

11 FEB. 1974

Aboard the Alpha Helix (Scripps-N.S.F. Research Vessel) - trawling with the Issacs-Kidd Midwater Trawl between Pt. Loma and Catalina Island ( $32^{\circ}45'W$   $117^{\circ}25'W$ ). This is the 1<sup>st</sup> entry of the "R/V Alpha Helix Baja Expedition."

Station AHBE 11 II 74 - 2, 400 M, 1645-1810:

Hatchet fish (Argyropelecus)

Lantern Fish (Symphotophorus)

Hydromedusae (Phialidium and sp.?)

Ctenophores (Beroë and Pleurobranchia)

Salps (Salpa and Pryosoma)

Sagitta sp.

Euphausiids (Euphausia and sp.?)

The sea is good; the air cold, overcast; the chemists seem to have it together pretty much; beer is \$7 a six pack, ciggies \$1.40 a carton. We're headed for the Isle of Lomona. The burden of setting up station numbers, keeping track of all the data, etc. etc. is being left up to me as no one else has had any experience at it. I have assumed the simplest method would be best, since the others know nothing about this sort of thing. We will therefore designate each station with the following number system: AHBE 5 II 74 - 2 - meaning: Alpha Helix Baja Expedition, the date, and the collection number for that collection. We will give each species within that collection a number, consecutively from one on. The chemists can therefore go ahead and grind stuff up while I make leisurely

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identifications of it. Plants will be numbered 001 on.

The Ship's crew are:

skipper - Cpt. Wayne Bristol

1<sup>st</sup> mate - Jeff Clark

2<sup>nd</sup> mate - Al Pelz

Able Seamen - Jim Brewer, John Smith,  
John Garrison (Garra)

Chief Engr. - Jack Fox

Asst. Engr. - Bill Collins

Electrician - Merle Post

Radio officer - Jack Bridwell

Chief cook - Charlie Jones

2<sup>nd</sup> cook - Alex Velasco

The Scientific Personnel are:

Lowell P. Hager - Head, Dept. Biochemistry, U. of Ill.

Ken Rinehart - Dept. Chemistry, U. of Ill.

Paul Shaw - Dept. Plant Pathology, U. of Ill.

Paul Hollenberg - Dept. Biochemistry, U. of Ill.

Gary Krejcarek - Dept. Biochemistry, U. of Ill.

Bob White - in Hager's lab

~~Bob~~ Ron Johnson - in Rinehart's lab (will soon work for E. Lily)

Dennis Daubek - in Hager's lab

Bill McClure - Dept. Biochemistry, U. of Ill.

Rafael Guerrero - Algalogist, U.C. Santa Barbara

myself

Tom Forhan - Diving officer, scientific support technician

2<sup>nd</sup> leg: add Glen VanBlaricom } Scripps Inst.  
Jim Sims } Box 1529  
Jerry Simda } La Jolla CA  
92037

12 FEB. 1974

In the vicinity of Catalina Island, California.

Two IKMWT in about 100M, at 1 AM. this morning. The second one got a better sample I suspect because it was towed faster (4 knots instead of 3). From these trawls:

Doliolum - the salp; many w/ commensal crustaceans resembling euphausiids.

Hormiphora - the ctenophore, resembling a slightly flattened Pleurobranchia, some of these also with commensal crustaceans.

Octopus sp. - many planktonic juveniles

Nansenia (candida?) - the silvery Argentinidae fish  
- many larval flounder

mysids - in great number

Eupronoe minuta - the pelagic hyperiid amphipod.

water T° at 0100 = 13° C (=55° F)

air T° at 0500 = 13° C

A third IKMWT was taken at 3 AM. this morning at a depth of ± 1000 M (about 100 M off the bottom). It was a typical deep water bathypelagic tow:

The jellyfishes Atolla & Periphylla  
Sagitta

Some brilliant red prawns (a caridean and another resembling a giant mysid).

Teuthoidea squid

Purple copepods (cyclopoid), at 1st resembling hyperiids

0800 - 1030 A.M.

The Illinois crew made a short shore collection at Fisherman's Cove, Isla Santa Catalina. I wish I could have gone with them (I needed to sleep) because they collected only 14 species of large inverts. Hard to believe, even for amateurs these are as follows:

12 FEB. 1974 (cont.)

Megathura crenulata

Nerisica norrisi

Pisaster ochraceus

Tegula funebris

Stichopus parvimensis

Anthopleura xanthogrammica

Mytilus californianus

Lottia gigantea

Pollicipes polymerus

Haliotis cracherodi

Nuttallina fluxa

Pugetia producta

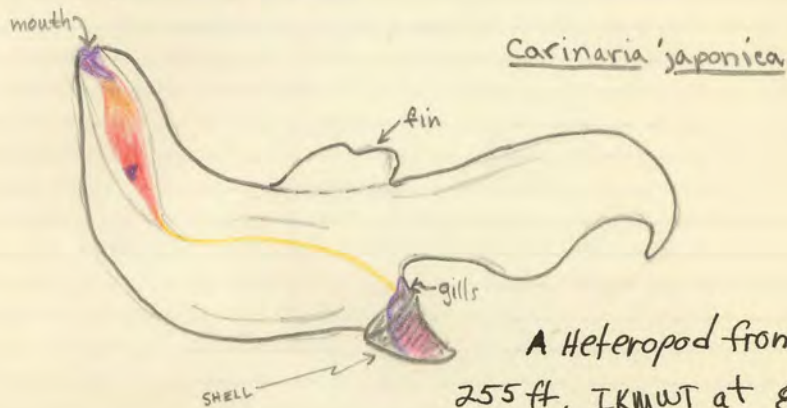
Collisella limatula

Plocamium karykina (the encrusting red <sup>mucus</sup> sponge)

Pelagia panopyra

OF the Myetophids we've been collecting, about 1 out of 10 is infested with one or two of the parasitic copepods Salmincola.

Several IKMWT this evening captured one of those unusual molluscs, a Heteropod. Also some gulper eels, probably Saccopharyngidae.



A Heteropod from  
255 ft, IKMWT at 8 p.m.  
in the evening.

13 FEB. 1974

Santa Catalina Island, California.

Ran 2 IKMWT, one at 400 M, another at 750 M (both early in the morning). Caught the following (along with the usual collection of mysids, euphausiids, scyphozoans, chaetognaths, etc.)

Hatchet Fish, Sternoptyx diaphana

Dragon Fish, Stomiidae (probably Stomias atriventer)

Pyrosoma

Shore collected in the afternoon at Catalina Harbor:

Pachygrapsus crassipes

Petrolisthes

Pugettia gracilis

Macron lividus

Pagurus samuelis

Dendrostemum pyrroides

Verongia thurina

Fissurella volcano

Nopalia mucosa

Cyanoplax hartwegi

Stenoplax conspicua

Collisella scabra

Cirolana sp.

a scale worm

Pisaster giganteus

SCUBA dove in late afternoon:

Muricea californica

Leptychaster sp. ?

Kelletia kelletii

Megathura crenulata

Linckia columbiae

Heterodontus francisci (spotted horn shark)

Scorpaena guttata (spotted scorpion fish)

Night Light (around 9 P.M.) brought out a really high school of squid, 10's of thousands of them (Loligo), about 10" long. It also brought up around 50-75 spines

13 Feb, 1974 (cont.)

dogfish sharks (Squalus acanthias).

