Southern California Association of
Marine Invertebrate Taxonomists

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SCAMIT Newsletter

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SUBJECT:	Non-polychaete problem animals from B'98 sampling. Part II
GUEST SPEAKER:	None - Megan Lilly, Discussion Leader
DATE:	19 April 1999
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	City of San Diego Marine Biololgy Lab 4918 North Harbor Drive #201 San Diego, CA

Rudilemboides stenopropodus
Photo by Dean Pasko (CSDMWWD)

We will continue with our consideration of problem taxa encountered in the Bight'98 infaunal sampling exclusive of the annelids. Our last meeting merely scratched the surface. We may not finish at this meeting either. Planned topics are the isopod *Caecianiropsis*, crabs of the genus *Deilocerus*, the application of Dean Pasko's new *Photis* key, the sand dollar genus *Dendraster*, juvenile crabs of the genus *Cancer*, *Astropecten* seastar species, oedicerotid amphipods, the amphipod genus *Byblis*, leucothoid amphipods in solitary ascidians...and more. Bring problem or demonstration specimens. Please save cnidarian problem animals for the May meeting.

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METHODOLOGY ON THE WEB

Member Tom Parker directs our attention to an interesting website which contains discussions of and information on preservation of biological materials. The site is run by the American Society of Ichthyologists and Herpetologists, and despite their vertebrate subjects, we share an area of interest.

gopher://kaw.keil.ukans.edu:70/hh/curation/ichs_herps/newsletter11

This is an archival site, and the information is not hot off the presses, but it is still very valuable, and worthy of your attention. Of particular interest is the preservation method which allows very good to excellent retention of color in preserved materials.

Another useful information source on preservation and handling of biological specimens is provided at

http://www.nmnh.si.edu/iz/usap/usapspec.html#top_of _page

This is a set of instructions originally designed for use with the Polar research programs. It lays out a series of methods for preservation of various invertebrate phyla. I doubt if there is anything new here for most people, but this is a useful compact presentation on the subject.

MEETINGS

Coastal Zone 99 will be meeting in San Diego this July 24-29th. As usual, a broad spectrum of topics will be addressed. A number of workshops will be held including ones on the role of marine protected areas in coastal management, and one on volunteerism. Questions concerning wastewater discharge, recovery of affected areas, habitat restoration, regional monitoring, and other subjects of typical SCAMIT concern will be discussed at numerous sessions. A number of present and past SCAMIT members will be presenting talks. On-line registration and information is available at http://omega.cc.umb.edu/~cz99.

A bit further away is the 14-16 July conference on Interrelationships of the Platyhelminthes to be held in London. The conference is organized by the Linnean Society of London in association with the Systematics Association, and the British Society for Parasitology. Those interested in this phylum should find the scheduled talks stimulating at least. Those wishing to present, or stage a poster still have time. Poster titles and abstracts must be in to Dr. Tim Littlewood, Department of Zoology, The Natural History Museum, Cromwell Road, London SW7 5BD [**e-mail: dtl@nhm.ac.uk**] prior to 30 April 1999.

NEW LITERATURE

In a continuing series of papers presenting various aspects of their multi-year monitoring results Mauer et al (1998) discuss the distributions of *Spiophanes missionensis* [now *S. duplex*] and *Prionospio sp A* [now *P. jubata*] in the area around the discharge of the Orange County Sanitation Districts. They found the two species to be negative and positive (respectively) indicators of the organic enrichment of domestic wastewater discharge. They suggest that the two species in tandem are a more sensitive indicator of effect than either separately, regardless of whether the effect was of human or natural origin.

Unfortunately we here in southern California do not encounter gastropods in the genus *Trichotropis*, which are commonly found in boreal waters north of us. I say unfortunately both because the animals are quite attractive, and now are shown to have interesting habits. Pernet & Kohn (1998) demonstrate that *T. cancellata* functions not only as a regular suspension feeder catching particles from the water column, but also as a kleptoparasite stealing particles from its neighbors. Their experiments indicate that parasitism is the main energy source for the snails, who make do with suspension feeding while hosts are unavailable.

Several different types of polychaetes were victimized, including sabellids and sabellariids. The snail inserts it's pseudoproboscis into the worm's mouth, and intercepts the incoming string of food particles streaming down from the radioles. This can go on for hours without the worm seeming to be upset about working for no gain.

