

246. Pseudochama radians, Lamarck, 1819.

Chama radians Lamarck. Anim. S. Vert., 6(1), p. 96.

Along the beach, this species has only been collected in worn specimens near the jetty of South Padre Island from where specimens have been taken by divers. The dead specimens are beach worn and have lost their surface sculpture. Also collected live by diving at Port Aransas (Ref. 159). Locally offshore the species can be quite common, for instance on Stetson Bank where it lives in profusion. Most common on shale outcrops rather than calcareous reefs. There appear two forms of the species, one with strong foliaceous surface sculpture and one which is rather smooth. Both appear to merge. In the previous list of N.W. Gulf of Mexico material, I reported the strong foliaceous material as Pseudochama Sp. A., but I now believe that it is merely a form of P. radians. There is however, a quite different species among our material discovered since the listing in the Texas Conchologist. Juvenile material of the "spiny" form is quite red and almost resembles a miniature Spondylus. The smooth form is probably a consequence of strong erosion of the valves. Remarkable about Pseudochama is the fact that in many specimens, the deeply cupped valve has evolved a peculiar

mechanism for attachment. Under the umbo, some lamellae have developed into initially hollow tubes which progressively get filled with shell material. These lamellae penetrate the substrate so that the shells get anchored quite firmly on a set of "pilings". The phenomenon is especially observable in specimens from Stetson Bank where the substrate is dark-blue deep water, Miocene clay, pushed up by salt movement.

Previous records for the Texas faunal province are: 159, alive at Port Aransas; 206, Beach Records in Texas Conch., 253, on reef off Padre Island, uncommon; 269, figured on page 172.

Records H.M.N.S.: 14 lots, of which 9 contain live collected material.

Depth Range: 0-23 fms.

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

Maximum Size: 73 mm.

Eastern Pacific Analogue: Possibly Pseudochama corrugata Broderip, 1835. "La Paz, Baja California" (Keen, 1971).

247. Pseudochama Sp. A.

A single, quite different species was obtained from Hospital Rock off Port Aransas. The single, deeply cupped valve, does not appear to have ever been attached to a solid substrate. It does not fit the description given by Abbott of P. inezae Bayer, and more material is needed before it can be identified. The valve is strongly foliaceous, red colored, ventrally crenulated, with a nepionic shell quite different from P. radians, in that it is roughly punctate. However, part of the nepionic shell is covered by later shell material and is "tucked under".

Previous records for the Texas faunal province are: None.

Depth Range: Top of Hospital Rock off Port Aransas (±200 feet).

Geographical Range: Unknown.

Maximum Size: 42 mm.

Eastern Pacific Analogue:

Genus Arcinella Schumacher, 1817.

Both valves equally inflated and rotated. Attached only during a short period, but adult free-living. Strongly spinose. Echinochama Fischer, 1887 is a synonym. Large prodissoconch. The two socalled Western Atlantic and the rare Eastern Pacific species are probably not more than subspecifically different.

248. Arcinella cornuta Conrad, 1866.

Arcinella cornuta (Conrad, 1866). Amer. J. Conch. 2(2), p. 105.

The identification of the Texas material is not without some uncertaintity. It is apparently widely accepted that there are two species in the Western Atlantic which differ in various respects such as the amount of inflation, thickness of the shell, size of mature specimens and number of radial rows of spines. In the second edition of American Seashells, Abbott (1974), mentions that A. cornuta has 7-9 rows of radial rows and A. arcinella has 16-35 usually 20 rows. Most Texas specimens have 13

rows of spines and a single specimen has 16, and a few 10-12. A. arcinella is reported to be slightly larger (up to 2 inches), thinner, less inflated, and more spinose. Whether it is the deep water morph of A. cornuta, we shall leave for experts to decide. Beach collected shells on South Padre Island of Arcinella often must be classified as A. cornuta, (very heavy, fewer radials, but in excess of 2 inches) whereas live collected, dredged specimens are lighter, more densely spinose and are somewhat intermediate in character. Beach shells are uncommon at Galveston, but increase in frequency towards the south. Offshore it is an abundant species, although live material is not common. Parker (Ref. 175) lists it for the calcareous environment but widespread over sandy and shelly bottoms in rather shallow offshore waters (0-40 fms.). Giant specimens, probably Pleistocene fossils can be taken from the beaches off South Padre Island, where also, a few rare live specimens have been taken. The length of the spines is quite variable and tend to be longer in deeper water specimens; often the valves show an internal red color. In this genus the nepionic shell is large and offset from the post nepionic shell (see Treat. Invert. Paleont., part N, Vol. 1, p. 101). These nepionic shells are quite common dredgings (always reddish in color) and are quite different from adult Arcinella; however, they are easily observed on mature specimens. With Chama congregata, this species is among the most common bivalves of the N.W. Gulf of Mexico. In spite of the large spines, the species is not exempt from attack by Natica or Thais. Neatly drilled specimens with a hole right in the middle of the spines have been dredged. The spines themselves, are formed from scales which become rolled up like a cigar. They show clearly, a groove and are hollow when broken.

Previous records for the Texas faunal province are: (Most references are to Chama arcinella or Echinochama arcinella Linné). 1, Galveston; 7, listed; 19, beach valves; 21, listed, 45, Matagorda, Texas; 67, Point Isabel; 69, listed in Appendix 8; 98, listed for Padre Island; 110, beach worn shells, rare at Galveston, fresh shells occasionally on Mustang and Padre Island, living off Freeport, Port Aransas and Port Isabel, Pl. 9, figs. 11-12; 123, live shells are not uncommon on the shell banks in the area (11-16 fms.) east and southeast of Freeport, Texas; 132, off East Texas (dead in 7 to 9 fms.); 144, reported offshore; 145, dead on deep shelf; 156, Stetson Bank; 170, off East Texas; 174, listed; 175, listed under calcareous bank assemblage, pl. 6, fig. 24; 201, Mudlump fauna, Mississippi delta; 206, Beach Records in Texas Conch., Vol. 3(1); 225, Galveston; 236, Galveston; 253, rare on reef off Padre Island; 269, figured on page 172.

Records H.M.N.S.: 89 lots of which 16 contain live collected material.

Depth Range: 0-40 fms.; alive 0-28 fms., mostly on shelly, sandy bottoms. Rare on outcrops or calcareous reefs.

Geographical Range: North Carolina, West Indies to Brazil , Pacific?

Maximum Size: 52 mm.

Eastern Pacific Analogue: Arcinella arcinella californica (Dall, 1903) "Gulf of California to Panama" (Abbott, 1974).

SUPERFAMILY ARCACEA

FAMILY ARCIDAE

It is customary to divide this large family of taxodont bivalves into a number of subfamilies which are all represented in the N.W. Gulf of Mexico. Arcinae with genera Area, Barbatia and Acar; Anadarinae with genus Lunarca, Anadara, Bathyarca and Bentharca; Striarcinae with genus Arcopis.

Noetia is here, because of its completely different juvenile form ("Sheldonella" stage) placed in a different family, but this is here considered a point of minor importance. Much more important is a clear and reasonable insight into the relationships between the various categories, and this is exceedingly difficult to get from a study of Texas material only. Especially the genus Anadara is beset with problems and available literature (Treat. Invert. Paleont., Abbott, Keen, Rost, McLean and others) is so contradictory and unclear that I must largely rely on my own observations.

Of all the areas along the Texas-Louisiana coast, only three species have ventured into the coastal bays but none goes as far in brackish water as some Tellinids do.

Genus Arca, Linné, 1758.
Easily recognized by the long straight hinge line with numerous teeth. The animals are attached byssus which protrudes through a notch in the ventral margin. In our area two species.

249. Arca zebra (Swainson, 1833).
Navicula zebra, Swainson, Zool. Ill, No. 26, p. 118 (exparte)
Syn. A. occidentalis, Philippi, 1847, Abb. u. Beschreib III, p. 29, pl. 4, figs. 4 A-C.
Widespread, but never in large numbers as A. imbricata and preferring deeper water, where it is restricted to shelly bottoms, miocene shale uplifts and calcareous environment. Sometimes beach specimens are found close to the jetty at South Padre Island, where once two juvenile live specimens were taken (see ref. 206, vol. 3 (3)). Some juvenile material in the H.M.N.S. collection is very narrow and slender with a large posterior wing, and almost appears another species (Arca Sp. A., ref. 206, vol. 9, p 77, No.701), but is nothing more than a somewhat aberrant form.
Previous records for the Texas faunal province are: 61, Rockport area (note: possibly A. imbricata); 62, listed for Mustang and Padre Island (possibly erroneous identification), 67, Port Isabel; 69, listed in appendix 8; 110, taken on Coral banks 100 miles off Galveston, and beach shells occasionally at Port Isabel; 145, listed, 147, alive on Baker Bank, dead on Big Southern Bank; 156, Stetson Bank; 170, listed for transitional shelf assemblage, pl. 5, fig. 3; 192, Alacran Reef (Mexico) pl. 6, figs. 8, A, B; 206, Beach Records, Texas Conch., Vol. 3, (3), 19; 251 Yucatan shelf; 253, reef off Padre Island, uncommon, also outside of Octopus vulgaris den;

figured on page, 150.

Records H.M.N.S.: 25 lots of which 14 contain live collected material.

Depth Range: 0-55 fms.; alive 6-55 fms. Probably living at base of Port Isabel jetty.

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

Maximum Size: 83.8 mm. (beach shell Port Isabel).

Eastern Pacific Analogue: Arca pacifica (Sowerby, 1933) "... the intertidal zones or dredged in depths to 137 m. from Scammon 's Lagoon, Baja California, to Paita, Peru (Keen, 1971).

250. Arca imbricata Bruguière, 1789.

Arca imbricata Bruguière, Encycl. Method; vol. 1, p. 98. A. umbonata Lam . 1819 is synonymous.

The main habitat of this locally abundant species are the Pleistocene rock ridges off Galveston and Freeport. Here the species lives in countless numbers, some specimens form the substrate for a very remarkable brachiopod which attaches itself on the smooth shelf between the umbones. Truly common on the beach and sometimes taken live in the inlet at South Padre Island on rocks. The dense tangle of byssus in clusters of Arca imbricata is a favorite habitat for small bivalves and gastropods. It also lives in calcareous environment, the miocene shale uplifts and rarely is taken from shelly bottoms. Juveniles are already quite different from those of A. zebra, which are much more slender.

Previous records for the Texas faunal province are: 1, Galveston Island; 7, listed; 19, beach worn valves all along the Gulf; 21, cited; 45, alive, Galveston; 58, Matagorda Peninsula; 67, Port Isabel; 98, beach Padre Island; 110, worn specimens at Galveston; fresh shells on St. Joseph, Mustang and Padre Islands, pl. 6, figs. 13-14; 135, dead in gulf; 136, sometimes very abundant (70 feet); 147, dead on Baker Bank; 156, Stetson Bank; 159, alive at Aransas Pass; 174, listed; 175, Calcareous Banks assemblage, 10-60 fms., attaching, pl. 6, fig. 22, 206, Beach Records Texas Conch., Vol. 3, (3), 1966, 236, Galveston, 251, listed Yucatan Shelf; 253, most dominant pelycepod on reef off Padre Island, heavily preyed upon by Octopus vulgaris; 269, figured on p. 149.

Records H.M.N.S.: 26 lots of which 10 contain live collected material.

Depth Range: 0-35 fms.; alive 0-12 fms.

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

Maximum Size: 63.0 mm.

Eastern Pacific Analogue: Arca mutabilis (Sowerby, 1833). From Bahia Magdalena, Baja California, through the Gulf of California and south to Ecuador and may be dredged to depths of 82 m. (Keen, 1971).

Genus Acar Gray, 1857.
Along the Texas-Louisiana coast the genus Acar is represented by two different species. They each live in totally different environments. It is possible that both are widely divergent morphs of the same species each adapted to its particular environment. However, the morphologial differences are so striking that I present the two forms as different species.

Because juveniles of Acar are already somewhat different in shape and ornamentation from those of other species in Barbatia I believe that it is significant to consider Acar as a full genus, as Rost already has suggested.

251. Acar domingensis (Lamarck, 1819).

The difference with the other species can be summarized as follows: A. domingensis: reaches the relative large size of 30 mm, is irregular in shape and is often quite coarsely ornamented: there almost always is a strong median sulcus and the outline is rather quadrate. Many valves show significant interruptions in growth. In coarsely sculptured material, the umbonal ridge often carries on its posterior end strong spines.

The other species is much smaller (up to 8.0 mm.) is wedged shaped (narrow anterior end), without interruptions in growth, there is no sulcousin mature specimens, which always possess a regular and fine, almost cancellate, ornamentation. The umbonal ridge is subdued and without spines.

There exists a deep-water morph of A. domingensis which may constitute a third species, but which appears to be connected to the shallow water form by a continuous series of intermediates. This form is less inflated and has very coarse, almost cancellate sculpture, (the radial elements are much more subdued than in A. domingensis). We shall list this morph separately, but consider it part of A. domingensis.