The trip is satisfactory so far considering the interests of the scientific party. They are ready to collect (for short durations, during the day, if the sun is shining) but not sort. Rafael and I are doing all of the sorting, identifying, labeling, and logging. Tom Forhan and I are doing most of the night work. We've been up the last 2 nights running IKUWT all night. The "Kidd" is a small one, about 4' paravane.

The following animals have been shown to contain bromine: Sagitta sp.

Lottia gigantea

Collisella limatula

The following, Chlorine:

Octopus sp. (larvae from the IKUWT)

a conger eel (Congridae)

14 Feb. 1974

Catalina Cove, Catalina Island, California.

Shore collection:

Collisella lineatula (about 4 lbs. !!)

Collisella scabra (about 1/2 lb.)

Patiria miniata

Polyclads

Hipporix antiquatus

Septifer bifurcatus

Didemnum carnulentum

Ophitasporgia sp.

white, encrusting demospongia

Serpulorbis squamigerus

SCUBA collection, ± 30':

Astraea undosa

Astrometis sertulifera

Leucosolenia sp.

Ophiolithrix spiculata

Pleuronichthys decurrens (curtain turbot)

wierd & beautiful, calcareous ectoproct (erect, branching; tan)

15 Feb. 1974

Mexico, Baja California Norte (west coast), Isla  
Todos Santos

SCUBA collection:

- Strongylocentrotus purpuratus  
" franciscanus } extremely abundant  
Patiria miniata  
Stichopus pasvimensis  
Pisaster ochraceus  
" brevispinus  
Lottia gigantea  
Mytilus californianus  
Pollicipes polymerus  
Anthopleura xanthogramma  
Linckia columbia  
Henricia leviuscula  
" sp. ?  
Craniella arb (the globose, orange sponge with spiral  
radiating fibers on the inside)  
Ophiothrix spiculata (extremely abundant)  
Halichondria? (a large, orange, foul smelling sponge)  
Corynactis californica (abundant)  
Astrometis sertulifera  
Paraxanthius taybri  
Spirontocaris (palpator?)  
Herbstia?  
Astrangia lajollaensis (?)  
Aglaophenia (struthionides?)  
Cliona celata (abundant)  
Amphina sp. (a banded brittle star)  
Craspon dentipes  
Geodia mesotriana  
Pycnopodia helianthoides (abundant)  
Astropecten armatus (abundant)



15 Feb. 1974 (cont.)

Lytechinus anamensis (abundant)

Leioptilus? - sea pen

Stylatula - sea pen

Mediaster aequalis (abundant)

Pagurus sp. (lg., hairy, below 30')

IKMWT: 1300 M (= 3900 feet), 7:30 - 10:30 p.m.

- ① a web-armed octopus (Vitreledonellid)
- ② the giant ostracod (Gigantocypris)
- ③ orange, pelagic nemertines
- ④ A gulper eel (probably Saccopharyngidae)
- ⑤ the giant red mysids (Gnathophausia??)
- ⑥ plus the usual assortment of Atolla, Periphylla, Sagitta, mysids, euphausiids, Aequoria (?), amphipods, copepods, etc etc.



Really nice diving on this island (Todos Santos).

16 Feb. 1974

otter trawls off Punta Banda, Baja California Norte, Mexico.  $\pm$  50-60' H<sub>2</sub>O, sandy, flat bottom.

Sicyonia

Leptocottus armatus (staghorn sculpin)

Syngnathus leptorhynchus (bay pipefish)

Onchidella hildae ?

brittle star (Ophiacantha?)

Ophiothrix spiculata - vast numbers

strange, white goose barnacles (look like Lepas)

Heterocrypta occidentalis

Cancer antennarius

Lepidopsetta bilineata (Rock sole)

Paralichthys californicus (California halibut)

Symphurus atricauda (California tonguefish)

Hippoglossina stomata (Bismouth Sole)

Synodus lucioceps (California lizardfish)

Zaniolepis latipinnis (longspine combfish)

Pleuronichthys sp. (turbot)

Porichthys myriaster (midshipman)

Pelagia panopyra - vast numbers

Nice day, clear, warm, but heavy surf. 4 of us tried to get into the estero of Punta Banda (myself, Rafael Guerrero, Paul & Ron Johnson) in the Boston Whaler. When the depth hit about 8' the surf started to break and curlers 3-5' formed. The very 1<sup>st</sup> one swamped us. The boat was completely filled with water (right up to the top!) and the outboard stalled. We called the ship via hand transceivers but before they got a rescue party out we had vowed beyond the

16 Feb. 1974 (cont.)

breakers and got the engine running again. It was very exciting and fun in a thrilling way but Paul Shaw & Rafael got their cameras soaked. I hope a water and methanol rinse, with oven drying, does the trick. I also picked up some cymatroids the cook caught on a flatfish. They look like Nerocila but some were on the gills, others on the body. 3 flatfish yielded 6 or 7 isopods. The bottom here must be teeming with the buggers.

I am also now taking pictures for the project. Don't have much free time (that's good - the harder I work the faster the time goes and the sooner I get to La Paz). I must be getting too old for this sort of thing. It tires me much more than it used to & I miss the relaxing life of Tucson and A.M. (especially A.M.).

17 Feb. 1974

Mexico, Baja California Norte (west coast),  
Isla Todos Santos, off Punta Banda.  
SOUBA collection:

<u>Cypraea spadicea</u>	<u>Dermasterias imbricata</u>
<u>Hinnites multirugosus</u>	<u>Lima hemphilli</u>
<u>Cryptosula</u> sp.	<u>Pododesmus cepio</u>
<u>Kelletia kelletii</u>	<u>Xestospongia?</u>
<u>Tegula gallina</u>	<u>Floramia karykina</u> (the mucus-secreting sponge)
<u>Flabellina iodinea</u>	
<u>Muricea californica</u> (?) red, 60 cm. tall; white zooids	
<u>Membranipora</u> (on <u>Nerocystis</u> stipe).	

The urchins and Bat stars rule on  
this island (S. franciscanus, S. purpuratus  
and Patiria minicata). Some of the bays  
are so covered with urchin practically  
nothing else exists.

There is a small (2 shack) Mexican  
fishing camp here. The Mexicans dive  
(w/wet suits) for abalone and Gelidium  
(coulteri?). Black abalone. The Gelidium  
is dried and pressed in a wine-press  
looking device to be shipped to the  
main land for algin extraction.

18 Feb. 1974

Mexico, Baja California Norte (west coast), outside Bahía San Quintín.

IKMWT:

3900'  
4 hrs.

Sawtooth snipe eel, Serrivomer sector

Brasscale, Melamphaidae

Silver Hatchetfish, Argyropelecus sladeni

gammarid amphipods:

Lysianossidae (Eurythenes?)

Eusiridae (Rhachotropis?)

Tubeshoulder, searsiidae

plus usual mysids, myctophids, euphausiids, scyphozoans, etc.

otter Trawl:

150'  
1 hour

Cancer anthonyi

red, yellow & white gorgonians

Gorgonia sp.