Sponges do not flee, nor do they fight. Gandhi-like they pursue the path of passive resistance. They also subscribe to the theory that the best defense **is** a good defense. Most use some form of structural deterrent to predation, usually sharp spicules in various shapes and densities. Many others opt for chemical warfare, and sponges are very sophisticated chemical factories. Sampling of sponges for unique new bio- active compounds has preoccupied the pharmaceutical industry for several decades. Basic ecological research has also benefitted. Becerro et al (1998) report on the interactions between two different types of predators, grazing nudibranchs and nipping fishes, with the branching sponge *Cacospongia* sp. The sponge controls the distribution and concentration of several secondary metabolites which deter or prevent feeding by one of the two predators. Even the lower levels of secondary metabolites measured were sufficient to prevent fish nipping of the sponge. The problem of best dealing with the nudibranchs, who utilize the secondary metabolites to make themselves unpalatable to potential predators, is more complex. 'At what concentration of secondary metabolites can I minimize nudibranch grazing and also minimize nudibranch survivorship derived from my accumulated deterrent chemicals?' Tough being a sponge!

Nudibranch taxonomy has always been a bit soft. It got softer when Schulze & Wägele (1998) investigated morphological variability in *Flabellina affinis*. They found many of the traditional morphological characters quite variable in this species. Surprisingly the living coloration and color pattern seemed less variable than most other characters. Their detailed investigation of the morphology and histology of this animal is helpful for anyone dealing with flabellinid taxonomy.

Beare & Moore (1998) present information on the life history of two oedicerotid amphipods, one of which occurs in California. At least for now: Bousfield indicated that we probably didn't have the same species of *Westwoodilla* that occurs in the north Atlantic. We are, however, still considering our local species to be *W. caecula*, until new information is provided in a further publication. The authors found reproductive females in the *W. caecula* population throughout the year, although reproductive effort seemed concentrated from midsummer to early autumn. *Westwoodilla* females had smaller broods, but suffered less brood mortality, than *Monoculodes packardi* (the other species investigated).

An interesting reproductive pattern for a small group of syllid polychaetes is described by Kuper & Westheide (1998). This involves external brooding with eggs attached to the parent by special modified chaetae which differ from those epitokous swimming setae often associated with reproduction in polychaetes.

Cancer magister juveniles have in the past been considered to be carnivorous. Jensen & Asplen (1998) present observations documenting use of diatoms as food in the field by juvenile crabs. They also present the results of rearing experiments using a variety of food substrates, including diatoms.

Introduced species have usually been considered a nuisance (sometimes a damn nuisance in the areas of their greatest impact), but seldom has the economic consequence of their presence been calculated. Pimentel et al (1999) do so. Preliminary calculations are offered for a number of different types of non-indigenous species in both terrestrial and aquatic habitats in the U.S.. The authors point out that there have been positive, intentional, introductions of non-indigenous species. Food

crops which originated in other parts of the world now account for 98% of the agricultural production in this country. Estimated negative impacts tote up to about $122 billion per year currently, an amount that continued efforts to control non-indigenous species should reduce in future. The trend over the past 30 years or so has been one of increase, however.

Competition with introduced species is not the only cause of distress to native populations. Frequently problems can be laid to other human influences. In a fairly exhaustive consideration of crustacean fisheries in the Gulf of Alaska, Orensanz et al (1998) discuss the collapse of a broad spectrum of exploited populations. A combination of over fishing and management approach seems involved. The authors make some suggestions aimed at preventing such economic catastrophes in the future.

An instructive example from the freshwater literature considers another alternative to competition with an invader; habitat modification. Beckett et al (1998) document the history of disappearance of one amphipod taxon in the Ohio River, and its replacement by another. This was originally undertaken with the idea that either there had been a competitive displacement by an introduced animal, or that there had been taxonomic drift in the identification of the samples. Neither proved to be the case. The identifications had been correct and verified, and the original species *Crangonyx pseudogracilis*, had died out over a year before the first occurrence of the replacement species in the sampling area. Based on the pattern of retreat of *Crangonyx* in the years before its local extinction, the authors hypothesize that the change was caused by the construction of dams on the river, which changed the flowrate to one disfavoring this amphipod.

