Captain's Corner

Our Third Annual SCMEA Conference, "The A B Seas of Marine Education," held in Hilton Head in October, was a tremendous success. THANKS to the conference planning committee, the participants, the presenters, and the caterers. Although no one was prepared for the burst of cold weather, everyone seemed to make the best of the outdoor activities, particularly at our marine education materials auction on Saturday evening, which turned out to be a fun-filled, "fond-filled," welcomed addition to the conference. Fred James, our fantastic auctioneer, has been referred to as "a hoot," "fun," "wonderfully entertaining" and "a dear" on the conference evaluation forms! With 125 participants in attendance at the conference, including over 60 new members, SCMEA is certainly on its way to becoming a well-known, established, professional organization in South Carolina, providing educators throughout the state with the ability to learn more and continue to network in marine education.

All indications point to an increasing interest in marine education in South Carolina, a very positive trend since this decade will be one in which environmental concerns will take the lead in important issues requiring immediate attention, not only on local, state, and national levels, but on the global level as well. The Assistant Secretary for External Affairs of the Smithsonian stated, "I am utterly convinced that most of the great environmental struggles will either be won or lost in the 90's, and that by the next century, it will be too late." This statement is now echoed by many scientists, educators and environmental groups around the world. Accordingly, the forthcoming decade will be one in which individuals will be required to alter their behavior in an effort to effectively change the impact that their behavior has upon the environment. Clearly, rules and policies need to be viewed as reasonable and socially acceptable by an aware and educated public. The key to formulating this aware and educated public lies in education programs that are initiated in preschool and continue into adulthood.

Educators have become increasingly aware of the importance of introducing students to science at an early age. Studies have shown that an affinity for the sciences is developed during childhood, thus educators need to provide ample opportunities for students that foster their natural, inherent curiosity of the sciences. There is, however, a fundamental problem underlying this issue in regard to teachers educating students about marine science. Teachers, in general, have stated that they do not feel qualified to teach students marine science topics since they themselves have little to no background or training in this subject. They have also expressed a need to increase their awareness of available resources that address marine science concepts and issues.

Teachers are aware that they are often the most powerful influences in a child's life (Time Magazine, Oct. 8, 1990) and it is hoped that by learning, networking and sharing ideas with others interested in marine education through involvement with SCMEA, teachers will become more confident in introducing marine science topics into their classrooms. Consequently, more students in South Carolina will become exposed to marine science concepts and coastal environmental issues and it is hoped that this exposure will affect positive change in the way they address environmental issues in the future.

Paula Keener
SCMEA President
Committees Need Your Ideas, Abilities and Time!

SCMEA has grown tremendously since its start three years ago from a handful of marine educators to over 200 active members, and we've accomplished a lot! As we've grown, s

listed below are several committee that have been set up to help us achieve our goals. Please contact the committee chairs if you would like to serve on any of the committees or have some ideas to share.

1991 Conference Planning Committee - Purpose: To plan and coordinate the 1991 Annual Conference. This includes working out the logistics for a meeting place, meals, sessions, auction and volunteers to assist during the conference. Members so far: Beth Day, Chair, Stuart Dudley, Julie Finlayson, Debbie Maddaloni.

1991 Nominating Committee - Purpose: To review potential candidates and recommend one candidate for each available position on the Board for consideration by the membership during the Annual Conference. Members so far: Rhett Wilson.

Scholarship Review Committee - Purpose: To develop a scholarship program for SCMEA members to enable them to participate in activities that further marine education in South Carolina. Members: Wendy Allen, Chair, Julie Cliff, Beth Day, Rhett Wilson.

Program and Materials Review Committee - Purpose: To identify marine education programs and materials in use in South Carolina and survey the need for additional programs and resources. Members: Rhett Wilson, Chair, Beth Day.

What is an ESTRA?

An article in the last Seascapes described the South Carolina Earth Science Resource Mobilization Project whose purpose is to identify, mobilize and develop resources which will serve to strengthen the teaching of earth science in South Carolina. A major portion of this project involves the selection and preparation of fifteen Earth Science Teacher Resource Agents (ESTRAs) around the state who will assist in the collection and dissemination of these resources. At this point, the project has been in operation for about a year and a half. The fifteen ESTRAs and several alternates have been selected, and many teaching resources have been identified and compiled. These include collections of maps, audio-visual materials, classroom activities and a host of other materials. These have yet to be completely cataloged, but if anyone would like to know more about the collection of these materials, the project in general or about what is going on in earth science in South Carolina, please contact John Carpenter or Phil Astwood at the Center for Science Education listed with the Board addresses or contact the ESTRA in your area.