Astrangia lajollaeensis

Mycale? (yellow encrusting sponge)

Plocamia karykina

Tetilla? (erect, folded, yellow sponge)

white, ball-like demospongia

Psolus (chitonoides?)

Aglaophenia sp. (about 2-3 cm. tall)

Sycionia sp. (w/ spot on abdomen)

Pandalas danae

Crago nigricauda

Pagurus sp.

18 Feb. 1974 (cont.)

FISH (from otter trawl)

Ratfish Hydrolagus collicii

Rockfish Sebastes sp.

Spotfin Croaker Roncador stearnsii

California lizardfish Synodus lucioceps

Longspine combfish Zaniolepis latipinnis

Prickleback Stichaeopsis sp.

Shortbelly rockfish Sebastes jordani

Calico Rockfish Sebastes dallii

Southern spurnose poacher Gomopsis

Plainfin midshipman Porichthys notatus  
stiletus

SCUBA collection (San Martin Island):

Toxorhynchus sp.

Kelletia kelletii

Neacenta alta (moon snail)

Pachythione sp. ? (small cucumber,  
about  $\frac{1}{2}$ " long; white w/ reddish tips; feet evenly  
disseminated on body)

It is interesting to note that for the first time a significant portion of our collection fauna (as we move south down the Baja coast) is what one could consider a tropical (or at least subtropical) input. The 4 species of

18 Feb. 1974 (cont.)

gorgonians for example (none of the 4 is Muricea Californica), and all the new sponges & the new Sicyonia. Rafael Guerrero informs me he has found some tropical algae here also. The temperate influence is still dominant of course, but the presence of Hydrozoa and the other warm-water forms is significant, and they seem to make their strongest play in the shallower, coastal waters. No tropical fauna was seen on San Martin Island.

Hydrozoa  
clathrates

19 Feb. 1974

Isla Cedros, Baja California Norte, Mexico.  
Bahía del Sur (anchored off salt wharf in south Bay). Sea surface  $T^{\circ} = 14^{\circ}C$  ( $57^{\circ}F$ ). This is the salt wharf of the Bostic (B.E.E.) map, at least this is where it's supposed to be, however, this definitely isn't any deepwater facility with 6 500 salt barges coming in daily. It's actually a very small fishing village, probably not over 30 people in residence. We bought lobster for under \$5/25. There are some nice kelp beds here. Tom & I SCUBA'd on the sandy bottom in the SW corner of the bay and found, to my amazement, many many burrows in the sand, each with an entrance about 2" wide, perfectly round, and the opening lined with clam shells and sand dollar tests. They were deep, too deep to dig up but in one, believe it or not dear reader, I swear I saw a hagfish. Upon checking with Miller & Lea (1972) I find that indeed, there is a population at Cedros Island, but I don't know whether it was the black hagfish, the Pacific Hagfish or the whitetail hagfish. Since the part I saw, the anteriormost 3" was pale tan I suspect it was the Pacific, Eptatretus stoutii. We collected, on this sandy bottom the hermit Pagurus setosus and the gastropod Bursa californica. Ken Rinehart & Bill McClure collected by SCUBA in some kelp ~~beds~~ beds nearby and recovered the following: Leptopecten camerella  
Aplidium (pellucidum)



19 Feb. 1974 (cont.)

a garibaldi - Hypsypops rubicundus

Sponges: Haliclona sp.

Chondrosia reniformis(?)

Rhabdoderma nuttingi

an orange-brown, encrusting sponge

an encrusting white sponge

Tetilla or Halichondria, encrusted  
around blades of eelgrass.

The currents are very strong in this bay, making diving difficult. The cook reported seeing Pleuroncodes (or a similar form) tonight but I saw none. Again the temperate forms seem to be dropping out, but very slowly. The sponges are new or warm water? Leptopecten camerella is warm water. Pork chops & Lamb chops for dinner tonight. Sure beats that aborted, bastardized shit Charlie called chow mein last night. Collected some polychaetes for Kudenov, night lighting. No squid or fish seen. Sandy Bottom, 60', visibility about 10' at best.

Hot Items (animals) to date are:

<u>Species</u>	<u>µg/gm. (halogens in lipids)</u>
<u>Sagitta</u> sp.	14
octopus larvae	high
Conger eel	12
unidentified malacostracan from 250'	17
<u>Lottia gigantea</u>	high
<u>Collisella limatula</u>	high
<u>Collisella scabra</u>	21
<u>Hipponix antiquatus</u> (the ancient hoof shell)	48

19 Feb. 1974 (con't.)

<u>species</u>	<u>ug/gm (halogens in lipids)</u>
<u>Mycete?</u>	14
<u>Verongia thiona</u> (the sulfur sponge)	13
<u>Tethya aurantia</u>	30
Scaleworm A	24
Scale worm B	13
Dogfish Shark ( <u>Squalus acanthias</u> )	13
<u>Ophiothrix spiculata</u>	36
<u>Amphiura</u> sp (banded brittle star)	13
<u>Astrometis sertulifera</u>	13
<u>Henricia leviuscula</u>	16
<u>Aglaophenia struthionides</u> (feather-plume hydroid)	30
<u>Astrangia lajollaensis</u> (?)	40
foliose ectoproct	13
<u>Patiria miniata</u> (the bat star)	20
<u>Pagurus</u> sp.	high
<u>Herbstia</u> sp. 2	20
<u>Aglia</u> (?)	35
Short bellied Rockfish	20

Species showing antibiotic activity are:

Stichopus parvumensis

Kelletia kelletii

Verongia thiona

Ophitasporgia sp.

pink, compound tunicate

Herbstia sp. 1

Septifer bifurcata (the little ribbed mussel)

erect, yellow demospongia

foliose ectoproct

Flabellina iodinea

brownish-red, encrusting sponge (on algae & eelgrass)

Pachythione sp. ?

Plocamia karykina

red demospongia

20 Feb. 1974

MORNING: Mexico, Baja California, Isla Cedros,  
Bahía del Sur.

still at Cedros, for one more SCUBA dive. Last night Pleuroncodes was around. We're collecting a lot of sponges. Too bad, because they can't be identified by anyone but an expert. Several different growth forms of an encrusting yellow-orange-reddish sponge have been collected and all emit the characteristic Halichondria odor (that's the best bit of information Gene Kozloff ever passed on to me!!). Our dive recovered:

- ① Halichondria ?
- ② a tan keratose "bath sponge", similar to the one I've seen in the Gulf so often but never taken the time to I.D.!
- ③ Eugorgia aurantica - the tropical sea fan
- ④ A colonial turicate - the zooid seem to be in pairs, spaced evenly thru a pale yellow-green matrix. Very beautiful. Encrusting to  $\frac{1}{4}$ " on a red alga.
- ⑤ Ophiothrix spiculata
- ⑥ a chaetopterid (probably mesochaetopterid)
- ⑦ a scaleworm, probably Halosydna or a similar form.
- ⑧ Pilumnus spinohirsutus
- ⑨ Pachycheles (monilifer?)
- ⑩ Halichondria again; encrusted on a red abalone.
- ⑪ the attractive, foliose ectoproct (see 14 Feb. 1974)
- ⑫ a seastar that appears identical to Othelia tenuispina (the northern Gulf of California endemic!)
- ⑬ Ocenebra poulsoni (a "Pt. Conception to Baja" snail)
- ⑭ Pterynotus rhyssus (a "Pt. Conception to Baja" snail)
- ⑮ Triumphis distorta - this gastropod is supposed to range from El Salvador to Ecuador. It didn't reach the homogenizer

20 Feb. 1974 (cont.)

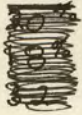
upstairs but rather I have put it in alcohol for shipment to Cal Academy. This one isn't the 1st nor will it be the last to avoid the dreaded "chemist's clutch".

