Scotch Bonnet

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26TH YEAR

Phalium granulatum

TABLE OF CONTENTS

EDITOR'S COMMENTS

This publication represents a joint effort by our North Carolina Shell Club membership. All inclusions, from scientific articles to poetry to size records, are contributions from our club members. Even the layout and printing of the bulletin is a member's contribution of talent and time.

We shell club members range from professionals in the field of malacology to those casually interested in shelling and strongly in the companionship of kindred spirits. One thing is for sure - we all obviously appreciate the beauty of shells. But more than that, we recognize that the pursuit of an interest in any aspect of the natural world is reward in itself which keeps us active and interested in life no matter what our age or life style. For that we are grateful, and reach out to share that interest with one another as well as those who will join us in the future.

Sally Nunnally

October 1983

NORTH CAROLINA SHELL CLUB, INC.
(MAILING ADDRESS: PO BOX 609, MOREHEAD CITY, NC 28557)

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TRIP TO THE PHILIPPINES

APRIL, 1980

Ruth S. Dixon

On April 7, 1980 Marguerite Thomas and I flew Pan Am to the Philippines from Guam on a non-conducted trip to the Philippines. We only had information that Bruce Bennard had given me in regard to the islands and the hotels. We landed first at the Manila Airport on Luzon Island; the Philippines include many islands. Bruce says that at low tide the islands increase in numbers. We were overwhelmed by the large population, the traffic, the heat and the poverty that was evident all around us. We were taken aback by the security everywhere; men with machine guns at the airport and men with shot guns at the entrance of every hotel, banks and department stores. Can you imagine two little grey haired ladies from North Carolina suddenly finding themselves in an environment such as that? On our first day we went on an all-day tour which included the volcano in the middle of a lake and visited the Carfel Museum where we viewed their beautiful shell collection and made a few purchases. I only bought a few shells, for I was looking forward to finding my own. I did purchase two pectens taken from the Cebu Sea, Pecten lentiginosus and Pecten macasserensis and two from the Sulu Sea, Pecten larvata and Pecten luculentum. I also purchased Murex penchinati, a very lovely rose colored murex. Seeing the shells displayed in the museum was a wonderful experience. Mrs. Carfel was a wonderful hostess to us welcoming us and serving drinks and cookies. While Marguerite was resting and sleeping, I dared to go out on the streets that evening and made a few purchases.

After spending two nights here, we flew to Cebu City on the Island of Cebu where we spent one night at the Magellan International Hotel. The young

man, who operated the elevator and brought our bags to our room, learned of our interest in shells. He contacted his friends who later came to our hotel room with shells for sale. I have a feeling that he was a go-between for dealers who want to sell shells to "rich Americans". I understand this is a common practice. Don't think for a single moment that the Filippinos don't know the value of shells, for they seem to be quite knowledgable. It did not take them long to find out that we were not the "rich Americans", so they went back and brought shells that were more in our price range. Perhaps the fishermen do not fully realize the value of their finds, but I doubt that. This is a source of income for the poor and also for those who are not so poor.

The shells they brought first to our room were the very rare ones and the most expensive such as the Golden Cowries, Cypraea aurantium and Conus gloriamaris. After communicating with them that we wanted shells in the medium priced range, they returned with many lovely shells that we could purchase. The Magellan accommodations were adequate. The hotel was in the process of renovation, and I am sure the rooms are quite lovely now. The food was delicious and the pool and grounds were beautiful. Since the hotel was in the heart of the city, we asked to be transferred to the beach. We learned that the Magellan had a luxury beach resort on Mactan Island but there were no vacancies. We were not about to stay in the city when we wanted to shell - not in our room but on the beach and in the water. After some inquiries from a nearby Travel Agency, we learned that there was an opening at Tambuli Resort on Mactan Island. After some negotiations with our hotel clerk, she soon had a taxi driver drive us across the bridge, past the airport along narrow dirt roads, past the native thatched roof dwellings with little children playing in the yards with the clothes that mother nature gave them when they were born,

through small villages and then turned down another road toward the beach where we were greeted by beautiful palm trees with the fronds waving in the sea breeze, lovely brillant colored tropical flowers, shrubs, and the white sand beach on the beautiful turquoise blue Mindanao Sea. We soon found ourselves in a quaint thatched roof cottage on the beach, a little tropical paradise.

We had our meals in the hotel dining room in the Pavalion. If you ever go to the Philippines, you will learn that most Filipinos are walking stores. On Tambuli they had shells and opals for sell. There are the very rich and the very poor - no in-between. We had security guards all day and night walking around our cottage. I understand that this more of a status symbol rather than a need of protection, but it did give me a secure feeling to awaken in the night to the walking of our guard past our cottage. The guards did prevent the Filipinos from worrying us trying to make a sale, for they would not permit them to come past the beach. If you were interested in their wares, you could just walk down to the beach. We engaged two young fellows, Celso P. Apa, and Constantino Taghoy who had an outrigger to carry us out to a small island around 4:00 p.m. where I snorkeled with Celso. He was quite nice and helpful, a good snorkeling partner who pointed out to me the different shells that were camouflaged to their environment. As the sun sank on the horizon and there was less bright sunlight, I began to find cowries which was a great thrill for me, for I had found few on Guam except for Cypraea moneta which were quite plentiful there. The larger cowries seem to be found at night. I found Cypraea vitellus Linne and Cypraea arabica Linne. I wish that the daylight had lasted longer for I was having wonderful luck. In the three hours that we shelled, I think we had excellent luck with Marguerite shelling on the shore in the shallow water with Constantino. Celso and I found Bursa

tuberosissima, Corculum cardissa, Terebra subulata, Conus lividus, Strombus labiatus, Strombus luhuanus, Lambis lambis, Conus miles, Casmaria erinaceus, Cypraca asellus, Chlamys senatorius of the Pectinacea family and many small shells, some of which have not been identified yet. Celso took charge of my bag that I usually hang from my belt. I also kept a plastic jar inside the bag to put the cones in to prevent them from brushing against my leg and stinging me, but Celso ignored all my precautions by not using gloves to pick them up or putting them in the jar. He just picked them up with his hands and dropped them in the bag with no concern about the proboscis. Since we could not rent the outrigger the next day, for the boat was shared by family members, we decided to go sightseeing.

The morning after sightseeing, we boarded the outrigger again at 6:00 a.m. and went back to the same island. It was low tide and as we approached we looked out in the distance and saw 50 to 100 local natives standing in the water about waist deep shelling or looking for food. There were also small outrigger boats pulling dredges. Since Marguerite was on shore wading, she saw one boat come in to shore to sort his catch dividing them into different containers. We had good luck snorkeling finding Lambis lambis, Strombus aurisdianae, Strombus luhuanus, Strombus lentiginosus, Conus imperiales, Bulla ampula, Conus capitaneus, Conus vexillum, Casmaria erinaceus, Strombus labiatus, Conus lividus, Lophiotoma acuta from the family Turridae, Turbo argyrostomus and many other shells. After shelling as long as we dared, since we were scheduled to fly to Davao at 1:15 p.m., the boys turned the boat back toward Mactan Island and to our cottage where we quickly had showers, changed clothes, packed our shells in containers and plastic bags and into our carry-on bags. After calling a porter to get our bags to the Pavalion, we had breakfast and waited for our taxi driver to take us to the airport. By the

way, I forgot to mention that on the day of sightseeing I had a few problems. Be careful how much fruit you eat when on these paradise islands for Marguerite and I made pigs of ourselves and loaded up on fresh pineapple, papayas, and mangoes.

At 1:15 p.m. we flew out on the Philippine Airline plane loaded with wet, dripping, live shells and arrived in Davo in about 40 minutes. It is quite a hassle in the Philippine Airports, not because they are so large, but because they have so many fees to be paid every step you take. It isn't that it is so expensive, but that it is confusing. We were met by an air conditioned taxi and driven to the Insular Hotel which is a very large hotel surrounded by many acres of palm trees, shrubbery and tropical flowers. The lawn was manicured by the Filipino workers. The topiary was trimmed into shapes of animals such as squirrels, eagles, cocks (a very important animal in the Philippines, for cock fighting is one of their important sports, which is not my "cup of tea". We had a lovely large room with a balcony overlooking the Davo Gulf. After we unpacked our bags, we put our Tambuli shells in alcohol on the balcony and went for a walk. The Insular is a beautiful hotel and the food is delicious, much better than at Tambuli. Breakfast was the best meal at Tambuli. There were several places to select from at the Insular. On Tambuli you were more or less a captive guest and had to eat what was offered. After a good meal of Philippine fish cuisine, we went to bed early, for we had had a busy day.

The next day being Sunday, April 13th, we decided to go on a City and Country Tour. After learning that the tide was low that a.m., we delayed our tour until afternoon and went shelling in the Davao Gulf back of our hotel. There were venders selling local shells on the beach, and of course I made some purchases, after which I went into the water where I found Oliva funebralis in the sand, Cypraea annulus, coral and small pectens. There were

quite a number of Filipinos in the water having fun, whom I found very friendly. After I shelled a while, I enjoyed talking to the young people. I especially enjoyed talking with Ester Telin who was a college senior. She introduced me to her brothers and sisters and father. After lunch, we went on an enjoyable Town and Country Tour.

Early Monday morning, after having made reservations with the Tourism Specialty Office, we left the dock at 9:00 a.m. for Samal Island. Again, we had two young fellows to operate the outrigger, but they were not helpful like the two were at Tambuli. They merely carried us over on the boat and went with us to the Pearl Farm and to the gift shop where I had an encounter with a snake while walking on the path to the shop. After we went into the water, the boys went to sleep on the boat. I needed a snorkeling partner, but I had to go it alone. The tide was low and the shelling was great. I waded with Marguerite at first and was so thrilled when she found the first Calpurnus verrucosus Linne in the family Ovalidae on soft coral in shallow water. After she pointed it out to me, then I began to find several. We found many Trochus tubiferus, Cymatium pileare, Latirus barclayi, Trochus maculatus, Drupa grossularis on rocks and coral, Polinices flemingiana, Vexillum rugosum, Tridacina crocea in the family Tridacinidae, Cyrineum gyrinum in family Cymatiidae, Cymatium nicobaricum, Rhinoclavis vertagus from family Cerithiidae, Bursa tubercsissima from family Bursidae, Tonna perdix from family Bursidae, Spondylus ducalis from family Spondylidae, and Terebrae amanda from family Mitridae. Marguerite found in very shallow water a Cymbiola vespertilio of the Volutidae family. Then I started snorkeling alone. I was so thrilled when I found a huge cone. It looked so large sitting on the coral in the water that I nearly flipped. Since I did not have my plastic jar in my bag, I was very uneasy and careful for I did not know right

off which cone I had found. I learned later that it was a Conus striatus which is one of the known poisonous species. Since the tide was coming back in, I started swimming toward the shore shelling all the way. As I snorkeled in, I found a lovely gold-mouthed Turbo chrysostomus, an Angaria delphina from the family Trochidae which was all covered with gross growth and also Chicoreus brunneus of the Muricidae family which was also covered with growth. I didn't realize that I had nice finds until I turned them over and saw the operculum of the shells. By this time the tide had come back in and I had to swim quite a way to reach Marguerite, for I could not get around the rocks except by swimming. We awakened the boys and went back to our hotel happy and tired.

Since we had to fly out early the next morning, we packed our shells and suitcases to fly back to Guam to visit my son and his family. It was quite a hassle getting all our shells packed so we would not create any odor problems on the plane, but fortunately we made it to our plane and settled down in our seats with our shells under our seats happy and tired.

A "SHORT" SAGA

She bought some new shorts and she wore 'em,
'Til she stooped for a shell and she tore 'em.
She salvaged the shell
But words cannot tell
Of the damage
To her decorum!

Bruce Huffaker

POEM

Maggie and milly and molly and may
went down to the beach (to play one day)

and maggie discovered a shell that sang
so sweetly she couldn't remember her troubles, and

milly befriended a stranded star
whose rays five languid fingers were;

and molly was chased by a horrible thing
which raced sideways while blowing bubbles; and

may came home with a smooth round stone
as small as a world and as large as alone.

for whatever we lose (like a you or a me)
it's always ourselves we find in the sea.

(E.E. Cummings, in The Colorado Review, Vol. 1, No. 1, Winter Issue)

-Contributed by Peggy A. Wilkerson
Raleigh, NC

Thought you might also find a place to use this:

"It is perhaps a more fortunate destiny," said Robert Louis Stevenson in his Lay Morals, "to have a taste for collecting shells than to be born a millionaire. Although neither is to be despised, it is always better to learn an interest than to make a thousand pounds; for the money will soon be spent, or perhaps you may feel no joy in spending it; but the interest remains imperishable and ever new."

-Contributed by Peggy A. Wilkerson
Raleigh, NC

SHELLS

SCULPTURED GEMS OF INFINITE VARIETY---
SOME BOLDLY ETCHED; OTHERS, OF DELICATE SYMMETRY.
SHAPES OF FASCINATING COMPLEXITY.
VIVID MAXIMA CHROMA TO TINTS OF EXQUISITE ARTISTRY.
MOTHER NATURE'S OWN JEWELS OF THE SEA,
CAST UP FROM HER SUBMARINE TREASURY;
DISPLAYED ON THE SANDS, SO DRAMATICALLY!

1981 EMILY J. COLLYMORE

MUSEUM BENEFITS FROM DONOR'S HOBBY

"The most fascinating thing about shells," Cora Staples says, "is that each one is built by a little glob of flesh. Many species of mollusks appear far back in geological time and then continue unchanged, or with very little change, right through to the present."

Mrs. Staples' knowledge of shells is evident in the variety of the Red and Cora Staples Shell Collection, given to the museum by Mr. and Mrs. Red Staples of Butner. The shells vary in size from the tiny Emerald Nerite to the giant clam, Syrinx aruanun. After arranging to give about half of her personal collection to the museum, Mrs. Staples spent months searching out and buying shells to make the exhibits representative of a worldwide collection.

Mrs. Staples had no thought of collecting seashells when she purchased a book, THE ROMANCE OF SHELLS, six years ago. "I just wanted to do some shell decoupage," she said. But the book sparked her interest in collecting shells, and her hobby has lured her into studying and learning more about the animals that built them.

Although she says she could never choose a favorite among her shells, Cora Staples specializes in bivalves, particularly spondylus and pectens. Mrs. Staples is a member of several shell clubs, including the North Carolina Shell Club, and has won first place ribbons and silver bowls in shell competitions.

Reprinted from "Whalebones"
Spring 1980

SHELL-LESS MARINE MOLLUSKS, and some with Regressively-Modified Shells

This is just an introduction to the extensive topic of marine mollusks who have lost their shells, or whose shells are in the process of regressive modification. In general, there are two big reasons for such changes. There are a few forms that are parasitic on sea-cucumbers, sea-anemones, starfish, or sea-urchins, where they have less and less use for a shell. In the great majority of cases, however, these changes are the result of Darwinian evolution and the natural selection of the fittest to survive in a special environment (= ecological niche or ecosystem), or in a specialized adaptive way. Thus, regression to a more simplified form is not due to retention of primitive characters as much as it is evidence of a degree of specialization. This is particularly true of our first example, which deals with the third class of Mollusca, namely, the APLACOPHORA, von Ihering, 1876 (also known as 'Solenogastres' Gegenbaur, 1878, and by other junior (= later) synonyms). These form a small group of wormlike sublittoral (= living in shallow water close to the shore) marine mollusks, which are partly primitive and partly specialized in form. In all cases, there is no shell, the exoskeleton (= cuticular) layer which may bear a variety of projections or spicules. Evidence of a more highly developed nervous system suggests that the simple body form and regressive features, including loss of the shell, are attributable to secondary, evolutionary, modification, rather than to the persistence of a primitive body makeup. Thus, Pelseneer (1906) regards the Aplacophora as degenerative forms, derived later than the Polyplacophora (= Chitons, or Coat-of-Mail Shells, with 8 shell pieces or valves, who constitute Class II), but from a common Amphineuran ancestry. Some systematists unite the two groups, as sub-groups of a single class: AMPHINEURA von Ibering, 1876 (meaning with 'nerve-cords on both sides'). Aplacophora means 'bearing no (protective) covering.' The APLACOPHORA are taxonomically classified in two 'Natural' Orders, the first with four Families, and the second with one. Detailed consideration of the Solenogasters will not be attempted here, and the reader is referred to the few specialized accounts of them in the not-wholly-adequate scientific literature. Tucker Abbott (1974), p. 407, cites a couple of good references.