Barbara Clarkson - W.A. Perry Middle School, Columbia
Christine Harris - J.V. Martin Junior High, Dillon
Jane Hester - McCracken Middle School, Bluffton
Lee Howell - Jefferson Elementary School, Jefferson
Cleveland Lee - Fairfield Middle School, Winnsboro
Thomas Littlejohn - Roper Mountain Science Center, Greenville
David Mitchell - North Myrtle Beach Middle School, N. Myrtle Beach
Melany Nussbaumer - Riverside Middle School, Saluda
Michael Parker - Blue Ridge Middle School, Greer
Lemuel Patterson - Sanders-Clyde Elementary School, Charleston
Linda Ridge - Richard-Carroll Junior High School, Bamberg
Rex Smith - Woodmont Middle School, Piedmont
Karen Stratton - Fulmer Middle School, West Columbia
Emmie Thirlwell - Chapin High School, Chapin
Jane West - Castle Heights Middle School, Rock Hill
Spineless Wonders: Sea Cucumbers

by Fred James

Sea cucumbers belong to the phylum Echinodermata (spiny skinned animals). At first glance the average observer of marine life would never suspect that these worm or sac like organisms are related to sea urchins, sand dollars and starfish. Instead of spines or stiff bumps, sea cucumbers have calcareous plates embedded in their body wall. These plates vary in shape and can be observed by taking a piece of the body wall, dissolving it in bleech, adding a drop of water and a cover glass to a slide, and then viewing with a microscope. Students are often surprised to learn that all Echinoderms have internal skeletons covered by a thin layer of external tissue.

Sea cucumbers have tube feet filled with fluid which are operated by a water vascular system, unique to the echinoderm family. When the ampullae contract (see illustration below) and the valve is closed, water is forced into the tube foot which lengthens. When the sucker of the tube foot comes in contact with the surface, it secretes a substance which bonds the foot to the substrate. Another secretion from the sucker dissolves the bond. Contraction of longitudinal muscles in the tube foot pull the sea cucumber along.

On the South Carolina coast, sea cucumbers burrow into soft sediments. In the tropics, they are often found in grass beds and in tide pools hanging by sticky feet. They vary greatly in shape and size, ranging from several millimeters to over one meter in length! In tropical waters, many species look like a solid piece of bumpy rubber hose as much as three inches in diameter. While most species lie on their sides and move with their tube feet, one group of sea cucumbers has been observed swimming in an undulating fashion on moonlit nights! They capture food on their sticky tentacles which they stick one at a time into their mouth and "lick" clean. A few species lack tentacles and pass sand and mud through their guts, extracting food just like earthworms.

These unique organisms typically breath through their anus by drawing water into the rectum, off of which branch structures called respiratory trees (neat trick). Living inside the anus of various sea cucumbers are ciliated protozoans, small crabs, an amazing parasitic snail and an interesting fish called the pearl fish. The parasitic snail is bizarre since it looks like a worm and the male snail is so small it lives in the reproductive tract of the female (the ultimate home for a male)! The only characteristic which places them with the snails is their larval stage! The pearl fish, reaching sizes of up to 15 cm in length, is commonly found in the tropical five toothed sea cucumber. Scientists have no idea why this cucumber should have 5 teeth surrounding its anus. The pearl fish leaves the sea cucumber at night to feed and lives in the hind gut by day. If a predator attacks the fish at night, he often retreats to the sea cucumber, forcing his way through the anal opening, past the teeth and into the safety of the rectum. This anal home provides a protective abode since most tropical sea cucumbers produce a toxic material which paralyzes predaceous fish. Sea cucumbers are famous for their ability to eviscerate (shoot out their nontoxic guts) when handled. If a fish attacks, the sea cucumber often eviscerates, leaving his guts behind for the intruder to eat while the sea cucumber makes its retreat. The sea cucumber can regenerate its gut!

In the orient, the sea cucumber is boiled to bring about evisceration. The animals body wall is cleaned, dried, and sold as "Tre pang" or "Beche-de-Mer" which is used as a thickening for soup. In Japan, freshly skinned raw sea cucumber is a popular delicacy called "Namako" which is served at Sushi Bars! (Editor's Note: Maybe Fred can be convinced to prepare some of these delicacies for us at the next SCMEA conference!)

In the next column, I will discuss sexual reproduction in invertebrate animals. Unlike these spineless creatures, hopefully, it will send a thrill through your spine!