AFTERNOON:

steamed to Bahia Tortola, on the south side of Punta Eugenia. Puerto San Bartolome is a fair sized village, perhaps 50 buildings. The bay is calm despite winds & swells at sea. The shores are mostly sandy with rocky cliffs in places. There is no sign what-so-ever of any mangroves. water  $t = 14.5^{\circ}\text{C}$  ( $58^{\circ}\text{F}$ ).

Only 3 of the animals (out of 15) collected yesterday at Cedros can be positively labeled as warm-temperate fauna. A tabulation of all of the Cedros material (19<sup>th</sup> & 20<sup>th</sup>) follows: (inverts only)

warm-temperate fauna	tropical-subtropical fauna	cosmopolitan	unknown affinity
		?	

This is  Warm Temperate = 30%  
Tropical/subtropical = 25%  
unknown affinity = 45%

This doesn't prove much since a total of only 44 murets was recorded from Cedros, and since I don't offhand know the affinities of 26 of these. However, it is interesting that, randomly, about the same number appear to be temperate as tropical.

Land Snails on Isla Cedros: Xerariouta canescens

(Adams & Reeve, 1848)

21 Feb. 1974

Mexico, Baja California Sur (west coast), Bahía Tortola (= Bahía Tortuga <sup>is in 1 corner of this Bay</sup> ~~at some maps~~) sea surface T° = 14.5°C. Sunny, clear, with onshore winds to 20-30 knots.

*Cystocira osmundacea*

SCUBA collection (25') in kelp beds (Macrocystis and Eisenia). Bottom fine sand & silts, strong bottom currents. Occasional outcrops of rock on which all the material collected was found. The sand/silt bottom was littered with the shells of pectens (Leptopecten ?), possibly killed by silting.

The Fauna:

green dot = panamic  
blue dot = temperate  
red dot = transitional form  
gray dot = cosmopolitan

- Othelia tenuispina - the N. Gulf endemic seastar!!
  - Muricea californica } fan gorgonians
  - Eugorgia aurantica }
  - Astrocanium spinosum - basket star(?)
  - Ophionereis annulata } brittle stars
  - Ophioderma panamense }
  - Ophioderma variegatum }
  - Ophiotrix spiculata
  - Arbacia incisa - urchin
  - Aplysia vaccaria - the large, dark sea hare (and his egg mass)
  - Chromodoris macfarlandi - the beautiful violet nudibranch w/ gold longitudinal stripes.
  - Dendrodoris krebsii - the red margined, black doris
  - Dialula sandiegensis - brown doris w/ black circles
  - Cronius ruber - swimming crab
  - Aplidium sp. - sea park
- many sponges (at least 10<sup>6</sup> spp.), including a Haliclona resembling leucosolenia but purple.

Shore collection (o-tide) at same areas:

- Phragmatopoma californica (extensive formations)
- Balanus tintinnabulum
- Anthopleura xanthogrammica

21 Feb. 1974 (cont.)

- Jaton festivus - rock snail
- Modiolus (capax?) - definitely a modiolus but much larger, more massive, and fatter than any I've seen.
- Lithophaga attenuata - boring clam
- Barnea sp. (a rock pholad)
- Tegula ligulata - snail
- Pteria sterna - the winged clam (a pearl maker)
- Bursa caelata - snail
- Crucibulum (spinosum?) - cup & saucer limpets
- Crepidula striolata - slipper limpet
- Lucapinella sp. - volcano limpet
- sabellids & polynoids

Of the species I can place zoogeographically (23 of the above 40+45) 15 are tropical and 7 are temperate, that's 64% tropical - 27% temperate. I would tend to consider Punta Eugenia (from this data) a major faunal barrier region for the temperate species. The discovery of what appears to be Othilia tenuispina is a real mind blower! why haven't I found it in the SO. Gulf? Is it a disjunct population? where did it originate, the Gulf or outer Baja? Is it a temperate or tropical-origin form?

11/78 - This probably wasn't O. tenuispina, but a new species; it also seems to occur in Bahía San Ignacio & Bahía Magdalena!! J. Kosterudik has specimens.

22 II 74-

Mexico, Baja California Sur, Bahía Tortola (south side Pt. Eugenio). Scuba collection made around ~~the~~ Coffin & Sulfur Islands, 70', sandy bottom.

- Eugorgia aurantica
  - red gorgonian
  - Berthellina ilizima - the apricot slug
  - weird sea whip
  - Diadema mexicanum
  - Tegula regina
  - Thieleia? (the red sponge)
  - Atergia corona (the white sponge with the long glass-like internal fibers)
- Canus sp. (small, tan)  
Pododesmus sp.

Shore Collection, some bay:

- Tetradita squamosa
  - Parapholas sp.
  - Dodecaceria sp. (little, black, colonial polychaete)
  - Diodora saturnalis
  - crepidula onyx
  - Collisella limatula
  - Cirriformia sp.
  - Gcenebra poulsoni
  - Acauthina lurida
  - Acauthina tetricanthina
- 2 peanut worms, looks like Phascolosoma and Dendrostomum
- Ophioderma sp.?

The SCUBA collection was small because we spent most of the time helping the local Mexicans from Puerto San Bartolomé search the bottom for 2 dead men. One was recovered, with a briefcase full of money!!

23 FEB. 1974

MEXICO, BAJA CALIFORNIA SUR, BAHIA TORTOLA.

SCUBA COLLECTION, 40':

- Panulirus
- Dialula sandiegensis
- Hermisenda crassicornis  
brittle star - resembling O. spiculata but w/o the serrated edges on the arm spines.
- Cryptosula sp. - foliose
- ~~X~~ Portunus xantusii (xantusii?)
- Dendroaster excentricus
- Nembrotha eliora - the gold nudibranch with blue stripes. very beautiful. Keen describes her as a northern Gulf endemic.
- Epialtoides murphyi (Garth)  
The spider crab known only from Ecuador and Colombia. Put in 60% EtOH to send to Garth.
- Patiria miniata; • Tegula funebris; • Collisella limatula

SHORE COLLECTION:

- Cirratana sp.
- Pyura sp. - solitary ascidian
- Thelepus sp. - polychaete
- Ophionereis annulata
- Ophioderma variegatum
- Ophioderma panamense  
Ophioderma sp. - solid tan color;  $\frac{1}{2}$  O. panamense
- ~~X~~ Chromodoris macfarlandi - nudibranch, violet <sup>size</sup>  
with gold stripes
- Crepidula (striolata?)
- ~~X~~ Stenoplax magdalenensis
- Octopus sp. (fitchi?)
- ~~X~~ Octopus bimaculatus
- Fissurella sp.
- Bulla sp.
- Epitomapta (tobagae?)



