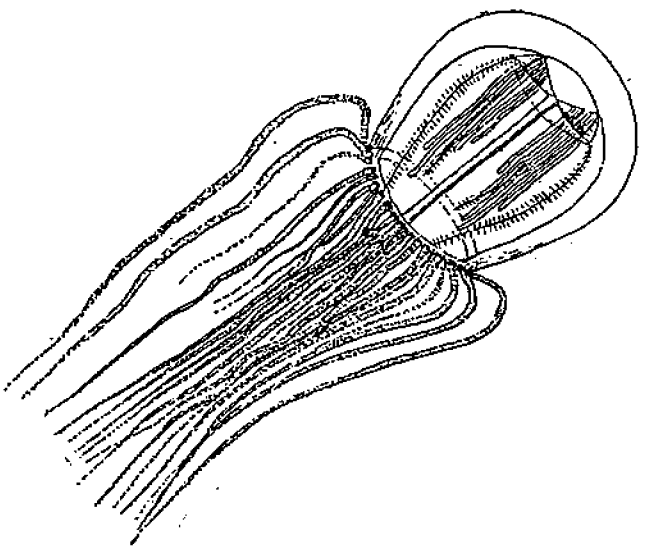
March, 1997 **SCAMIT Newsletter** Vol. 15, No. 11

NEXT MEETING:	Workshop - The Taxonomy of Benthic Cnidaria
GUEST SPEAKER:	Moderator - John Ljubenkov
DATE:	10-11 April 1997
TIME:	9am - 4pm each day
LOCATION:	Dancing Coyote Ranch, 20355 Hwy 76, Pauma Valley, California



Polyorchis (from Hyman, 1940. The Invertebrates, Volume 1 - Protozoa-Ctenophora)

APRIL 10-11 WORKSHOP

Our April meeting has been replaced with a two day workshop titled Taxonomy of Benthic Cnidaria emphasizing the fauna of So. California and adjacent regions. Sessions on Hydrozoa and Anthozoa are planned, with particular attention to *Polyorchis*, corymorphine hydroids and their medusae, *Plumularia*, burrowing anemones, gorgonians, sea pens and other octocorals. Bring problem specimens, of which there should be no lack. Please contact John @ 619)742-2238 for directions, information, to indicate attendance, or for help arranging accommodations for overnighting.

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NEW LITERATURE

A variety of new papers were distributed at the meeting for member examination. Two dealt with echinoderms, which form the backbone of Taxonomic Atlas Volume 14, our discussion topic for the meeting. Both concerned holothuroids, with Rodgers & Bingham (1996) addressing the subtidal zonation of the eastern Pacific *Cucumaria lubrica*, and Foster & Hodgson (1996) examining the relationships between gut morphology, tentacle morphology, and feeding in five South African cucumbers.

The population of *C. lubrica* used as the basis of the first paper was from Anacortes, Washington. Responses of the species in southern California waters are probably quite similar. The authors found the population distributed within fairly distinct depth bands, apparently based largely on the responses of the animals to light.

The South African species examined in the second paper had three different tentacle morphologies; dendritic, modified dendritic, and peltate. The authors found these morphological differences to reflect differences in food substrate used. Species which had a high proportion of plant matter in their diet also showed elongation of the gut to provide additional time for digestion of cellulose in the food.

Sudo & Azeta (1996) report on life history and secondary production of the Japanese amphipod *Byblis japonicus*. This species does not occur in the Eastern Pacific, but is not too different from the local *B. veleronis*. The authors review all previous life history information on ampeliscid amphipods; a useful reference.

The extent to which a single fish population can affect a benthic crustacean one was detailed by Berghahn (1996). He reports on an invasion of juvenile whiting in 1990, which caused localized near extinction of a shrimp (*Crangon crangon*) in the Wadden Sea. Although isolated, such severe depredations are not unique events. They appear to be a recurrent feature involving several gadoid fishes, with records from 1959, 1970, 1983, and 19th century European waters. Happily the shrimp population recovered within one year in the most recent episode.

Krueger & Cavanaugh (1997) discuss a closer relationship between two disparate populations; that of species in the clam genus *Solemya* and their bacterial symbionts. Given the closeness of their relationship one would assume them to have co-evolved from one seminal symbiotic event. Comparisons of 16S rRNA genes in a series of symbiont species indicate this is not so. The relationship with *Solemya* seems to have been independently established on a number of occasions. Some of the bacterial symbionts are, for instance, much more closely related genetically to symbionts of lucinid bivalves than to species symbiotic with other *Solemya* species.