The fourth Class of Mollusca, GASTROPODA Cuvier, 1797, the 'belly-footed' ones, are for those whose shell (if any) is all in one piece (= univalve) and typically is more-or-less snail-like. The Class is divisible into two or three Sub-classes, of which the first (IV-A) is now generally called Streptoneura Spengel, 1881, (= with 'twisted nerve' cords), largely replacing the older term "Prosobranchia' Milne-Edwards, 1868 (= with ''gills in front' of the heart). Its first Order (I): Archaeogastropoda Thiele, 1925, is for the ancient (in evolution) Gastropods. It contains a Super-Family (XV): Neritacea Rafinesque, 1815, which includes Family (68): TITISCANIIDAE Bergh, 1890, created for a single shell-less Genus: TITISCANIA Bergh, 1890, with the type-species (and sole representative) T. limacina Bergh, 1890. This is an unique kind of Sea-Slug, from Mauritius and the Indo-Pacific.

Incidentally, our numbering of the major categories (= taxa) in each Class is a personal working system based on several leading taxonomic (= classificatory) works.

In a sub-ordinal group that has been called Heteropoda Lamarck, 1801, is Super-Family (XXXIX): CARINARIACEA de Blainville, 1818. (Syn. 'Atlantaces" Wiegmann & Ruthe, 1832), comprizing three Families: (171) CARINARIIDAE de Blainville, 1818; (172): ATLANTIDAE Wiegmann & Ruthe, 1832; (173): PTEROTRACHEIDAE Gray, 1840. Members of this last family are shell-less, with the name Genus PTEROTRACHEA Forskal, 1775, having the type-species P. coronata Forshal, 1775, which

is a shell-less pelagic (= open ocean) finned gastropod, with a keeled tail, head with a large proboscis, short tentacles, and numerous slender branchial (= gill) processes. It is found, rarely, in the Gulf of California and the Indo-Pacific. Although they are now classified in the different families, there may very well be evolutionary steps in the shell regression, from (a) Carinaria, e.g. C. cristata (Linne, 1767), with a 2-inch pointed-cap shell; through (b) Cardiopoda, e.g. C. placenta (Lesson, 1803), with a minute cartilaginous shell that has a greatly expanded lip, which is bilobed in front; to (c) the shell-less Pterotrachea species, e.g. P. coronata Forskal, 1775. All these are uncommon, widely-ranging pelagic gastropods.

The second Gastropod Sub-class (IV-B): is now generally called Euthyneura Spengal, 1881 (= with 'straight nerve-cords'), encompassing the older groupings: (a) 'Opisthobranchia' Milner Edwards, 1868 (= "gills in the rear') and (b) 'Pulmonata' Cuvier, 1817 (with 'lung-like' air breathing organs). The parasitic fifth Gastropoda Order (5): Parasita P. Fischer, 1883 (Syn: 'Entoconchida' (Gill, 1871) Abbott, 1973), which, in our personal opinion, may be reduced to the rank of a Super-Family (LII): Entoconchacea Gill, 1871) has as its first Family (210): ENTOCONCHIDAE Gill, 1871. Its name Genus: ENTOCONCHA J. Muller, 1852, has the type-species E. mirabilis J. Muller, 1852. This interesting little mollusk is parasitic within the red sea-cucumber (Holothurian), Stichopus, and its relatives. Entoconcha has a partly-coiled larval shell, which is minute, ovate, and smooth, with a short spire and blunt apex. As it grows parasitically inside the sea-cucumber, the shell is lost and the mollusk becomes a worm-like snail, with a well developed pseudopallium (= false mantle), which serves some of the functions of the original mantle or pallium. A reported Puget Sound occurrence in the California sea-cucumber is questioned by Abbott (1974), p. 310 (see following).

A second Genus: ENTOCOLAS Voit, 1888, with the type species E. Ludwigii Voit 1888, is a small shell-less, sac-like, snail that lives in the intestine of the Holothurian (= sea cucumber) Myriotrochus, in the Bering Sea.

While the larval shells of Entroconchidae usually show a tendency to spiral, this is not the case with members of the second Family (211): ENTEROXENIDAE Heading & Mandall-Barth, 1938, which is based on the much more reduced Genus: ENTEROXENOS Bonnevie, 1902, which is endoparasitic in European Holothurians (= sea-cucumbers). The type species is E. ostergreni Bonnevie, 1902. Enteroxenos means "stranger in the intestine" (of the sea-cucumber). A related Genus: COMENTEROXENOS Tikasingh, 1961, differs from Enteroxenos by having a more complex branching tubular system in the female ovaries. The type-species is C. parastichopoli Tickasingh, 1961, named for its housing in the Californian sea-cucumber, Parastichopus californicus (Stimpson), where it lives attached to the anterior end of the host's intestine. Abbott (p.310) thinks it could be this species, rather than Entoconchus mirabilis (see above), which was found in Puget Sound sea-cucumbers of this same species. A third Genus: THYRONICOLA Mandell-Barth, 1946, with type-species T. mortensia Mandahl-Barth, 1946, occurs in the N. European White Frilly sea-cucumbers Eupentacta quinquesemita (Selenke) and E. pseudoquinquesemita (Selenke) and E. pseudoquinquesemita Deichmann. An American species Thyronicola americana Tickasingh, 1961, although barely 2 mm. wide, grows to a coiled length of up to 12 inches.

All these parasitic gastropods are pseudo-hermaphroditic (= bisexual), with the very regressive 'dwarf male' held captive in the pseudopallial brood-pouch of the female, thus ensuring perpetuation of the species.

There are a number of other marine mollusks which have undergone an evolutionary rather than acquired, regression of their shell, until many of them have become shell-less in the adult phase. We will illustrate this with some casual, and some in-depth, consideration of a number of other marine euthyneuran (opisthobranch) gastropods.

In the sixth Gastropod Order (6): Cephalaspidea P. Fischer, 1883, Super-Family (LIV): CYLICHNACEA A. Adams, 1850 (Syns. 'Philinacea"; 'Scaphandracea') some 44 genera (and subgenera) are distributed in 5 families, the members of which show this successive regressing evolution, ultimately to the shell-less condition. The first Family (219): CYLICHNIDAE A. Adams, 1850, and its first Subfamily (219a): Cylichninae A. Adams, 1850, are for some small Barrel-Bubble Shells, recent (= presently living) members of which belong to the Genus: CYLICHNA Loven, 1846, or its various sub-genera. The strict type-species is C. (Cylichna) cylindracea Pennant, 1777, the Cylindrical Barrel-Bubble, dredged off the coast of Norway. There are a number of N.W. Atlantic species, several of which are found off N. Carolina.

The second Subfamily (219b) Scaphandridae, is for the larger Canoe Shells in the Genus: SCAPHANDER Montfort, 1810, and its sub-genera. The strict type-species S. (Scaphander) lignarius (Linne, 1767) is the large Mediterranean Canoe Shell, whose length can exceed 3 inches. Another Giant Canoe Shell, S. (Scaphander) punctostriatus Mighels, 1841, ranges from N. Europe and the Artic Seas to off our East Coast down to Florida and the West Indies. It reaches up to 1-1½ inches in length. The Noble Canoe-Shell S. (Bucconia) nobilis Verrill, 1884, from off the New England coast, is nearly as large; and S. (Bucconia) watsoni Dall, 1881, Watson's Canoe Shell, is a much smaller shell from deep water off Cape Hatteras, N. C., down to the Caribbean. These representative examples of the two foregoing subfamilies serve to show that they have well-formed, external, and more-or-less cylindrical shells.

The second Family (220): PHILINIDAE Gray, 1850, is for the Lobe Shells or fragile Paper-Bubble Shells, where the shell is wide-mouthed and more degenerate, but is still exterior to the main body of the animal. Genus: PHILINE Ascanius, 1772, has a number of sub-genera. Its strict type-species is P. (Philine) operta (Linne, 1767), the Open Paper-Bubble or Lobe Shell. I believe Linne's specimens came from the Cape of Good Hope, but essentially similar shells range up to the Mediterranean and to England, where Ascanius' holotype (= used for the original naming) was given the subspecies name P. (Philine) operta quadripartita Ascanius, 1772, the 'Four-part' Lobe Shell. Philine (Laona = 'Ossiania') quadrata quadrata (S. Wood, 1839) is an English Coralline Crag fossil, but the subspecies P. (L.= 'O') quadrata scutulum (Loven, 1840) still lives in deep water off Iceland, along with another species P. (Hermania) scalva (Muller, 1774). 'Scalva' means rough; and 'scutulum' is a little shield, in Latin. I believe it is the subspecies name--scutulum which should be applied to the shell called just--quadrata, the Quadrate (= Four-lobed) Paper-Bubble, dredged in the Arctic, N. Atlantic, and down to N. Carolina offshore. There are a number of other species found off both the East and the West coasts of America. One or two tiny species, 1-2mm. long, found off lower California, are now put in a separate Genus, WOODBRIDGEA S.S. Berry, 1958.

In the next two families, there is just a small internal shell and the animal has regressed to a simpler slug-like form. Like many land-slugs, sea-slugs often develop a thickened patch to help protect the head region. This structure is called the cephalic plate.

Family (221): DORIDIIDAE Gray, 1847, is based on the Genus: DORIDIUM Meckel, 1809, with the type-species D. tricolorata (Renier, 1807), the Three-colored Doridiid from the Mediterranean. The Latin term 'Doridium' is the diminutive of DORIS, which suggests a relationship (actually not at all close) to the Nudibranch genus DORIS Linne, 1758, which evolved considerably later. Renier (1804) had suggested a genus name 'Aglaja', but this did not fulfil the present ICZN Code nomenclature requirements, so, until such time as official action may be taken to conserve the name 'Aglaja' (and hence the Family synonym 'Aglajidae'), these must be regarded as nude (= invalid) names (n.n. = nomen nudum; plural nomina nuda). Some Doridiid species occur in the Caribbean and off California. Another genus in this group is NAVANAX Pilsby, 1895, whose type-species, N. inermis (Cooper, 1863) is the formidable Californian sea-slug, whose length can reach 7 inches. It voraciously sucks-in and devours various bubble-shells, nudibranchs, and other sea-slugs, even including members of its own kind. The International Oceanographic Foundation's excellent little publication Sea Frontiers (Vol. 25(3), 151-152, 1979) has some nice colored illustrations, but erroneously puts it in the next Genus: CHELIDONURA A. Adams, 1850, the type-species of which is C. hirudinina (Quoy & Gaimard, 1833), the Leech-like sea-slug of the Caribbean.

The fourth Family (222): GASTROPTERIDAE Swainson, 1840, is based on the Genus: GASTROPTERON Meckel, in Kosse, 1913, meaning 'winged stomach'. Its type-species is G. meckeli Kosse, 1913, Meckel's Winged Sea-Slug, from the Mediterranean. A related species, the Bat-wing Sea-Slug, G. rubrum (Rafinesque, 1814) occurs from the Gulf of Mexico to Brazil; and another species G. pacificum Bergh, 1894, the Pacific Bat-wing sea-slug, ranges down the West Coast of N. America from Alaska to the Gulf of California.

The members of the last two families have cephalic shields under which a reduced internal shell lies posteriorly. From the sides of the body two fleshy wing-like extensions (called parapodia) project and undulate to give the mollusk a wavy, rolling, swimming motion. It can also crawl on the ocean bottom.

The fifth Family (223): RUNCINIDAE H. & A. Adams, 1854, is for some special tiny sea-slugs without any shell, lacking a distinct cephalic shield, and without parapodia. Genus: RUNCINA (Forbes, in Forbes & Hanley, 1857) is based on the type-species R. coronata (Quatrefages, 1844), the tiny Crowned sea-slug of the Mediterranean and the N. Atlantic. Its discoverer Quatrefages mistakenly put it in a genus he called 'Pelta', unaware that PELTA Beck, 1837, was an earlier homonym for a small dune snail which properly goes under the prior generic name SUCCINEA Draparnand, 1801, so that both uses of the term 'Pelta' are invalid, and the suggested Family name 'Peltidae', as a synonym for RUNCINIDAE, must be abandoned. (Incidentally, Succinea campestris Say is found on sand dunes in N. Carolina, particularly on vegetation near temporary pools that form after rain.) Runcina coronata hancocki Forbes, 1853, is an English subspecies that is very close to the Mediterranean--coronata coronata. Other Runcinid genera include: (a) RUNCINELLA Odhner, 1924, with type-species R. zelandica Odhner, 1924, from New Zealand; and (b) ILDICA Bergh, 1889, with type-species I. nana Bergh, 1889, from Mauritius in the Indian Ocean.

The next Gastropod (Opisthobranch) Order (7): ACOCHLIDIOIDEA Kuthe, 1935, is for the Sand Nudibranchs, comprising the Super-Family (LVIII): ACOCHLIDIACEA Kuthe, 1935, containing 7 genera of small and little-known sea-slugs, the so-called Sand Nudibranchs, which are now distributed between 3 families (or possibly subfamilies). The first Family (230): ACOCHLIDIIDAE Kuthe, 1935, is

based on the Genus: ACOCHLIDIA Kuthe, 1935, with the type-species (and sole representative) A.weberi (Bergh, 1895), Weber's Sand Nudibranch. Bergh (1895) used the now questioned genus name 'Hedyle', and hence the family name 'Hedylidae', under a super-family name 'Hedylopsidacea' Bergh, 1896. Thiele (1931), p. 443, accepted Bergh's names and listed the three groups as 'sub-families.

The second Family (231): HEDYLOPSIDAE Bergh, 1896, is based on Genus: HEDYLOPSIS, which Thiele (1931) separated from Bergh's (1895) 'Hedyle', for the type-species (and sole representative) H. spiculifera (Kowalevsky), the Spiky Sand Nudibranch. Thiele (1931) also separated Genus: PARHEDYLE, with type-species (and sole representative) P. tyrtowii (Kowalevsky), Tyrtow's Sand Nudibranch.

The third Family (232): MICROHEDYLIDAE Odhner, 1938, is created for four new genera. Genus: MICROHEDYLE Hertling, is based on the type-species M. glandulifera (Kowalevsky). The Gland-bearing Sand Nudibranch. Genus: OKADAIA Baba, 1930, with type-species O. elegans Baba, 1930, the Elegant Sand-Nudibranch is one that I've not been able to confirm. Genus: GANITUS Marcus, 1953, is based on the type-species G. evelinae Marcus, 1953, Eveline's Sand-Nudibranch, known only from Brazil. Genus: UNELA Marcus, 1953, is based on the type-species U. remanei Marcus, 1953, Remane's Sand-Nudibranch, which ranges from S. E. Florida to Brazil. All these sand-nudibranchs are exceedingly simple forms of shell-less opisthobranch gastropods.