Acar domingensis is sometimes taken from beachdrift at Sargent and farther to the southwest, all the way to the Mexican border. It lives offshore off Galveston and Freeport mainly on Pleistocene rock ridges on muddy environment. In general, it is a rather variable species in which mature valves are often somewhat misformed, due to cramped living conditions (boreholes).

Previous references for the Texas faunal province are: 7, listed as Acar reticulata fm; 45, Texas; 56, listed; 110, from the coral banks 100 miles off Galveston and 50 miles off Port Arthur; 136, alive off East Texas at 70 feet; 145, listed in table 1; 140, dead from Baker Bank, dead from Big Southern Bank, alive from West Flower Garden, alive from East Flower Garden; 159, alive at Port Aransas during 1955; 170, listed for transitional shelf assemblage off East Texas, plate 13, fig. 3; 174, listed; 175, listed for calcareous bank assemblage, pl. b, fig. 23, 192, pl. 9, fig. 7 A, B;

201, listed in appendix, Mississippi Mudlumps; 206, Beach records Texas Conch., Vol. 3(4); 251, listed for Yucatan shelf; 253, abundant, attached to rocks, a single rock measuring 140 X 140 X 140 mm. yielded 64 live individuals; 269, figured on page 151.

Records H.M.N.S.: 36 lots of which 12 contain live collected material. 30 (11 alive) are shallow water, 6(1) alive are the deep water modification.

Depth Range: Shallow water morph, 0-27 fms; alive: 0-27 fms., most on rocky bottoms or shell bottoms; rare on coral reefs. Deep water morph: 35-85 fms., alive at 55 fms., on shelly mud bottoms. The specimen from 85 fms. is probably adventitious.

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

Maximum Size: 29.5 mm.

Eastern Pacific Analogue: Acar gradata (Broderip and Sowerby, 1829.
Baha, California to Negritos, Peru, intertidally on rocky shores or dredged in depths of 37 m. (Keen, 1971).

252. Acar Sp. Indet B.
This very much smaller species only lives on the coral and algal reefs. As stated, it is very pointed anteriorly, its sculpture is almost evenly cancellate and it is more evenly inflated so that the umbonal ridge is not outspoken. Although some rare Acar domingensis are also taken on the coral reefs, these in general, except for very small juveniles, can be easily separated from Acar spec. indet. B.

Previous Reference for the Texas Faunal Province are: None.

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

Depth Range: 60-168 feet, alive at 60-90 feet.

Geographical Range: Unknown.

Maximum Size: 8.0 mm.

Eastern Pacific Analogue: Acar bailyi (Bartsch, 1931)? "Southern California to the Gulf of California intertidally and to depths of a few meters (Keen, 1971).

Genus Barbatia Gray, 1842.

It is apparently customary to separate the genus into a number of very closely related subgenera for which I could use here Barbatia ss, Cucullaearca and Fugleria. In spite of some morphological differences which become outspoken in senile material, I believe that these differences are too slight to really form a valid base for distinction. Here a subgeneric designation of the three species will be omitted.

253, Barbatia candida (Helbling, 1779).
Arca candida Helbling, Abh.Privalgesell. Bohmen, Vol. 4, p. 129, pl. 4, figs 39-40, (West Indies).
Juveniles of this species are often taken with those of Acar domingensis but can be immediately separated from those, because apart from having a much finer ornamentation and being much flatter; the prodissochonch is distinctly colored

brown, contrasting with later shell growth which is white. Of all the Arcids on the Texas coast, this is the most variable even more so than Anadara transversa and the entirety of material in the H.M.N.S. collection is quite puzzling. There appear to be two types of juveniles, but at the moment, I am unable to make a convincing case for two different species. In material of 10-20 mm. in size all types of shapes, familiar also in the genus Anadara can be seen; quadrate outlined, wedged-shaped shells, and forms with sagging ventral margins; mature or senile specimens can reach huge size (up to 80 mm.)and appear as far as I am able to judge from photographs - indistinguishable from the Panamanic Barbatia reeveana Orbigny.

B. candida has only been rarely collected on or near the beach (Port Aransas, South Padre Island) but is fairly widespread in offshore waters off Galveston and Freeport, where it prefers rocks, or shelly bottoms; its main habitat are however, the calcareous environment and miocene shale outercrops off Louisiana and Texas, where it lives and reaches large size.

Previous Records for the Texas faunal province are: 147, dead from Baker Bank, dead from Big Southern Bank pl. 1, fig 11; 156 on Stetson Bank; 159, a single live specimen at Port Aransas, attached to rock; 170, deep shelf assemblage, alive; 174, listed; 175, calcareous banks assemblage, common attaching from 10-60 fms; 206, beach records Texas Conch., Vol. 3(5) 253, uncommonly found attached to rocks, fresh valves near Octopus vulgaris den; 269, figured on page 152, but mislabelled B. tenera; 14.

Records H.M.N.S.: 34 lots, of which 14 contain live collected material.

Depth Range: 0-44 fms., alive: 8-55 fms.

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

Maximum Size: 80 mm.

Eastern Pacific Analogue: Large specimens are indistinguishable from Barbatia reeveana (Orbigny, 1846).
Baja California, South to Torritos, Peru, intertidally and to depths of 120 m. (Keen, 1971).

14. Barbatia tenera (C.B. Adams, 1845).
Arca tenera, C.B. Adams, Proc. Boston Soc. Nat. Hist., 2, p. 9.
This is one of the least common Texas Barbatia's. It is dredged occasionally from rocky environment from Louisiana to Freeport, Texas, and lives in relatively shallow water. On the beaches it is rare (Galveston seawall) except near Port Aransas, where divers have taken live material from the jetties and beach material is fairly common. Offshore its habitat are mainly the miocene shale uplifts and the Pleistocene rock ridges (indurated shells from fossil b eaches). Although reported from the calcareous environment, we have not collected the species there. In spite of its appearance (thin and somewhat boxy) this species is closely allied to the much larger B. candida. Off the Texas coast, sometimes rather elongated specimens are found which approach the size of equal sized B. candida closely. The ribbing, however, is clearly different. In B. tenera the beaded ribs are slender and threadlike with

a very thin thread in between two fatter ones. In B. candida the ribs are much coarser and the thin thread in between is missing. Juveniles of B. tenera are quite similar to Anadara, but can be distinguished by the hinge. Very small juveniles are quite close to those of B. candida.

Previous records for the Texas faunal province are: 147, dead on Baker Bank, dead on West Flower Garden; 156, Stetson Bank; 206, Beach records Texas Conch. Vol. 3(4); 269 figured on page 151, but mislabelled B. candida.

Records H.M.N.S.: 15 lots of which 2 contain live collected material.

Depth Range: 0-25 fms.; alive 11-12 fms..

Geographical Range:

Maximum Size: 33.5 mm.

Eastern Pacific Analogue: Barbatia illota (Sowerby, 1833), is possibly the same. Angel de la guarda Island, Gulf of California, to Lobitos, Peru, offshore to depths of 70 m. (Keen, 1971).

255. Barbatia cancellaria (Lamarck, 1819).

Arca candida Lamarck, Anim. S. Vert., Vol. 6, p. 41, 1819.

This well known Arcid lives only in the rather restricted environment of the coral reefs, but some old valves have been found on the miocene shale uplifts and a single lot of dead shells comes from deeper water off Louisiana (55 fms.). These may be displaced shells.

The species is, when fresh, always completely colored a reddish brown; most specimens show a lighter radial over the median part of the disk descending from the umbo. Only once an old specimen was collected on the beach (Sargent). Juvenile material is dark brown and thus easily distinguishable from other species in the genus. The statement by Andrews that this is a "deep water species, often brought in by Shrimpers" is incorrect.

Previous Records for the Texas Faunal Province are: 7, listed; 45, listed, 56, listed; 110, coral banks 100 miles off Galveston; 147, dead on Baker Bank; alive, West Flower Gardens, alive East Flower Garden, pl. 1, fig, 12, 13; 192, pl. 8, figs. 12A, B (Yucatan); 206, Beach Records Texas Conch., Vol. 3(4); 214, pl. 10, figs. 5, 6 (Campeche Bank); 269, figured on page 150

Records H.M.N.S.: 12 lots, of which 6 contain live collected material.

Depth Range: 8-55 fms; alive 10-28 fms. coral and algal reefs. probably displaced at 55 fms.

Geographical Range:

Maximum Size: 29.6 mm.

Eastern Pacific Analogue: Barbatia lurida (Sowerby 1833), is not very close judging by figures. "Bahia San Luis Gonzaga, Gulf of California to Zorritos Peru, intertidally to 22 m. (Keen, 1971).

Genus Lunarca Gray, 1842.

Rather oval thick shelled bivalves; ligament almost entirely behind beak. Juveniles are somewhat different from Anadara in missing the median sulcus and being thicker shelled. Only a single species.

256. Lunarca ovalis (Bruguière, 1789).

Arca ovalis Bruguière, Encycl. Meth. p. 110.

Synonyms: Lunarca pexata Say L. americana Gray
L. campechiensis Gmelin.

Widespread throughout the coastal bays and very shallow offshore waters, often thrown up alive on the beaches. Covered like Noetia ponderosa by a thick dark coat of periostracum and often living with that species in mud bottoms all along the Texas-Louisiana coast. Specimens obtained from some coastal bays appear slightly different in shape (less compact, thinner and larger) than specimens from offshore. Material dredged below 10 fathoms of water is probably all Pleistocene in age. Those of Stetson Bank undoubtedly are fossils. Although perhaps not a valid generic characteristic this species has haemoglobin in its blood. According to Taylor, this internal anatomy is different from Anadara, resembling that of Trisidos. (Taylor, Paleontology, Vol. 13, 1975, p. 221.

Previous Records are: 1 listed; 7, listed; 15, Galveston, Corpus Christi, Sabine Pass, 18, Galveston; 19, living in Matagorda Bay, dead on Matagorda Island beach; 21, listed; 45, Galveston, Corpus Christi 56, listed; 61, Port Aransas area; 62, Mustang Island, Padre Island; 66, listed for Marine Pleistocene of Texas; 67, Port Isabel; 69, listed on page 54; 98, alive in Cedar Bayou, 110, one of the most common shells on all Texas beaches, pl. 6, figs. 1, 2; 123, two live specimens in 6½ fms. about 20 miles off Sabine jetties. Old shells abundant on Sabine Bank. Old shells in 15½ fms. southeast of Freeport, Texas; 126, outer sandy beaches and near shore sandy areas of Carolinian Province (note: lives almost exclusively in very muddy environment); 135, dead in Gulf, alive in bays; 136, alive in intertidal zone off East Texas. Abundant in sandy sediments on beach and in shallow water; 143, Matagorda Bay; 145, upper sound, inlets, and shallow shelf assemblages, pl. 5, figs. 13A, B; 156, Stetson Bank, "may not be living on the bank now"; 160, Matagorda Bay, alive at many locations; 164, abundantly alive in inlet influenced areas at Rockport, alive in open bay centers; 170, transitional shelf assemblage off East Texas; 174, listed; 202, Laguna de Terminos, Mexico, pl. 1, figs. 3 A-B; 206 Recent Records, Texas Conch., Vol.3(4) ; 208, shelf mud and silt, tidal inlet and open bay center environments in South Texas; 225, Galveston; 236, Galveston; 253, a few valves on gulfside bottom off Padre Island reef; 261, shallow offshore Galveston, 266, Padre Island, 269, figured on page 153.

Records H.M.N.S.: 91, lots of which 28 contain live collected material.

Depth Range: 0-37 fms.; alive 0-9 fms. on mud bottoms.

Geographical Range: Cape Cod to Texas and the West Indies; Brazil (Abbott 1974).

Maximum Size: 66 mm.

Eastern Pacific Analogue: Lunarca brevifrons(Sowerby, 1833). "From West Coast of Baja California in depth of 44 m. and southward to Northern Peru. (Keen, 1971).

Genus Anadara Gray, 1847.
The genus Anadara along the Texas-Louisiana coast is represented by a rather uniform group of species. Many subgenera have been proposed and are in use (see f. i. Keen 1971), but in the N. W. Gulf of Mexico, species can be assigned only to three categories, which are closely related. One of these is Cunearca, another is Caloosarca, but the third I cannot assign with certainty to any of the known subgenera. For the last Abbott uses both Larkinia Reinhardt, 1935 and Sectiarca Olsson, two subgenera which I do not believe that are in any way different, at least if one takes A. transversa and A. baughmani as Larkinia. Caloosarca is quite close, but might be considered separately.

The group of species to which belong such well known species as A. transvera, A. floridana, A. baughmani, look when they are juvenile so amazingly similar that they must belong to the same subgenus. Apparently juvenile material (< 5 mm.) of these species have been little studied because I find some incorrect statements about some of these species in the published record. For instance, it is stated (Abbott, 1974) that Sectiarca does not possess overlapping valve margins. This is only approximately true for fully mature specimens of over 3 inches, although the H.M.N.S. collection has a large specimen with some overlap, but small juveniles almost always have overlap. This overlap moreover is apparently a general character of the shallow water Anadarinae. Lunarca which in the mature stage never has it, sometimes, although rarely shows it in juvenile material. The so called split nature of the ribs in Sectiarca is likewise a poor character, because it is missing in juvenile material. One of our surprising finds offshore Louisiana, Caloosarca catasarca Dall, also shows split ribs.