OLD LITERATURE

Don Cadien is happy to report that he purchased the Jan Stock/Universiteits Museum van Amsterdam duplicate reprint collection. This collection, which resulted from integration of Jan Stock's reprints with those of the Universiteits Museum (Dr. Stock died early in 1998), was offered by Dr. Dirk Platvoet on the CrustL listserver late in January. The majority of the collection arrived on a plane early in March. A set of Dr. Stock's currently available reprints and the duplicates from his pycnogonid literature are still to arrive. The collection was estimated to be over 7000 items, nearly all dealing with crustacean taxonomy or ecology. No list of what was contained in the collection was available at time of purchase, so arrival of the material itself was anxiously awaited. A listing of the titles represented (although not of the material still to arrive) has now been prepared in ProCite® format. Many of the individual titles were duplicated. These duplicates will be made available in the near future. Areas particularly well represented were those on which Dr. Stock himself concentrated; copepod parasites of invertebrates, freshwater amphipods of Europe, and the troglobitic, cavernicolous, anchialine, and interstitial fauna of the tropical west Atlantic. To this will be added the pycnogonids, when those boxes arrive.

Discoveries among this material will be gradually appearing in these pages as Don has a chance to read them and determine their relevance to SCAMIT. There are many novel items, including drafts and page proofs, as Dr. Stock served as editor, member of the editorial board, or reviewer for several journals.

22 MARCH MINUTES

The meeting was called to order by soon-to-be-outgoing Vice-President Don Cadien (CSDLAC) at approximately 9:45 am. Don reminded members present of the upcoming Channel Islands Conference at the Santa Barbara Museum of Natural History. This

conference is relatively unique in that attendance is free. Costs are borne by the MMS. The Species 2000 workshop was also mentioned. See the February NL for details.

A request for pinnotherid/worm commensals was discovered on the Annelida List Server. Scott Harrison at Texas A&M is researching pinnotherids and is particularly interested in their association with polychaetes. He would prefer specimens fixed in 100% ethanol, but will take any he can get. Scott is willing to cover the costs of shipping and handling. Contact him at **scott@bio.tamu.edu**, or by mail at Department of Biology, Texas A & M University, College Station, TX 77843-3258, or telephone at 409-845-0168.

Don then brought our attention to the funding crisis at the Bishop Museum in Hawaii and encouraged all to write letters in support of the Museum. Many institutions are having their public funding restricted, reduced, or eliminated. This is just a particularly severe case. More information and means of contacting them were listed in the February NL.

The upcoming election was discussed, and it was then reiterated that we still did not have a vice presidential candidate for SCAMIT (fortunately we now do, please see the attatched ballot). There was a call for further nominations without much success. Candidate statements were circulated in the February NL, and the ballots are attached to this newsletter. All voting is by printed ballot only, e-mail and other on-line voting is not permitted. We urge you all to express yourself fully on the ballot, although -once again-, it's a small universe of candidates. If you have suggestions for the officers include them on the ballots. All of you please consider running yourself next time out, or write yourself in on the present ballots. SCAMIT needs your involvement in as many ways as possible for its continuation and growth. If you have ideas about how we can change for the better; get elected and implement them!

With the business aspect of the meeting concluded we dove into the taxonomy of the B'98 infauna. Don started with the sponges stating that their ID level will stay at Porifera, unless it is a readily identifiable species. Most of the sponges encountered in the Bight'98 sampling came from either San Diego Bay, or the Channel Islands. As Don Cadien examined the samples from both the Wrigley Institute and the Northern Channel Island National Marine Sanctuary, he met with Dean Pasko and Megan Lilly (CSDMWWD) earlier, and went over the sponges. Level of identification was not as much a concern as preventing the use of more than one name for any given species in the database. Many of the species encountered were only provisionally identified, although some were taken to species. These taxa can be retained in the final data analysis, since quality assurance measures were applied prior to data submission.

As for the Cnidarians, the Anthozoa - Edwardsiidae and Ceriantharia are to be pulled and set aside for member John Ljubenkov to ID. Unfortunately, all other families, orders, etc are to be handled in-house by participating agencies. We are hoping the May meeting will have the authors of the Cnidarian section of the MMS Atlas in attendance. The meeting will cover not only species which **are** in the Atlas, but also those species which **are not**. It was felt by some members present that many of the anthozoa identifications will end up at Actinaria sp. This is a difficult group at best, and the varied success of labs in working them up generally dictates that the data must be reduced to lowest common denominator prior to analysis.

A call for difficult Platyhelminthes (well, **all** of them are difficult, but some more so) was then put forth. Dean Pasko showed an interesting flat worm from San Diego Bay which was heavily pigmented and bore nuchal tentacles. At this point it is still unnamed, as no one present instantly recognized it as occurring in their samples. No other different flatworms had been found among the Bight'98 infaunal samples to date.