The Euthyneuran SUPER-Order: PTEROPODA Cuvier, 1804, commonly called Sea-Butterflies, is composed of two large Orders: (9) (a): THECOSOMATA de Blainville, 1824, having 'covered bodies', for the most part with a translucent horny (= conchiolin) shell, except for the soft-shelled (virtually shell-less) Family (239): CYMBULIIDAE Gray, 1840, etc. (see below); and (10) (b): GYMNOSOMATA de Blainville, 1824, having shell-less 'naked bodies'. (Incidentally, these used to be classified under a much later Order (13), the Sacoglossa (see later).) Sub-orders are recognized by some authorities. There are 17 genera (and subgenera) in the first Super-Family (LX): LIMACINACEA de Blainvill, 1823 (Syn.: 'Spiratellacea' Dall, 1921), with 2 in Family (235): LIMACINIDAE de Blainville, 1823, (Syn. = 'Spiratellidae' Dall, 1921); and 15 in Family (236): CUVIERINIDAE Gray, 1840 (Syn.: 'Cavolinidae' H. & A. Adams, 1854), which may be subdivided into three subfamilies.

The second Super-Family (LXI): PERACLIDACEA C. W. Johnson, 1915, has 6 genera arranged in 4 Families: (237) PERACLIDAE: (238) PROCYMBULIIDAE; (239) CYMBULIIDAE; (240) DESMOPTERIDAE. In Family (237) PERACLIDAE, the fragile brownish shell has left-handed (= sinistral) whorls, resembling the fresh-water pond snails Physa. The PROCYMBULIIDAE, CYMBULIIDAE, and DESMOPTERIDAE are essentially shell-less.

The 7 Gymnosomate (10) families may all be combined in one Super-Family (LXII): HYDROMYLACEA Pruvot-Fol, 1942 (with the invalid synonym 'Anopsidacea' Hoffmann, 1931). Earlier names, based on junior synonyms or homonyms, or, in one case, on a misspelling, must be rejected, so we will only use, for the first Family (241), the correct name HYDROMYLIDAE Pruvot-Fol, 1942. This is properly based on the Genus: HYDROMYLES Gistel, 1848, with the type-species H. gaudichaudii (Souleyet) from the Indo-Pacific. Family (242): LAGINIOPSIDAE Pruvot-Fol, 1942, is based on a single Genus: LAGINIOPSIS Pruvot-Fol, 1922, with type-species L. triloba Pruvot-Fol, 1922. Family (243): PNEUMODERMATIDAE Latreille, 1825, is based on Genus: PNEUMODERMA 'Cuvier, 1804', Peron and LeSueur, 1810, with type-species P. atlanticum Oken, 1815, cf. P. mediterraneun (Beneden,

1838). There are three other genera. Family (244): CLIOPSIDAE A. Costa, 1873, is based on a single Genus: CLIOPSIS Traschel, 1854, with type-species: C. krohnii Troschel, 1854. Family (245): NOTOBRANCHAEIDAE Pelseneer, 1886, is based on Genus: NOTOBRANCHAEA Pelseneer, 1886, with type-species N. macdonaldi Pelseneer, 1886. There are two other genera. Family (246): CLIONIDAE Rafinesque, 1815, is based on Genus: CLIONE Pallas, 1774, with type-species C. limacina (Phipps, 1774), the Common Clione, from N. Carolina up to the Arctic, Canada, and circumpolar, west to Alaska and east to N. Europe. There are three other genera. Family (247): THLIPTODONTIDAE Kwietniewski, 1910, is based on Genus: THLIPTODON Boas, 1886, with type-species T. geganbauri Boas, 1886. There is one other genus.

All these Gymnosomate Pteropods lack a shell, and have no skirt nor cavity in the much reduced mantle (= pallium), but the head is well-developed and bears two pairs of tentacles, the posterior ones carrying rudimentary eyes. Jaws are evident and a radula (= rasping tongue) is present. The Pteropods are a big topic for a separate study, so we'll leave them here after these few introductory remarks.

The Gastropod (Eythyneuran) Order (13): SACOGLOSSA von Ihering, 1876 (with several synonymns) contains a number of groups of marine mollusks in which the shell is modified, reduced, or absent.

Super-Family (LXXXIX): OXYNOACEA H. & A. Adams, 1854, contains 7 genera (including sub-genera), arranged in two families (some having now been removed from earlier assignments in other taxa).

Family (329): ARTHRESSIDAE Evans, 1950 (and Morton, 1958), which may deserve prior recognition as 'VOLVATELLIDAE' Pilsby, 1895, is based on Genus: ARTHESSA Evans, 1950, with type-species A. cincta (G. H. Nevill), the colored Sea-Slug from Ceylon. Genus: VOLVATELLA Pease, 1860 (which is now removed from association with the Cephalaspidean Genus: CYLINDROBULLA P. Fischer, 1856) has the type-species V. fragilis Pease, 1860, the Fragile Sea-Slug, from Hawaii.

Family (330): OXYNOIDAE H. & A. Adams, 1854, is based on Genus: OXYNOE Rafinesque, 1819, with the type-species O. olivacea Rafinesque, 1819, the Olive-colored Sea-Slug from the Mediterranean. The Oxynoe Sea-Slugs have a fragile shell, consisting of one large whorl, covering the gills, and is nearly all aperture. There are also a couple of Caribbean and one Panamic species. Genus: LOBIGER Krohn, 1847, is based on the strict type-species L. (Lobiger) serradifalci (Calcara, 1840), which is another Mediterranean Sea-Slug. ? Sub-genus: Dipterophysis Pilsby, 1896, perhaps based on a malformed specimen, may not be separable from L. (Lobiger) s.s. (= in the strict sense), but Zilch (1959-60), p. 55, separates it on the basis of the questionable type-species L. (Dipterophysis) souverbiei (P. Fischer, 1857). It occurs in the Caribbean and in the Indo-Pacific. Subgenus: Lophopleurella Zilch, 1956, (replacing 'Lophopleura' Thiele, 1912; non Ragonot, 1891) is based on the subtype species L. (Lophopleurella) capensis (Thiele, 1912), from the False Bay side of the Cape Peninsula in South Africa. Sub-genus: Ptergophysis P. Fischer, 1883, is based on the subtype species L. (Ptergophysis) viridis (Pease, 1860), a Greenish Sea-Slug from the Caribbean and the Indo-Pacific.

The next Sacoglossan Super-Family (XC): PLAKOBRANCHACEA Gray, 1840 (Syn." 'Elysiacea' H. & A. Adams, 1854) contains some 22 genera (and subgenera)

arranged in 5 families. Family (331): PLAKOBRANCHIDAE Gray, 1840 (Syn.: ;Elysiidae' H. & A. Adams, 1854), is based on Genus: PLAKOBRANCHUS Hasselt, 1824, with the type-species P. ocellatus Hasselt, 1824, the Eyed Sea-Slug.

Genus: ELYSIA Risso, 1818, is based on the strict type-species E. (Elysia) viridis (Montagri, 1804), from European Seas (England). It is usually known as the Timid Sea-Slug from Risso's (1818) incorrect name 'Notarchus' (see later) timidus. Other species occur off the East and the West coasts of the U.S.A. Subgenus: Elysiella Verrill, 1872, is based on the subtype species E. (Elysiella) verrilli Thiele, 1931 (replacing the invalid species name - 'catula' Verrill, 1872; non Gould, 1870). Verrill's name, however, is the reason for its popular designation as the Kitty-cat Sea-Slug. It ranges from Massachusetts to Virginia, and other species occur off Bermuda, Florida, and in the Caribbean. Sub-genus: Thuridella Bergh, 1872, is based on the subtype species E. (Thuridella) splendida Grube, the Splendid Sea-Slug (Elysia). Sub-genus: Elisiobranchus Pruvot-Fol, 1930, is based on the subtype species E. (Elisiobranchus mercieri Pruvot-Fol, 1930, Mercier's Sea-Slug.

Genus: TRIDACHIA Deshayes, 1857 (needlessly emended to 'Thridachia' by Thiele, 1931, p. 415) is properly based on the strict type-species T. (Tridachia) crispata (Morch, 1863),--replacing the invalid earlier name--'schrammi' of Deshayes, 1857. This is the common (Sea)-Lettuce Slug,which is found among the Sea-lettuce (ulva) off Bermuda, S. Florida, and in the Caribbean. Subgenus Tridachiella Macfarland, 1924, is based on the subtype species T. (Tridachiella) diomedea Bergh, 1894, which ranges from the Gulf of California to Panama.

Family (332): CALIPHYLLIDAE Tiberi, 1880, is based on Genus: CALIPHYLLA A. Costa, 1867, with the strict type-species C. (Caliphylla) mediterranea A. Costa, 1867, from the Mediterranean. Sub-genus: Lolifera Pease, 1871 (replacing 'Polybranchia' Pease, 1860; non Latreille, 1825; and also replacing 'Phyllobranchus' Alder & Hancock, 1864; non Cirard, 1850), is based on the subtype species C. (Lolifera) orientalis (Kelaart).

Genus: CYERCE Bergh, 1871, is based on the type-species C. elegans Bergh, 1871, the Elegant Sea-Slug (Caliphylla). Two Caribbean species are also reported.

Family (sss): LIMAPONTIDAE Gray, 1847 is based on Genus: LIMAPONTA Johnston, 1836, with the European type-species L. capitata (O.F. Muller, 1774), which Johnston (1836) needlessly re-named 'nigra', the Black Sea-Slug, from specimens off Massachusetts.

Genus: ACTEONIA Quatrefages, 1844, is based on the type-species A. senesta Quatrefages, 1844. Similar, if not identical, species were called--'cocksii', and 'corrugata', by Alder and Hancock.

Family (334): HERMAEIDAE H. & A. Adams, 1854 (Syn.: 'stiligeridae' Iredale & O'Donoghue, 1923), is based on Genus: HERMAEA Loven, 1844, with type-species H. bifida (Montagu, 1815), from Europe (England). Abbott (1974) notes one New England species and another from Sonora Province, W. Mexico. Genus: APLYSIOPSIS Deshayes, 1835 (Syn.: 'Hermaeina' Trinchese, 1873, for--maculosa Trinchese, 1873), is properly based on the strict type-species A. (Aplysiopsis) elegans Deshayes, 1835, the Elegant False Sea-hare. Subgenus: Phyllobranchiopsis Cockerell and Elliot, 1905, is based on the subtype species A. (Phyllobranchiopsis) modesta (Loven, 1844), the Modest False Sea-hare, from Europe, Canada, and both sides of the U.S.A. Genus: COSTASIELLA Pruvot-Fol, 1951, is based on the type-species C. virescens Pruvot-Fol, 1951. Genus: PLACIDA Trinchese,

1876 (Syn.: 'Laura' Trichese, 1873-n.n) is based on type-species P. brevirbinum Trinchese, 1876, named for its 'snub-nose'. Abbott (1974), p. 339, cites P. dendritica (Alder & Hancock, 1843) as a widely-ranging N. Atlantic and N. Pacific species, which is found in outer tide pools feeding on Bryopsis and Codium. Thiele (1931) p. 414, makes Placida a sub-genus of Genus: PHYSOPNEUMON A. Costa, 1869, the strict type-species of which is P. (Physopneumon) carneum A. Costa, 1869, the Fleshy Sea-Slug. Sub-genus: Hermaeopsis A. Costa, 1869, is based on the sub-type species P. (Hermaeopsis) variopictum (A. Costa, 1869), the Variably-painted Sea-Slug. Genus: STILIGER Ehrenberg, 1831, is based on the strict type-species S. (Stiliger) ornatus Ehrenberg, 1831, the Ornate Sea-Slug. Winckworth (1932) p. 333, includes one English species S. (S.) bellubus (d'Orbiguy, 1837) and Abbott (1974) pp. 339-340, includes this among a number of American species. Sub-genus: Ercolania Trinchese, 1882, is based on the subtype species S. (Ercolania) pancerii Trinchese, 1882. Abbott, p. 380, mentions another Mediterranean species S. (E.) costai Pruvot-Fol, 1951, as also found living among Padina off Key Largo, Florida.

Family (335): OLEIDAE Thiele, 1926, is for the single Genus: OLEA Kjerschow & Agersborg, 1923, with the type-species (and sole representative) O. hansineensis Kjerschow & Agersborg, 1923, which Abbott, p. 340, reports as living on the eelgrass Zostera in Puget Sound, Washington. The reader is referred to A. Tucker Abbott's American Sea-Shells, 2nd ed. (1974), for details concerning most of the foregoing species, genera, and families.

The next Sacoglossid Super-Family (XCI): JULIACEA E. A. Smith, 1885 (with some more recent synonyms), is especially interesting since their unusual shell is in two pieces, so that they were once classed among the Bivalves, until Joe Morrison (1961) pointed out that the snail-like animal is obviously a Gastropod. Hence, we now list, as Gastropod Family (336): JULIIDAE E. A. Smith, 1885, and its first Sub-family (336a): Juliinae E. A. Smith, 1885, as primarily based on Genus: JULIA Gould, 1862, with the type-species J. exquisita Gould, 1862. Abbott (1974) p. 341, after Myra Keen (1971) p. 815, mentions a Panamic species J. thecaphora (Carpenter, 1857); and Habe (1961), p. 93 (of the English edition) cites a Japanese species as 'J. (Prasina)' japonica Kuroda & Habe, 1951. The American authors regard 'Prasina' Deshayes, 1863, as a synonym, rather than a separable sub-genus. They also regard as junior synonyms the family and superfamily names 'Tamanovolvidae' and 'Tamanovolvacea', Kawaguti & Baba, 1959 (see below). The Super-family name 'Bertheliniacea' Baba, 1961, is likewise invalidated (fide Keen & Smith, 1961) if only the full Family: JULIIDAE is recognized. However, this is now subdivided into two Sub-families, the second being (336b): Berthelininae Beets, 1949, based on the separate Juliid Genus: BERTHELINIA Crosse, 1875, the original strict type-species of which was a Paris Basin Eocene fossil: B. (Berthelinia) elegans Crosse, 1875. Recent surviving species have since been found on various Caulerpa sea-weeds, growing in Japan, the Gulf of California, the Caribbean, and also in North Carolina waterways (fide Charles Jenner). These shells are now put into a Sub-genus: Edenttellina Gatliffe and Gabriel, 1911, with the above Japanese representative J. (Edenttellina) limax (which Kawaguti & Baba put under 'Tamanovolva') as the true subtype species. 'Edenttellina' means 'toothless tellin', erroneously likening it to a small Tellin, which is a well-known Bivalve genus. A Caribbean species B. (Berthelinia)caribbea Edmunds, 1963, is cited by Abbott (1976) p. 361, as living on the green alga (= sea-weed) Caulerpa verticillata Agardh, in salt-water channels of our southern mangrove swamps. I'm not sure whether Charles Jenner (of our UNC Zoology Department) has identified his N. Carolina specimens with the Caribbean species. Other representatives are found in Baja California.