The role of gastropod egg capsules in shielding the developing young of intertidal species from harmful exposure to ultraviolet light is discussed by Rawlings (1996). He found that in *Nucella emarginata* the capsule decreased UV-A by 45% and UV-B by 95%, protecting the contained embryos. Removal of capsules resulted in higher embryo mortality. Although this type of capsule is not a response to ozone-hole developments, species which invested in heavier, more UV protective egg capsules are now reaping an increased benefit from the recent increases in UV exposure intensity.

Taxonomic difficulties in the conid gastropod genera *Oenopota* and *Propebela* were investigated by Lundberg et al (1996) using cladistic methods. Although the group of species they considered were from the north Atlantic, much the same problems would be encountered with the north Pacific and Arctic members of these genera (rampant homoplasy for one). Using the 23 north Atlantic species, their analysis indicated that *Propebela* was a monophyletic clade, while *Oenopota* was paraphyletic. Their data matrix included 26 morphological characters derived

from the shells, radulae, and operculi of the animals. No anatomical characters were used, since they are, in most cases, unknown. A much stronger and more definitive analysis involving anatomical characters remains to be performed by someone with a considerable amount of time to do dissections and anatomical evaluations of the many species. Such an analysis would provide a much broader spectrum of characters for analysis, perhaps allowing some of the more homoplasious to be eliminated.

The paper by Bavestrello et al (1996) provided observations on the relationships between the colonial hydroid *Eudendrium glomeratum* and its associated epifauna. While this hydroid is from the Mediterranean, we have a local species (*Eudendrium rameum*) which probably has very similar types of relationships with it's associates. The most interesting observations were of a clepto-commensal relationship with a caprellid. The caprellid would allow the hydroid hydranths to catch prey, and then steal them for it's own consumption! Perhaps human behavior isn't so different after all (sounds a lot like some advisor/ grad student situations to me). Relationships with predatory aeolid nudibranchs and pycnogonids were also discussed.

DEAR VICE-PRESIDENT GORE...

We also circulated at the meeting a letter sent down via E-mail by member Gary Gillingham (KLI) who thought we might be interested either individually or as an organization. It was to be sent to Vice-President Gore to call his attention to the intensifying crisis caused by alien species invasions of North American ecosystems. It was authored by a group of scientists from various disciplines. They solicited further signitors who felt that the problem they described required higher national priority. Several of the members present expressed interest. The deadline for submission was 14 March, so if you did not find out about this prior to this Newsletter, your chance of signing has passed. Sorry to not have provided a heads-up earlier.

MINUTES OF THE 10 MARCH MEETING

After our business meeting and circulation of the literature items mentioned above we proceeded to our discussion. Leader Megan Lilly usually kept us to our path, but a few digressions occurred. We began our examination of Volume 14 of the Taxonomic Atlas Series (Blake et al 1996) with the echinoderms. In general we were all pleased with the volume, and considered it a valuable edition to the series. Most of the comments received had to do with minor errors and discrepancies in the texts. Chapter 4. Phylum Echinodermata provoked no comment.

Chapter 5. Class Crinoidea was singled out as a fine discussion of the one included species, something which can serve as a model to strive for in future. There was an omission in the first literature citation on Pg. 93, where the year of publication of Bernard and Ziesenhenne's paper (1961) was left out.

Chapter 6. Class Asteroidea seemed to have some problems with literature citation.

◆ The citation of "Lambert, 1945" on pg. 102 and subsequently throughout the chapter should read "Lambert, 1981".

◆ Citation of "Morris et al, 1980" on pg. 109 should read "Feder, 1980".

◆ References to "Lissner, 1980" and "Lawrence, 1987" throughout the chapter are not supported by inclusion of these references in the Literature Cited. They are included in the bibliography at the end of this newsletter so you can add them to your copy.

◆ A more serious problem was the misattribution of authorship for the taxon *Astropecten verrilli* (pg. 101 and 104). According to Maluf (1988) the author of this species is de Loriol, and date of publication is 1899; there should not be parentheses around the author/date.

◆ We also disagree with the statement that *A. verrilli* is the only *Astropecten* occurring north of San Pedro, California (pg. 105). *Astropecten armatus* are taken well to the north in the Santa Barbara Channel, and possibly north of Pt. Conception. Channel occurrences are documented by voucher specimens collected during the SCBPP in 1994. *Astropecten ornatissimus* is still known from too few specimens for it's distribution to be accurately determined. Although no specimens are yet known from north of San Pedro, it may have been reported in the past as *A. verrilli*, masking a more northern distribution.

◆ On page 105 the name Verrill is misspelled (as Verill) in the authorship of *Hippasteria spinosa*.