Nemerteans were next on the list. There is still some discussion as to what level of identification one should strive to take the nemerteans. There was some problem with this during the 1994 SCBPP and attempts are being made not to duplicate it this time around. Dean Pasko had a strange/new nemertean which at this point will remain at Lineidae. Dean is working on an ID sheet for this animal.

Nothing unusual was noted for Sipunculids at this time from Bight'98 benthic samples, but both San Diego and LA County have newly encountered species in their regular monitoring.

An alert concerning echiurans. Don Cadien asked us all to be on the look out for *Listriolobus hexamyotus*. It is usually found in the mouths of bays and estuaries and looks similar to our common offshore *L. pelodes*. Separation of the two is quite simple, and can be done externally. It depends on the count of longitudinal muscle bands; six in *hexamyotus*, and eight in *pelodes*. With sampling in shallower waters, and areas around rivermouths, our likelihood of encountering this species is increased. Under normal circumstances *L. pelodes* is so easily recognizable that we seldom confirm it's identity. *Listriolobus hexamyotus* looks just about the same as its congener, but differs in longitudinal muscle band count, and in nephridia number.

Molluscs were next on the agenda. Kelvin Barwick had brought three different animals to be considered. One of them was the new species of *Daphnella* which graced the cover of the January NL. This species is to be described by Dr. Jim McLean in his long anticipated California mollusk monograph. The second animal considered had been very common in San Diego Bay samples. It was a small juvenile of *Saxidomus nuttallii*. Juveniles of this species look nothing like the adult, having only the finest concentric microsculpture, and bearing distinctive rows of dark brown chevron marks descending from the umbos on both the anterior and posterior slopes. The shape of the juvenile also differs from that of the adult; small juveniles are nearly circular, with central umbos. As the juveniles grow, the umbos move progressively forward as the posterior portion of the valves grows allometrically relative to the rest of the clam.

The third questionable animal was a tiny juvenile *Chione* sp., also from San Diego Bay. A discussion then ensued regarding the size at which young *Chione* can be confidently identified to species. Don recommended that animals below 10 -12 mm be kept at *Chione* sp. Juvenile *Chione fluctifraga* may be identifiable to species at slightly smaller sizes, due to their unique sculpture. Difficulty in separating very small *Chione* from tiny *Protothaca* spp. was also discussed. The only method mentioned to accomplish this separation was relative shape. Very small *Chione* tend to be nearly circular, with central umbos. Very small *Protothaca* are more oval, and often nearly rectangular.

Two small clams from Northern Channel Islands samples were mentioned. The first was *Nutricola* [previously *Psephidia*] *lordi*, and the second is as yet unidentified. The *Nutricola* were mentioned only because they seem to be quite common in the coarse island-shelf sediments. The other tiny clam was represented by two specimens, one only 2mm, the other nearly twice that size. Both are characterized by their sculpture of flattened concentric

ridges. The smaller animal had been removed from it's shell, and the hinge and pallial sinus examined. They were still not fully formed, and almost surely differ from those in the adult. Both were suggestive of the white surf clam, *Amiantis callosa*. Without a growth series to connect the juveniles with the adult, no identification at this size can be more than an educated guess. Inquiries of Paul Valentich Scott at the Santa Barbara Natural History Museum found that the smallest animal they have in their collection identified as *Amiantis* is 10mm long. Not close enough. At present this species is retained as Veneridae unidentified. Perhaps more material will allow the dots to be connected. Kelvin Barwick (CSDMWWD) was kind enough to digitize several shots of these tiny clams. The result presented the concentric sculpture and overall shape nicely.

Don mentioned encountering a seldom seen (in our area) tusk-shell species in the coarse sediments of the northern Channel Islands, *Antalis pretiosum*. He gave a brief review of the characters which he uses to separate the scaphopods, particularly the dentaliids. He stressed the importance of shell curvature, shell microsculpture, cross-sectional shape, shell thickness, and (where present) terminal slits. Since slits are often decollated with juvenile portions of the shell, their absence is not informative. When present, however, they can assist in separating otherwise similar species. The species keyed out properly in Shimek's new key (Shimek 1998).

It was then time for a brief, but enjoyable lunch. Upon our return the crustaceans were delved into with fervor.

Don Cadien brought specimens of *Photis elephantis* for Dean to review. He had not seen the species before, and will have to modify his key slightly to accommodate the male/female differences in *P. elephantis*.