The next Order (14): 'ANASPIDEA' Boettger, 1955, was created for the well-known large Sea-hares in Family (338): APLYSIIDAE Rafinesque, 1815. Since 'Anaspidea' is an earlier name for an Order in PISCES (= Fishes),we suggest that 'APLYSIOISA' Rafinesque, 1815, is a more appropriate ordinal name, and it agrees with the Family name and with the established Super-Family (SCII): APLYSIACEA Rafinesque, 1815, of which APLYSIIDAE is its first full Family (338). This and the Sub-family (338a): Aplysiinae Rafinesque, 1815, are based on Genus: APLYSIA Linne, 1767, with the strict type-species A. (Aplysia) depilans (Linne, 1758), the Hairless Sea-hare, which ranges widely inshore off the continents that border the Atlantic Ocean. The International Commission for Zoological Nomenclature (ICZN, for short), in Opinion 200, conserves these uses of the cited terms. Linnaeus, in 1758, had used the term 'TETHYS leporina', meaning 'Sea-hare', but, in 1767, he clearly indicated that the Genus name TETHYS should be used only for a small Dendronotid Nudibranch (which is now put in a much later Family (365): TETHYIDAE Rafinesque, 1815, based on this revised use of Genus: TETHYS Linne, 1758, with the now-recognized type-species T. fimbria (Linne, 1758)). Some authorities attribute A. depilans to Gmelin, 1791, the author (after Linnaeus' death) of the 13th, and final, edition of the famous Systema Naturae (= the System of Nature) in which Linnaeus originally laid down the foundation of our modern scientific (Latin) binomial nomenclature. A. (Aplysia) punctata (Cuvier, 1804) is the Dotted Sea-hare, found swimming among Sea-lettuce (Ulva) in the seas of Europe. Aplysias have wing-like lateral body extensions, called parapodia, which enable them to swim with an undulating motion. When frightened, they often cloud themselves in a burst of dark-brown fluid, much like the ink of the Octopus. Aplysias have a fragile yellowish internal shell of uncalcified conchiolin. A. (Aplysia) willcoxi Heilprin, Willcox's Sea-hare, is the common species in North Carolina, and it ranges up to Cape Cod, Massachusetts, and also to Bermuda, Florida, Texas, and the West Indies. Sub-genus: Aplysiopsis Bergh, 1898, is based on the sub-type species A. (Aplysiopsis) juanina (Bergh, 1898), named for its occurrence off Juan Fernandez (Robinson Crusoe's Island) in the S. E. Pacific. Sub-genus: Neaplysia Cooper, 1863, is based on A. (Neaplysia) euchlora A. Adams, 1801, the Truly-green Sea-hare from Japan and Borneo. Sub-genus: Pruvotaplysia Engel, 1936, is based on A. (Pruvotaplysia) parvula Guilding, in Morch, 1863, the Diminutive Sea-hare from the Caribbean and from California. Subgenus: Syphonota H. & A. Adams, 1854, is based on A.(Syphonota) geographica (A. Adams & Reeve, 1850), the Geographic Sea-hare of the Indo-Pacific, which is questionably reported also off Dry Tortugas, Florida. Subgenus: Tullia Pruvot-Fol, 1933 (Syn. = 'Metaplysia' Pilsby, 1951), is based on A. (Tullia) juliana Quoy & Gaimard, 1832, the so-called Walking Sea-hare from Florida and to Brazil. It is also reported from California. Subgenus: Varria Eales, 1960, is based on A. (Varria) dactylomea Rang, 1828, the Spotted Sea-hare from both sides of the Atlantic. A. (Varria) Morio Verrill, 1901, is the Giant Black Sea-hare of the Caribbean and N. W. Atlantic. It can reach a length of 12 inches, but this is much less than the Giant Black Sea-hare of California, which reaches up to 30 inches, and can weigh as much as 35 pounds. Its scientific name is A. (Aplysia) vaccaria Winkler, 1935 (the name means 'cow-like') and we should have mentioned it earlier among our examples of the strict genus A. (Aplysia) species. Genus: PARAPLYSIA Pilsbry,1895, is separated on the basis of type-species P. mouhoti (Gilchrist), from the Indo-Pacific.

The second Aplysiid Sub-family (338b): Dolabriferinae Pilsbry, 1895, is based on Genus: DOLABRIFERA Gray, 1847, with the type-species D. dolabrifera 'Cuvier' (Rang, 1825), from Reunion I. in the Indian Ocean. It is commonly called the Warty Sea Cat and it is occasionally found off Bermuda, in the Caribbean, and also off California. Genus: PETALIFERA Gray, 1847 (Syn.: 'Aplysiella' P. Fischer, 1872) is based on the strict type-species P. (Petalifera) virescens (Risso, 1826),

from the Mediterranean. Perhaps (Rang 1825) should be credited for the species name Petalifera. A rare species P. (Petalifera) ramosa Baba, 1959, occurs off Japan and off S. E. Florida. Sub-genus: Pseudaplysia Pilsbry, 1896, is based on subtype species P. (Pseudaplysia) punctulata (Tapparoni-Canefri), the Pinpointed False Sea-hare, from Japan. Genus: PHYLLAPLYSIA P. Fischer, 1872, has the type-species P. lafonti (P. Fischer, 1870), Lafonte's False Sea-hare, from the Mediterranean. There is a Caribbean species and another from the West Coast.

A third, questionably-separable, Sub-family (338c): Dolabellinae Thiele, 1926, is suggested for Genus: DOLABELLA Lamarch, 1801, with type-species D. callosa Lamarck, 1801, from the Red Sea. Martyn's (1786) prior name--'scapula' is invalid according to the ICZN, D. gigas, and D. auricularia (Lightfoot, 1786), from the Panamic region, are other well known species.

The internal shells of Dolabriferinae and Dolabellinae are conspicuous and partly calcified in some species, but they may be entirely absent in others. Because of the calcification, some fossil representatives are to be expected, hence it is now thought that the Dolabellinae should include the preserved fossil Genus: SABAZIELLA Issel, 1922, with the type-species S. texturata (Issel, 1922) from the Pliocene of Italy.

The fourth Sub-family (338d): Notarchinae Eales, 1925, is based on Genus: NOTARCHUS Cuvier, 1817, with the type-species N. indicus (Schweigger), from the Indian Ocean. Marcus and Marcus (1962) report a Florida Keys (Islamorada) recovery of a Japanese sub-species N. punctatus armatus Baba, 1938.

Genus: BURSATELLA de Blainville, 1817, with the type-species B. leachii de Blainville, 1817, is from the Red Sea and the Indo-Pacific as far as New Zealand. A subspecies B. leachii pleii Rang, 1828, occurs from N. Carolina to Florida, the West Indies, and Brazil. Now elevated to the rank of Genus: ACLESIA Rang, 1828, has the type-species A. savignana (Audouin, 1826). A reputed California species--rickettsi Macfarland, 1966, may belong in the genus: BARNARDACLESIA Eales & Engel, 1935, has the type-species B. cirrhifera (Quoy & Gaimard, 1832) (Syn.: - 'lineolatus' Gould, 1852) from the Indo-Pacific. Abbott (1974), p. 346, says S. longicauda is abundant off Baja California and occurs in tropical seas all over the world.

Family (337): AKERIDAE Pilsbry, 1853 (ICZN Opin. 539), which Boettger, 1935, emends to 'Akeratidae', has been deferred to this point. Its special interest is that it has now been reduced to the single name Genus: AKERA O. F. Muller, 1776, with the type-species A. bullata O. F. Muller, 1776, from Copenhagen, Denmark. (Its former associates HAMINOEA and CYLINDROBULLA are now reassigned elsewhere, thus changing the classifications in Thiele (1931)).
AKERA has a cephalic shield, and parapodia used for swimming, but tentacles are lacking. There is an external shell, but this is thin, inrolled, and somewhat resembles a Bubble-Shell (Bulla). Two species have been reported from the Caribbean (fide Abbott, 1974).

The next Order (15): Notaspidea Odhner, 1939 (cf. 'Acoela' Thiele, 1926) includes two Super-families. For the first, Odhner (1939) prefers to accept 'Umbraculacea' Doll, 1889, but this is legitimately preceded by (XCIII): TYLODINACEA Gray, 1847, with two Families, and each with two sub-families.

Family (339): TYLODINIDAE Gray, 1847, and its first Sub-family: Tylodininae Gray, 1867, are based on Genus: TYLODINA Rafinesque, 1819, with the strict type-species T. (Tylodina) 'punctulata' Rafinesque, 1819, (= citrina Joannis)

from the Mediterranean. Some more species occur from California south, and in the Caribbean. Sub-genus: Tylodinella Mazarelli, 1897, has the sub-type species T. (Tylodinella) trichinesi (Mazarelli, 1897), from the Mediterranean. The second Sub-family (339b): Umbraculinae Dall, 1889, is based on Genus: UMBRACULUM Schumacher, 1817, with the strict type-species U. (Umbraculum) sinicum (Gmelin, 1791), from the Indo-Pacific. There is a very similar Caribbean species U. (Umbraculum) umbraculum (Lightfoot, 1786). Lamarck (1819) coined the synonymous generic synonym 'Umbrella', and the flattened, limpet-like, yellowish external shell is often called an Umbrella Shell. But 'Umbrellidae' Gray, 1860, as a synonymous family name, is invalidated by the junior status of 'Umbrella' as a generic name. The Umbraculum animals are much larger than the shell, which obviously serves as a less-than-adequate protective shielding. A couple of questionable sub-genera (Thiele; Zilch) include: (a) Hyalopatina Dall, 1889, for U. (Hyalopatina) rushii (Dall, 1889), from the Bahamas; and (b) Bertinia Jousseaume, 1883, for U. (Bertinia) bertinia Jousseaume, 1883, from Japan. A more questionable fossil Genus: EOSINICA Aldrich, 1903, may also belong here, with the type-species E. elevata (Aldrich, 1903), which has a more elevated limpet-like shell, and is reported from the Eocene at Wood's Bluff, Alabama.

The second Super-Family (XCIV): PLEUROBRANCHACEA Menke, 1828 (fide Odhner, 1939), consists of a couple of sub-families united under the full Family (340): PLEUROBRANCHIDAE Menke, 1828, are based on the Genus: PLEUROBRANCHUS Cuvier, 1804, which has several synonums. Its strict type-species is P. (Pleurobranchus) peronii Cuvier, 1804, from Mauritius in the Indian Ocean. Subgenus: Pleurobranchopsis verrilli Thiele, 1931, (replacing--'aurantiaca' Verrill, 1900; non Risso, 1818). It comes from Bermuda in the N. W. Atlantic. Sub-genus: Oscanius Leach in Gray, 1847, has the sub-type species P. (Oscanius) membranacea (Montagu, 1815), from England and the Mediterranean. Subgenus, Susania Gray, 1847, has the sub-type species P. (Susania) testudinaria (Cantraine) from the Mediterranean. Abbott (1974) p. 348, mentions two additional species.

Genus: BERTHELLA de Blainville, 1824, is based on the type-species B. plumula (Montagu, 1803), from England and the Mediterranean. Genus: BERTHELLINA Gardiner, 1936, is based on B. engeli Gardiner, 1936, another English species. Genus: BOUVIERIA Vayssiere, 1896, has the Mediterranean type-species Bouvieria aurantiaca (Risso, 1826); (not Verrill, 1900). Genus: GYMNOTOPLAX Pilsbry, 1896, has the type-species G. americanus (Verrill, 1900) from the Pacific coast of N.America. Genus: PLEUROBRANCHOIDES O'Donoghue, 1930, has the type-species P. gilchristi O'Donoghue, 1930, from the Indo-Pacific.

The Pleurobranch Sea-Slugs Have a tough mantle, thickened on top (= dorsally), as large as the foot, and covered by a thin, calcareous, oblong shell.

The second Sub-family (340b): is for the shell-less Pleurobranchaeinae Pilsbry, 1896, based on the name genus: PLEUROBRANCHAEA Lene, 1913, with the type-species P. Meckelii Lene, 1913, from Australia. Another Genus: KOONSIA Verrill, 1882, has the type - (and only) species K. obesa Verrill, 1882, ranging from Martha's Vineyard, Mass., to Delaware Bay. Thiele (1931) pp. 419-420, also includes the following: (a) Genus: EUSELENOPS Pilsbry, 1896, with the strict type-species E. (Euselenops) luniceps (Cuvier, 1804); and (b) a Sub-genus: Pseudobranchella Thiele, 1925, with sub-type species E. (Pseudobranchella) nicobarica Thiele, 1925, from the Indian Ocean.

Finally, we come to the true Nudibranchs, which must be regarded as an extensive topic for future study, and we'll merely introduce them here with a few preliminary remarks. NUDIBRANCH means 'naked gills', which often project

conspicuously from the backs of these shell-less Gastropod Mollusks, that are now included in Order (16): NUDIBRANCHIA Cuvier, 1817. This is in need of modern revision, according to Abbott (1976), p. 317. It is a good working plan to subdivide this large group into a number of Sub-orders, or even further into Infra-Orders, as listed by Taylor & Sohl (Malacologia 1(1) 7-32, 1962). In any detailed study of Nudibranchs, live specimens should be examined in their native marine habitat. They are among the most beautiful, often delicate, and absorbingly interesting of all marine mullusks. Some fine colored illustrations of many of them are available in a number of publications. I've copied some of these, chiefly from the International Oceanographic Foundation's SEA FRONTIERS.

If we were to move from the sea to the land, we would encounter numerous kinds of terrestial shell-less mollusks, including numerous kinds of land-slugs, but this again is another big story.

A FEW NOTES ON MIXING SHELLS AND PARROTS

Alta VanLandingham

As most of our members know, or at least the ones who have been to meetings on Ocracoke in the past year or so, Van and I have a lot of shells and now we also have a lot of parrots. We have had some interesting things happen between the parrots and the shells.

Mostly our shells stay in the Shell Shop, and the parrots stay in the bird rooms, but once in awhile things get mixed up. Like one time last Spring. Van had gone to a shell club meeting while I stayed home to babysit birds. It has gotten to the point where we have to take separate vacations. I wonder if some of our friends think we are separated???

But back to the story. It was Saturday afternoon, and the shop was quite busy, and with Van at the meeting, I had no help. So I was busily wrapping shells when a lady at the other end of the shop screamed and clutched her throat. I jumped up and ran down there and asked what happened. She pointed a shaking finger and said that bird just moved. Later, when things were calmer, she said she had been looking at shells and admiring the pretty stuffed bird in the case, and all of a sudden the bird scratched his head. That is when she screamed, and the bird flew, or tried to. It was our Senegal Parrot name Radwin. He was sitting on the Volute shelf, and when he flew he scattered Volutes, Olives on the next shelf, and Turrids below that. It took me two weeks to get everything back in order. There were shells, tags, feathers, and droppings all mixed up. Later, Van and I wondered why Radwin was in the Volute section instead of the Murex section.

A few weeks after that Radwin's girlfriend, another Senegal parrot named D'Attilio got even on that score. Saundra Spencer, who works for us, comes in a bit early so that she can help me with all the clean-up of birds and shells before time to open the shop. So this morning she asked who is making such a commotion in the Shell Shop. She had heard noise as she was passing by. I said, "Gee, no one is out there this early," and she said, "Well, I heard a lot of crashing and banging." We rushed out to the shop, and there is D'Attilio puttering around on the Murex shelf. No damage, but again shells, tags, feathers, droppings, scattered all over. Maybe she didn't like my arrangement of the Murex shells.

Almost all of our birds are named for famous conchologists or malacologists. We have Linnaeus, Lamarck, Radwin, D'Attilio, Abbott, Clench, and so on and on. I hope no one objects to our use of their good name. We do it in affection. When Tucker Abbott found out we had named a bird for him, he seemed pleased--said he always knew his name was for the birds. He did make one request--asked us not to let the bird try to name any new shell species. Well, we do what we can. But the bird keeps trying to name a new Murex. Wants to call it Murex AAAWWWKKK. At this point there is nothing we can do, so Tucker and the bird will have to settle it between themselves.

Lamarck has escaped from the bird room into my office work-room and stolen some Latiaxis species that I had on the work table for identification. I missed the shells and looked all over the room for them. He did this at a time when I was busy elsewhere, and didn't know he had even been in the work room. The shell was Latiaxis pagodus, and had already been identified years ago by Adams, so I I don't know what Lamarck's problem was. Maybe he just wanted to make sure the shell was in gem condition before I put it out. When he finished looking them over, they were no longer in gem condition, so instead of putting them into the display case, I put them in my shell packs, which sell for $1.50. Where else can you buy Latiaxis pagodus, with at least 20 other shells for $1.50? And where else can you have an extended conversation with so many famous, world-wide malacologists??? They may not say what you'd like to hear, but they will always say something.

A PIECE OF THE OCEAN

Carolyn C. Smith

It was a cold and rainy January day and Lenny and I were suffering from the worst malady that can befall shell collectors--salt water withdrawals. As luck would have it, we found ourselves outside an aquarium shop gazing wistfully at a tank of beautiful, brightly colored fish. In we went and, wonder of wonders, discovered a number of salt water tanks full of a gorgeous array of sea creatures. In no time flat we were loading our tank and all other necessities for setting up our own ocean.

Like shellers standing ankle-deep in shells, we began washing gravel and coral and reading books on all we had to do to bring the ocean into our family room. And what an exciting, interesting world we entered!