◆ On page 106 *Pteraster tesselatus* is misspelled (as *P. tessalatus*) in a parenthetical entry under "Biology".

◆ On pg 110, in the second sentence in the **Description** section - the word "longer" in regards to arm/disc ratio, should be replaced with "larger". The word "are" should be inserted after the word "ratio" at the beginning of the third sentence.

These are for the most part quite trivial errors, but since these volumes are likely to receive use for some time as sources, we should do our best to catch and correct even the trivial errors so they are not inadvertently perpetuated under the guise of authority.

Chapter 7. Class Ophiuroidea. Generally we found this chapter to be very well done, and, except for the complete lack of a key, easy to use.

◆ Spencer and Wright (1966), mentioned several times on pg. 115 is omitted from the literature cited list.

◆ On pg. 137, in the third paragraph of the **Description** section, the author states "Generally 5 oral papillae." We feel this is a typo and should read "Generally 4 oral papillae", as we can only count 4 oral papillae in the formula presented.

◆ On pg. 148 under **Remarks** we felt the statement "distinctions between nominal *Amphiura* and *Amphioplus* species with 4 pairs of oral papillae can be baseless." could use some further amplification. Perhaps Dr. Hendler can be persuaded to provide some at a future meeting.

◆ On pg. 150 the synonymy of *Amphioplus hexacanthus* with *Dougaloplus amphacanthus* will have to be discussed with Dr. Hendler. While it is clear from his type examination that the two species are synonyms, we have been applying the name *A. hexacanthus* to an entity which differs markedly from *D. amphacanthus* in disk morphology. What should it be referred to? Certainly not to *D. amphacanthus*!

◆ On pg. 160 the final paragraph indicates that preserved specimens of *Ophiuroconis bispinosa* "retain considerable pigmentation". This has not been observed by those members present, except for possibly one instance. Does handling of our preserved material differ from that of the museum?

Chapter 8. Class Echinoidea. Once again some difficulty with the literature citations.

◆ Lambert and Thiery, 1924 (pg. 189) were not included in the literature citations.

◆ In the discussion under **Biology** of *Allocentrotus fragilis* the statement "Their feeding is characterized as predator-scavenger," was not consistent with the experience of the members present. All of us who have seen these animals broken open have found sediment filled guts, hardly the hallmark of a predator or scavenger. It is suggested that the common appearance of these animals around food falls (Lissner, pers. obs.) is an opportunistic behavior which differs from the norm for this animal. It may be that our observations around wastewater discharges are also atypical for the species as a whole, and that

they are opportunistically feeding as sediment swallowing surface deposit feeders in areas of high sediment organic content. Discussions with the authors would be valuable.

◆ The side-by-side illustrations of peripetalous fascioles (Figure 8.7) and subanal fascioles (Figure 8.9) of *Brissopsis pacifica* and *Brisaster latifrons* were very useful. They should help dispel any lingering difficulties in separating these animals during field sampling.

◆ The literature citation for Nichols et al (pg. 194) is incorrect. It should read Estuarine Coastal Shelf Science 29: 171-182.

◆ Thompson, Tsudada, Laughlin and Moylen. 1987a (pg. 194) should read Thompson, Tsukada, Laughlin and Moylen. 1987.

Chapter 9. Class Holothuroidea. Unfortunately the near-shore high-energy sand bottom species *Paracaudina chilensis* (J. Müller 1850) was inadvertently left out of this otherwise comprehensive treatment of the California fauna. This animal is described in some detail in Hôzawa (1928), and discussed by Clark (1907) and Ohshima (1929). Dr. Bergen has seen and identified specimens from the area, but neglected to include them. Aside from this lack most comments were laudatory. The general consensus was "aaaah, at last it's out."

◆ In the key on pg. 203, couplet 6 will require modification to include *Paracaudina chilensis*. A suggested fix is being worked on, but will require location and reexamination of specimens of this infrequently encountered species. At issue is the nature of the tentacles. Dr. Bergen suspects that they will be interpreted as more like those of molpadiids, and would key that way. An additional couplet to distinguish *Molpadia* from *Paracaudina* on the basis of ossicle form, and lack of phosphatic bodies would be added.

◆ Later in the key, on pg. 206, couplet 30A should read - "Spire of supporting tables bifurcate"; while couplet 30B should read - "Spire of supporting tables multifurcate".

◆ On pg 229 in the last sentence of the first paragraph, the first "*P. lubricus*" should read "*P. astigmatus*".