Dr. Fred James is a professor of Biology at Presbyterian College, Clinton, SC 29325. Suggestions can be made for future "Spineless Wonders" columns by writing or calling Fred at (803) 833-8402.

Illustration by Lee Nesbit - '90
1990 Conference Best Yet!

SCMEA's 3rd Annual Conference, "The A B Seas of Marine Education," held in Hilton Head, October 26-28, was an overwhelming success. It's hard to imagine topping the SCMEA conference held in Charleston last spring but we did! The conferences just keep getting better and better, thanks to the growing support of SCMEA members.

Attendance reached an all-time high of 125 and over 60 of the participants joined as new members. Conference activities began Friday afternoon with two study cruises aboard the Anila, tours of the Coastal Zone Education Center and the Waddell Mariculture Center, and a Project WILD-Aquatic workshop. Todd Ballantine presented the keynote address Friday evening and took us on a photographic journey from the ocean, across the dunes and into the marshes of Hilton Head - an excellent introduction to the ecology of the local area. Seventeen different concurrent sessions were presented on Saturday and many of these were repeated, giving participants an opportunity to attend the sessions that interested them most. A nice assortment of marine education materials and exhibits were also displayed at the conference site.

Saturday evening, we travelled to the Waddell Mariculture and Research Development Center for a "Seafood Feast," a business meeting, and SCMEA's first fund-raising auction. A beautiful sunset over the Colleton River greeted us as we previewed the auction items before digging into a delicious "Frogmore Stew" prepared by Doris Akers and Roxanne Pentz of the SC Wildlife and Marine Resources Department. President Rhett Wilson kept the business meeting short as people savored shrimp, sausage and corn on the cob on a rather brisk fall evening. Rhett summarized and encouraged people to applaud SCMEA's accomplishments over the year: a very successful spring conference, a state-wide mailing list of people interested in marine education, and SCMEA tee-shirts! She also reported that we had 146 members whose dues were current and 199 people who had paid dues in the last two years. Combined with over 60 new members gained at the conference, this brings our current membership over the 200 mark! "Hurray!" as Rhet tried to say through a microphone system that turned her subtle southern draw into a nasal "New Yorik" accent. Rhet also reported that SCMEA was now incorporated thanks to the hard work of Phil Astwood and legal counsel and she identified committees with which members could become involved. After surprising Wendy Allen with a certificate of appreciation for her contributions to SCMEA, Rhet turned the meeting over to incoming president, Paula Keener. Paula called on the Nominating Committee to present the slate of officers and the committee's recommendations were approved by the membership: Beth Day, President-elect; Phil Astwood, Secretary/Treasurer; Bruce Lampright, Director. Paula recognized the many people who had helped to gather the conference together, the meeting was adjourned, tables were cleared, and then the real frenzy began: SCMEA's first annual auction lead by auctioneer Fred James! The auction was such a success that the committee is planning separate coverage in the newsletter. Although the auction may have emptied a few pockets, participants saved some energy for the field trips to beach and mud flat habitats and local wildlife refuges on Sunday.

The Conference Planning Committee headed up by Paula Keener did an outstanding job selecting the meeting facilities and organizing the conference. We had the entire newly renovated USC Beaufort at Hilton Head campus to ourselves and it was easy getting from session to session. The Hilton Inn was also very accommodating and their complementary Continental Breakfast of fresh fruits, pastries and quiche was a pleasant surprise. Much of the credit for the success of the conference also goes to the presenters, field trip leaders, and other participants who joined in the sharing of knowledge, activities and friendship that is the at the heart of this organization.

Begin Planning for the 1991 Conference...

Plans for the 4th Annual SCMEA Conference are already underway. Beth Day, as President-elect, is chairing the Conference Planning Committee and welcomes your suggestions. Although the exact dates and locations have not been decided, the committee is looking in the Myrtle Beach area for sometime in October. 1991 Conference details and a call for papers will be included in the spring newsletter. In the meantime, begin to think about what you might present during our next conference!
Something for Everybody at SCMEA's First Auction

SCMEA held its first fund raising auction at the annual conference in October this year. It was wonderful success, raising over $1,300 in less than two hours, and everybody had fun in the process. Some of the auctioned items included a personal computer and software, curriculum materials, posters, batik fish designs on silk scarves, sweetgrass baskets, lots of beautifully designed sweatshirts and tee-shirts, and a dusty, shriveled up stingray that will be returned to the auction each year to give others the opportunity to acquire the treasured SCMEA mascot. The auction committee of Beth Day, Chair, Bob Bacon, Julie Cliff, Debbie Maddaloni, Bruce Lampright, and Cindy Renkas did an excellent job putting together this successful fundraiser. A special thanks also goes to Fred James for serving as our entertaining auctioneer and for his winning bid on the SCMEA stingray. Thanks are also extended to everybody who helped support the auction by bidding on items and especially to those organizations and individuals who donated items for the auction.