Unable to get to the coast immediately, we settled for store-bought animals for our tank's first residents. Our first attempt at keeping fish ended sadly as we lost three fish in succession, so we resorted to a most precocious hermit crab who quickly established claim on the entire domain and thrilled our children by taking pieces of shrimp from our fingers. The aquarium dealer encouraged us by saying: "A hermit crab is always a safe and successful choice for a new tank."

Alas, one morning Lenny turned on the tank light and there attached to the coral was the remnant of a hermit crab. After a quiet bathroom burial, he meekly and reluctantly told me of the death of our crab. "I left the shell in the tank," he said out of the side of his mouth. We were so discouraged we didn't even talk about this latest defeat. Later in the morning, Lenny began yelling some unintelligible words about "back from the dead", and there in his little shell was our hermit crab, complete with a fresh new coat he had received when he molted during the quiet of the night!

There were many more lessons to be learned through experience. There was eventually a succession of beautiful sea anemones to come to live in our tank. They challenged our patience to the limit as two just seemed to wither away, and a third pushed its huge foot through the groove in our sub-gravel filter and tore itself trying to get out. This problem was resolved by hiding a small Tridacna clam under the gravel and letting our next anemone dig down and take hold of the clam. (Oh, there is no bliss to compare with that of the little Clown Fish as he finally finds refuge in the soft long tentacles of "his" anemone.) We also added small Atlantic anemones found on Ocracoke several months later.

We now have two different types of Clown Fish, each with its own private anemone, at opposite ends of our tank. In addition to the Clowns, we have two varieties of Damsel and an Atlantic Puffer. The Puffer will eat anything small enough to fit into his mouth, as we unhappily discovered when he devoured a lovely little Peppermint shrimp which we had just minutes earlier added to the tank. All our fish are from the aquarium shop since we've not been lucky enough to catch our own.

We next discovered the Cluster Duster, a lovely little bouquet of wormlike tubes with feathery animals which come out to collect food particles from the water. Such a delicate animal had no chance at all in our tank. By now our hermit crab had become a tyrant, snipping at fish fins and religiously giving the Cluster Duster a pruning. So back to the aquarium shop went the crab and a trade-in on a Bahama starfish was negotiated.

Do not try to integrate Bahama stars and feather dusters. In a few days the remnants of the Cluster Duster left by the crab were vacuumed up by the starfish. Then it began to munch anemones. A Bahama starfish is a bottomless pit. When our Banded Coral Shrimp came to live with us, the starfish would quickly gobble up every molting of the shrimp.

By now we had begun to bring mollusks home in buckets of sea water rather than in plastic bags and oh, what a thrill it was to see that lovely orange animal stretch happily out of his shell when we dropped in our first Fasciolaria hunteria.

Sally Nunnally had given us an iced-down Oliva sayana which quickly came alive when he landed in the warm water of his new home. The mollusks dug in and began plowing around leaving tunnels and upheavals which greatly disturbed the long-tentacled anemones. It soon became evident that we were no longer a one-tank family. And so we set up our second thirty-gallon tank six months after the first was begun.

Into the second tank went the more voracious, assertive tank-dwellers: the Bahama star, all of the shells except for a Ponderous Ark, which sits in the gravel quietly filtering, and a few Cantharis, which live in the coral branches and bother no one; the Coral Banded Shrimp; and two sea urchins, which we found on the rock jetty near Beaufort. The urchins gave us a fright when first added to the tank as they dropped a few spines. We decided it must have been due to the dramatic change in water temperature and environment, since the spines were quickly replaced by new ones. Both are now readily dining on a steady diet of frozen shrimp and tank algae.

It was most interesting to watch the feeding of the shells. The favorite food of everyone is the Coquina--Donax variabilis. However, all readily accept frozen shrimp. The Oliva sayana would blast out of the gravel like a submarine, envelop the food with his soft foot and dive back down in a flash. The Olive, two Polinices duplicatus and a host of Periwinkles and Oyster Drills fell prey to the Fasciolaria, however. Bivalves haven't a chance as our Venus Clams proved. At present the shell survivors in the second tank are two Banded Tulips, one red True Tulip, and one small Busycon.

The two varieties of Tulips are constantly avoiding each other, careening around wildly whenever their paths cross in their meanderings around the tank. They use their pointed operculums to dig into the gravel and practically pole vault in opposite directions at each encounter. I think the True Tulip is the more aggressive of the pair since at one encounter it grabbed the Banded Tulip with its foot. I intervened and rescued.

Another interesting observation has been the growth of the Banded Tulip. The shell it has added since coming to live in our tank is much brighter than that which it built in the inlet at Topsail Beach. The growth line prominently denotes the change in environment. I think the warm protected water and the steady diet of Coquinas and shrimp have promoted the lovely new color. It comes up to eat and plod around the tank for a few days, then digs down into the gravel and out of sight for a week sometimes. When it emerges it has grown a little.

And so if you find yourself beset with shell-collecting blues one dreary winter day, if you feel landlocked and cannot live another day without salt water, find yourself a good aquarium supply store, get out your patience and perseverance, and enter the most interesting and enjoyable adventure imaginable!