Chapter 10. Hemichordata: Enteropneusta. Dean Pasko has been applying this chapter to the material from San Diego, and has found two of the genera, *Schizocardium* and *Stereobalanus*. He showed us examples of the two. His method of separating them involves a simple cut across the proboscis so that it's internal structure can be clearly seen. As shown in Figure 10.2, the four genera which occur in the area have distinctly differing proboscis cross-sections. This is a step in the right direction, allowing us to get far beyond our previous limits in identifying the animals. While we may have several species in some of these genera, we must content ourselves with unambiguous placement within genera for the time being.

◆ In Key I. on pg 255, couplet 3 is internally contradictory as regards the length of the proboscides of the two choices. In 3B *Schizocardium* is characterized as having "Proboscis not elongate, generally ovate" while later on in the same line the proboscis is described as "3x length, 5x width of *Saccoglossus*". Since *Saccoglossus* was characterized as having "Elongate cylindroid proboscis" in 3A, one is left to ponder the definition of the term elongate.

Chapter 11. Phylum Chordata: Subphylum Urochordata, Class Ascidiacea. Although Gretchen Lambert could not join us for the meeting she sent us greetings through John Ljubenkov. She also provided us with information on contacting her. The telephone system at Cal State Fullerton is being revamped, and her number is changing. She can be reached at 714)773-3481 (or FAX @714] 773-3426) until March 26. After that date her number will become 714)278-3481 (or FAX 714] 278-3426). Her E-mail address is glambert@fullerton.edu.

We had no comments on her chapter except a general pleasure in having it available. As of yet none of us have tried to apply the key.

Chapter 1. The Brachiopoda. This chapter held few surprises for us because of the presentation that Dr. Hochberg gave SCAMIT in 1993 on the same subject.

◆ We noted that the attribution of the species *Laqueus californianus* to "Koch, 1848" in the SCAMIT list is incorrect according to the usage on pg. 9. It is correctly used with parentheses as on pg. 9 and will be changed in Ed. 3 of the SCAMIT list.

◆ In couplet 4 of the Key (pg. 10) we disagree with the wording of 4B. All of the *Terebratulina crossei* taken during the SCBPP were translucent, and would not key properly here. We have no suggested fix, and will hope for some replacement from Dr. Hochberg.

◆ On pg 16 under the **Diagnosis** section of *Frieleia* the author states "both valves may be somewhat sulcate". This is at variance with the statements in the key circulated during the 1993 SCAMIT meeting, and perhaps also with the illustration of *Frieleia halli* (Figure 1.6), which is essentially non-sulcate. We assume that the reference is to the vanishingly small median indentation in the anterior margin which gives the slightly bi-lobed appearance noted for *F. halli*. We need clarification from Dr. Hochberg.

◆ On pg 19 under **Biology** the statement "appears to be solitary" is at variance with our experience in the SCBPP. In several shelf-break coarse sediment trawl samples from that program we found the species both in monospecific clusters of numerous individuals, and in mixed clusters with *Laqueus californianus*.

◆ On pg 20 near the bottom of the page *Terebratulina unquicula* should be *T. unguicula*.

◆ On pg 23 near the bottom of the second paragraph oxygen is given a rather innovative spelling. That we can only find such trivial errors to comment on is a tribute to the quality of this chapter. By the way, the plates are remarkably clear and detailed, displaying the subtle differences in surface structure and sculpture which are important in species differentiation.

Chapter 2. Phylum Sipuncula. Unfortunately the author was not able to make full use of the recent monograph on the sipunculids by Cutler (1994) which arrived too late for much inclusion.

◆ On pg 57 we have some conceptual difficulty with the distributions listed for *Nephasoma diaphanes diaphanes* and *Nephasoma diaphanes corrugatum*. We fail to see, for one thing, how a cosmopolitan animal can be subdivided into subspecies based on morphological rather than distributional grounds. If they are not separable at specific level, then their overlapping distributions become incompatible with any concept of population isolation (especially in broadcast spawning animals such as these). Until some information is made available to suggest a method of reproductive isolation (ie. differences in spawning timing, sperm-egg chemical incompatibility, etc.) these two should be viewed as either separate species or ecophenotypic variants rather than as subspecies.

We suspect that *N. diaphanes* is a complex of closely related sibling species and not a single cosmopolitan taxon. Cutler suggests this as a possibility for all sipunculid "cosmopolitan" species in his discussion of zoogeography (1994 pg. 320). Under the circumstances, the author's choice not to differentiate the subspecific taxa is the appropriate one, and one that SCAMIT will also follow.