We next considered the problem of *Rudilemboides stenopropodus* vs *Rudilemboides sp A*. Dean Pasko had only seen sp A offshore, but Bight'98 has provided him with plenty of material from San Diego Bay referable to *R. stenopropodus*. He has yet to find a way to distinguish females of the two taxa, but males can be separated on the basis of the structure of the gnathopod 1. Don Cadien indicated that the only species taken off Palos Verdes was *R. stenopropodus*, and that he had not encountered *R. sp A* in CSDLAC sampling.

Synchelidium spp were next discussed. There are problems with the SCAMIT sheet description of *S. rectipalmum* varying from the original description in terms of the condition of the 2nd pleonal epimeron and lobe on article 2 of the 7th leg which were pointed out by Dean Pasko. This species is the only local species whos ID is fairly straight-forward and simple; it shouldn't be problematic.

Don Cadien pointed out the difficulty of determining transverse vs. moderately oblique palm. How do we define the orientation? This question has considerable importance throughout this family, and really throughout the Amphipoda. No concrete definitions were proposed, and we are going to think about the problem, and hopefully answer it at the next meeting.

We examined the *S. rectipalmum* specimen to see what characters were present on the uropods. Don is attempting to evaluate the use of number, location, and orientation of stout setae (spines in traditional parlance) and cuticle serrations on the uropodal rami. While these details require examination at 400x on a compound scope, they are generally visible in a whole-mount preparation, and consequently demand little manipulation of these small animals. Many specimens of both sexes of as many different "species" as possible must be

examined before these character states can be either accepted as useful or dismissed as invariant between taxa or too variable within a taxon.

Those whose sampling areas do not normally include coarse substrates may be encountering the amphipod genus *Tiron* for the first time. There are two species locally, both of which are turning up in the Bight'98 samples from the northern Channel Islands. The two can be told apart easily on the basis of the dactyls of the legs. They are normal and slightly curved in *T. biocellata*; and reduced, stubby, nearly sub-chelate in *T. tropakis*. The two also differ in telson setation, with *T. biocellata* bearing only one or so small stout setae near its distal end, and *T. tropakis* with two rows of stout setae extending most of the length of the telson in the female. The male *T. tropakis* has much the same telsonic setation as *T. biocellata*. Both species are included in Barnard's 1972 key , but full illustrations of *T. biocellata* are only in Barnard 1962. Both species share the arresting characteristic of having a pair of ommatidea sitting side by side near the bottom of the cephalon, far removed from the majority of the eye. These must serve some special purpose, but no explanation has yet been offered.

Tim Stebbins preliminarily reported on his examination of the species in the genus *Paracerceis*, whose females are generally considered to be inseparable. Tim has borrowed material of *P. sculpta*, *P. gilliana*, and *P. cordata* from the Natural History Museum of Los Angeles County, and is reviewing this material to improve our ability to distinguish these widely occurring animals. Although their presence in samples from San Diego Bay in Bight'98 provided the impetus for this review, they also occur offshore in a number of situations. Tim also examined the specimens of *Paracerceis sp A* SCAMIT which Don Cadien brought down. He doubted that the specimens from southern California were the same as those reported by Brusca from the Gulf of California. Tim seemed to think that characters could be found for accurate separation of females, but it will take some work.

A specimen of presumed to be *Caecianiropsis* was examined. It also came from a sample at 95m off the West end of San Miguel Id. A single individual was found. Problem - although the presumptive genus is blind (as in the Caec of the name), this animal has eyespots quite visible through the cephalon. It is also pretty large. Don Cadien will attempt to retrieve other specimens identified as *Caecianiropsis* from CSDLAC and from collections made at offshore dumpsites in 1982. He will bring this material to the next meeting, where the question of what this thing is can be addressed. He doubts that it is the same as the intertidal form described from beach interstitia in Tomales Bay, but that remains a possibility. In the past it has been recorded as that species, *Caecianiropsis psammophila*, or as either *C. nr. psammophila* or C. sp. when taken offshore.

We reviewed differences between the two species of *Deilocerus*, and examined a lot from off San Miguel which has both species represented. Normally the two are found in different depth horizons, with *D. planus* inshore on coarse bottoms, and *D. decorus* offshore. Their co- occurrence in a single sample from 95 m is interesting, and provides the rare opportunity to review their differences without worrying about either geographic or ecophenotypic variability. Both sexes were represented at several sizes, so growth related differences were also available for study. Don Cadien thinks he has a different set of characters to separate the two species which can be used for all but the smallest individuals of both sexes. Unfortunately we ran out of time, and will continue at the next meeting.