A characters which links all Anadarids except Lunarca is the outspoken median sulcus, which even in large shells can be seen, (for instance, fig. 9, pl. 3, Tulane Stud. Geo., Vol. 7 (1), 1969). It is also outspoken in Lunarca brasiliana, which, however, develops in the juvenile state (< 5 mm.) already in a shape different from Anadara.

The reason that so much confusion in the arrangement of anadarid arcs of shallow coastal waters exists (the minute forms of deeper water form a separate group) is that most species during growth exhibit a remarkable change in shell morphology. Especially A. floridana and A. baughmani show an amazing series of stages during which the shell morphology changes strongly.

To be continued

AUCTION TIME! AUCTION TIME! AUCTION TIME!

Save your dollars, raid your piggy bank, bring your check book and come to the April 26th meeting of the HCS. We will have our special auction for members on that date at the Houston Museum of Natural Science classroom meeting room. We will start this meeting at 7:15 p.m. with refreshments and viewing time of the shells to be offered for auction, silent bidding and sale. The business meeting will be held at 7:45 p.m., and at 8:00 p.m. the action will begin.

Ruth Goodson and Lloyd Meister, chairmen for the event, have urged members to bring in more shells. You may call them for pickup or take your shells to the homes of assistants Margaret Baldwin or Cynthia Biasca. The shells need to be priced or selected for the various categories, so bring them now, please. There will be surprise boxes offered for $1.00. This has been popular with members. You may wrap your shells in boxes for this, or you may bring shells you feel will fit this category and the committee will package them. The boxed shells should be shells you'd feel you'd like if you paid $1.00 or more for them.

Several dealer friends have sent special shells, and members have been giving shells. Among the species we have already are Spondylus americanus, Chama lazarus, Cardium pseudolima, Strombus gigas, a set of 10 colors of Pecten australis, Lyropecten nodosus, a large bailer shell, Voluta nobilis, Chicoreus artemis, Pyrulofusus dexius, Neptunia contraria, Xenophora pallidula, Conus mercator, and Cymbium glans. There will be a good selection of Texas shells.

This event is planned for fun and enjoyment for members. We get a chance to see a lot of shells and the bargains are many.

DO COME.

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MAY PROGRAM ANNOUNCED

Audrey and Wayne Holiman, our members from Edinburg, Texas, will present a slide program on collecting on the Baja Peninsula, Mexico, at the May 24, 1978, meeting. They have collected extensively in Mexico and other areas in the Panamic Province. You will recall their beautiful exhibit of Panamic Province shells at our Museum show last May. Bring your friends and come with pencil and pad to take notes on collecting areas and shells you can find. The Holimans are always willing to share their information on their travels.

Texas CONCHOLOGIST

VOLUME XIV NO. 4 JUNE, 1978

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DUES TIME IS NOW!

Fiscal year of the Houston Conchology Society, Inc., is June 1 to May 31 of each year. Please pay your dues promptly to the treasurer so that you can be assured of receiving your Newsletters and the quarterly, The Texas Conchologist, and be on the Membership List to be mailed to members next fall. The deadline for membership dues is August 15.

Please mail your check with the membership form attached to this issue for proper handling.

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CIRCULATION

Mr. & Mrs. Sam Miron
723-3628
5238 Sanford Street
Houston, Texas 77035

EDITORIAL STAFF

Helmer Odé, Editor
664-9942
4811 Braeburn Drive
Bellaire, Texas 77401

W. W. Sutow
748-7233
4371 N. MacGregor Way
Houston, Texas 77004

Constance E. Boone
668-8252
3706 Rice Blvd.
Houston, Texas 77005

The TEXAS CONCHOLOGIST accepts contributions for publication from amateurs, students, and professionals, subject to approval by the editorial board. Manuscripts should be typed, double spaced and should be submitted to the editorial staff.

ABOUT THE SHELL AUCTION '78

By Lloyd F. Meister

Although I was billed as the co-chairman of this year's auction my major contribution will be this brief missive. The real ramrod of the auction was Ruth Goodson, the other co-chairman, who made the rounds of people (Dealers) as far away as Refugio and Rockport getting shells. The ones that should have been listed as co-chairmen are Margret Baldwin and Cynthia Biasca. The help of these two ladies and many other people was invaluable. It is this kind of help that makes for success.

Clarice Van Erp was, as always, our auctioneer. She is a very outgoing, naturally funny lady who is well suited for the job. With a lot of hard work Clarice brought in close to $650 which was more than half the net total of $1090.90. Our thanks to you, Clarice, for your wonderful help.

There were many members and friends who gave shells this year. There are a few whose names we do not have. So as not to leave anyone out it has been decided not to list local donors but only to offer our thanks for your donations.

There were several dealers from around the country who made donations and we feel that they should be listed:

Bauer's Rock and Sea Shell Shop - Galveston, Texas - Chama lazarus.
E. D. Green - Refugio, Texas - A set of 10 Pecten australis.
Walter Lasiter - Rockport, Texas - Striped bubble, some pink bivalves and some pectens from Texas.
Earl Adkinson - Rockport, Texas - Pecten flabellum.
John Davis - Rockport, Texas - Strombus gigas.
Ed Hanley - Fort Myers, Florida - Pair Turbo petholatus, (1 orange, 1 green).
Morrison Galleries - Sarasota, Florida - Neptunia contraria and Pyrulofusus dexius (both rare).
M. Fulkerson - Collector's Corner - Houston, Texas - Set of 5 Pecten farreri.
Mr. & Mrs. Wayne Holiman of Edinburg, Texas, our long-time members, sent a box of West Coast shells among which were 2 pair of Typhis cumingi. We mention the Holimans because they are out of the Houston area.

We express our gratitude to all of the above.

Again our thanks to all who had any part in this year's auction whether worker or donor or buyer or all three.

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FOLLOWING BOOKS WERE PURCHASED FOR THE CLUB LIBRARY 1977-1978 FISCAL YEAR:

Grzimck's Animal Life Encyclopedia, Vol. 3
What Shell Is That?
Shells of Britain and Europe
Shells and Shores of Texas
Seashore Life of Florida and The Caribbean
Fossils and Locations of The Claiborne Group (Eocene) of Texas
Standard Catalog of Shells
Cowries
1978-1979 International Directory of Concholgists
Sea Shells of The Cape Verde Islands
Handbook of Paleontology For Beginners

)LLOWING BOOKS ARE ON BACK-ORDER:

Color, Universal Language and Dictionary of Names
Mollusks on Stamps
Poisonous and Venomous Marine Animals of The World
A Synopsis of The Living Conidae

FOLLOWING PUBLICATIONS ARE PURCHASED FOR THE CLUB LIBRARY:

Hawaiian Shell News
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Malacological Review
Nautilus
Veliger
*Sea and Shore and many shell club publications come to us on exchange basis

1977-1978 EXPENDITURES FOR LIBRARY:

$241.53 - Purchase of books
$275.00 - Purchase of complete set of Veliger publications, some bound and some unbound, plus assorted supplements
$134.00 - Subscriptions to periodicals
$ 4.20 - Library expenses (file cards)

J. C. SARTOR
Treasurer

NOTE: Our library is located in the Information Office at The Houston Museum of Natural Science (first floor near sales counter). Books and periodicals may be checked out for two weeks and renewed once. Your membership card is entry to the library. We hope you will use the fine material we are purchasing and receiving in exchange.

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HOUSTON CONCHOLOGY SOCIETY
SUMMARY OF INCOME AND EXPENSE
FISCAL YEAR 1977 - 1978

INCOME

Regular - Membership Dues		$ 928
Special - Sale of Back Issues		159
- Dividends on Savings		262
- Auction		1,030
- Donations		100
	TOTAL INCOME	$2,479

EXPENSE

Texas Conchologist		$ 990
Newsletter		276
Donations to Museum		1,000
Club Library		655
General Club Expense		116
Payments Due		31
	TOTAL EXPENSE	$3,068

NET DEFICIT $ 589

J. C. SARTOR
Treasurer

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SEARCH AND SEIZURE By Constance E. Boone

Try Search and Seizure's "$25,000 Pyramid" game---------

Category selected: SOMETHING ABOUT SHELLS

1. SOMETHING TO READ ABOUT SHELLS: See the list of books elsewhere in this issue we have acquired for our club library. Check out several and learn something new about shells. For instance; the complete set of Veliger will now be available to you and will provide excellent reading, volume by volume. Many years ago that is how I continued studying shells---by reading every book we had in the library then. Grzimek's Animal Life Encyclopedia Vol. 3 on Mollusks and Echinoderms has many interesting facts about sea life. Read about starfish, for instance. Set a task for yourself---decide you want to learn about the habits and life styles of your favorite shells and comb the literature we have.

2. SOMETHING TO EXPERIENCE ABOUT SHELLS: If you have a favorite family of shells, try this year to manage and collect yourself at least one species of that family. Stop smoking, stop drinking, stop buying shells, stop eating if you have to---until you've saved enough dollars to take you where you can collect one sample of the family of shells you crave. You say "no way can I travel"? O.K., if you really are home bound and saving to go won't do it, then it is permissable to write to a dealer or to persuade a real friend to airmail, special deliver to you an honest-to-goodness live specimen from your family of shells. Set up an aquarium and observe that specimen as long as you can keep it alive.

3. SOMETHING TO WRITE ABOUT SHELLS: Write your experiences and observations in shelling down for your own use in correctly cataloging your shells when you are finally home. Keep a notebook or journal on trips and visits to the beach. Jot down what you collected at each location, each station, noting conditions, tides, every detail that will make your sample more important. Dates, abundance of species and specimens even if you collect only a few, substrate, water depth, descriptions of the animals live and discussion of their activities in their natural environments---all these make excellent additions to good collections. Who knows? You may discover something completely new about your favorite animals. This April Mildred Tate called me and told me Janthinas were arriving at Surfside and that Epitoniums had been collected. She related the experience of some collectors in the Brazosport area who deposited live Epitoniums (angulatum, probably) and live Renilla muelleri (sea pansy) in an aquarium and that the Epitonium ate the Renilla. Write reports and notes for use in Texas Conchologist. This is really important to our readers.

4. SOMETHING TO TELL OTHERS ABOUT SHELLS: Be generous in sharing your knowledge with inquisitive youngsters and adults on the beaches and visitors in your home. You may help to awaken them to the joys of shelling. If you are asked, join the club brigade of members which goes to schools, clubs and organizations with talks on shells. Volunteer to help with this at the next meeting; we may not know you want to do this. It is amazing how much you'll find you know about shells to tell those who know only that shells exist.

5. SOMTHING NEW TO KNOW ABOUT SHELLS: Having read it also in Nautilus, it was delightful to have a note from Austin member Ruby McConnell who had just read the report by William G. Lyons of a new species of Fusinus. (Nautilus, Vol. 92 (2), April, 1978) Fusinus stegeri Lyons, 1978, is from the Eastern Gulf of Mexico and Lyons states that specimens of this species are common in cabinets of many shell collectors who have obtained unsorted deep water dredgings (most of us have such dredgings from the Blacks). Also, the Nautilus, Vol. 91 (4), October, 1977, reports Dr. Don Moore's new species of the smallest adult clams in the world. Said to be common in sand in shallow water in the Caribbean, Condylonucula cynthiae and Condylonucula maya form a new genus and have been overlooked by shell collectors because of their extremely small size. (Eat your heart out, Jim Sartor!) It would take 10 million of them to fill a regular clam bucket and three adults would cover the head of a pin! A release from Dr. R. Tucker Abbott, editor of Nautilus, compares this with the largest clam in the world, the giant Tridacna of the Southwest Pacific, which can weigh 500 pounds and grow to four feet in length. These miniature clams mature at the size of about a half-millimeter.

   Another article to read is Part IIb of the Family Columbellidae, the Pyreninae of the Western Atlantic, by the late George E. Radwin, published in the April, 1978, issue of the Veliger, Vol. 20 (4).

6. SOMETHING TO HELP THE CLUB ABOUT SHELLS: We need to rebuild our supply of shells, spare specimens and beach shells. Please clean, sort and label such shells, box them for storage and take them to Herschel Sands' home. We have many uses for shells. Please do take the time to pick up the common Dosinia pairs, the ark pairs, cockle halves, moon snails, ear shells, orange-mouthed Thais, Busycons, angel wing valves, scallops, etc. They are great for schools, help us make prettier packages for our next public sale, and make any visit to the beach worthwhile. I've seen the beach littered with good shells after a hard blow. Take the time to stoop to gather them and take the time to clean them nicely for us. If you have any doubt of the merit of this pyramid box, look in the museum store next time and see what Texas beach shells are selling for to visitors, many who come from out of state and seek Texas shells as souvenirs or for collections.