◆ Much the same zoogeographic concerns prompted us to reject (for the moment) the synonymy of what we had *previously called Onchnesoma sp A* with *Phascolion lutense* on pg. 57. We accept the transfer to *Phascolion*, but believe that a synonymy with *P. lutense* is

premature. SCAMIT will treat this as *Phascolion sp A*, believing it very unlikely that it is the same taxon whose type-locality is at 53°S in 3658m! It remains a possibility that the two may be the same, but the case is not yet proven to our satisfaction. One additional point: San Diego specimens of *Onchnesoma sp A* were submitted to Cutler, who found them probably identifiable with *Phascolion hupferi*, in a different subgenus than *P. lutense*. Inclusion of Figure 2.3E (pg 58) is regrettable, as it is far below the standard in evidence elsewhere throughout the volume, and adds nothing to the description of the animal.

Chapter 3. Echiura. We have needed an update of Fisher for sometime, not because it was inadequate, but to assure us that we were not missing recent changes.

◆ The key (pg. 71) is unfortunately not parallel, making it harder to use than it need be.

◆ Members asked about the visibility of the "inconspicuous longitudinal muscle bands" of *Listriolobus hexamyotus* (pg. 72) and were reassured that they are visible through the skin on most specimens, and could be clearly seen on dissection. This species is usually too deep to occur in the sampling programs of SCAMIT agencies, but may occur in shallower water near the heads of submarine canyons. It has been taken in the past in Orange County near the head of the Newport Submarine Canyon in less than 30m.

◆ On pg. 75 members might add at the end of the **Description** of *Arhynchite californicus* that in life the animal is a very deep forest green, a pigment that comes off on one's hands and will stain them if not promptly removed. Where the tissue is thinnest the green is very bright; almost flourescent.

◆ On pg. 77 members might add at the end of the **Description** of *Nellobia eusoma* that in life the animal is forest green like *Arhynchite californicus* but is less densely pigmented than that species. It has been taken from burrows in compacted clay from emergent clay reefs on offshore bottoms by CSDLAC. The burrows were probably constructed by co-occurring sipunculids, and invaded by the *Nellobia* when vacant, as they do not appear to have a tough enough exterior to burrow for themselves.

◆ On pg. 79 the reference to Thompson (1979) should be in the Proceedings of the Taxonomic Standardization Program.

The members who participated were well satisfied with Volume 14, and with the work of the authors who contributed to it. We also feel that the editors did an excellent job of pulling together contributions of considerably varying coverage and style into a coherent whole. We will be routinely using this volume for quite some time. Thanks to Megan for her artful direction of the proceedings, and for maintaining the composite set of notes which served as the basis for these minutes.

WHEREFORE ART THOU *P. alba*?

We often get excited about the appearance of a new benthic community member in our area (i.e. *Philine auriformis*), but we frequently allow the absence or severe decline of populations to go unremarked. The large lens-shaped philinid snail which formerly graced our trawl catches, *P. alba*, is a case in point. It was in the past an animal frequently taken in trawls at mid to outer shelf depths, but I have seen it only rarely in recent years (the last CSDLAC specimen was trawled in 1987). A large animal, it was probably longevous, surviving perhaps for a decade or more (speculation on my part - life span of the animal is undocumented). Although it's egg mass is not described, *P. aperta*, an apparent ecological analogue in European waters, has many small eggs and planktotrophic veligers (Schaefer 1996).

I assume *P. alba* was/is k-selected, with either low-level continuous recruitment or episodic higher level recruitment events. If so, we have

probably experienced partial or complete failure of recruitment for a number of years. This would jibe with my total inability, despite examination of a large number of benthic grabs taken from a wide variety of places, to find any juvenile *P. alba*. I thought I had done so on several occasions, but on further examination the animals always proved to be something else. Have any readers encountered any juveniles? How about recent observations of adults?

We can only speculate on why such failures might have occurred. My suggestion would be that the larval recruitments were severely affected by the same causes which yielded a 70% decline in near-shore zooplankton populations over the last several decades. A climatic connection was indicated for this decline (see Roemmich & McGowan 1995), but the exact mechanism is unclear. Other guesses? Other cases of severe decline or apparent local extinction? Submit entries in the "Great Explanation Derby" to the editor.

SUGGESTED WEB LINKS

Several members have contributed suggested links to other web sites of interest to SCAMIT members for inclusion in our website. So far we have had the Opisthobranch Newsletter Site, Bernard Picton's nudibranch site, Gary McDonald's Opisthobranch systematic site and the Ascidian Homepage suggested. Other links are welcome; make your suggestions. We will try to provide what you, as members, will find most useful.

ELECTRONIC FILING

Several out-of-area members attempted to vote in the SCAMIT election electronically, by E-mail submission of their ballots. Unfortunately we are not able to count this type of input. The official SCAMIT ballots distributed with your printed newsletter are the only acceptable votes. Sorry. This restriction comes from our organizational charter, and also prevents us from voting by "show of hands" during a meeting. We will have to reconsider this provision as our activities move more into the electronic domain. At present, and for the foreseeable future, we need your vote on the paper ballot.