[You may have noted that a few names were repeated over and over in the minutes of the last meeting. Well, we could only report what was said by **attendees**. If your name should have been there, and your comments reported, why weren't you there? We should be reporting comments by a number of participants at each of these meetings. Diversity of experience and opinion serves us all. I hope more of you can make meetings in future. Those of you too distant to attend should realize the newsletter is as close as your computer (or your writing desk). We value your input, and solicit it. - the Editor.]

My Life as a Biologist

Donald J. Reish

Chapter 13: Conclusion of my SC and Hancock days

I had a pollution grant from the US Public Health Service with a 3 year initial period and a 2 year continuation. The total for the 5 years was $35,000 which included SC's overhead. My salary was $5000 a year which ended up as $6500 at the beginning of my 5th year. I conducted 3 benthic surveys in LA-LB Harbors in 1954 and one in 1955. Many people helped me take the samples including Jerry Barnard, Keith Woodwick, and my brother. They helped without pay. Results of the 1954 surveys were published in the Hancock Occasional Paper series in 1959. I divided the harbors into 5 ecological zones based on species composition. These divisions were based on my understanding of the animals and their environment, and not on any statistical analysis. The uniqueness of the publication is that I was able to include all the raw data. Years later Don Boesch used my data for his EPA—US Army Corps publication on cluster analysis. My results and his cluster analysis agreed almost 100%. I have often expressed my opinion that a person knowledgeable of the environment does not really need statistics. I do, however, realize that statistics have become a necessity today. I think back to my dissertation days when I had to use a slide rule to do chi square analyses.

Bob Menzies had gone to Scripps on soft money after completion of his doctorate. He told me that Bob Parker was conducting a survey around the mouth of the Mississippi River and needed help in identifying polychaetes. It was my first consulting job; I was paid $3.00 per hour. I was still in Hartman's lab and I didn't tell her what I was doing since she did not believe in getting paid to identify worms. You should do it for the love of the worms! In that collection I found a new species, *Cossura delta*, which I described. Hartman never commented about the species nor questioned the source of the material. It was the first new species that I had done on my own. Chuck Horvath had a consulting job in the West Basin of LA harbor where a creosote company stored its pilings. He turned the job over to me when he went to the Arctic. Wooden blocks were suspended in the water and checked monthly for wood borers. He had used weights, but when I needed additional ones, I used a gallon jar. In late 1953 I looked at the mud which had accumulated in the jar and discovered *Neanthes caudata* which later became known as *N. arenaceodentata*. Herpin had published on the earlier stages of the worm and I completed the life cycle and published in Pacific Science. I then placed gallon jars all around the harbor and studied polychaete settlement and related it to areas of pollution. I published the findings in California Fish & Game. Many of my ideas for the use of gallon jars came from the monograph of Gunnar Thorson. I met him on 3 or 4 occasions; he was a very dynamic person and one who would talk with any and all.

During one of these talks he wondered why polychaetes were so numerous in the benthos of southern California but not in the Danish seas. I had read some of Petersen's benthic studies of the early 1900s, and, believe it or

not, one morning while taking a shower, the answer came to me. The Danes used a large screen to wash their sediments and we used a finer one. I then loaded up my car with gallon jars, formalin, and an orange peel bucket and headed down to Alamitos Bay (Basin 1had just been dredged from land a few months earlier). I washed the sediment through a series of Tyler sieves, and identified and counted the animals retained on each sieve. I published the results in Ecology and this paper is still being cited. No one had ever thought of the importance of the mesh size before. Maybe I should take showers more often!!!

The 5 years I was on the US Public Health Service grant afforded me many opportunities to do exploratory research. I cultured many different polychaetes including *Capitella, Ophryotrocha, and Ctenodrilus*. As I had written earlier, I realized something was strange about *Capitella*, but I really didn't grasp the picture. I was also able to publish many papers during this time, and I believe that it gave me the opportunity to develop a "publication" habit which has resulted in my publishing at least one paper per year since my first one in 1950.

Jerry Barnard and I ate lunch together for several years including our post-doctoral period. We talked about many things and thought it would be great to do a "Light's Manual" for southern California. We discussed how we would do this; of course we never did, but it was always on my mind and was the seed for my "Marine Life of Southern California." More on this at a later chapter.

Next: I accept a position at Long Beach State.

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