23 FEB. 1974 (cont.)

- Astraea undosa
- Arabella iricolor - polychaete
- Glycera sp.
- Pachygrapsus crassipes

The totals for 3 days collecting in Bahía Tortola are as follows:

tropical species 31 (39%)  
temperate species 17 (21%)  
transitional species (so. cal. → Baja) 4 (5%)  
cosmopolitan species 2 (3%)  
affinity unknown 26 (33%)

TOTAL = 81 (algae total for Bahía Tortola = 28)

Algae (identifications by Rafael Guerrero):

<u>Padina durvillaei</u>	<u>Cryptonemia obovata</u>
<u>Cystocleira osmundacea</u>	<u>Stenogramma interrupta</u>
<u>Colpomenia sinuosa</u>	<u>Schizymenia pacifica</u>
<u>Laurencia pacifica</u>	<u>Rhodymenia arborescens</u>
<u>Rhodymenia dawsonii</u>	<u>Botryocladia pseudodichotoma</u>
<u>Amphiroa annulata</u>	<u>Eisenia arborea</u>
<u>Dictyota flavellata</u>	<u>Desmarestia munda</u>
<u>Corallina pinnatifolia</u> var. <u>digitata</u>	
<u>Corallina pinnatifolia</u>	
<u>Corallina officinalis</u> var. <u>chilensis</u>	
<u>Lithothrix aspergillum</u>	<u>Scytosiphon lomentaria</u>
<u>Codium fragile</u>	<u>Ilea fascia</u>
<u>Gelidium pusillum</u>	<u>Zonaria farlowii</u>
<u>Nienburgia andersoniana</u>	<u>Centroceras clavulatum</u>
<u>Polyneura latissima</u>	<u>Ulva linza</u>
<u>Callophyllis pinnata</u>	

23 FEB 1974 (cont)

Bahía Tortola is without a doubt more tropical in character than it is temperate. Interestingly enough the tropical forms outweigh the temperate in numbers of species, but the temperate forms hold their own in overall biomass. Dominant shore animals were Balanus, Tetraclita, Pachygrapsus, Civolana, Astraea undosa, Tegula funebris, Collisella limatula. These are all temperate forms.

Dominant subtidal animals are sponges, ectoprocts, gorgonians, Patiria & Haliotus.

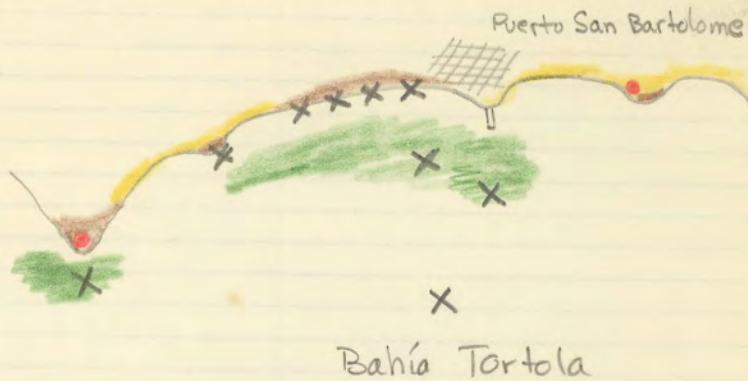
If any place had to be given as the point of change, where cold & warm water faunas mingle equally, bath no doubt fighting to survive the thermal tolerance extremes of summer and winter, each in their turn, then Bahía Tortola may be it.

It would be interesting to be here in the dead of summer to see if the biomass dominance shifts into the favor of the tropical forms, as the cold water fauna takes their turn at thermal stress. The bay is shallow enough throughout (rarely over 30') to accept considerable heat build-up in the warm months of the year.

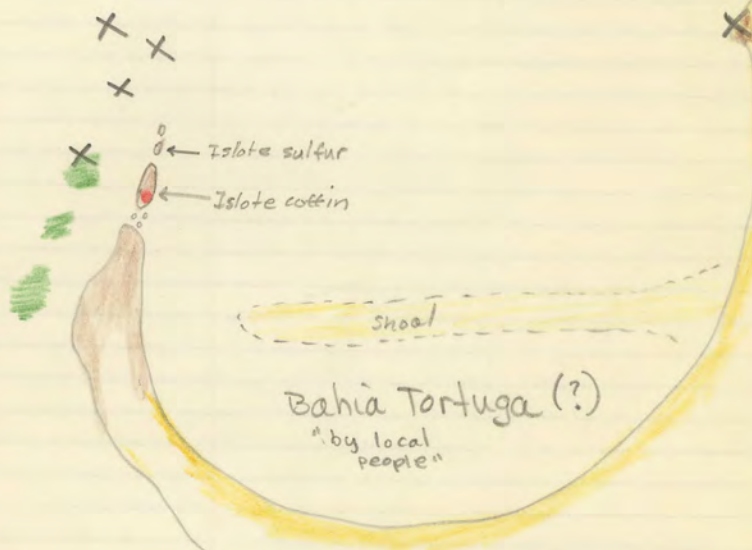
The fauna of Bahía Tortuga (the very shallow SW bite of Bahía Tortola) wasn't checked. It may have been decidedly more tropical than Bahía Tortola!!

23 Feb, 1974 (cont.)

### Map of Bahía Tortola



sandy, barren bottom  
strong bottom currents (February)



- = sandy shore
- = rocky shore
- = kelp beds
- = light house
- = dive sites & collecting sites

NOTE: No mangroves encountered

27 FEB 1974

MEXICO, BAJA CALIFORNIA SUR, BAHÍA  
MAGDALENA.

A large bay with many mangrove. A collection  
was made in a very large mangrove estero  
near Puerto Magdalena.

Black Mangrove or white (or both!!)

Red Mangrove - Rhizophora mangle

Uca macrodactylus

Anadara tuberculosa

Ostrea columbrensis

Litaspongia sp. ?

Grapsus grapsus

Panopeus ?

Diodon hystrix (porcupine fish)

Hepatus lineatus

Pachygrapsus transversus (or crassipes?)

small diadumenid-like sea anemones  
(white & brown) on mangrove roots.

Sabella sp.

Paralabrax maculofasciatus

Cerianthus (2 species - preserved)

Mugil cephalus

Polysiphonia flaccidissima

Placodium pacificum

Dexbesia lamourouxii

Griffithsia pacifica (epiphyte on Litaspongia)

Blue Herons, Snowy Egrets and Cattlewrens?

Round sting rays

Land Snails  
(d. by Carl Christensen)  
Xerariobta areolata  
(Reifer, 1945)

27 FEB 1974 (cont.)

The estero was pretty depperate compared to Gulf esteros, as can be seen by the species list. I'm not sure why. The water was warm, about 66°F, and the mangrove stand was very large, the main channel winding back about 1-2 miles, deep enough all the way for a 16' outboard. At the very head was a small lagoon probably 20 feet deep at least. It was a fine silt bottom. The mangroves are healthy and beautiful here.

---

Collection made outside the mouth of the estero, on the sandy beach, rocks and shallow SCUBA.