ASC NEWS

The most recent newsletter from the Association of Systematic Collections contains a most interesting opinion article on the valuation of natural history collections (Fitzgerald 1997). The author suggests that there are several methods of valuation, and that each requires a different set of assumptions about the purpose of the collection. Most of us have not considered our collections to have a dollar value associated with them. Perhaps it is time to consider their value, as society as a whole is in the midst of a large re-prioritization of it's financial allocations. I recommend this article as a stimulating push into discussion of collections valuation.

The newsletter also contained a mention of the ASC web site, which will likely become one of SCAMIT's linked sites. Until then you can find them at http://www.ascoll.org. They also provide a variety of links to other sites of probable interest. Surfs Up!

NAMIT NOTES

The latest edition of the NAMIT newsletter has just been received. It announces an upcoming workshop on Nemertea and Cnidaria with Steven Hulsman addressing the former and John Ljubenkov the latter. It will take place on Friday and Saturday June 13-14 at the Port Townsend Marine Science Center, Fort Worden State Park, Port Townsend, WA. Interested parties are encouraged to attend. If you are planning to do so please contact Maggie Dutch, NAMIT c/o Washington State Dept. of Ecology, Ambient Monitoring Section, PO Box 47710, Olympia, WA 98504-7710 or via FAX @ 360)407-6884, or E-mail at mdut461@ecy.wa.gov. Based on the

newsletter, NAMIT is getting it's house increasingly in order, and progressing nicely. Our congratulations and best wishes to our sister organization to the north.

SCBPP ANALYSIS UPDATE

Most SCAMITeers were involved to some extent in the Southern California Bight Pilot Project (SCBPP). Once field work and sample analysis was completed (in 1994 and 1995 respectively) the project dropped from most members' view. Our involvement has continued through participation of some members in committees handling the data generated. It is now 1997, and we have yet to have a report in hand to allow examination of the fruits of our labors. Why, you ask?

Preliminary results were presented at both the 1995 and 1996 Southern California Academy of Sciences Meetings, and work towards final report preparation has continued unabated.

One of the factors which has delayed the process was the extensive Quality Control effort and production of metadata required. Another factor was the desire to analyse the data with other than "canned" approaches. Our goal in the project is to produce analyses which can inform regulators and managers simply and unequivocally about the extent to which the study area as a whole has been impacted by man's activities. Along the way, as we discarded measure after measure as potential analytic tools, we found that to do justice to the data a new tool was required.

Consequently the benthic analysis committee has been involved over the last 2+ years in the development of a new benthic index to combine the best features of Dr. Bob Smith's Index 5, and Dr. Jack Word's Infaunal (Trophic) Index. The design phase of this project is over, and we are now beginning verification testing of what appears to be a very powerful new tool for teasing out anthropogenic influence (at present mostly wastewater discharge) from background natural variability. As we live in a particularly variable area, with alternating warm and cool current regimes bringing both northern and southern species into our "California Transition Zone" (Newman 1979), our data provides a challenging test of the new measure.

With all of the data thoroughly modified to remove taxonomic inconsistancies, and with the new analysis tool in hand we are very close to the end of the road. All that remains is the final computer analyses, a brief period of pondering the meaning of all those printouts, and the writing of the report(s). Although the schedule is still in flux, we will have the final report out this year, and sooner, rather than later.

RAMBLINGS & RUMINATIONS

I have an interest in popular cosmology, feeling that it provides stimulating reading. I was reading a book about new developments recently when the author discussed the conceptual change introduced by Thomas Kuhn in his "The Structure of Scientific Revolutions".

Kuhn introduced the concept of paradigm shift to account for wrenching direction changes in the history of science. It is during these changes that theories long considered close to received truth are discarded and replaced by radically different explanations of the natural world. It occurred to me (while reading about paradigm shift in origin of the universe terms) that the common phenomenon of finding an animal as soon as it is described (but usually not before) is directly related to "paradigm shifting" in our gestalt perceptions of organisms.

It has always amazed me that I seem to find an animal right after it's description. It is as if the animal were newly created, and appears everywhere at once. What I assume is really happening is that our perceptions of reality are being modified to accommodate this new gestalt, and differentiate it from those most similar to it. Thus the process of "learning to distinguish" a

species is one of modifying one's perception of reality by subtle shifting of the paradigm.