Ms. Doris Jean Alexander
1310 Dogwood Lane
Raleigh, NC 27607

Doris D. Andrews
1902 Druid Lane
Wilmington, NC 28403

Miss Hortense Bailey
Route 1, Murray Rd.
Winston Salem, NC 27106

Mary Banks
P.O. Box 783
Swansboro, NC 28584

Miss Deborah Barbee
P.O. Box 184
Pine Level, NC 27568

Ruth R. Barfield
Route 3, Box 153
Jacksonville, NC 28540

Dr. Bruce Bennard
67 Dogwood Acres Dr.
Chapel Hill, NC 27514

Mrs. W. P. Blake
P.O. Box 79
Topsail Beach, NC 28425

Mr. Jim Bowman
1729 Vernon Rd.
Rocky Mount, NC 27801

Charlotte Ann Bragg
P.O. Box 186
Ocracoke, NC 27960

Chris Broadwell
214 Main St.
Fort Mill, SC 29715

Mrs. Louise Broadwell
319 N.E. 47th St.
Long Beach, NC 28461

Mrs. Sue Broadwell
802 E. Oak Island Dr.
Long Beach, NC 28461

Viola T. Broadwell
150 E. 18th S.E.
Long Beach, NC 28461

Miss Eleanor Brooks
1020 W. Peace St., Apt. C-4
Raleigh, NC 27605

Ann Buddenhagen
712 Godwin Court
Raleigh, NC 27606

Mrs. Gloria R. Buzzell
206 Del Rio Avenue
Wilmington, NC 28403

Mrs. Mary Carr
P.O. Box 181
Salter Path, NC 28575

Lois P. Carson
Jud Carson
1416 Park Dr.
Raleigh, NC 27605

Mrs. Patricia M. Cavanaugh
269 Staffordshire Rd.
Winston Salem, NC 27104

Dr. A.F. Chestnut
Inst. of Fisheries Research
Morehead City, NC 28557

Mrs. Lloyd D. Childers
232 E. Park Dr.
Raleigh, NC 27605

Dr. Mary Gill Clarke
Route 5, Box 102
Chapel Hill, NC 27514

Mrs. Emily J. Collymore
Mandy Lane
Morehead City, NC 28557

Mr. Billy Corbett
P.O. Box 3009
Wilson, NC 27893

Mrs. Kathryn-Jewell Cox
141 N.E. 19th St.
Long Beach, NC 28461

Dr. Elliott M. Cramer
P.O. Box 428
Chapel Hill, NC 27514

Mrs. Floyd L. Crawford
Route 2, Box 43
Swansboro, NC 28584

Mrs. George W. Crone, Jr.
433 Plymouth Avenue
Winston Salem, NC 27104

Miss Sarah L. Cummings
Route 1, Box 83
Pembroke, NC 28372

Mrs. Norma E. Currie
912 Rodie Avenue
Fayetteville, NC 28304

Payne Daniel
5513 Edington Lane
Raleigh, NC 27604

Mrs. Ruth B. Darden
324 Fairwood Court
Fayetteville, NC 28305

Mrs. Evelyn Davis
802 Parker St.
Durham, NC 27701

Janice D. Dawson
308 Pine Ridge Ave.
New Bern, NC 28560

Mrs. Josephine Dees
1200 Arlington Blvd.
Greenville, NC 27834

Mr. William DeRuyter
P.O. Box 159
Ocracoke, NC 27960

Miss Charlotte Dexter
721 Edgewater Club Rd.
Wilmington, NC 28405

Miss Dorothy Dickey
3000 E. Fiddler's Creek Apts.
Southport, NC 28461

Mr. & Mrs. Jay W. Dillon
712 Pennsylvania Ave.
Hertford, NC 27944

Mrs. Ruth S. Dixon
711 Parker St.
Durham, NC 27701

Mrs. Harry N. Doyle, Jr.
9301 Briarwood Rd.
Fairfax, VA 22032

Mrs. N.E. Edgerton, Jr.
1625 Oberlin Rd.
Raleigh, NC 27608

Mrs. Gene B. Edmunds
2322 Rosalind Avenue
Roanoke, VA 24014

Ann Ehringhaus
Box 206
Ocracoke, NC 27960

Anne M. Elder
2561 Battery Place
Wilmington, NC 28403

Mrs. Martha L. Elliott
1730-C N. Hamilton St.
High Point, NC 27262

Miss Frances L. Elmore
P.O. Box 133
Florence, SC 29503

Ms. Helen R. Eubanks
P.O. Box 181
Oriental, NC 28571

Emily D. Ezzell
701 Edgewater Club Rd.
Wilmington, NC 28405

Heather Ann Faircloth
Rt 7 Box 270-F
Fayetteville, NC 28301

Jennifer Faircloth
Rt 7 Box 270-F
Fayetteville, NC 28301

Dr. & Mrs. John H. Ferguson
226 Glandon Dr.
Chapel Hill, NC 27514

Mr. & Mrs. John Fiddner
510 N. Channel Dr.
Wrightsville Beach, NC 28480

Mr. & Mrs. B. B. Fink
804 Deblea Court
Jacksonville, NC 28540

Mrs. Margaret H. Fisher
232 E. Park Dr.
Raleigh, NC 27605

Mrs. Rose M. Forrest
3327 Deerwood Dr.
Gastonia, NC 28052

Grace Foulk
7408 E. Oak Island Dr.
Long Beach, NC 28461

Mary W. Freeman
1303 Lakewood Dr.
Greensboro, NC 27410

Mrs. Elizabeth Fuller
204 Leftwich St.
Greensboro, NC 27401

Mrs. William H. Gaither
1903 Pinewood Circle
Charlotte, NC 28211

Sue Glasby
P.O. Box 672
Lillington, NC 27546

Mrs. Sally P. Gluck
1215 Mona Passage Court
New Bern, NC 28560

Norma Grabenstein
507 Biscayne Dr.
Wilmington, NC 28405

Miss Elizabeth Grady
108 Nun St.
Wilmington, NC 28401

Dr. Albert W. Grauer
232 Christopher Wren Dr.
Williamsburg, VA 23185

Mrs. Ann R. Green
Route 1, Box 25
Sneads Ferry, NC 28460

Hazel E. Green
101 Castle Dr.
Jacksonville, NC 28540

Alice H. Greenlaw
700 B Hawes Court
Raleigh, NC 27608

Mrs. Donna W. Griffin
Windy Griffin
1061 Eaglewood Avenue
Charlotte, NC 28212

Mr. & Mrs. Charles T. Haigh, Jr.
121 Devane St.
Fayetteville, NC 28305

Bertam B. Hall
P.O. Box 1608
Pinehurst, NC 28374

Mr. & Mrs. William L. Haltiwanger
401 Seapath Tower
Wrightsville Beach, NC 28480

Mrs. Clyde Harmon
1811 Rolling Rd.
Greensboro, NC 27403

Mr. & Mrs. Brian G. Harper
Rt 10 Box 45
Chapel Hill, NC 27514

Norma Merrill Hartman
209 Marsh St.
Beaufort, NC 28516

Mrs. Shirley L. Haworth
Dan Haworth
107 Sagewood Rd.
Jamestown, NC 27282

Michael Hays
Box 206
Ocracoke, NC 27960

Mr. Ralph C. Heath
4821 Kilkenny Place
Raleigh, NC 27612

Mrs. Florence High
P.O. Box 7353
Myrtle Beach, SC 29577

Mrs. Kathy Hill
Ann and Thomas
Route 1, Box 269-A
Sunset Beach, NC 28459

Patsy W. Hoffman
2905 St. Regis Rd.
Greensboro, NC 27408

Roberta P. Hon
205 E. Moore St.
P.O. Box 10943
Southport, NC 28461

Mr. W. B. Huffaker
1004 Oakwood Court
Martinsville, VA 24112

Mr. & Mrs. Dan Jackson
Rt. 1 Box 206
St. Pauls, NC 28384

Mr. & Mrs. Paul R. Jennewein
P.O. Box 394
Wrightsville Beach, NC 28480

Lillie Jernigen
Box 69
Carolina Beach, NC 28488

Mrs. Helen F. Jividen
P.O. Box 1254
Atlantic Beach, NC 28512

Ann Johnson
P.O.Box 158
Flat Rock, NC 28731

Gertrude Johnson
120 N. Atlantic Avenue
Southport, NC 28461

Mrs. Hubert K. Johnson
113-B Parmele Blvd.
Wrightsville Beach, NC 28480

Mr. & Mrs. Junius Johnson
1704 Tryon Rd.
New Bern, NC 28560

Mrs. Kenneth L. Johnson
3206 Sussex Rd.
Raleigh, NC 27607

Mrs. Rebecca Johnson
P.O.Box 8612
Roanoke, VA 24014

Mr. William T. Johnson
2614 S. Jefferson St.
Roanoke, VA 24014

Mr. & Mrs. Arthur Jones
1603 Swain Dr.
Long Beach, NC 28461

Margaret T. Kelly
4621 Angier Avenue
Durham, NC 27703

Mrs. W.L. Kibler
% The Gate House
P.O.Box 548
Shallotte, NC 28459

Mrs. Mary-Frances Kilburn
207 South 3rd St.
Wilmington, NC 28401

Agnes King
232 North 25th St.
Wilmington, NC 28405

Mrs. Joann Kistler
1505 Ridge Rd.
Raleigh, NC 27607

Mary M. Knott
7812 Haymarket Lane
Raleigh, NC 27609

Anne R. Kuntzleman
Woodgate Apts. #301
Reading, PA 19606

Mrs. Ina B. Kuralt
71 Wild Swan Lane
Kitty Hawk, NC 27949

Madlon C. Landt
1100 Blenheim Dr.
Raleigh, NC 27612

Mrs. Peggy B. Langston
4509 Tenella Rd.
New Bern, NC 28560

Sheila Lanier
Rt 1 Box 533 AA
Wilmington, NC 28405

Mr. & Mrs. R. H. Lanning
4648 Carmel Vista
Charlotte, NC 28211

Helen V. Leontis
504 W. Knox St.
Durham, NC 27701

Mr. Herman Lindsey
Gary, James, and John
809 William St.
Jacksonville, NC 28540

Miss Hughrena MacDonald
Box 534
New Bern, NC 28560

Mrs. Peggy A. Mahony
120 Edgewater Lane
Wilmington, NC 28403

Miss Gladys Mason
6 Nantahala St., Box 458
Badin, NC 28009

Virginia L. Massey
106 Pinegate Circle, Apt. 2
Chapel Hill, NC 27514

Mr. & Mrs. James Mattocks
P.O.Box 2062
High Point, NC 27261

Mrs. N.H. McCollum, Jr.
502 Patrick St.
Eden, NC 27288

Mrs. Donald W. McCoy
2516 Edgewater Dr. N.
Fayetteville, NC 28303

Mrs. Murphy McGirt
P.O.Box 548
Maxton, NC 28364

Mr. Edward McGowen
P.O.Box 16
Turkey, NC 28393

Mrs. R. C. McInnes
F-6 Raleigh Apts.
Raleigh, NC 27605

Barbara R. McIntyre
619 Stacy St.
Raleigh, NC 27607

Mr. & Mrs. William W. McKee
106 McLean Avenue
Highland Park, MI 48203

Mrs. Frances L. McLell
1012 River St.
Jacksonville, NC 28540

Miss Phoebe Meadows
P.O.Box 721
Swansboro, NC 28584

Miss Delores J. Miller
801 S. Ivey Lane
Florence, SC 29501

Mrs. Sara C. Mitchner
704 Morrison Lane
Laurinburg, NC 28352

Mr. & Mrs. John Mobley
7225 Wrightsville Ave.
Wilmington, NC 28403

Nancy T. Morgan
725 Montclair Dr.
Wilmington, NC 28403

Ms. Barbara Morton
25 West Bayshore Blvd.
Jacksonville, NC 28540

Mr. & Mrs. Bill Nash
811 Yaupon Dr.
Southport, NC 28461

Mr. & Mrs. Peter Naumuk
Rt. 2, Box 482
Burgaw, NC 28425

Mr. & Mrs. Wayne Neff
John Neff
7 McAvoy MCAS H
Jacksonville, NC 28540

Mr. John R. Newell
221 Royal Oak Dr.
Wilmington, NC 28403

Barbara N. Newton
51 Beach Road South
Figure 8 Island
Wilmington, NC 28405

Mr. Douglas Nunnally
P.O.Box 943
Wrightsville Beach, NC 28480

Sally Nunnally
Box 8704
Wrightsville Beach, NC 28480

Mrs. Evelyn C. Ottaway
Rt 1 Box 131
Holly Ridge, NC 28445

Carolyn A. Owen
& Children
Rt 3 Box 244-A
Summerfield, NC 27358

Miss Kate B. Parker
Rt 3 Box 336
Jacksonville, NC 28540

Mrs. Dorothy Pate
147 6th St., NE
Long Beach, NC 28461

Robin L. Peacock
3416 Cherry Lane
Raleigh, NC 27607

Helen M. Pine
8517 Culfor Cresent
Norfolk, VA 23503

Mrs. E. H. Piper
P.O.Box 85
Gloucester, NC 28528

Mr. & Mrs. Hugh Porter
119 Fairway Rd.
Morehead City, NC 28557

Jason Porter
9 Park & Stay
Chapel Hill, NC 27514

Mrs. Frances L. Post
Rt 1 Box 215-A
Holly Ridge, NC 28445

Mrs. Albert L. Potts
403 Dogwood Lane
Jacksonville, NC 28540

Mrs. Betty A. Powers
512 W. Broad St., Box 128
St. Pauls, NC 28384

Mrs. Jeurlene Prechtel
108 Club Ct. Cape Carteret
Swansboro, NC 28584

Tina Price
719 Lockridge Rd.
Charlotte, NC 28209

Mrs. Betty H. Proctor
P.O.Box 988
Atlantic Beach, NC 28512

Mrs. Peg Quigley
387 W. Blackwell St.
Dover, NJ 07801

Lawson A. Rankin
Standard Theatre Supply
P.O.Box 20660
Greensboro, NC 27420

Mrs. Robert Reusch
P.O.Box 85
Gloucester, NC 28528

Mrs. Carol B. Reynolds
619 Quaker Lane
High Point, NC 27262

Mr. & Mrs. Douglas W. Reynolds
Christopher and Douglas
5108 Goldsboro Dr., Apt. 2
Newport News, VA 23605

Mr. & Mrs. Charles Richardson
216 E. Drewry Lane
Raleigh, NC 27609

Mrs. Lois Ronner
3805 Winston Blvd.
Wilmington, NC 28403

Mr. & Mrs. William Rosenthal
302 Pine Valley Dr.
Wilmington, NC 28403

Carolyn Jean Ross
555 Stoneybrook Rd.
Statesville, NC 28677

Myrtle T. Royal
P.O.Box 24
Kure Beach, NC 28449

Mrs. Q. J. Scarborough
1103 Norwood St.
Fayetteville, NC 28305

Mrs. Neal K. Schey
15 Fairway Ridge
Lake Wylie, SC 29710

Mrs. Christine L. Seme
P.O.Box 1202
Boone, NC 28607

Mr. Fred C. Sener
4370 Bridlepath Rd.
Winston-Salem, NC 27103

Kenneth G. Sexton
Rt 2 Box 75
Morrisville, NC 27560

Mr. & Mrs. A. L. Sherk
752 Austin Lane
Winston-Salem, NC 27106

Mrs. Geraldine Shiel
Rt 3, Reefstone 21 P.K.S.
Morehead City, NC 28557

Mr. & Mrs. Edwin H. Sims, Sr.
419 E. Main St.
Washington, NC 27889

Mrs. Edwin W. Skinner
49 Quail Ridge Rd.
Greenville, NC 27834

Mr. & Mrs. Leonard Smith
Chris and Toni
5300 Fair Oak Rd.
Durham, NC 27712

Mr. & Mrs. William C. Snyder
Jason and Mary
338 Cathay Rd.
Wilmington, NC 28403

Mr. & Mrs. Herman F. Spain
1418 Park Dr.
Raleigh, NC 27605

Suzanne Spencer
Rt 2 Box 75
Kit Creek Rd.
Morrisville, NC 27560

Miss A. Pauline Sproul
512 North Channel Dr.
Wrightsville Beach, NC 28480

Mrs. George Staples
Ridge Rd.
Butner, NC 27509

Mrs. Helen Stephens
General Delivery
Oriental, NC 28571

Dale V. Stingley
P.O.Box 113
LaBelle, FL 33935

Margaret E. Strock
Station 1, Apt. 4H
Wrightsville Beach, NC 28480

Mrs. Mary Frances Sult
760 Huntley Dr.
Boiling Spring Lakes
Southport, NC 28461

Mrs. Ernestine R. Talbert
1141 Wimbledon Dr.
Roxboro, NC 27573

Miss Marguerite T. Thomas
P.O.Box 721
Swansboro, NC 28548

Marie Thorup
4733 College Dr.
Wilmington, NC 28403

Mrs. Joseph E. Trahan
1006 Vaughn Dr.
Mechanicsville, VA 23111

Mrs. John L. Troutman
Rt 8
Raleigh, NC 27612

Mr. & Mrs. Carl W. Truckner
1409 Ruffin St.
Durham, NC 27701

Mrs. Roberta M. Tyler
2600 Evans St.
Morehead City, NC 28557

Mrs. V. L. Utter
1417 Canterbury Rd.
Raleigh, NC 27608

Rajeer Vaidyanathaan
225 Cherrywood Lane
Swedesboro, NJ 08085

Mr. & Mrs. Thomas VanLandingha
Box 542
Hampstead, NC 28443

Mrs. Douglas VanNoppen
145 Chinquapin Lane
Waynesville, NC 28786

Mr. & Mrs. James E. Wadsworth
Wilson Court
Chapel Hill, NC 27514

Mr. & Mrs. Herbert Wallick
Rt 2 Box 140
Mebane, NC 27302

Mrs. Chester Walsh
P.O.Box 146
Atlantic Beach, NC 28512

Mrs. Alex H. Walters
1009 Cobb St.
Durham, NC 27707

Mrs. J. Stacy Walton
Eloise Walton
13 East Bayshore Blvd.
Jacksonville, NC 28540

Mrs. John Wasili
P.O.Box 187
Frisco, NC 27936

Mrs. Dorothy Watkins
748 Catawba St.
Raleigh, NC 27609

Mrs. Harold Watson
301-A Crowell St.
Yaupon Beach, NC 28461

Mrs. R. D. Watson
2825 Rothgeb Dr.
Raleigh, NC 27609

Mr. & Mrs. Dean Weber
510 Greenwood Rd.
Wilmington, NC 28403

Margaret C. White
1406 Stovall Dr. B-2
Raleigh, NC 27606

Peggy A. Wilkerson
7709 Audubon Dr.
Raleigh, NC 27609

Doris Williams
Rt 2 Box 522
Durham, NC 27705

Anne J. Williford
2891 Baywood Rd.
Fayetteville, NC 28301

Mrs. Bettie Wolford
76 Pelican Dr.
Wrightsville Beach, NC 28480

Miss Charley Lee Woodward
410 South Front St.
Wilmington, NC 28401

Mrs. W. W. Worrall
Rt 1 Box 412
Bath, NC 27808

Margaret Wren
302 67th Ave. North
Myrtle Beach, SC 29577

Miss Ann Yelvington
Rt 1 Box 208
Clayton, NC 27520

Mrs. Doug Yongue
Prince St.
Laurinburg, NC 28352

RECORD SIZES OF NORTH CAROLINA MOLLUSKS

LIST NO. 5

Hugh J. Porter

U. N. C. Institute of Marine Sciences

This fifth listing is a review of List Number 4, published in 1975 in North Carolina Shell Club Bulletin, Number 8. Additional or more recent records (few in number) have been included. No gastropod species of less than 6mm (0.25 inches) or bivalve species of less than 15mm (0.59 inches) have been included.

These listings were created partly because of their value to molluscan ecologists and taxonomists. More importantly, they were created to stimulate the amateur collector's interest in his North Carolina shells and serve as a partial guideline for determining approximate shell values when merchandising or bartering is involved. This latter, of course, is important when one has shells in his collection or wishes to add unattainable specimens to it.

To be eligible for listing, specimens must have been found initially in North Carolina (if from scallop shell piles, piles must be of North Carolina caught shells). Additional records will be noted of live taken specimens if these are not as large as a recorded empty shell. Measurements must be verified by a member of the North Carolina Shell Club's Executive Committee. It would be hoped that upon the dismantling of a collector's collection, recorded record-sized specimens would be offered to a well-known collection of North Carolina shells whether it be amateur or museum.

Measurements used are according to the Van Nostrand Catalogue, volume 2, page 276. Many UNC-IMS species' measurements may seem small and possibly are; the UNC-IMS collection which this listing is basically developed from, frequently of species to be included in the listing, contained only a few small specimens. Nomenclature is based primarily on Abbott, 1974 (2nd Edition - American Seashells). For world size records refer to Wagner and Abbott's "Standard Catalog of Shells" - World Size Records, American Malacologists Publ., 1982, pp. 80-001-80-025.

NOTES CONCERNING LISTINGS:

- H = Height of shell (hinge edge or apex to ventral edge in a perpendicular direction).
- L = Length of a shell (maximum anterior to posterior measurement).
- W = Width of a shell (maximum width).
- SF = Offshore North Carolina Calico Scallop Fishery.
- * = Live taken specimen.

Specimens reside in the following collections: Cochran - Mr. F. C. Cochran, Williston, N. C.; Crews - Dr. J. M. Crews, UNC, Wilmington, N. C.; Dudley - Mrs. D. Dudley, Beaufort, N. C.; DMR - Duke Marine Laboratory, Beaufort, N. C.; IMS - Mollusk Collection, UNC, Institute of Marine Sciences, Morehead City, N. C.; Johnson - Mrs. Charlotte Johnson, Raleigh, N. C.; Laughinghouse - Mr. Billy E. Laughinghouse, Beaufort, N. C.; Moody - Miss Lois Moody, Hampstead, N. C.; Pentz - Mr. R. K. Pentz, Wilmington, N. C.; Petuch (see the Veliger, Vol. 15, No. 1); Piper - Mrs. E. H. Piper, Gloucester, N. C.; Porter - Mr. and Mrs. H. J. Porter, Morehead City, N. C.; Riggs - Mrs. Harriet Riggs, Swansboro, N. C.; Safrit - Mr. Glenn Safrit, Beaufort, N. C.; Truckner - Mr. C. Truckner, Durham, N. C.; Tyler - Mr. J. Tyler, Morehead City, N. C.; Van Landingham - Mr. and Mrs. W. Van Landingham, Wrightsville Beach, N. C.; Walton - Mrs. J. S. Walton, Jacksonville, N. C.; DAW - Dr. D. A. Wolfe, Boulder, Colorado.

CHITONS, GASTROPODS AND TUSK SHELLS

ACMAEA RETIFERA (Dall) Reticulate Wentletrap	1.02 inch (43mm)	Riggs	(S. F.) Beaufort
ARCHITECTONICA MOBILIS Roding (Common Sundial)	2.32 inch (59mmW	DAW No. 1762	Offshore Beaufort
	2.69 inch (62mmW	Walton*	(S. F.) Beaufort
ASTRAEA PHOEBIA Roding (Long-spined Star Shell)	1.70 inch (43mm)	IMS No. 4035.1	(S. F.) Beaufort
	1.42 inch (36mm)	IMS No. 4035.2*	(S. F.) Beaufort
BALCIS COMOIDEA (Kurtz & Stimpson) (Conical Melanella)	0.43 inch (11mm)	IMS No. 467	Bogue Sound Beach
BALCIS INTERMEDIA (Cantraine) (Cucumber Melanella)	0.41 inch (10.4mm)	IMS No. 1032	Cape Lookout area
BULLA STRIATA (Bruguiere) (West Indian Bubble)	1.85 inch (47mm)	DAW No. 1532	Offshore Beaufort
BURSA BUFO (Bruguiere) (Chestnut Frog Shell)	2.44 inch (62mm)	Cochran	(S. F.) Beaufort
	2.24 inch (57mm)	Walton - now IMS No. 4041*	(S. F.) Beaufort
BURSA THOMAE (Orbigny) (St. Thomas Frog Shell)	0.98 inch (25mm)	IMS No. 4349.1*	SE of Cape Lookout
BUSYCON CANALICULATUM (Linne) (Channeled Whelk)	8.42 inch (214mm)	Laughinghouse	Bogue Sound?
	7.60 inch (193mm)	IMS No. 1534*	Off Shackleford Banks
BUSYCON CARICA (Gmelin) (Knobbed Whelk)	11.15 inch (283mm)	Piper*	Cape Lookout
BUSYCON CONTRARIUM (Conrad) (Lightning Whelk)	12.83 inch (326mm)	Laughinghouse-now IMS No. 3377	(S. F.) Beaufort
	11.90 inch (303mm)	Piper-now IMS No. 9856*	Cape Lookout
BUSYCON SPIRATUM (Lamarck) (Pear Whelk)	5.30 inch (135mm)	IMS No. 1015*	Off Drum Inlet
CALLIOSTOMA EUGLYPTUM (A. Adams) (Sculptured Top Shell)	0.89 inch (22.5mm)	IMS No. 1832*	SE New River Inlet
CALLIOSTOMA FULCHRUM (C. B. Adams) (Beautiful Atlantic Top Shell)	0.45 inch (11.5mm)	IMS No. 1648*	Morehead City State Port
CALLIOSTOMA YUCATECANUM Dall (Yucatan Top Shell)	0.47 inch (12mmW	IMS No. 2286	Onslow Bay
CANCELLARIA RETICULATA (Linne) (Common Nutmeg)	2.28 inch (58mm)	Walton	(S. F.) Beaufort
	1.70 inch (43mm)	IMS No. 1824*	SE New River Inlet
CANTHARUS MULTANGULUS (Philippi) (False Drill)	1.38 inch (35mm)	IMS No. 1816	SE New River Inlet
CASSIS MADAGASCARIENSIS (Lamarck) (Emperor Helmet)	6.6 inch (157mm+	DAW	Off New River Inlet
CASSIS MADAGASCARIENSIS SPINELLA Clench	10.60 inch (274mm)	IMS No. 2307*	Off Cape Fear
CERITHIUM ATRATUM (Born) (Florida Cerith)	1.66 inch (42mm)	IMS No. 2277.1*	Bogue Inlet
CERITHIUM LITTERATUM (Born) (Stocky Cerith)	0.67 inch (17mm)	IMS No. 4034	(S. F.) Beaufort
CERITHIUM LUTOSUM Menke (Dwarf Cerith)	0.55 inch (14mm)	Wade Brown-now IMS No. 4949	?Cape Lookout
CHAETOPLEURA APICULATA (Say) (Common Eastern Chiton)	0.98 inch (25mm)	IMS No. 9855*	Newport River
CIRSOTREMA DALLI Rehder (Dall's Wentletrap)	1.30 inch (33mm)	Laughinghouse	(S. F.) Beaufort
COLUBRARIA LANCEOLATA (Menke) (Arrow Dwarf Triton)	1.14 inch (29mm)	IMS No. 1844	ESE New River Inlet
CONUS DELESSERTII Recluz (Sozons Cone)	4.06 inch (103mm)	Laughinghouse-now IMS No. 4728*	(S. F.) Beaufort
CONUS FLORIDENSIS Sowerby (Floridensis Cone)	1.38 inch (35mm)	IMS No. 1829.2*	SE New River Inlet
CORALLIOPHILA CARIBAEA Abbott (Caribbean Coral Shell)	1.02 inch (26mm)	Laughinghouse	(S. F.) Beaufort
CREPIDULA ACULEATA (Gmelin) (Spiny Slipper Shell)	0.95 inch (24mm)	IMS No. 1887.5*	SE New River Inlet