7. SOMETHING TO DO WITH YOUR OWN SHELLS: Catalog at least 100 Texas shells collected during the year. Catalog at least 100 shells acquired on a trip or from exchanges, etc. Follow through the correct procedure as outlined in many of our library books. Work out the nomenclature yourself with the help of books and not just by asking others what the names are for your shells. You'll be delighted with the satisfaction you'll gain from your own efforts. If you get half of them wrong, don't worry. You can always correct the name or update it, but you've made the effort to do the work first.

8. SOMETHING TO DO THIS FALL ABOUT GETTING SHELLS: Maryann Curtis is busy setting up field trips for the fall and winter months. By all means, join club members on these field trips. Even if you can go for just a couple of hours, try coming on a field trip to "sink your toes in the sand" and find your own shells. This is most rewarding and great fun.

9. SOMETHING TO PHOTOGRAPH ABOUT SHELLS: We need good slides or prints of shells as they live and interesting shots about trips and shelling. Texas Conchologist will be happy to use good photos to illustrate your articles or to use as spot features. Black and white glossy prints are best for our use, but we can use glossy prints made from clear color slides. The club will benefit also from your slides and photo stories, so let Charlie Doh, program vice-president, know what you have to share in a program. We have no idea where all our members have gone on shelling trips. One of you may have been to Alaska, or to South Africa, surely some exotic isle in the Pacific, maybe Easter Island. Let us know about it.

   We might also like to build a file of good slides for our library. Lucy Clampit is still working on the hints on shelling slide and tape story that will be deposited in our library for check out use, but we have a need for other slides. Dodie Beazley called me this spring seeking a source for good slides of exotic and rare shells to illustrate a talk she planned to give. It might be a good project for someone to offer to head to secure good slides to have on our library shelves for checkout by members.

10. SOMETHING MORE TO SHARE ABOUT SHELLS: Good specimen shells you can share make desirable door prizes. Offer these to President Frank Petway. Be sure to do your homework and give the shells complete with full data, and don't forget to add your name as collector.

Will you reach the top of this Pyramid game this club year?

If you do, you will have gained $25,000 of knowledge and good will. If this isn't enough incentive, this columnist promises good specimen shell prizes to each contestant finishing all 10 categories by May 1, 1979. Awards will be made at the May, 1979, meeting.

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SEMINAR FIELD TRIP NEWS

A weekend seminar field trip to Port Aransas and Port Isabel will be sponsored by the Houston Museum of Natural Science and the University of Houston Continuing Education Center October 20, 21, 22, and 23, 1978. The first day will feature trawling for shrimp on the University of Texas Marine Laboratory boat. The second day's field trip will be at Laguna Atascosa. Both shelling and birding field trips are planned for the third day at South Padre Island with housing at the island's Hilton. Opportunity will be provided to visit Mexico. On the fourth day there will be a shrimp boil and tour of Aransas Wildlife Refuge. Dr. T. E. Pulley, Carl Aiken, and Dr. John Tveten are leaders. Call Sherman Pease at 749-1232 (Continuing Education Center) for more information on cost and reservations. Transportation will be by bus.

SINISTRAL DEXTRADS IN PHILATELIC CONCHOLOGY By W. W. Sutow, M.D.

In this age of heightened sensitivity for minority rights and against discrimination of any sort, I call attention to still another example of what (given motivation) might be exaggerated into an "issue". This concerns the minority group of us southpaws or the lefties.

The adjective "dextral" and "sinistral" are straightforward denotations of handedness - right and left. But language doesn't stop there. Look at the work "dexterous" - clearly complimentary to the right-handed masses. Even in describing those who can use both hands well, the language has coined the term "ambidextrous" (not ambisinistral) - again a clear favoring of the righthanded majority.

Historically, therefore, we lefties have suffered under various social injustices. Looking at the situation in another way, the minority left-handed population is less than honored by such words as "sinister' the connotations of which need no explaining. Practices discriminatory to the southpaws exist in other languages. Take the word "gauche". It is French in origin and means "left". In Webster's dictionary it is a bona fide adjective in English usage. There are also the nouns derived from it: "gaucherie" and "gaucheness". The words are defined as "lacking in social experience and grace", "tactlessness", and "awkwardness". Needless to say, the implications are all bad.

While these comments have nothing to do with conchology and philately, they can serve to introduce the subject of seashell lefties. Under usual circumstances, the occurrence of a left-handed seashell would be a rare developmental anomaly - and the collection of such specimens would be a treasured event. The left-handed Indian chank shell (Turbinella pyrum), for example, would appear to have deep religious significance. Its depiction on the state seal of Travencore emphasizes its importance among the Hindus. (see Nautilus 88:1, 1974).

It is not surprising, therefore, that designs utilizing such a shell would appear on postage stamps issued by various countries. In stylized form, the left-handed chank shell was depicted on millions of stamps printed by Travencore, Cochin, and Travencore-Cochin. Among other normally sinistral shells that appeared on stamps is the land snail Brachypodella gracilis (Wood) on Jamaica #220 (Scott). A stylized land snail shown on Korea #303, 313, 378, and 380 is also sinistral.

On the other hand, through carelessness and accidents, there have been issued other millions of postage stamps that depict seashells "backwards". That is, the shells appear to be sinistral when in fact it was intended to show them in the natural dextral form.

Recently, Dick Petit compiled a list of these stamps. The list along with comments were published in the Volume 26, Number 3, 1977 issue of Bio-philately, the official publication of the Biology Unit of the American Topical Association. The stamps and shells discussed

by Petit are listed below.

Conus lienardi Bernardi & Crosse, Conus cabriti Bernardi, and Conus coccineus Gmelin are cones pictured on a set of airmail stamps issued by New Caledonia in 1968. (C58, C59 and C60). All three cones are pictured in mirror-image fashion, that is backwards and left-handed.

Mitra papalis (Linne) is pictured along with Malea pomum (Linne) on Maldive Islands #283 and #286. These stamps are distinct in that of the two shells shown on each stamp, only Mitra is sinistral.

Cymbiola rutila Broderip. The stamp designer has shown this shell in reversed form on a recent (1976) issue from Solomon Islands. Thus the numbers of sinistral specimens are steadily increasing.

Strombus gigas Linne is a favorite mollusk of stamp designers of the Caribbean Islands. It is shown reversed on Bahama #217 and #243 as well as on Cayman Islands #304 and #305. (The numbers given for various stamps represent identification numbers in Scott's Standard Postage Stamp Catalogue).

Charonia variegata (Lamarck) is shown with other seashells on the margin of a souvenir sheet issued by Brazil (#1130). The trumpet shell is reversed.

Conus stupella Kuroda. Shown on China #1700, this cone generated considerable embarassment for the Taiwan postal officials. Not only was the shell shown in reversed fashion but even the name was misspelled (twice).

Voluta delessertiana Petit and Murex tribulus Linne are depicted sinistrally on Malagasy (formerly Madgascar) #447 and #448 respectively.

The article by Petit indicates that careful study of the various seashell stamps may reveal even other stamps with sinistral shells. The recognition of the sinistral pattern is usually easy - the reversed coiling is obvious. On the other hand, with some species, a careful study is needed to diagnose a left-handed presentation. For example, Cypraea caputserpentis Linne is shown in left-handed form on Cook Islands #388.

Conus aulicus Linne as well as a Cymatium species appear in sinistral form on Maldive Islands #172, 176, 179 and 181. Sinistral varieties of Conus litteratus Linne and a Distorsio are shown on Maldive Islands #175 and #186. A close scrutiny of Wallis and Futuna #C59 will show a reversed shell.

The reversed depiction of a seashell creates an anomaly of man and not of nature. Just how easy it is to do is indicated by the illustration in the book Shell Collecting - an Illustrated History by S. Peter Dance (1966). On page 35 is reproduced an etching of Conus marmoreus Linne by the great artist Rembrandt. The shell appears as a sinistral specimen - a mirror image of the true situation.

With millions of these philatelic sinistral errata distributed over the years, a collection of these stamps would be interesting - and entirely feasible. However, collecting a matching set of the real shells will be something else again.

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MOLLUSCANA By W. W. Sutow, M.D.

These paragraphs might well be titled "Japanese Malacologists Revisited".

My four week trip to Japan was not for pleasure or for sightseeing. The schedule was tight but in between the lectures at various medical schools I managed to eke out as much conchological activity as I could during some afternoons and on Sundays. Among the most stimulating hours for me were those spent with conchological friends.

On October 20, 1977, I reached Osaka from Hiroshima City via the "Shinkansen" (the "bullet" express train). From Osaka station we headed in the direction of Kobe, or so I surmised from the road signs that occasionally came into view. This was a heavily industrialized area and the thick traffic included a roaring concentration of big trucks. One hour and a half later we drove into the quiet suburbs called Nishinomiya City. After asking three times, we finally pulled into the tiny yard of Kaisei Hospital. And there I saw Dr. Tokubei Kuroda again after 12 years.

Dr. Kuroda, undoubtedly the dean of Japanese malacologists, had been honored recently on his 92nd birthday. He looked very much the same as I remembered him when he helped me so much between 1948 and 1954. I had seen him only once since in 1965. His gracious wife was still alive then but she had passed away a few years ago.

Dr. Kuroda walked more slowly - and used a cane. But his eyes (in spite of the cataracts he indicated he had) looked sharp. He was very neatly dressed in Western clothes (he was attired in traditional Japanese clothes the last visit). And his speech, as usually, was gentle, courteous and kind as in the past.

He had been living in one section of the hospital which bordered right on the sea. Dr. Norio Kikuchi, director of the hospital, was an avid shell collector and he had provided the housing for Dr. Kuroda (and Mrs. Kuroda while she was alive) for the past number of years. In the hospital yard was a separate two-story building for Dr. Kikuchi's malacological laboratory. The upstairs room had served until recently as a meeting place for the shell club in Osaka.

Because of his problems with his sight and because of his legs, Dr. Kuroda no longer participated in shell collecting activities. He has continued, however, to give talks to the local shell club and has provided help and consultation to all who sought his aid.

I saw only the one room which served as his living quarters as well as his library and den. The desk gave ample evidence that conchologists still sent specimens to him for identification. Dr. Kuroda's

hand was firm as he wrote out the new address of Dr. Habe for me. He said, as I left, "I shall probably not see you again". I had no proper answer. I just shook hands.

Taizo Ninomiya's house was difficult to find - but after maneuvering through some really narrow and winding streets of Tokyo, we located the two-story building that served as his home, office and laboratory. Behind the building was another two-story structure that provided space for working and storage. This gentleman is well-known among shell collectors throughout the world (see Hawaiian Shell News, 23:4, December, 1975).

Ninomiya was assigned to Korea by Japan during the war as an expert on lumber to be used for construction of planes. When he returned to Japan, in order to earn his living, he started to prepare microscopic slide specimens to be used in classrooms (e.g. biology, botany, zoology, microbiology laboratories). These activities have become family business. Currently he has expanded into the area of commercial shell jewelry manufacture and sale throughout Japan. (The Hawaiian Shell News article by Elmer Leehman provides a fascinating profile of this extraordinary shell collector and his family.)

The Ninomiya waiting room and study-den are on the second floor. The walls of the waiting room are covered with vertically hanging display cases - 20 of them. These cases contain, volutes, pectens, pen shells and cowries. The walls of the larger den are also lined with vertical display cases. In addition there were a number of rows of chin-high drawer cabinets. Ninomiya collects seashells like a true conchologist but his collection is especially rich in volutes, cowries and Japanese species.

There are so many rarities here that the awe of handling one of few existing specimens of a given species becomes diluted. For example, in respect to cowries, how can one really appreciate these species, most of which one is seeing for the first time, when he is shown at one time such Cypraeas as guttata, teramachii, midwayensis, fultoni, broderipii, rosselli, kuroharai, ostergaardi, langfordi, marginata (albino), episema and the like. The Ninomiya collection of cowries now has almost all of the species listed by Burgess in his book. The missing species can be counted on one hand. (We never reached the volutes, cones and murexes. Ninomiya's collection in these areas seemed equally as impressive. But we simply didn't have time enough.)

I had talked with the Dr. Tadashige Habe 12 years ago when he was curator at the National Science Museum in Ueno Park in Tokyo. Since them, there has been erected (1972) a six-story National History Institute in another section of Tokyo (Shinjuku area). Three years ago, Dr. Habe transferred his research activities to the new Institute where he is the director of the Division of Invertebrate Zoology. The shell display (as well as other exhibits) are still housed in the National Science Museum at Ueno Park. This National Museum celebrated its 100th anniversary last November.

I met Dr. Habe for the first time in the early 1950s when he was conducting malacological research under Dr. Kuroda at Kyoto University. He was publishing his paper-back (4 volume) monographs entitled "Genera of Japanese Shells". Since then he had an appointment at Kyushu University Marine Research Institute before moving to the National Science Museum.

Dr. Habe has contributed extensively to the malacological literature. Among his books that are well-known are:

> Shells of The Western Pacific In Color, Volume II (1961). This is the companion volume of Kira's popular Volume I of this set.
>
> Shells of The World In Color, Volume II. The Tropical Pacific (1965). He is senior author of this book with Kosuge as co-author.
>
> Shells (1975). This is a two-volume textbook on shells for high school and college students (written in Japanese).