Pleuroncodes planipes

Protothoca grata

collisella mitella

Acanthina tyrianthina

Nerita funiculata

Melampus sp.

Anadara tuberculosa

Grapsus grapsus

Balistes polytepis (triggerfish)

Scorpaena sp. (scorpion fish)

Lithophaga attenuata

27 FEB 1974 (cont.)

Loligo ?

Hepatus lineatus

Turbo fluctuosus

Tridachiella diomedea

Luidia phragma (thick)

Clypeaster testudinarus (thick)

Tripsyche ? (tube snail)

crepidula arinata

Crucibulum scutellatum (thick)

Arbacia incisa (many)

Bumodosoma ?

Clavelina sp.

Pyura sp.

Ascidia ?

Tethya aurantia

many species of sponge and sabellids

Thelepus sp.

Serpula sp.

Pirites californica (thick)

Holorhynchus californicus (bat stingray)

shovel-nose shark

round stingray

Ocyropsis occidentalis

Nerita scabricosta

28 FEB. 1974

Mexico, Baja California, Cabo San Lucas. SCUBA collections made on rocks of point (the "friars") and the sandy bottom of the bay (0'-120'). Water T° = 69°F (very nice indeed) - sunny, warm, balmy, thoroughly a pleasant day. Morning dives and afternoon dives made. As Cabo is full of interesting but unidentifiable animals. The chemists are, I think, wondering why so many animals have no names. I had expected their questioning looks before this even. Only a biologist realizes that no one person can put names on Marine fauna of all taxa from a region a poorly known as Baja. I feel without ~~doubt~~ I am the only person qualified to even attempt what I'm doing (perhaps Jerry Bakus could do as well, however I really doubt it) - What does it matter to a world's authority on a subject on a ship full of people that don't appreciate (believe?) it?? Oh well, today's collection yielded the following:

5 species of gorgonian

- ① Gorgonia sp. 1 - lacework very fine, the open areas very small (purple)
- ② Gorgonia sp. 2 - lacework larger, open spaces larger (purple). Probably G. adamsi.
- ③ lavender ground w/ yellow bumps; robust; ends blunt & thick; branching on one plane only.
- ④ solid red; thick (2-3 cm. thick); foliose; (sponge like); branching in 2 planes.
- ⑤ solid purple; thin; two planes (Psammogorgia?)

Mithrodia bradleyi

Terebra strigata

28 Feb. 1974 (cont.)

Dendronotus sp. (brown with white,  
raised spots; 3-4 cm. long)

Entoprocta (Pedicellina by Light's manual)

Muricanthus princeps

Laxosuberites?

Porcillopora robusta

Pharia pyramidata

Chama mexicana

Megapitaria squalida

Pedochela ziesenhenei (w/subchelate dactyls)

Rhinobates productus (guitar fish)



1 March 1974

Mexico, Baja California Sur, Cabo San Lucas.  
SCUBA and shore collection at east end of  
Bahía on rocky stretch of shore and to  
40'. The life here is much richer than at  
the point. Water T° = 69° F

Isostichopus fuscus

Heliaster microbranchius

Phataria unifascialis

Toxopneustes roseus (the large, short-spined  
urchin)

Pharia pyramidata

Eucidaris thousari

Pocillopora robusta (= P. elegans - Squires, 1959)

Ophiocoma alexandri

Ophiocoma aethiops

Brissus?

Diadema mexicanum

Stenorhynchus debilis

Eurythoë complanata

Phascolosoma puntarena

Zoanthus danae

compound ascidian (green, bubbly, translucent)

solitary ascidian (resembles Haliclona; 30 mm x 12 mm.  
x 7 mm; siphons obvious, at free tip;  
deep lavender)

solitary ascidian - resembles a Pyura; orange;  
wrinkled; very hard.

Vermetus contortus

sea anemone: deep wine colored, w/verrucae

Littorina modesta

Collisella mitella

Purpura pansa

Rhopalaea

(I.D. by D. Abbott)

1 March 1974 (cont.)

Purpura columellaris

Conus princeps

Hexaplex erythrostomus

Renilla (not kollikeri; small, about 10 mm long)

Spirobranchus sp. (radioles blue, with white  
or brown at bases)

Zoobotryon pellucidum

Stylatula elongata?

Pinctada mazatlanica (with commensal shrimp,  
a gravid ♀)

Spondylus calcifer

lots of gorgonians (see 28 Feb., 1974)

FISH

surgeon fish

triggerfish

parrot fish

angelfish

wrasse

suffers

snake eels

THIS COLLECTION FROM BAHÍA SAN JOSÉ  
DEL CABO, @ 10 miles up the coast from  
Cabo San Lucas. (= Bahía Palmillas).

2 March 1974

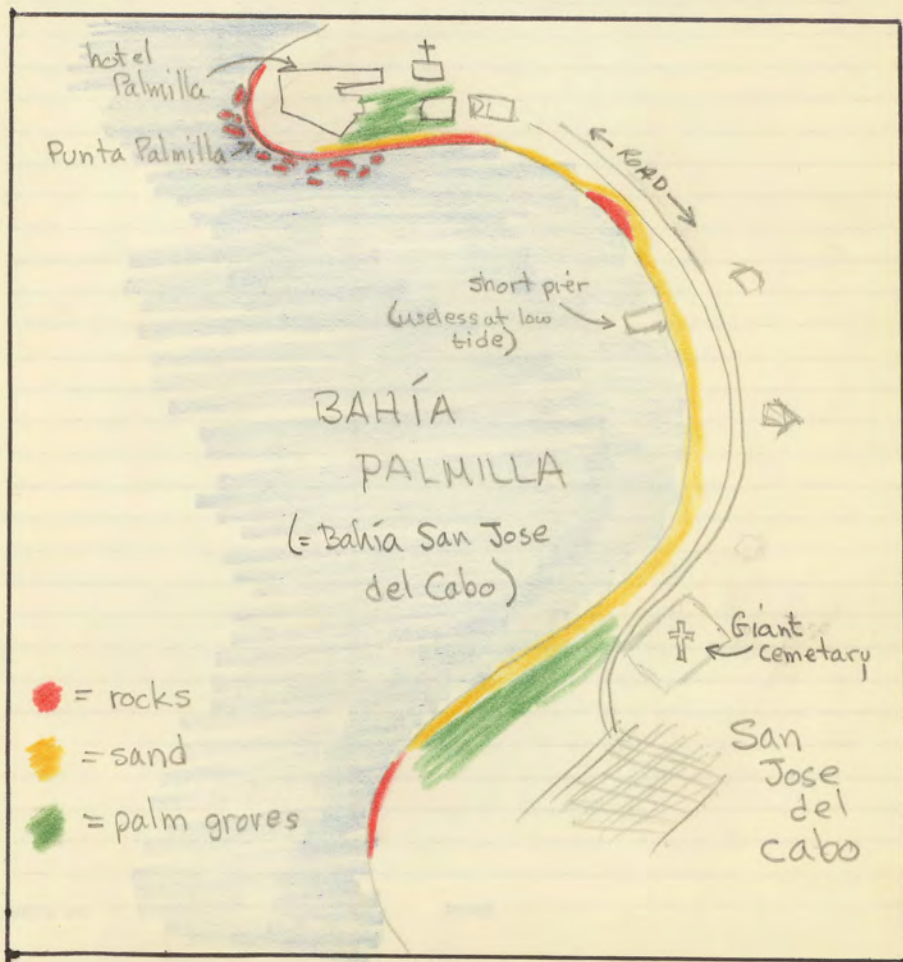
Mexico, Baja California Sur, Bahía San Jose del Cabo (= Bahía Palmilla)

a recipe for *juevos Motoleños* (from Rafael Guerrero):

in this order place - una tortilla maíz  
frijoles reritos  
un huevo  
some fresh green peas  
some jamón

then cover with cheese, sour cream,  
or cream cheese. Makes a delicious  
breakfast according to Lafuell.