SCMEA gratefully acknowledges the following donors to the auction:


(Sorry if we inadvertently left anybody off this list!)

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SCMEA Tee Shirts

100% cotton with pocket
Sizes: Adult S, M, L, XL
Colors: Blue ink on white(W), coral(C) or green(G)
Cost: $10/ea. for SCMEA members, $12/ea. non members plus $1.00 shipping and handling per shirt

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### SCMEA Tees Order Form

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Please send to: Phil Astwood, Secretary - Treasurer, SCMEA, c/o Center for Science Education, University of South Carolina, Columbia, SC 29208. Make checks payable to "SCMEA." Please allow at least a few weeks for delivery.
Resource News

Teaching Aquifer Protection - A Curriculum Supplement for Grades 4-6 is hot off the press and contains lots of classroom activities dealing with the water cycle, ground water, water pollution, and water recycling and conservation. Training workshops with the curriculum will be available through local extension offices. Contact the Clemson extension office closest to you for additional information about this new curriculum resource.

Newsletters of Interest to Marine Educators:
The newsletters below are available free of charge to interested persons upon request. Write to the addresses listed to be placed on the mailing lists for these publications.

The Carolina Coast - published quarterly by the Marine Resources Division of the SC Wildlife and Marine Resources Department. Contains articles about marine research and education activities of the Department and general information about marine resources.
Marine Resources Division
PO Box 12559
Charleston, SC 29412

Carolina Currents - newsletter summarizing coastal management and educational activities of the SC Coastal Council.
SC Coastal Council
4130 Faber Place
Suite 300
Charleston, SC 29405

Coastal Heritage - quarterly publication of the SC Sea Grant Consortium that features coastal issues and topics of public interest.
SC Sea Grant Consortium
287 Meeting St.
Charleston, SC 29401

Coastwatch - published by the UNC Sea Grant College Program. Features articles on marine resources and contains a "Back Page" section with new resource materials that are often of interest to educators.

UNC Sea Grant College Program
105 1911 Building
Box 8605
NC State University
Raleigh, NC 27695

Continuing Education Opportunities

SC Shrimp Festival - Sat., Dec. 29, 1990 - From 11:00am-3:00pm, the 3rd Annual SC Shrimp Festival will return to King St. Square between Wentworth and Hasell in Charleston. The festival features shrimp cooked in a variety of ways, hot dogs, music, and more. For more information contact:
Phyllis Shaffer
(803) 881-6206 or 886-6237.

Consortium Winter Conference - Jan. 25, 1991, 9:15am-4:45pm - Andres Duany, noted architect and planner will be a featured speaker at the SC Sea Grant Consortium's 9th winter conference, "Beyond the Boom: Rethinking Strategies for Coastal Growth," at the Charleston Museum on Meeting St. Duany will speak about his innovative "new towns," such as the famous Seaside, Florida development. Other speakers will address how today's development patterns, such as urban sprawl, affect natural resources and culture, and how South Carolina can plan for wiser development. For more information, contact:
John Tibebs
SC Sea Grant Consortium
287 Meeting St.
Charleston, SC 29401
(803) 727-2078.

EEASC Spring Meeting - March 8-9, 1991 - The Environmental Education Association of South Carolina will hold its spring meeting in the Aiken area. The planning committee is lining up a number of activities, some of which might include: a tour of the Savannah River Ecology Lab, an update on Aiken's model recycling program, and a USC-Aiken science workshop. Contact the committee chair:

Nancy Thompson
412 Baldwin Dr.
Sumter, SC 29150
(803) 481-4480

4H Marine Camp - July 8-12, 1991. This popular Marine Camp for youngsters will be held at the Future Farmers of America Camp in Cherry Grove, SC. For more information, contact your local Clemson University Cooperative Extension Service office and ask for the 4H coordinator. If you would like to volunteer as an instructor, call Beth Day, Marine Extension Agent, (803) 248-2267.