Dr. Habe had just published a hard-backed version entitled Systematics of Mollusca In Japan. Bivalvia and Scaphopoda. I had seen a copy of this book but it was not yet available even in the larger bookstores in Tokyo. When I left Dr. Habe, I had a copy of the book - compliments of the author (see Texas Conchologist 14:57, March, 1978).

One of the big surprises occurred in Nagasaki. I left that atom-bombed city in 1954. The long valley along which the force of the bomb had wreaked tragic damage was still in shambles then. On this revisit, there was no evidence of the past war. Instead, there were the impressive new buildings and the hustle-bustle of a modern metropolis. One of my trainees was now director of research on the atom-bomb survivors. With typical Japanese hospitality he had scouted around and had made arrangements to take me out to a fishing village where the fishermen's group had set up a shell museum.

I had visited this village twice - almost a quarter century ago. We had maneuvered a badly damaged road by the seashore then to get there. The fishermen had lived in houses supported by stilts over bay water's edge. They threw their refuse over the sides of the houses for the waves to wash away. In this refuse there were dozens of perfect seashell specimens that fishermen considered to be "nuisance junk" that came up with the fish in the nets. Yes, they welcomed my rummaging through whatever was underneath the houses.

All of this was in the past. Now the village was rebuilt. There was ample evidence of the economic boom that the people were enjoying. And the Museum was something else again (to be described in a later issue here). I walked into the Director's office and immediately recognized him - Dr. Sadao Kosuge. The last time I saw Kosuge was in 1968, in New York, in the basement of the American Museum of Natural History when the Kisters and I had attended the meeting of the New York Shell Club.

Dr. Kosuge had recently severed his Tokyo connections and had undertaken the job of organizing the Museum here. He was busily engaged in promotional and educational activities locally and regionally, in addition to publishing a popular scientific periodical called "Triton". My schedule permitted only two hours for this pleasant (and unexpected) interlude.

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SEEING PURPLE

by Carol Courtade
and Helen Eberspacher

When Helen Eberspacher invited us to join the shell group of the Outdoor Nature Club on their field trip to Port Aransas the weekend of April 21-23, we gladly accepted. Most of the group did not plan to arrive until after dark on Friday, but we decided to leave around 8:00 A.M. and have a leisurely drive, with a stop at Matagorda Beach. We found very little at Matagorda except a few worn sundials so after about an hour we drove on. We didn't intend to do any more shelling that day so took our time driving on, and after checking the ferry schedule to St. Joseph's Island we checked in at Mustang Isle Apartments around 3:00 P.M., only to find that our room was not ready--so to kill time we drove down to the beach near the apartments. What a sight greeted us! The Janthinas, along with the man-o-wars, were washing in by the thousands. The beach was covered with oil and tar, but the bright purple shells were clearly visible. We collected for over three hours, stopping just long enough to move the car from time to time, and often picking up 10 or 12 within a 3 or 4 inch radius--and when we turned to look at the area where we had just picked them up, more were already washing in.

To our great surprise, only two other people on the beach seemed at all interested in the Janthinas, and they told us they had been picking them up for four hours before we came. The cars were already running over them and by the next afternoon many of them were crushed.

It was an exciting experience and one that I'm sure we won't encounter again--it was simply a matter of being there at exactly the right time.

Carol

Helen Eberspacher and her group arrived at the Mustang Isle Apartments after the Courtades, too late to look for the Janthinas on Friday night. Hearing about the influx of the pretty purple snails, most of the group arose very early Saturday morning and went to the beach near the Apartments and found many of the snails. The group then went to Jerry Foy's Beach Rentals on South Padre Island Drive on the edge of Corpus Christi, arriving there at 9:00 A.M. Jerry piled everyone in his 10-passenger four-wheel drive station wagon and took us about 25 miles down North Padre Island. Due to the ravages of a hurricane last fall, going was rather slow, and that plus the fact that Jerry graciously stopped whenever someone wanted to investigate a shell pile, or pick up a pretty bottle or a hardhat (lost by oil well drillers out in the Gulf), prevented us from going farther down the beach. The Janthinas were there too, plus quite a few sea beans, but not many other shells. We got back to Corpus about 5:00 P.M.

The next morning (Sunday), the group went over to St. Joseph's Island (now called San Jose), catching the first Jetty Boat at 6:30 A.M. Since there were ten in the group, the price was discounted from $4.00 to $3.00 per person. Here again the Janthinas were found, plus several dozen large double Tellina alternata (pink, yellow and white), numerous Spirulas, Sinum perspectivum, and double Arks (Anadara brasiliana and Noetia ponderosa). The prize find of the day was by Mildred Elkins - a beautiful, very fresh, perfect Phalium granulatum, in bright dark color. The stragglers caught the 12:00 o'clock Jetty Boat back to Port Aransas.

P.S. Most of the Janthinas were the common (Janthina janthina), but there were a few of the J. globosa and J. pallida. The beaches were littered with Portuguese men-of-war and much, much tar.

Helen

(NOTE: Call Helen if you want information on jeep rentals or the larger vehicles offered by Jerry Foy in Corpus for trips to Big Shell down North Padre Seashore area).

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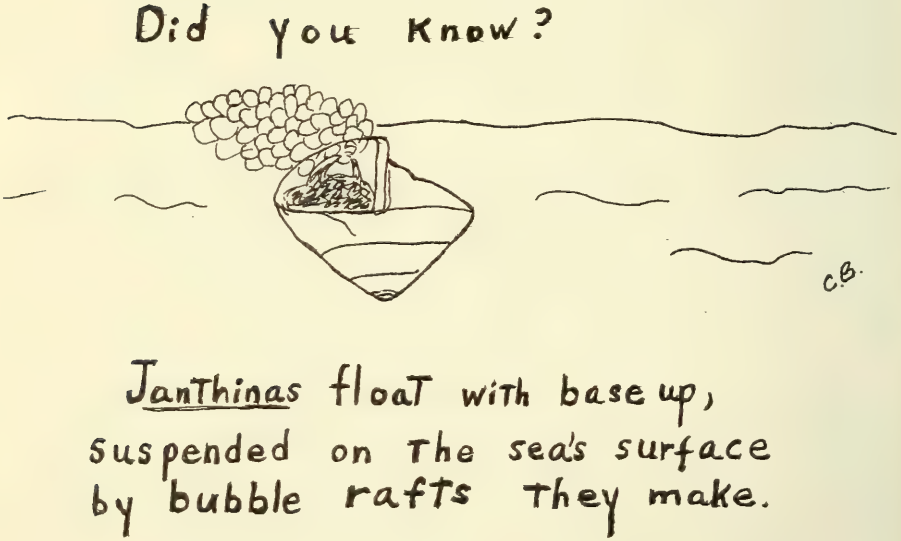

MEET ME UNDER THE MICROSCOPE

BY TINA PETWAY

At our regular meeting in April, 1978, we, the members of the Houston Conchology Society, proudly voted unanimously to make Dr. Helmer Odé the second honorary member of our club. Our first honorary member was Dr. Tom Pulley of the Museum of Natural Science.

Dr. Odé is retiring as Editor of the Texas Conchologist after having served in this capacity for more than 10 years. But let's go back a few years to learn more of this man who has made such an important contribution to our organization.

Helmer was born in Holland on August 30, 1918, and spent his young life there. His elementary and secondary education took place in Delft, Holland. It was during these years, when he was about ten years old, that he became interested in collecting shells. He built up a collection of the land mollusks of western Europe. His collection later was given to the University of Leiden.

In 1936 he began his studies at the University of Leiden in geology, and in 1945 received his Master's Degree. He then went to work for Royal Dutch Shell. Sometime before the beginning of World War II he met his charming wife, Weits. They were married in February, 1947, in Holland. They have three children. Their oldest daughter was born in the Netherlands. Their second daughter and a son were born here in Texas. The Odes came to the United States in 1950, being transfered here to Texas by Royal Dutch Shell. In 1965, Dr. Ode went to Holland to receive his Ph. D. from the University of Utrecht in geophysics.

In 1956 Helmer again became interested in mollusks. While in Galveston, Texas, Helmer was walking the beach and scooped up a handful of beach-drift just to see what might be found in it. Upon examining the microscopic shells from the beachdrift he realized that there was very little information available for identification on the subject of such mollusks. And so began his research on these tiny shells. Because of his gift at research he was selected to work out the difficulties in nomenclature on a project known as the Northwest Gulf Mollusk Population Survey organized under the direction of former member Harold Geis and also sponsored by the Houston Museum of Natural Science. This research is presented in this publication as the Continuing Monograph - DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN THE NORTHWEST GULF OF MEXICO. The Houston Museum of Natural Science is now the home of his own extensive collection, added by donation to the Northwest Survey material. He can usually be found at our monthly meetings "talking shells" with anyone who wants to discuss some new find or an old "problem" shell.

Helmer is an active member of our Society. He enjoys the club's field trips and loves to be outdoors. He is an active backpacking and canoeing enthusiast. He served as president of the Houston Conchology Society for two years, 1970 and 1971. He has served on the Board of Directors for several years. Though retiring as Editor of this publication, he will continue his work on his Monograph. His Monograph has been a great contribution toward making the Texas Conchologist recognized around the world as an outstanding scientific publication. For this, as well as for his friendship, his help, his enthusiasm as a member of H. C. S., his Dutch humor and wit, we are glad to know him and we say "THANK YOU, HELMER!" for keeping standards high in our club.

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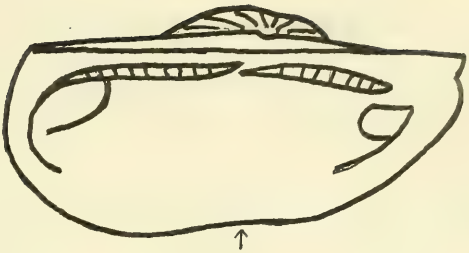
DISTRIBUTION AND RECORDS OF THE MARINE MOLLUSCA IN THE NORTHWEST GULF OF MEXICO

(A Continuing Monograph) By H. Odé

FAMILY ARCIDAE

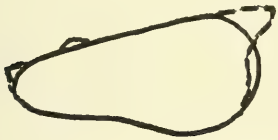
Genus Anadara continued:

Kennedy (ref. 170, plate 9, figs. 3a, b) figures a juvenile specimen of A. baughmani (labelled Anadara hemidesmos (sic!) from East Texas which in no way resembles the typical full-grown form of this species. Nevertheless, this is the common shape of A. baughmani when about 20 mm. in size. Fortunately, the H.M.N.S. collection has some lots many with complete growth series, so that juveniles of A. baughmani, which I otherwise would have interpreted as a separate species, could be placed correctly. In all six species, the hinge line is uniform in structure. The taxodont teeth are separated into a long posterior row and a shorter anterior row, meeting one another somewhat to the posterior side of the umbo. The plate-like teeth are finely vertically (with respect to the shell) grooved on one side.

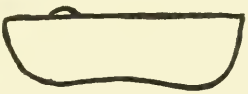


The outspoken median sulcus links all anadarids except Lunarca.

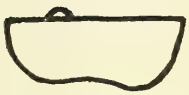
The prodessoconchs in A. transversa, A. floridana and A. baughmani are extremely small and specimens below one mm. in size are completely indistinguishable in shape. But when about 2 mm. in size, differences begin to show. A. floridana is the most elongate, with many flat, unsectioned ribs; A. transversa begins to assume a wedge shape and A. baughmani is rather compact with cancellate sculpture.



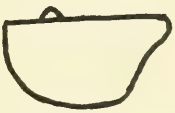
± 2 mm.
A. transversa
with and without
auricle or anterior
hook



3 mm.
A. floridana
and A. sp. A.



2 mm.
A. baughmani



1 cm.
Caloosarca
catasarca

In the above scheme of things, some variations occur and I am not always able to identify all material with certainty. Sometimes one finds juveniles of A. transversa with an auricle (see sketch) like occurs in Caloosarca. This occasional presence of an auricle in A. transversa strengthens my belief in the close relationship of most of the Anadara species in the N. W. Gulf of Mexico.

257. Anadara (Cunearca) brasiliana (Lamarck, 1819).

This widespread and well-known species is characteristic for the sandy beaches and the adjacent inlets and immediate offshore sandbars. It is never dredged in mud bottoms. Often cast upon the beaches alive after stormy seas. In offshore dredgings it is rare and most material obtained below 10 fms. is certainly of Pleistocene origin.

The two most remarkable aspects of this species are the distant areas of its distribution, the Carolinian Province and Brazil, and for this reason, it has been suggested that both populations could be different species, in which case, the species being discussed would become Anadara (Cunearca) incongrua Say.

2) Another somewhat disturbing, or at least at the moment, not understood, peculiarity of this species is the shape of the juveniles. They are when very small, quite Anadara-like, but rapidly develop along a different outline than Anadara does. Thus it is strange that juveniles of the supposedly closely related A. (Cunearca) chemnitzi are totally different in shape. These lack the median sulcus, are subcircular in outline and inflated, in one word, totally different. However, both species converge during their growth to very similar shapes.