CREPIDULA FORNICATA (Linne) (Common Atlantic Slipper Shell)	2.48 inch (63mm)	DAW No. 598f	Banks of Core Creek
	1.85 inch (47mm)	Piper*	
CREPIDULA PLANA (Say) (Eastern White Slipper Shell)	1.58 inch (40mm)	IMS No. 491*	Bogue Sound
CRUCIBULUM STRIATUM (Say) (Striate Cup and Saucer)	1.62 inch (41mm)	Piper*	Above Cape Hatteras
CYMATIUM CINGULATUM (Lamarck) (Paulson's Triton)	2.76 inch (70mm)	IMS No. 1106.1	SE of Cape Lookout
CYMATIUM KREBSII (Morch) (Krebs' Triton)	2.76 inch (70mm)	Cochran	(S. F.) Beaufort
	2.44 inch (62mm)	IMS No. 3384.1(*?)	(S. F.) Beaufort
CYMATIUM PARTHENOPEUM (von Salis) (Von Salis' Triton)	6.18 inch (157mm)	Piper*	(S. F.) Beaufort
CYPHOMA MAGGINTYI Pilsbry (McGinty's Cyphoma)	1.22 inch (31mm)	IMS No. 518	Fort Macon Beach
CYPRAEA CERVUS Linne (Atlantic Deer Cowrie)	5.91 inch (150mm)	Pentz*	E of Cape Fear (13fm)
CYPRAEA SPURCA ACICULARIS (Gmelin) (Atlantic Yellow Cowie)	0.83 inch (21mm)	IMS No. 33*	Onslow Bay
CYPRAECASSIS TESTICULUS (Linne) (Reticulated Cowrie-helmet)	2.80 inch (71mm)	Laughinghouse	(S. F.) Beaufort
DENTALIUM EBOREUM Conrad (Ivory Tusk)	1.95 inch (49mm)	IMS No. 511	Bird Shoal
DENTALIUM LAQUEATUM Verrill (Panelled Tusk)	1.93 inch (49mm)	IMS No. 1213*	SE of Cape Lookout
DENTALIUM TEXASIANUM Philippi (Texas Tusk)	0.98 inch (25mm)	IMS No. 751	Fort Macon Beach
DIODORA CAYENENSIS (Lamarck) (Cayenne Keyhole Limpet)	1.10 inch (30mm)	IMS No. 1010*	SE of Cape Lookout, N. C.
DISTORSIO CLATHRATA (Lamarck) (Atlantic Distorsio)	2.87 inch (73mm)	Truckner*	(S. F.) Beaufort
DISTORSIO MCGINTYI Emerson & Puffer (Florida Distorsio)	1.81 inch (46mm)	Walton	(S. F.) Beaufort
EPITONIUM ANGULATUM (Say) (Angulate Wentletrap)	0.90 inch (23mm)	IMS No. 574	Fort Macon Beach
EPITONIUM HUMPHREYSI (Kiener) (Humphrey's Wentletrap)	0.67 inch (17mm)	IMS No. 750	Fort Macon Beach
EPITONIUM MULTISTRIATUM (Say) (Many-ribbed Wentletrap)	0.36 inch (9mm)	IMS No. 1042	Just off Cape Lookout
EPITONIUM RUPICOLA (Kurtz) (Brown-banded Wentletrap)	0.55 inch (14mm)	IMS No. 742	Fort Macon Beach
EUPLEURA CAUDATA (Say) (Thick-lipped Drill)	1.14 inch (29mm)	IMS No. 559*	Holden Beach
FASCIOLARIA LILIUM HUNTERIA (Perry) (Banded Tulip)	4.53 inch (115mm)	IMS No. 1108*	Off Cape Lookout
FASCIOLARIA TULIPA (Linne) (True Tulip)	9.45 inch (240mm)	IMS No. 4597.1*	(S. F.) E of Cape Lookout
FICUS COMMUNIS (Roding) (Common Fig Shell)	4.42 inch (112mm)	Laughinghouse	(S. F.) Beaufort
HALIOTIS POURTALESII Dall (Pourtales' Abalone)	0.59 inch (15mm)	IMS No. 4144	SE of Cape Lookout
ILYANASSA OBSOLETUS (Say) (Eastern Mud Snail)	0.85 inch (21.5mm)	IMS No. 1632*	Bogue Sound
LITTORINA IRRORATA (Say) (Marsh Periwinkle)	1.06 inch (27mm)	IMS No. 1654*	North River
LUNATIA HEROS (Say) (Common Northern Moon Snail)	4.25 inch (108mm)	IMS No. 1112.2	Off Oregon Inlet
FAVARTIA CELLULOSA (Conrad) (Pitted Murex)	0.79 inch (20mm)	IMS No. 2431	SE of Cape Fear
MORUM DENNISONI (Reeve) (Dennison's Morum)	1.57 inch (40mm)	Petuch	ESE of Cape Fear
MUREX FLORIFER DILECTUS A. Adams (Lace Murex)	2.84 inch (72mm)	IMS No. 2306*	Off Cape Fear
MUREX FULVESCENS (Sowerby) (Giant Atlantic Murex)	7.08 inch (180mm)	Piper*	Cape Lookout
MUREX LEVICULUS (Dall) (Thin-ribbed Murex)	0.67 inch (17mm)	IMS No. 2356*	SE of Cape Hatteras
MUREX POMUM Gmelin (Apple Murex)	3.46 inch (88mm)	Walton*	(S. F.) Beaufort
MUREX RECURVIROSTRIS RUBIDUS F. C. Baker (Rose Murex)	1.33 inch (32.5mm)	IMS No. 1851*	ESE New River Inlet
NASSARIUS ACUTUS (Say) (Sharp-knobbed Nassa)	0.51 inch (13mm)	IMS No. 496	Bird Shoal
NASSARIUS ALBUS (Say) (Variable Nassa)	0.60 inch (13.6mm)	IMS No. 9624	Newport River
NASSARIUS TRIVITTATUS (Say) (New England Nassa)	0.79 inch (20mm)	DML No. 358*	Off Oregon Inlet
NASSARIUS VIBEX (Say) (Common Eastern Nassa)	0.61 inch (15.5mm)	IMS No. 475*	Bird Shoal
NATICA CANRENA (Linne) (Colorful Atlantic Natica)	1.70 inch (43mm)	Piper	?
NISO HENDERSONI Bartsch (Henderson's Niso)	1.38 inch (35mm)	IMS No. 1854	ESE New River Inlet
OLIVA SAYANA RAVENEL (Lettered Olive)	3.58 inch (91mm)	Cochran	(S. F.) Beaufort

PAPYRIDEA SOLENIFORMIS (Bruguiere) (Spiny Paper Cockle)	1.50 inch (38mm)L	IMS No. 637	New Topsail
	0.94 inch (24mm)L	IMS No. 2325.2*	SSE Cape Hatteras
PECTEN RAVENELI Dall (Ravenel's Scallop)	2.76 inch (70mm)L	IMS No. 1885*	SE New River
PERIPLOMA LEANUM (Conrad) (Lea's Spoon Clam)	1.73 inch (44mm)L	IMS No. 1383	Southport
PETRICOLA PHOLADIFORMIS Lamarck (False Angel Wing)	2.21 inch (56mm)L	IMS No. 747p	Fort Macon
	1.77 inch (45mm)L	DML No. 1845*	Harkers Island
PHOLAS CAMPECHIENSIS Gmelin (Campeche Angel Wing)	3.75 inch (96mm)L	IMS No. 451b	Yaupon Beach
PITAR MORRHUANUS Linsley (Morrhua Venus)	1.46 inch (37mm)L	DML No. 514	Off Oregon Inlet
	1.42 inch (36mm)L	DML No. 514*	Off Oregon Inlet
PHACOIDES FILOSUS (Stimpson) (Northeast Lucinia)	1.22 inch (31mm)L	DML No. 519*	Off Oregon Inlet
PLACOPECTEN MAGELLANICUS (Gmelin) (Atlantic Deep-sea Scallop)	6.38 inch (162mm)L	Piper*	Above Cape Hatteras
PLICATULA GIBBOSA (Lamarck) (Kitten's Paw)	1.33 inch (32mm)L	IMS No. 4414	Off Cape Fear
PODODESMUS RUDIS (Broderip) (False Atlantic Jingle)	1.02 inch (26mm)H	IMS No. 363*	SE Cape Lookout
POLYMESODA CAROLINIANA (Bosc) (Carolina Marsh Clam)	2.09 inch (53mm)L	IMS No. 2601*	Calico Creek
PSEUDOCHAMA RADIANS (Lamarck) (Atlantic Left-handed Jewel Box)	2.21 inch (56mm)H	IMS No. 1830*	SE New River
PTERIA COLYMBUS (Roding) (Atlantic Wing Oyster)	3.81 inch (97mm)L	IMS No. 1881*	SE New River
RANGIA CUNEATA (Sowerby) (Common Rangia)	3.18 inch (81mm)L	DAW*	Neuse River
RAETA PLICATELLA (Lamarck) (Channeled Duck Clam)	2.72 inch (69mm)L	IMS No. 732	Fort Macon
RUPELLARIA TYPICA (Jonas) (Atlantic Rupellaria)	1.10 inch (28mm)L	DML No. 1221*	Off Cape Lookout
SEMELE BELLASTRIATA (Conrad) (Cancellate Semele)	0.83 inch (21mm)L	IMS No. 2512	Off Cape Fear
	0.67 inch (17mm)L	IMS No. 2210*	SE Cape Lookout
SEMELE PROFICUA (Pulteney) (White Atlantic Semele)	1.38 inch (35mm)L	IMS No. 630b	New Topsail Inlet
SEMELE PURPURASCENS (Gmelin) (Purplish Semele)	1.10 inch (28mm)L	IMS No. 2513	Off Cape Fear
	1.02 inch (26mm)L	IMS No. 4473	SE Cape Lookout
SOLECURTUS CUMINGIANUS Dunker (Corrugated Razor Clam)	2.84 inch (72mm)L	IMS No. 1640	Offshore N. C.
SOLENYA VELUN Say (Boreal Awning Clam)	0.79 inch (20mm)L	IMS No. 1350*	Bogue Sound
SOLEN VIRIDIS (Say) (Green Jackknife Clam)	1.38 inch (35mm)L	IMS No. 4954	Atlantic Beach
SPENGLERIA ROSTRATA (Spengler) (Spengler Clam)	1.73 inch (44mm)L	IMS No. 9296.1*	SE Cape Fear
SPISULA RAVENELI (Conrad) (Southern Atlantic Surf Clam)	4.13 inch (105mm)L	IMS No. 1343*	Cape Lookout
SPISULA SOLIDISSIMA (Dillwyn) (Atlantic Surf Clam)	5.94 inch (151mm)H	IMS No. 101	Cape Lookout
	4.06 inch (103mm)H	IMS No. 3494.17*	Nags Head
SPONDYLUS AMERICANUS Herman (Atlantic Thorny Oyster)	3.23 inch (82mm)H	IMS No. 4417	Off Cape Fear
	3.07 inch (78mm)H	IMS No. 2596*	SE Cape Lookout
TAGELUS DIVISUS (Spengler) (Purplish Tagelus)	1.30 inch (33mm)L	IMS No. 504*	Bird Shoal
TAGELUS PLEBEIUS (Lightfoot) (Stout Tagelus)	3.58 inch (91mm)L	IMS No. 503*	Bird Shoal
TELLIDORA CRISTATA (Recluz) (White-crested Tellin)	0.95 inch (24mm)L	IMS No. 929	Atlantic Beach
TELLINA AEQUISTRIATA Say (Lintea Tellin)	0.90 inch (23mm)L	IMS No. 513*	Bird Shoal
TELLINA ALTERNATA Say (Alternate Tellin)	2.60 inch (66mm)L	Walton	New River Inlet
TELLINA LISTERI Roding (Speckled Tellin)	1.73 inch (44mm)L	IMS No. 2316	SSE Cape Hatteras
TELLINA MAGNA Spengler (Great Tellin)	4.96 inch (126mm)L	Walton	(S. F.) Beaufort
TELLINA NITENS C. B. Adams (Georgia Tellin)	1.42 inch (36mm)L	IMS No. 4543*	SE Cape Lookout
TELLINA PROBINA Boss (Boss' Dwarf Tellin)	0.79 inch (20mm)L	IMS No. 4464	SE New River
TRACHYCARDIUM EGMONTIANUM (Shuttleworth) (Prickly Cockle)	2.96 inch (75mm)H	DML No. 2232	Cape Lookout
	2.80 inch (71mm)H	Piper*	Cape Lookout Bight

PHALIUM CORONADOI (Crosse)	3.46 inch (88mm)	IMS No. 274*	Off Cape Fear
PHALIUM GRANULATUM (Born) (Scotch Bonnet)	3.40 inch (88mm)	Porter	Off Wrightsville Area
	3.00 inch (76mm)	IMS No. 409*	Offshore Beaufort
PLEUROPLOCA GIGANTEA (Kiener) (Florida Horse Conch)	16.25 inch (412mm)	Piper*	Off Beaufort Inlet
POLINICES DUPLICATUS (Say) (Atlantic Moon Snail)	3.58 inch (91mm)W	Van Landingham	Ocracoke
	3.02 inch (77mm)W	IMS No. 348*	Off Beaufort Inlet
POLINICES LACTEUS (Guilding) (Milk Moon Snail)	0.67 inch (17mm)	IMS No. 1728	SE Beaufort Inlet
	0.43 inch (11mm)	IMS No. 2558(*?)	SE Beaufort Inlet
PISANIA TINCTA (Conrad) (Tinted Cantharus)	1.18 inch (30mm)	IMS No. 351	Shark Shoal Jetty
SCAPHELLA DUBIA Var. GEORGIANA Clench (Dubious Volute)	4.42 inch (112mm)	DML No. 2511*	ESE Cape Lookout
SCAPHELLA JUNONIA (Lamarck) (Junonia)	5.28 inch (134mm)	Dudley	Fort Macon Beach
	2.76 inch (70mm)	Piper*	Offshore Beaufort
SIMNIA UNIPLICATA (Sowerby) (Single-toothed Simnia)	0.83 inch (21mm)	IMS No. 219*	Bogue Sound
SINUM MACULATUM (Say) (Maculated Baby's Ear)	1.70 inch (43mm)W	DAW*	Offshore Beaufort
SINUM PERSPECTIVUM (Say) (Common Baby's Ear)	1.73 inch (44mm)	DML No. 2309*	Pivers Island
STROMBUS ALATUS Gmelin (Florida Fighting Conch)	4.53 inch (115mm)	Piper	?
	4.30 inch (112mm)	IMS No. 2740*	SW of Cape Fear
STROMBUS COSTATUS Gmelin (Milk Conch)	6.02 inch (154mm)	Petuch*	ESE of Cape Fear
TEREBRA CONCAVA (Say) (Concave Auger)	0.90 inch (23mm)	IMS No. 1855*	ESE of New River Inlet
TEREBRA DISLOCATA (Say) (Atlantic Auger)	2.20 inch (56mm)	Van Landingham	Ocracoke
THAIS HAEMASTOMA FLORIDANA (Conrad) (Southern Oyster Drill)	3.81 inch (97mm)	IMS No. 238*	Ocracoke
TONNA GALEA (Linne) (Giant Tun)	7.39 inch (188mm)	Van Landingham	Portsmouth
	4.92 inch (125mm)	DAW*	Offshore Beaufort
TURBO CASTANEA Gmelin (Chestnut Turban)	1.65 inch (42mm)	IMS No. 919	Onslow Beach
	1.54 inch (39mm)	IMS No. 2266*	Bogue Sound
TURRITELLA EXOLETA (Linne) (Eastern Turritella)	2.75 inch (70+mm)	IMS No. 2254.1	SE Cape Lookout
UROSALPINX CINERA (Say) (Atlantic Oyster Drill)	1.50 inch (38mm)	IMS No. 1133	Bogue Sound
XENOPHORA CONCHYLIOPHORA (Born) (Atlantic Carrier Shell)	2.24 inch (57mm)W	Walton	(S. F.) Beaufort
	2.00 inch (51mm)W	IMS No. 1875*	SE of New River Inlet