NMEA Annual Conference - Aug. 6-10, 1991 - "Garden By the Sea" is the theme of the National Marine Educators Association's 1991 conference that will be held on the Rutgers University campus in New Brunswick, NJ. Field trips to New Jersey's beaches, pine barrens, and other natural areas are being planned as well as a full complement of sessions. Why not consider presenting a session at this national conference and share what you've been doing with others from around the Nation? NMEA members will automatically receive information about the conference. If you're not a member of NMEA and want information about the conference, contact:
NMEA 1991 Conference Committee
NMEA Chapter
45 Emerson St.
Carteret, NJ 07008.

Teacher Training Workshop at the Bermuda Biological Station - Aug. 6-15, 1991. The workshop is designed to provide teachers with an introduction to the Biological Station and help them plan a program for their students at the site. The cost is $695/person and includes room and board. For an application or more information contact:
Dr. Susan Cook, Education Director
Bermuda Biological Station
17 Biological Station Lane
Ferry Beach GE 01
Bermuda
(809) 297-1880
NMEA Membership Competitions
for Chapters

Which chapter will be the proud owner of the NMEA ship's wheel for 1991? Which chapter will earn the most Pike Points?

The beautiful NMEA ship's wheel will be presented during the 1991 Annual Conference to the chapter that shows the greatest percentage increase of NMEA members over the year. The winning chapter's name will be engraved in brass and permanently decorate one of the wheel spokes. FMSEA won the wheel in 1990 with an outstanding 92% increase of NMEA members in their chapter! Will SCMEA be next? Let's try!

In addition to the percentage-based membership competition, chapters can also compete for "Pike Points" - points that can be applied to the purchase of the infamous and valuable stuffed pike that has travelled thousands of miles between chapters, was pike-napped before the Miami conference, and was the highlight of the NMEA auction in Hawaii. One pike point will be awarded for each new NMEA member a chapter enlists and one pike point translates into one dollar during auction time. For example, MME gained 22 new NMEA members over the year and applied their 22 pike points to their winning bid for the pike, decorated in leis and plastic palm trees during the 1990 auction.

The chapter competitions begin September 1990 and will conclude June 30, 1991. A competition update will be given in the NMEA newsletter and final results will be presented at the 1991 conference in New Jersey. And, don't let the excitement of the contests make you forget the real benefits of joining NMEA: great conferences, informative newsletters, a fantastic journal, and an opportunity to network with some of the most talented, dynamic and friendly people you'll ever meet! A NMEA membership form is located elsewhere in the newsletter. Don't delay, become a member of NMEA and get others to join today! For more information about the contests or NMEA, contact our NMEA chapter representative:

Phil Astwood
Center for Science Education
University of South Carolina
Columbia, SC 29208
777-6920

SCMEA
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Bermuda Biological Station
17 Biological Station Lane
Ferry Beach GE 01
Bermuda
(809) 297-1880.
Become a Member of the
South Carolina Marine Educators Association

and join a group of dedicated teachers, naturalists, scientists and others interested in studying and teaching about the world of water, both fresh and salt. The Association provides a communication network for members to share information and ideas through newsletters and an annual statewide conference. Membership dues are $5.00 a year and include three newsletters, a discount on the registration fee for the annual conference, and an opportunity to interact with some of the most dynamic educators in the state!

Date: ______________________

Name ______________________
Home Address ______________________

Occupation ______________________
Place of Employment ______________________

Home Phone Number ______________________
Work Address ______________________

Work Phone Number ______________________

Are you currently a member of the National Marine Educators Association (NMEA)? ______ yes ______ no

Please send completed form with the $5.00 membership fee (make checks payable to SCMEA) to:

Phil Astwood, Secretary-Treasurer, SCMEA
Center for Science Education, University of South Carolina, Columbia, SC 29208

Join NMEA . . .

... and begin to network with educators around the country sharing a common love and concern for our water world. Membership benefits include a subscription to Current: The Journal of Marine Education; the newsletter, NMEA News; and registration discounts for some the best annual conferences you'll ever attend!

Name: ______________________
Address: ______________________

Occupation or Title: ______________________

(Street or PO Box) ______________________ (City) ______________________ (State) ______________________ (Zip) ______________________

Individual Memberships

- Student - $15
- Active, 1 year - $25
- Active, 2 years - $48
- Active, 3 years - $68
- Associate - $40
- Sustaining - $100 or more
- Life - $300 or more
- Patron - $500 or more

Institutional Memberships

- Affiliate (includes libraries) - $35
- Corporate - $250 or more

Are you currently a member of a regional chapter? ______ yes ______ no. If yes, which one? ______________________

Please make check payable to NMEA and mail to: National Marine Educators Association, PO Box 51215, Pacific Grove, CA 93950.