Of course, in some cases, there really is *de novo* appearance of an animal in an area related to invasion from elsewhere (ala *Philine auriformis*), but usually the organism has been right under our noses mixed up with something else. Taxonomic inertia (the tendency to view an unknown organism as at most a variant of what we already know) leads us to "shoe-horning" - forcing a specimen into a taxonomic category not quite big enough to contain it.

The practice is often expedient, as the alternative is a complete and thorough examination of the specimen and other related specimens; a time consuming option. Often the shoe-horned animals really do belong in an existing taxon, and only represent unreported variability within the population. Sometimes, however, the process prevents recognition of sibling species, submerging them within a broadly defined variable taxon.

Drawing the line between what is and what is not sufficiently different to warrant description as a new taxon is still an art rather than a science. The introduction of testability for taxonomic hypotheses through cladistic analysis is one of the most attractive aspects of cladistics. It offers (within limitations) replacement of a subjective determination of taxon boundaries by a less artful, but more repeatable procedure. It is one of the most persuasive reasons to move to a cladistic, or combined cladistic/phenetic based taxonomy.

If the sort of gestalt paradigm shift described above is really what happens when we are challenged to add another element to our taxonomic universe, then the new finding of new species would be expected. Then again, it may be nothing more that the existence of a label providing an improved basis for communication.

-Don Cadien

BIBLIOGRAPHY

BAVESTRELLO, GIORGIO, Carlo Cerrano, Riccardo Cattaneo-Vietti, and Michele Sara. 1996. Relations between Eudendrium glomeratum (Cnidaria, Hydromedusae) and its associated vagile fauna. Scientia Marina 60(1):137-143.

BERGHAHN, RUDIGER. 1996. Episodic mass invasions of juvenile gadoids into the Wadden sea and their consequences for the population dynamics of brown shrimp (Crangon crangon). Marine Ecology - Pubblicazioni Della Stazione Zoologica di Napoli I 17(1-3):251-260.

BLAKE, JAMES A, Paul H Scott, and Andrew Lissner. (eds.). 1996. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and The Western Santa Barbara Channel. Volume 14 - Miscellaneous Taxa. Santa Barbara Museum of Natural History: Santa Barbara, California, U.S.A. 305pp.

CLARK, HUBERT L. 1907. The apodous holothurians: a monograph of the Synaptidae and Molpadiidae (including a report on the representatives of these families in the collections of the United States National Museum). Smithsonian Contributions to Knowledge 35(1723):1-231.

CUTLER, EDWARD B. 1994. The Sipuncula: Their Systematics, Biology, and Evolution. Cornell Univeristy Press, Ithaca, New York. 453pp.

FITZGERALD, GERALD R. 1997. Collections Valuation: Opportunity or Crisis? ASC Newsletter 25(1):1, 3.

FOSTER, GREG G., and Alan N. Hodgson. 1996. Feeding, tentacle and gut morphology in five species of southern African intertidal holothuroids (Echinodermata). South African Journal of Zoology 31(2):70-79.

HôZAWA, SANJI. 1928. On the changes occuring with advancing age in the calcareous deposits of Caudina chilensis (J. Müller). Science Reports of the Tôhoku Imperial University, 4th series, Biology 3(3):361-377.

KRUEGER, DANA M., and Colleen M. Cavanaugh. 1997. Phylogenetic diversity of bacterial symbionts of Solemya hosts based on comparative sequence analysis of 16S rRNA genes. Applied and Environmental Microbiology 63(1):91-98.

LAMBERT, JULES and Paul Thiéry. 1909-1925. Essai de Nomenclature Raisonnée des Échinides. Chaumont: Librairie L. Ferrière. 607pp.

LAWRENCE, JOHN M. 1987. A Functional Biology of Echinoderms. The John Hopkins University Press: Baltimore. 340pp.

LISSNER, ANDREW L. 1980. Asteroidea collected during the BLM Survey of the Southern California Bight, 1975-1978. Proceedings of the Taxonomic Standardization Program, Southern California Coastal Water Research Project (SCCWRP) 8(2):2-12.

LUNDBERG, JOAKIM, Christoffer Schander, and Øystein Stokland. 1996. A preliminary cladistic analysis of North Atlantic Oenopota Moerch, 1852 and Propebela Iredale, 1918 (Gastropoda: Conoidea). Journal of Molluscan Studies 62(3):289-298.

MALUF, LINDA YVONNE. 1988. Composition and Distribution of the Central Eastern Pacific Echinoderms. Technical Report Number 2. Natural History Museum of Los Angeles County. 242pp.

NEWMAN, WILLIAM A. 1979. Californian Transitional Zone: Significance of Short-Range Endemics. Pp.399-415. *In:* Gray, Jane and Arthur J. Boucot (eds.), Historical Biogeography, Plate Tectonics, and the Changing Environment. Oregon State University Press: Oregon.