Rafael Guerrero  
Marine Science Institute  
U. C. S. B.  
Santa Barbara, Calif. 93106



2 March 1974 (cont.)

SCUBA collection (10'-40')

Echinometra vanbrunti

Selenkothuria lubrica

Pavona gigantea

Aplidium

Neorapana muricata

Onuphidae

Nephtidae

Balistidae (trigger fish)

Labridae (wrasse)

Paguristes sp. (black w/ red to yellow, raised spots on body and carapace)

3 March 1974

Mexico, Baja California Sur, Bahía  
Los Frailes.

Scuba & shore collections made. Not  
too good collecting - only one good rocky  
patch along shore, bottom mostly  
sand:

Oreaster occidentalis

Nidorellia?

Bugula sp.

Eudendrium sp.

Myrichthys tigrinus (snake eel) -

abundant in burrows on bottom  
(30-50')

Scurria mesoleuca (the variable limpet)

yellow tetradontidae (w/black rings)

Tyrodina fungina - the yellow limpet-  
like snail.

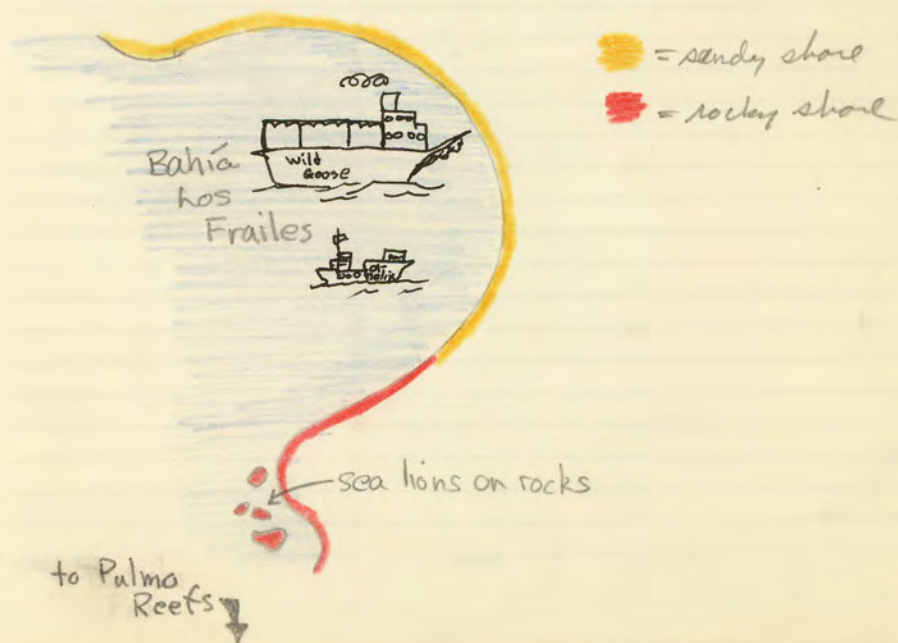
Cryptosula sp.

The highlight of the day was when  
John Wayne pulled in aboard his  
wood hulled, converted, 135' mine  
sweeper, the "M/V Wild Goose." What  
a luxury ship it is. He came over  
to the Helix for a tour and I laid  
a copy of my book on him -

3 March 1974 (cont.)

in return he laid a zypiso  
cigarette lighter on me that says  
one side "M/V Wild Goose" and  
on the other side "stolen from  
John Wayne". Very generous of  
him - trinkets for natives and all.

He didn't even look at the book, don't  
think he even read the title. He  
was snobby, rude, brisk, arrogant  
and generally the same way he  
is in the movies - a redneck  
bastard. Tomorrow is Palma  
Reef - at last.



4 March 1974

Mexico, Baja California Sur, El Pulmo  
Reefs (Bahía Pulmo?) - between Punto Pulmo  
and Punta Frailes.

The coral reefs of El Pulmo consist of  
8 or 9 long rocky extensions from the shore  
across the sandy-bottomed bay of El Pulmo.  
The rocky reefs appear to be igneous veins  
<sup>exposed by</sup><sub>shore erosion</sub>, reaching out across the bay. They  
are rich in animal life, especially fish.  
The sides harbor the coral masses. In  
some places the coral is very thick and clearly  
should be termed a coral reef structure; in  
other places it is sparse and the rocky  
reef is inhabited by gorgonians and  
other creatures of the shallow, warm  
Pacenic fauna. At low water  
springs the parts of the reef nearest  
shore are exposed. According to Squires  
(1959, Bull. Am. Mus. Nat. Hist) the more northerly  
reefs are shallowest, the more southerly  
reefs deeper. Squires also places the age  
of the Pulmo reefs at about 26,000 years.  
He lists the following corals as occurring

here: Pavona sp.  
Pocillopora elegans  
Porites sp. } dominant

4 March 1974 (cont.)

Pavona clivosa

Pavona gigantea

Pocillopora damicornis

} substantial  
amounts  
present

Psammocora sp.

Agaricia sp.

Mortipora fragosa

Solenastrea ecuadoriana

Tubastrea aurea

} rare

Steinbeck & Fickett (1941) considered the main coral to be Pocillopora capitata.

From my observations the principal coral is either Pocillopora robusta or Pocillopora elegans. Pinctes californica is also abundant although I wonder if this is what S&F called Pinctes porosa.

Sea water  $T^{\circ}$  here is  $\pm 70^{\circ} F$  ( $21^{\circ} C$ ). [Iguieres said Dec. - Feb.  $T^{\circ}$  is  $62^{\circ} F$  ( $17^{\circ} C$ )] He gives  $18^{\circ} C$  for March,  $22^{\circ} C$  April, and  $26^{\circ} C$  for July to Sept.

Animals collected on Pulmo Reefs will be listed at the end of our stay, in 2 more days.



6 March 1974

Mexico, Baja California Sur, Bahía Pulmo  
(Pulmo Reefs) water T° = 69° F. 3 SCUBA  
dives a day for 3 straight days, by 4  
divers. Visibility 20'-50'. weather good  
to fair.