Previous records for the Texas faunal province are: 1, very common, Galveston; 7, listed; 15, common at Galveston and Corpus Christi; alive at Sabine Pass and Quintana; 18, abundant at Galveston and Corpus Christi; 19, common all along the Gulf coast, bulk of drift on Matagorda Island alive; 21, listed; 26, (p. 635), listed, and discusses incongrua and brasiliana; 45, Point au Fer, Cameron, La., Corpus Christi, Galveston. Well at Saratoga, well at Galveston, Texas; 56, North Carolina to Texas; 61, Rockport area; 62, Mustang and Padre Island; 66, marine Pleistocene of Texas; 69, listed in appendix 8; 98, beach Padre Island; 110, "one of the most common shells of all Texas beaches", pl. 6, figs. 5-6; 126, listed for outer sandy beaches and near shore sandy areas of Carolinian Province; 135, dead in the Gulf; 136, alive in clay in intertidal zone (East Texas), sandy sediments; 143, Matagorda Bay; 145, upper sounds inlets, plate 2, figs. 6A, B (shows Noctia ponderosa (sic!); 160, dead in Matagorda Bay; 164, in Rockport area and in Laguna Madre; 170, shallow shelf off East Texas, alive; 174, listed; 206, Texas Conch., Vol. 3 (3); 225, Galveston; 236, Galveston; 261, shallow shelf, Galveston; 266, Padre Island; 269, figured on page p. 152.

Records H.M.N.S.: 34 lots of which 12 contain live collected material

Depth Range: 0-26 fms.; alive 0-4 fms.; remarkable is one live lot from the coral reefs at 100 feet, the only lot ever collected at such a depth in calcareous environment.

Geographical Range: Carolinas, Florida, Texas, Brazil.

Maximum Size: 62 mm., alive, Sabine Beach.

Eastern Pacific Analogue: ?

258. Anadara (Cunearca) chemnitzi (Philippi, 1851).

Arca chemnitzi Philippi, Zeits. f. Malak, 8, p. 50.

This smaller species resembles the previous one only when fully mature although it misses the twist in the ventral margin. However, juvenile material is quite different; this lacks the median sulcus, is circular in shape and quite inflated. There is no indication that the species still lives in the N. W. Gulf of Mexico, because all our material appears old and worn.

Beach specimens are quite common in beachdrift south of St. Joseph Island and dredged material is sparingly obtained in the Galveston-Freeport area in water depths less than 25 fms.

Previous records for the Texas faunal province are: 7, (as Arca orbignyi Kob.) listed; 45, listed; 56, listed; 67, Port Isabel; 110, found occasionally at Port Isabel; 145, shallow shelf (dead), Mississippi Delta; 206, Texas Conch., Vol. 3 (3); 269, figured on p. 153.

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

Depth Range: 0-27 fms.

Geographical Range; "Texas, West Indies to Brazil" (Abbott, 1974).

Maximum Size: 27.5 mm.

Eastern Pacific Analogue: Anadara (Cunearca) (Sowerby, 1833). Conception Bay, Gulf of California, to Zorritos, Peru, in shallow water, sandy mud bottom in depths of 4 to 73 m. (Keen, 1971).

259. Anadara baughmani Hertlein, 1951.

Anadara baughmani Hertlein, Texas Journ. Sci., Vol. 3 (3), p. 487-490. Syn. Anadara springeri Rehder and Abbott, 1951, Rev. Soc. Mal. C. de la Torre, Vol. 8, (2), p. 53-66.

In view of the already discussed changes in shell morphology during development I would guess that this species has been described previously to 1951. A check of the neogene record will probably turn up its valid name. When full grown and fresh, it is a striking species quite unlike any of the other Andaras. Then the shell has an almost pholas-like shape, which might indicate a burrowing mode of life in rough mud. Hildebrand (ref. 123) coined an appropriate popular name for this arc, potbellied arc. It is inflated and rather thick shelled. However, specimens of about 1 cm. in size are quite flat and carry small but strong, regularly placed concentric ridges between the costae. Juveniles (3-5 mm.) remarkably are rather inflated, short and compact with a large median sulcus. Their sculpture is almost cancellate, as still can be seen in most mature specimens, by inspection of the umbonal region. It is important to note that small juveniles of 2 mm. in size show a strong overlap of the valves. Not always are these small juveniles easy to separate from those of A. transversa and especially at locations where A. transversa (deepest part of its range) mixes with A. baughmani (shallowest part of its range), it is sometimes almost impossible to make the distinction. Juvenile valves often show the ribbing internally but with growth, the valves thicken and the internal ribbing is smoothed out. Vokes (Tulane Studies Geology, Vol. 7, p. 12, 1969) claims that A. hemidesmos Philippi, 1845, is a recent Caribbean species (Cuba, Martinique), closely related to A. baughmani. Recent discussions (f.i., Abbott, 1974) of the genus Anadara fail to mention this species. However, it

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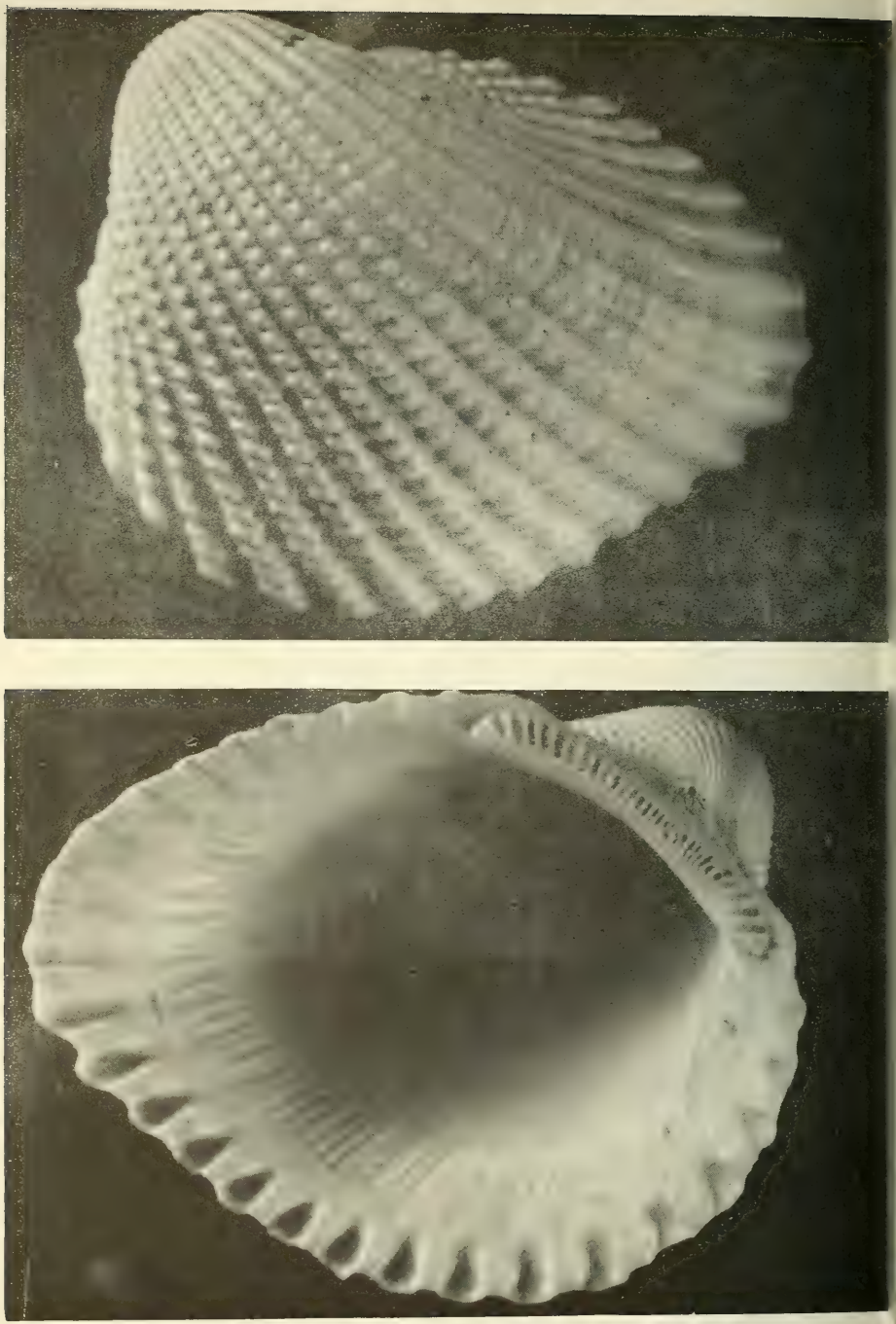
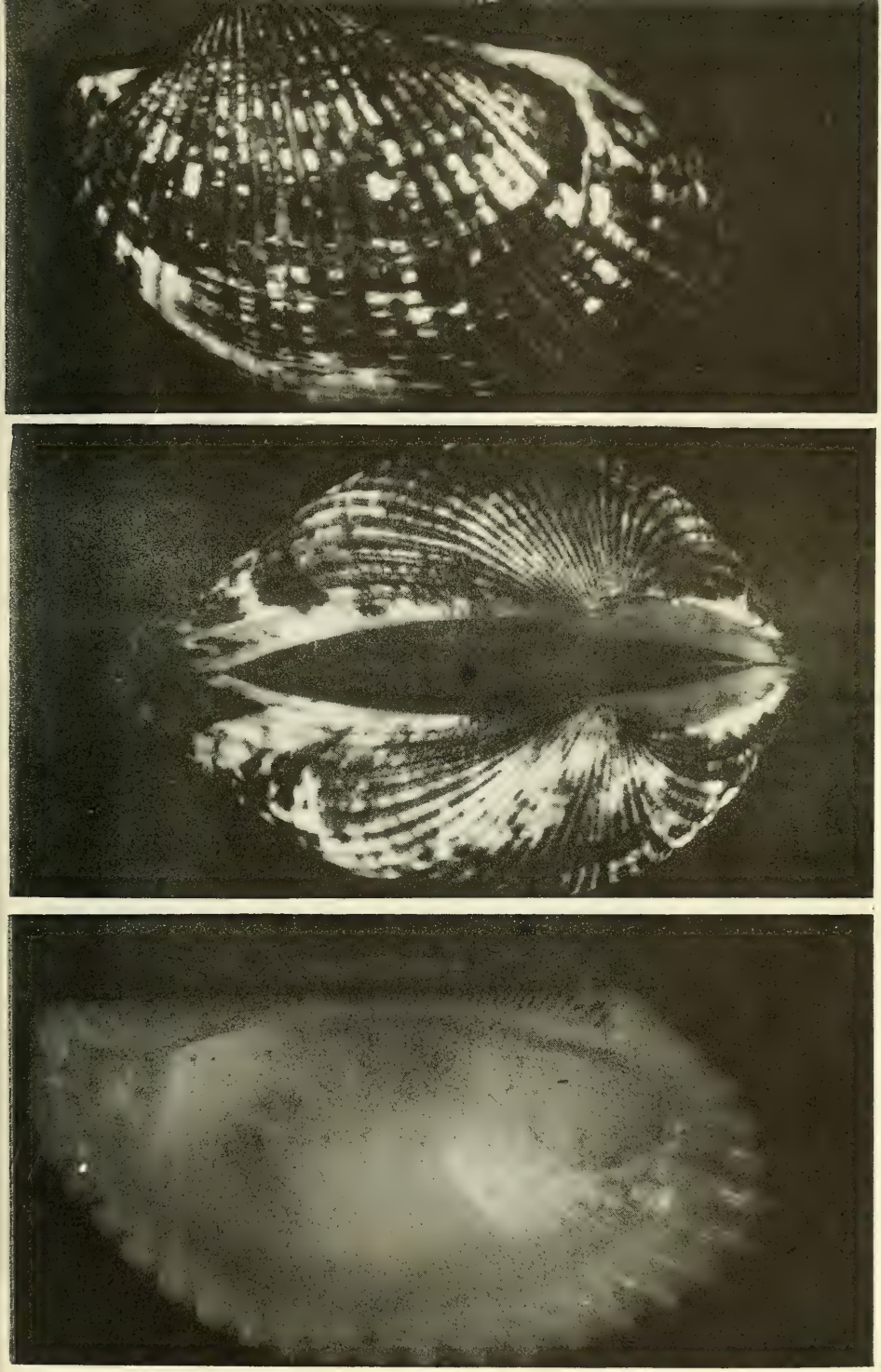


Anadara chemnitzi collected by diver Harold Geis 1½ mi. off Padre Island, 38 mi. N. of Port Isabel, Texas, in 25' to 50' water, Sept. 25, 1966. Size: 24 mm. length, 25 mm. height.



Anadara baughmani, dredged 34½ mi. SSE of Port Aransas, Texas, in 38 fms. Feb. 13, 1966. Size: 40½ mm. length, 24 mm. height.

is interesting that A. hemidesmos Philippi was reported for Texas (Kennedy, ref. 170), but in my opinion, the figured specimen is merely a juvenile A. baughmani. But it is to be noted that among the H.M.N.S. material of A. baughmani, there are some valves which may be distinct but not enough material is available. Moreover, there lives along the Texas-Louisiana coast, a fairly large arc, intermediate between A. floridana and A. baughmani, which appears to be undescribed. Fully mature specimens reach a size of 2 inches and look like A. floridana with few costae; its juveniles resemble those of A. baughmani. It is possible that either A. baughmani or this undescribed species is identical with A. hemidesmos Philippi.