OHSHIMA, HIROSHI. 1929. The Caudina of Asamushi. Annotationes Zoologicae Japonenses 12(1):29-45.

RAWLINGS, TIMOTHY A. 1996. Shields against ultraviolet radiation: An additional protective role for the egg capsules of benthic marine gastropods. Marine Ecology - Progress Series 136(1-3):81- 95.

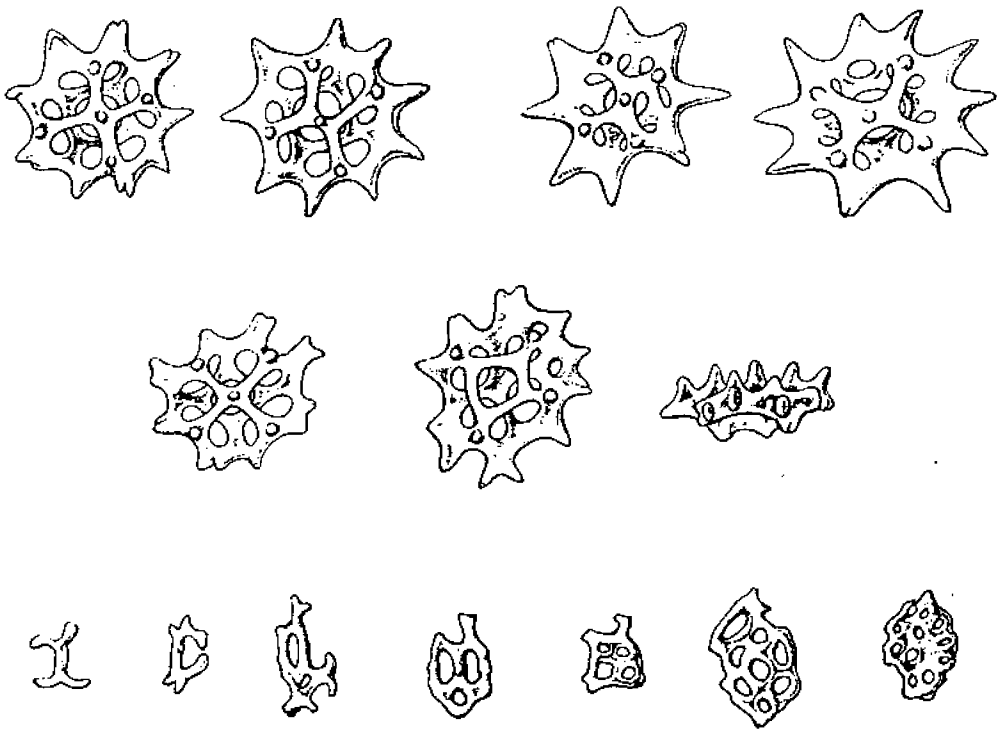
RODGERS, SHERRI A., and Brian L. Bingham. 1996. Subtidal zonation of the holothurian Cucumaria lubrica (Clark). Journal of Experimental Marine Biology and Ecology 204(1/2):113-129.

ROEMMICH, D., and J. McGowan. 1995. Climatic warming and the decline of zooplankton in the California Current. Science 267: 1324-1326.

SCHAEFER, K. 1996. Review of data on cephalaspid reproduction, with special reference to the genus Haminaea (Gastropoda, Opisthobranchia). Ophelia 45(1):17-37.

SPENCER, WILLIAM K. and C. W. Wright. 1966. Asterozoans. pp. 4-107 IN: Moore, Raymond C. (ed.). Treatise on Invertebrate Paleontology. Part U. Echinodermata 3(1). University of Kansas Press and Geological Society of America. Lawrence, Kansas. 366pp.

SUDO, H., and M. Azeta. 1996. Life history and production of the amphipod Byblis japonicus Dahl (Gammaridea: Ampeliscidae) in a warm temperate zone habitat, Shijiki Bay, Japan. Journal of Experimental Marine Biology and Ecology 198(2):203-222.



Ossicles of *Paracaudina chilensis* (from Hôzawa, 1928)

SCAMIT OFFICERS:

If you need any other information concerning SCAMIT please feel free to contact any of the officers.

			e-mail address
President	Ron Velarde	(619)692-4903	rgv@sddpc.sannet.gov
Vice-President	Don Cadien	(310)830-2400 ext. 403	mblcsdla@netcom.com
Secretary	Cheryl Brantley	(310)830-2400 ext. 403	mblcsdla@netcom.com
Treasurer	Ann Dalkey	(310)648-5544	cam@san.ci.la.ca.us

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