BIVALVES

AEQUIPECTEN MUSCOSUS (Wood) (Rough Scallop)	1.85 inch (47mm)L	IMS No. 1845*	ESE New River
AMERICARDIA MEDIA (Linne) (Atlantic Strawberry Cockle)	1.38 inch (35mm)H	IMS No. 1847	ESE New River
ANADARA BRASILIANA (Lamarck) (Incongruous Ark)	2.48 inch (63mm)L	IMS No. 762	Fort Macon Beach
ANADARA FLORIDANA (Conrad) (Cut-ribbed Ark)	4.36 inch (111mm)L	IMS No. 85	Atlantic Beach
	3.65 inch (92mm)L	IMS No. 1103.3*	SE Cape Lookout
ANADARA OVALIS (Brugiere) (Blood Ark)	2.24 inch (57mm)L	IMS No. 546a*	Holden Beach
ANATINA ANATINA (Spengler) (Smooth Duck Clam)	2.80 inch (71mm)L	IMS No. 473	Bird Shoal
ANDONTIa ALBA Link (Buttercup Lucine)	2.76 inch (70mm)L	IMS No. 71	Atlantic Beach
ANODONTIA PHILIPPIANA (Reeve) (Chalky Buttercup)	3.74 inch (96mm)L	IMS No. 712	Cape Lookout
ANOMIA SQUAMULA Linne (Prickly Jingle)	1.97 inch (50mm)H	?DML No. 856*	Off Cape Lookout
	1.02 inch (26mm)L	IMS No. 9687*	Newport River
ANOMIA SIMPLEX Orbigny (Atlantic Jingle)	1.33 inch (32mm)H	IMS No. 708*	Cape Lookout

ARCA IMBRICATA Brugiere (Mossy Ark)	2.60 inch (66mm)L	IMS No. 1880*	SE New River
ARCA ZEBRA (Swainson) (Turkey Wing)	3.55 inch (90mm)L	IMS No. 1879.9*	SE New River
ARCINELLA CORNUTA Conrad (Florida Spiny Jewel Box)	1.95 inch (49mm)H	IMS No. 2282*	Off Cape Fear
ARGOPECTEN GIBBUS (Linne) (Calico Scallop)	2.96 inch (75mm)L	IMS No. 782d*	Off Bogue Inlet
ARGOPECTEN IRRADIANS CONCENTRICUS (Say) (Atlantic Bay Scallop)	3.46 inch (88mm)L	IMS No. 1791.9*	Bogue Sound
ASTARTE BOREALIS (Schumaker) (Boreal Astarte)	1.18 inch (30mm)L	DML No. 576*	Off Oregon Inlet
ASTARTE CASTANEA (Say) (Smooth Astarte)	1.10 inch (28mm)L	DML No. 1646*	Off Oregon Inlet
ASTARTE UNDATA Gould (Waved Astarte)	1.20 inch (33mm)L	DML No. 1225*	Off Oregon Inlet
ATRINA RIGIDA (Lightfoot) (Rigid Pen Shell)	9.18 inch (233mm)L	IMS No. 407*	Beaufort
ATRINA SEMINUDA (Lamarck) (Half-naked Pen Shell)	7.36 inch (187mm)L	IMS No. 529c	Holden Beach
	5.91 inch (150mm)L	IMS No. 1797*	Off Shackleford
ATRINA SERRATA (Sowerby) (Saw-toothed Pen Shell)	9.85 inch (251mm)L	IMS No. 973*	Bogue Banks
BARBATIA CANDIDA (Helbling) (White-bearded Ark)	0.98 inch (25mm)L	IMS No. 2225*	SE Cape Lookout
BARBATIA DOMINGENSIS (Lamarck) (White Minature Ark)	1.18 inch (30mm)L	IMS No. 2265*	SE Cape Lookout
BARNEA TRUNCATA (Say) (Fallen Angel Wing)	2.21 inch (56mm)L	IMS No. 1936	Newport River
BRACHIDONTES EXUSTUS (Linne) (Scorched Mussel)	0.79 inch (20mm)L	IMS No. 6*	Famlico Sound
CALLISTA EUCYMATA (Dall) (Glory-of-the-Seas Venus)	1.22 inch (31mm)L	IMS No. 4483	SE Cape Lookout
CHAMA CONGREGATA Conrad (Little Corrugated Jewel Box)	1.34 inch (34mm)H	IMS No. 939*	Cape Lookout
CHAMA MACEROPHYLLA (Gmelin) (Leafy Jewel Box)	1.46 inch (37mm)H	IMS No. 764	Fort Macon
CHIONE CANCELLATA (Linne) (Cross-barred Venus)	1.66 inch (42mm)L	IMS No. 3407*	Middle Sound-Wrightsville Beach
CHIONE INTAPURPUREA (Conrad) (Lady-in-waiting Venus)	1.54 inch (39mm)L	Walton	(S. F.) Beaufort
CHIONE LATILIRATA (Conrad) (Imperial Venus)	1.34 inch (34mm)L	IMS No. 2295.1*	ESE Cape Lookout
CRASSOSTREA VIRGINICA (Gmelin) Easter Oyster	8.34 inch (212mm)H	IMS No. 683.2*	Cedar Island
CUMINGIA TELLINOIDES (Conrad) Tellin-like Cumingia	0.90 inch (23mm)L	IMS No. 763	Fort Macon
CYCLOCARDIA BOREALIS (Conrad) (Northern Cardita)	1.33 inch (32mm)L	IMS No. 1219*	Off Oregon Inlet
CYRTOPLEURA COSTATA (Linne) Angel Wing	5.76 inch (146mm)L	Van Landingham	Ocracoke
	4.92 inch (125mm)L	IMS No. 241*	Peletier Creek
DINOCARDIUM ROBUSTUM (Lightfoot) (Giant Atlantic Cockle)	4.68 inch (119mm)H	Piper*	Cape Lookout
DIPLODONTA PUNCTATA (Say) (Atlantic Diplodon)	0.79 inch (20mm)L	IMS No. 3133	SSE Cape Hatteras
DIVARICELLA QUADRISCULCATA (Orbigny) (Cross-hatched Lucine)	0.79 inch (20mm)L	IMS No. 501*	Bird Shoal
DONAX VARIABILIS Say (Florida Coquina)	0.79 inch (20mm)L	IMS No. 2605*	Bogue Banks
DOSINIA DISCUS (Reeve) (Disk Dosinia)	2.84 inch (72mm)L	IMS No. 647a*	Shackleford Banks
DOSINIA ELEGANS Conrad (Elegant Dosinia)	3.90 inch (99mm)L	IMS No. 396	Off Bogue Banks
	3.58 inch (91mm)L	IMS No. 1104.1*	SE Cape Lookout
ENSIS DIRECTUS Conrad (Atlantic Jacknife Clam)	5.00 inch (127mm)L	IMS No. 1342*	Newport River
EUCRASSATELLA SPECIOSA (A. Adams) (Gibb's Clam)	2.32 inch (59mm)L	IMS No. 3956	Off Emerald Isle
	2.28 inch (58mm)L	DML No. 571*	S Cape Hatteras
GEUKENSIA DEMISSA (Dillwyn) (Atlantic Ribbed Mussel)	5.24 inch (133mm)L	IMS No. 3378.3	Radio Island
GLYCYMERIS AMERICANA (DeFrance) (Giant American Bittersweet)	4.02 inch (103mm)L	Piper*	Offshore Scallops
GLYCYMERIS PECTINATA (Gmelin) (Comb Bittersweet)	0.86 inch (22mm)L	IMS No. 644	Shackleford Banks
GLYCYMERIS SPECTRALIS Nicol (Spectral Bittersweet)	0.98 inch (25mm)L	IMS No. 2713.3*	Cape Fear
HIATELLA ARCTICA (Linne) (Artic Saxicave)	1.30 inch (33mm)L	Walton	New River Inlet
	1.25 inch (32mm)L	IMS No. 1262*	ESE New River

ISCHADIUM RECURVUM (Rafinesque) (Hooked Mussel)	1.85 inch (47mm)L	IMS No. 560c*	New River
LAEVICARDIUM LAEVIGATUM (Linne) (Common Egg Cockle)	2.87 inch (73mm)H	Walton	(S. F.) Beaufort
	2.56 inch (65mm)H	IMS No. 2734*	Off Oregon Inlet
LAEVICARDIUM MORTONI (Conrad) (Morton's Egg Cockle)	0.73 inch (18.5mm)H	IMS No. 444	Bogue Sound
LAEVICARDIUM PICTUM (Ravenel's Egg Cockle)	1.02 inch (26mm)H	IMS No. 1895*	SE New River
LIMA SCABRA (Born) (Rough Lima)	2.60 inch (66mm)H	IMS No. 2704	SE Cape Fear
LINGA PENNSYLVANIA (Linne) (Pennsylvania Lucine)	2.48 inch (63mm)L	IMS No. 1065	Off Core Banks
	2.05 inch (52mm)L	DML No. 2508*	E of Cape Lookout
LITHOPHAGA ANTILLARUM (Orbigny) (Giant Date Mussel)	3.23 inch (82mm)L	IMS No. 1064*	Off Cape Lookout
LITHOPHAGA ARISTATA (Dillwyn) (Scissor Date Mussel)	1.34 inch (34mm)L	DML No. 1160*	Off Cape Lookout
LITHOPHAGA BISULCATA (Orbigny) (Mahogany Date Mussel)	1.22 inch (31mm)L	Walton	Bogue Sound
LYONSIA BEANA Orbigny (Pearly Lyonsia)	1.34 inch (34mm)L	Walton	Off New River
	1.06 inch (27mm)L	IMS No. 9311.1*	SE Cape Fear
LYROPECTEN NODOSUS (Linne) (Lion's Paw)	4.72 inch (120mm)L	IMS No. 1842*	ESE New River
MACOMA BALTHICA (Linne) (Balthic Macoma)	1.06 inch (27mm)L	IMS No. 1130.1*	Adams Creek, N. C.
MACOMA BREVIFRONS (Say) (Short Macoma)	0.95 inch (24mm)L	IMS No. 4460	SE Cape Lookout
MACOMA CONSTRICTA (Bruguiere) (Constricted Macoma)	2.64 inch (67mm)L	IMS No. 7551	Cape Fear River
MACOMA MITCHELLI Dall (syn.=M. PHENAX)	0.75 inch (19mm)L	IMS No. 9857.1*	Neuse River
MACOMA TENTA (Say) (Tenta Macoma)	0.67 inch (17mm)L	IMS No. 1236*	Bogue Sound
MACROCALLISTA MACULATA (Linne) (Calico Clam)	3.39 inch (86mm)L	IMS No. 2738*	S of Cape Lookout
MACROCALLISTA NIMBOSA (Lightfoot) (Sunray Venus)	7.39 inch (188mm)L	Van Landingham*	60 ft. Depth off Ocracoke
MACTRA FRAGILIS Gmelin (Fragile Atlantic Mactra)	3.75 inch (94mm)L	IMS No. 5136.1*	Off Core Banks
MARTESIA CUNEIFORMIS (Say) (Wedge-shaped Martesia)	0.59 inch (15mm)L	IMS No. 439*	Core Sound
MERCENARIA CAMPECHIENSIS (Gmelin) (Southern Quahog)	5.58 inch (142mm)L	Truckner*	Cape Lookout Bight
MERCENARIA MERCENARIA (Linne) (Northern Quahog)	4.42 inch (112mm)L	IMS No. 98*	Hoop Pole Creek
MERCENARIA CAMPECHIENSIS - MERCENARIA HYBRID??	5.94 inch (151mm)L	IMS No. 4897*	Bogue Sound
	6.10 inch (155mm)L	Moody*	Howard's Channel near Hamstead, N. C.
MODIOLUS AMERICANUS (Leach) (Tulip Mussel)	2.87 inch (73mm)L	IMS No. 1863*	SE New River Inlet
MODIOLUS MODIOLUS (Linne) (Northern Horse Mussel)	4.48 inch (114mm)L	IMS No. 1111*	ENE Oregon Inlet
MODIOLUS MODIOLUS SQUAMOSUS Beauperthuy (False Tulip Shell)	2.32 inch (59mm)L	IMS No. 7398*	Bogue Sound
MULINIA LATERALIS (Say) (Dwarf Surf Clam)	0.91 inch (23mm)L	IMS No. 8317	SW Beaufort Inlet
	0.67 inch (17mm)L	IMS No. 1057*	New River Inlet
MYA ARENARIA Linne (Soft-shell Clam)	3.65 inch (92mm)L	IMS No. 1627	Cape Lookout
	3.18 inch (81mm)L	DML No. 2506*	Shackleford Banks
MYTILUS EDULIS Linne (Common Blue Mussel)	2.56 inch (65mm)L	DML No. 786	N of Cape Hatteras
	2.23 inch (56.5mm)L	IMS No. 693*	Kitty Hawk
NOETIA PONDEROSA (Say) (Ponderous Ark)	2.48 inch (63mm)L	IMS No. 1121.5*	Off Shackleford
OSTREA EQUESTRIS Say (Crested Oyster)	2.05 inch (52mm)H	IMS No. 244C*	Bogue Sound
OSTREA PERMOLLIS Sowerby (Sponge Oyster)	2.13 inch (54mm)H	IMS No. 4796.40*	ESE New River
PANDORA TRILINEATA Say (Say's Pandora)	1.10 inch (28mm)L	IMS No. 2549*	W Wimble Shoals
PANOPEA BITRUNCATA Conrad (Atlantic Geoduck)	7.36 inch (187 mm)L	Safrit*	Off Atlantic Beach
	3.27 inch (210mm)L	Safrit (Fossil?)	Off Atlantic Beach

TRACHYCARDIUM MURICATUM (Linne) (Yellow Cockle)	1.66 inch (42mm)H	IMS No. 3406*	Middle Sound-Wrightsville Beach Area
VENTRICOLARIA RIGATINA (Mellgrin) (Queen Venus)	1.77 inch (45mm)L	IMS No. 2598*	SE Cape Lookout
YOLDIA LIMATULA (Say) (File Yoldia)	1.66 inch (42mm)L	IMS No. 593*	Off Oregon Inlet
YOLDIA SAPOTILLA (Gould) (Short Yoldia)	0.86 inch (22mm)L	IMS No. 1224*	Off Oregon Inlet