A. baughmani is a fairly widespread species in deeper water mud bottoms along the entire Texas-Louisiana coastline, is never collected on our beaches (except Mississippi mudlumps).

Previous records for the Texas faunal province are: 104, original description; 105, description as A. springeri Rehder and Abbott; 123, in 31-37 fms., only a few shells; 144, reported at loc. 167, 506; 145, deep shelf, pl. 7, figs. 9A-B; 146, deep shelf, pl. 3, fig. 20; 156, Stetson Bank, common, mudbottom; 170, transitional shelf assemblage; 174, listed; 175, outer shelf, 40-65 fms., abundant on mudbottom, whole coast, pl. 5, fig. 10; Texas Conchol., Vol. IX, No. 4, p. 76, No. 706; 266, reported for Padre Island (note: probably in error for A. floridana).

Records H.M.N.S.: 42 lots, of which 10 contain live collected material.

Depth Range: 9-152 fms., alive 38-70 fms., in mud.

Geographical Range: Gulf of Mexico.

Maximum Size: 54 mm.

Eastern Pacific Analogue: ?

260. Anadara spec. indet. B.

Also here I will omit assignment to a subgenus. This species is when fully grown closely related to A. floridana (ribs are not split, but somewhat nodulose), although much smaller (max. size 62 mm.). Most specimens show the strongly developed concentric ridges between the costae. Where these merge with the ridges the rib develops a slight node. The number of costae (according to Vokes offer a good specific character, ref. 238) is about 25-30, that in A. floridana 35-40. Juveniles of this species are sometimes inseparable from those of A. baughmani, but in general they are coarser in appearance, less cancellate and more nodulose. They differ from those of A. floridana in being less elongate and more compact. In full grown material the hinge is heavier developed than in A. baughmani.

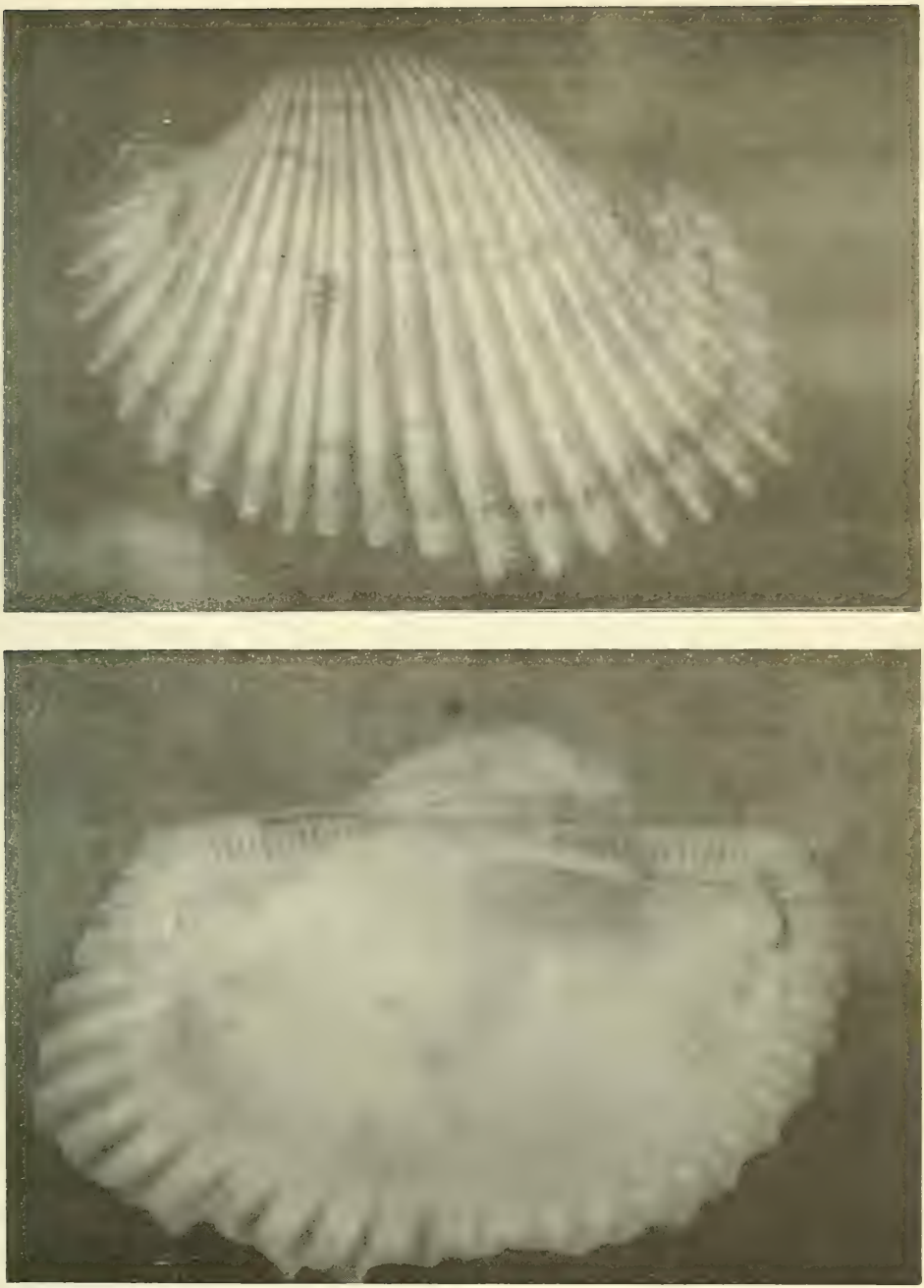
Previous records for the Texas faunal province are: 206, Texas Conch., Vol. 9, p. 73.

Records H.M.N.S.: 11 lots, of which one contains live collected material.

Depth Range: 25-55 fms., alive at 40 fms.

Geographical Range: Unknown.

Eastern Pacific Analogue: None.



Anadara sp. indet. B., dredged 54½ mi. SE of Freeport, Texas, Nov. 22, 1967. Size: 44 mm. length, 31 mm. height.

261. Anadara floridana (Conrad, 1869).

This huge arc, the largest of the Western Atlantic anadarids, is common all along the Texas-Louisiana coast. It used to be known as A. lienosa floridana, but is now taken by most workers as different from lienosa Say. Also reported as A. secticostata Reeve, whose origin is unknown. It is remarkable that juveniles start out in the same size as those of other species in the genus, such as for instance A. transversa, and in this respect the species resembles for instance Dinocardium, whose juveniles are also the size of other cardiids. Juveniles often show overlap and even a specimen of 93 mm. does show overlap of the valve, but a live specimen of about 11 mm. is completely without overlap. I must disagree with the placement of this species in a separate subgenus Sectiarca; the species is close to A. transversa and A. baughmani. Even such species as A. catasarca and A. notabilis which are placed in a subgenus Caloosarca and which appear to form a somewhat separable group, based only on slight geometrical differences are close to A. floridana and A. baughmani. Juveniles of A. floridana are quite elongate, and when about 1-2 cm. in size have a quite smooth appearance due to the fact that the grooves between the ribs are narrower than in any other species in the N. W. Gulf of Mexico. The split nature of the ribs becomes apparent only in fullgrown material. Because also some fossil Caloosarca show this development I do not attach any special significance to it and in my interpretation A. floridana is merely a large species in a group of closely related species.

The species is widespread along the Texas-Louisiana coast, although live large sized material is rare; beach specimens can be found from Galveston (quite rare), to Sargent (occasionally) to Padre Island (fairly common). The depth range appears on the whole somewhat shallower than that of Anadara spec. indet. B, but still overlaps it completely (only dead shells).

Previous records for the Texas faunal province are: 7, listed; 16, from well at Galveston at 305-35 feet and 440-459 feet; 21, listed; 45, Galveston; 56, listed; 110, lives off the Mexican coast, and badly worn shells are sometimes found on Padre Island; 135, dead in Gulf; 136, found dead on Heald Bank; 145, deep shelf, (dead), pl. 7, figs. 8a, b; 156, common on Stetson Bank; 160, Matagorda Bay, one valve, supposed to be of Pleistocene origin; 206, beach records Tex. Conchol., Vol. 3 (3); 236, Galveston; 241, dredged in 12 m. off Cameron, La., fig. 2; 269, figured on page 154.

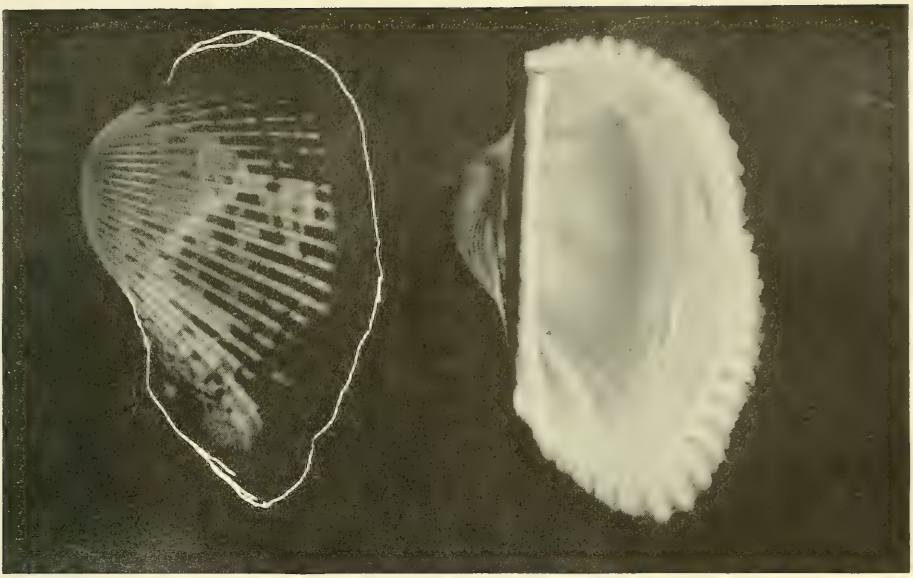
Records H.M.N.S.: 69 lots of which 9 contain live collected material.

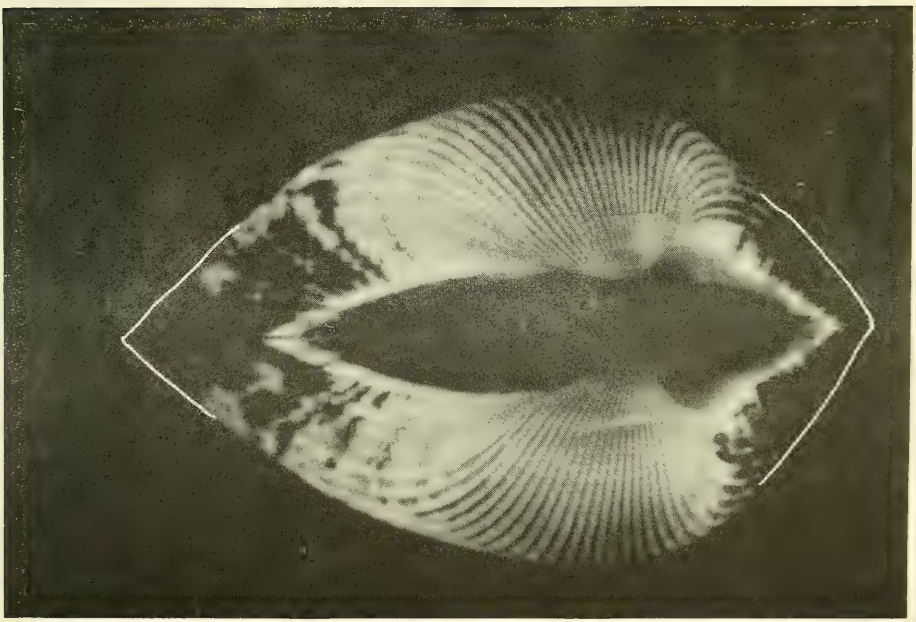
Depth Range: 0-60 fms.; alive 8-26 fms.; some of the material from deeper water might be of Pleistocene origin.

Geographical Range: N. Carolina to Texas and the Greater Antilles (Abbott, 1974).

Maximum Size: In excess of 100 mm. (broken beach valve), 99 mm. for fresh dredged specimen with epidermis.

Eastern Pacific Analogue: None.





Anadara floridana dredged in 11 fms. near 30 mile S. rigs off Galveston, Texas, Feb. 15, 1966. Size: 88 mm. length, 54 mm. height.

262. Anadara transversa (Say, 1822)

This species is the nightmare of those systematicists who rely mainly on geometrical shape for identification. None of the species in the N. W. Gulf of Mexico is more variable and changing in shape from population to population. The usual shape is a quite rounded wedge. In the Olsson and Harbison (1953) treatment of neogene species from Florida a number of fossil species is figured, all of which without exception are present in recent Texas material. A. plicatura (Conrad) and A. improcera (Conrad) are often collected in the bays; forms resembling A. brevidesma Conrad. A. lineolata is rare, but occur, and one valve of a morph resembling A. peterburgensis Olsson and Harbison, 1953, we shall report under that name, although I suspect that finally this entire complex of species will be proven closely related. (See also Bird 1965, Pal. Am., Vol. 5 (34), p. 30).

Bay specimens have a tendency to grow large, thick shelled and compact; some Pleistocene populations dredged offshore are flatter, thinner shelled and even larger (42 mm.), but the most common morph living in shallow offshore water, is a fairly small brownish flecked wedge shaped shell of about 1 inch in size when mature.

The species cannot be well understood without a critical study of Neogene material from the entire South Eastern U.S.A. I can only add some observations to what has been stated earlier. Most juveniles lack the concentric intracostal ridges, but in deeper water material these ridges appear, and in many cases differentiation with juveniles of A. baughmani becomes difficult if not impossible. Some morphs from the bays are not wedge shaped but far more square in outline; these shells never grow as large as the wedge-shaped ones.

A. transversa is the most ubiquitous arc of the Texas-Louisiana coast, but is restricted to fairly shallow water; specimens collected below 25 fms. are undoubtedly Pleistocene fossils. Abundant in beachdrift everywhere and living offshore till 25 fms. depths, attached to hard objects in muddy environment (often on Pleistocene rock ridges).

Previous records for the Texas faunal province are: 15, dead valve on beach at Galveston, Corpus Christi, Sabine Pass; 18, Galveston, Corpus Christi; 19, all along Gulf beach; 21, listed; 45, Point au Fer, Cameron, La., Galveston, Corpus Christi, several well records; 56, listed; 58, Aransas Pass; 62, Mustang and Padre Islands; 66, marine Pleistocene of Texas; 67, Port Isabel; 69, listed in appendix 8; 98, alive in Cedar Bayou; 110, one of the most common shells on all Texas beaches, pl. 6, figs. 7-8; 123, north of Sebree Bank in 17-20 fms., in 16 1/2 fms. attached to empty Atrina serrata shells near Sebree; 135, dead in Gulf, alive in Bay; 136, common off East Texas, alive at many stations, attached by byssus, often to the internal surfaces near the umbones of large shells; 143, Matagorda Bay; 145, upper sound, inlets, shallow shelf, Mississippi Delta, pl. 2, figs. 9a-b; 160, Matagorda Bay, alive at many locations; 164, alive in Rockport area and Laguna Madre; 170, transitional shelf environment off East Texas, alive; 174, listed; 202, pl. 1, fig. 2 (Mexico); 206, beach records Tex. Conchol.,

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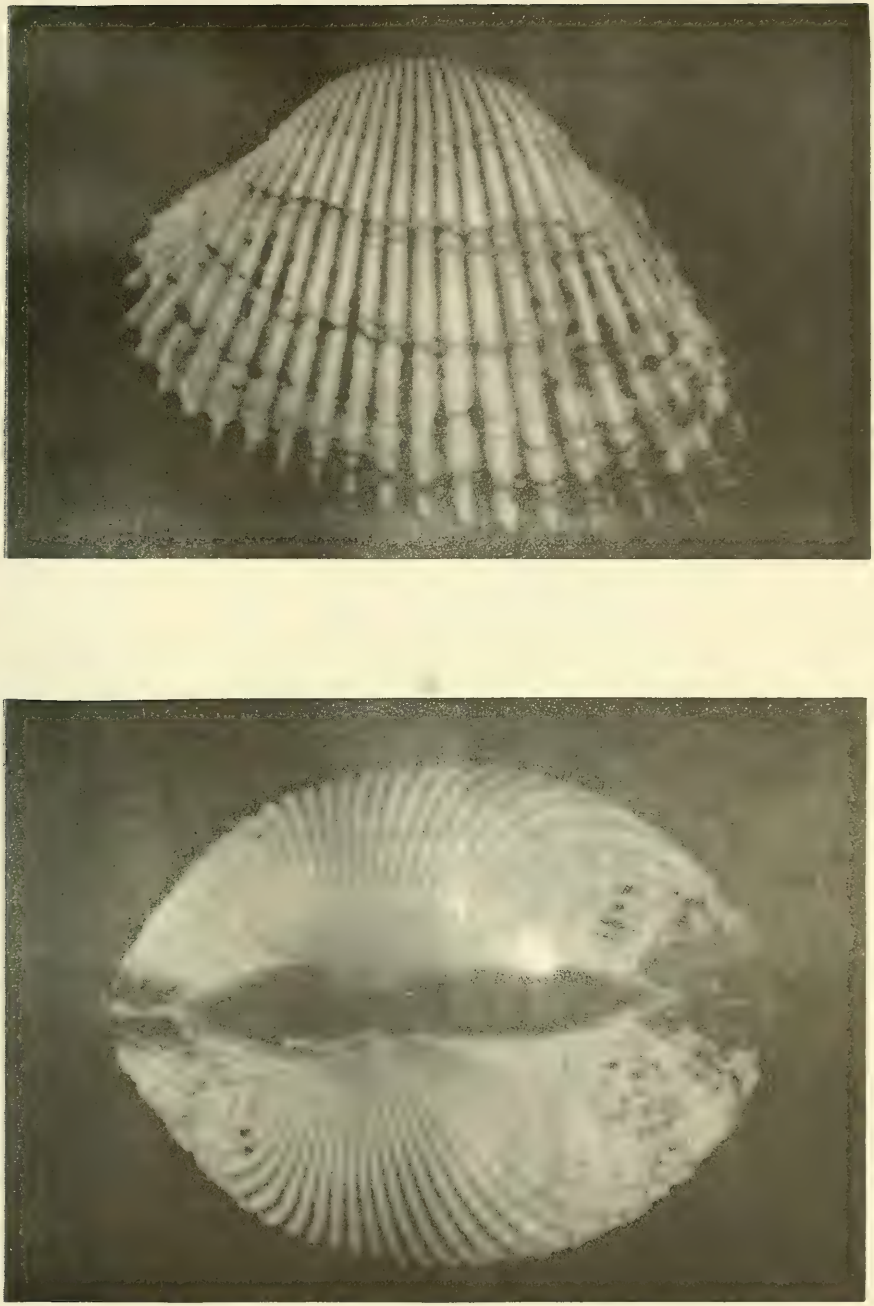

Anadara transversa collected on mud flats, Hoecker's Point, Galveston West Bay, by Harold Geis, Feb. 27, 1968. Size: 38 mm. length, 26 mm. height.

Vol. 3 (3); 208, listed from various environment, attached to seawhip; 225, Galveston; 236, Galveston; 261, offshore Galveston; 253, on reef off Padre Island; 269, figured on page 154.
Records H.M.N.S.: 116 lots, of which 52 contain live collected material.
Depth Range: 0-40 fms., alive 0-25 fms., one lot from 57 fms. is doubtfully identified.
Geographical Range: South of Cape Cod to Florida and Texas (Abbott, 1974).
Maximum Size: 42 mm. (Pleistocene valves from 25 fms.).
Eastern Pacific Analogue: ?

263. Anadara peterburgensis (?) Olsson and Harbison, 1953.
A single valve of a very broadly oval Anadara is here referred to this "species". If this valve is, as is most probably, merely an extreme morph of A. transversa, this species then is one of the most variable ones in the entire phylum of Mollusca
Previous references for the Texas faunal province are: None.
Records H.M.N.S.: 1 lot of a single valve. No live material.
Depth Range: 7 1/2 fms.
Geographical Range: Plio-Pleistocene of Florida.
Maximum Size: 12 mm.
Eastern Pacific Analogue: None.

264. Anadara (Caloosarca) notabilis (Roding, 1798).
Of this wellknown species only 3 lots are available in the H.M.N.S. collection. One lot consists of two sandblasted beach specimens from South Padre Island which are probably fossil or adventitious. Another is a single white shell from Heald Bank which gives the impression of being beachrolled, and which also could be a fossil or adventitious. The 3rd lot consists of a single very perculiar small specimen with a large auricle, which is only tentatively assigned to this species. It is a Caloosarca, quite different from the next species, in that it is somewhat wedge-shaped like some juvenile A. baughmani.

If this is indeed A. notabilis it is the only specimen known to me of recent origin in the N. W. Gulf of Mexico. There are several records in the literature but most are not trustworthy. Vokes (ref. 238) cites the species from off East Texas based on records of Hulings (ref. 136). Unfortunately Hulings is in error and the specimen figured by him are juvenile Lunarca ovalis. I may note here that also Abbott's figure 4975 in the 2nd edition of Am. Seashells is not notabilis, but probably A. floridana.
Previous records for the Texas faunal province are: 7, (Arca auriculata Lamarck), listed; 45, Texas (Dall); 136, at Sabine Bank, incorrect on plate 5, fig. 3, which shows juvenile Lunarca ovalis; 238, discussed on page 12.
Records H.M.N.S.: 3 lots, none alive.
Depth Range: 0 (beach)-6 fms.; Heald Bank, 28 fms., 1 fresh shell of doubtful identity.
Geographical Range: North Carolina, Florida to Brazil (Abbott, 1974).
Maximum Size: 55.5 mm. (Heald Bank).
Eastern Pacific Analogue: ?

To be continued

All photos by Harold Geis


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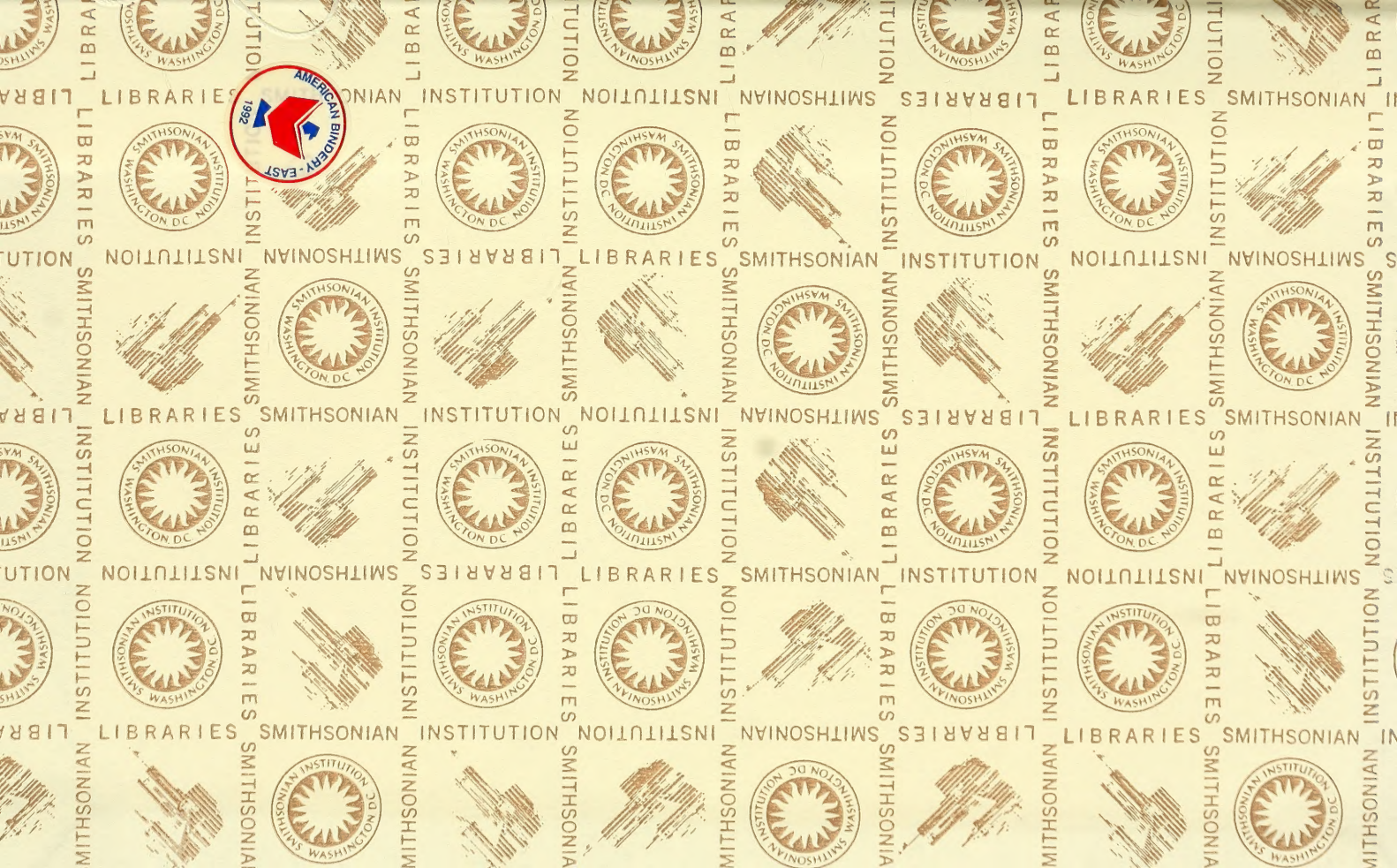
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