Dominant Animals (= most abundant)

Extensive  
coverage

Pocillopora (elegans or robusta)

Porites californica

Pavona gigantea

Gorgonia adamsi

Gorgonia sp. (smaller lacework than G. adamsi)

Tridachiella diomedea

Eucidaris thouarsi

Diadema mexicana

Eupta godetroyi

Pharia pyramidata

Ophiocoma aethiops

Ophiocoma alexandri

Conus princeps

Stenorhynchus debilis

Eurythoë complanata

Megalomma sp. (radioles banded, from base,  
brown, white, black, repeating)

Brandtothuria impatiens

Phascolosom agassizii

Trapezia ferruginea

Muricanthus nigrinus

Lithophaga aristata

6 March 1974 (cont.)

soft yellow cucumber } see descriptions on  
hard red cucumber } next page

Less Common Animals

Mithrax sinensis  
Daira americana } in the coral heads

Psammocara sp.

Cardita sp. (bright yellow, 2-3 cm. long)

a holothurian that appears to mimic the  
Mexican Dancer slug!

Hymeniacidon sp.

Tedania?

Diopederma danianum (brown & red banded  
brittle star)

Pleurobranchia areolatus (cottony nudibranch)

Cheilea cepacea (cup & saucer limpet)

Diodora digueti

Littorina aspera (from shore)

Collisella discors (from shore)

Neorapana tuberculata

Neothyone gibbosa

Lineus geniculatus

Coenobita compressus (from shore)

Ophionereis annulata

Tylo dina fungina (from shore)

Heliaster kubiniji

Ascidia sp.

Neorapana muricata

Spondylus calcifer

Hypselidoris californiensis

6 March 1974 (cont.)

Axius (seen but not collected)

Toxopneustes roseus (w/ petaloid suckers)

Tripneustes depressus

ophiactis simplex

conus brunneus

Paguristes (legs & carapace hairy; circled with red ridges)

Armina californica

Aglaophenia (diegensis?)

Maetrellona exoleta (brown clam)

Aplidium (several species)

Dendronotus sp.

Pteryrotus rhyssus

Aglaophenia (propingua?)

Alpheus sp.

Chiridota aponocrita

Zoobotryon pellucidum

Phataria unifascialis

stingrays (Dasyatis sp.)

torpedo rays (Torpedinidae)

Otholia tenuispina

Holothuria  
inornata?

Red cucumber: skin tough, brick red w/ numerous papillae. Tube feet mostly on ventrum, which is somewhat flattened. Tube feet black. 140-170 mm long.

Labiobolmas  
ameri sp.?

Yellow cucumber: Body very soft, yellow orange in color. Tube feet in 5 symmetrical rows around body, black-tipped. 40-70 mm long.

6 March 1974 (cont.)

Algae of the Pulmo Reefs & shore of  
Bahía Pulmo (I.D. by Rafael Guerrero):

Dictyota crenulata

Codium simulans

Dictyota sp.

Dictyota flabellata

Nemalion virens

Enteromorpha intestinalis

Centroceras clavulatum

Laurencia decidua

Pterocladia pyramidale

Lyngba sp.

Padina durvillaii

Codium setchellii

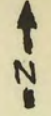
Land Snails from  
shores of Bahía Pulmo:  
(I.D. by Carl Christensen)  
Rabdotus harrisi  
(Jacobson, 1958)

A list of the books necessary for a Baja  
Expedition (from San Diego south & into the Gulf)  
follows:

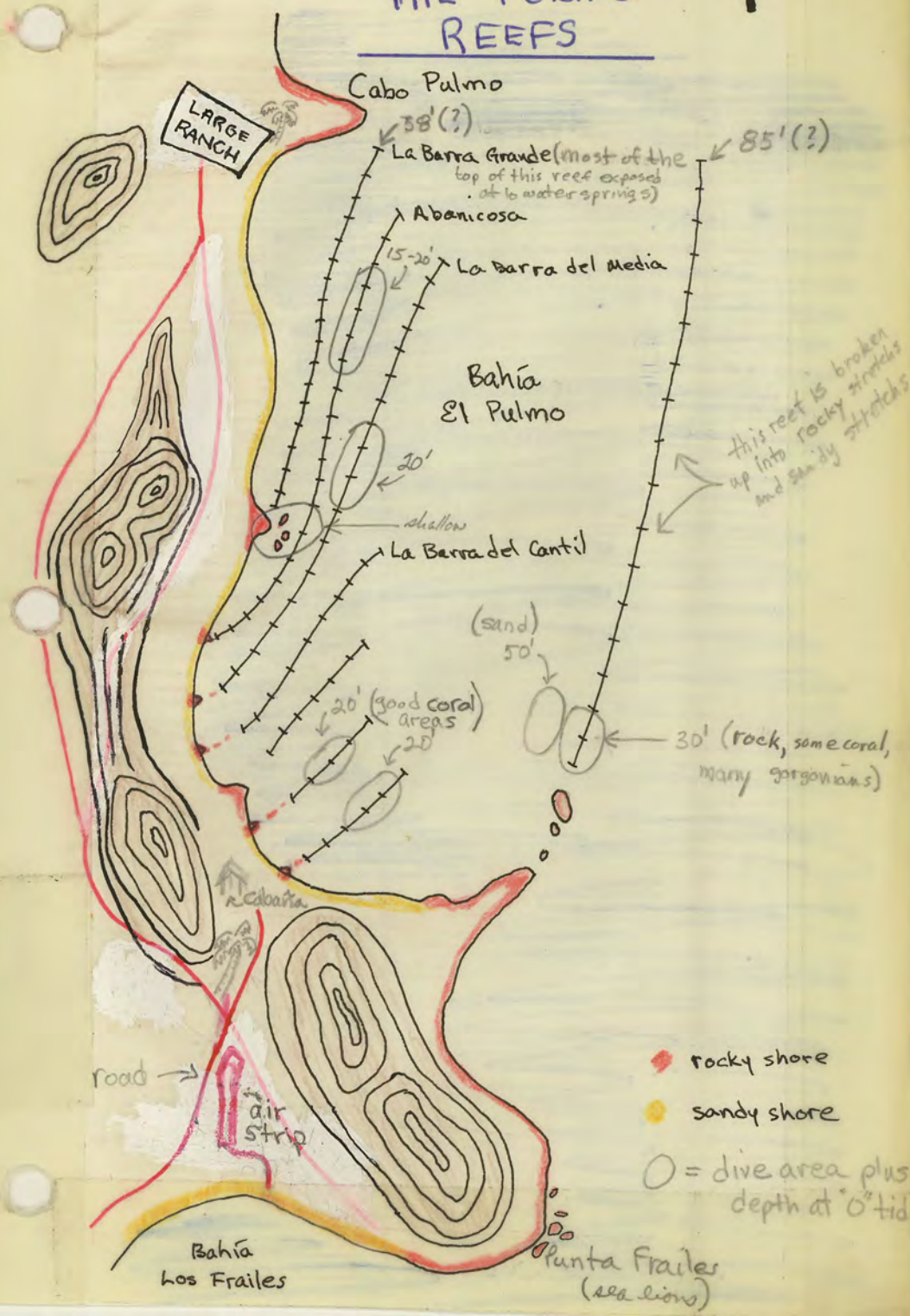
- ① Harriman Alaska Exped: Monograph of the  
Shallow water Starfishes of the North Pacific  
Coast. A.E. Verrill. publ. Smithsonian Inst. 1914
- ② Los Equinodermos de Mexico. M.E. Casó. publ.  
Universidad Autónoma de Mexico, Mexico, D.F.
- ③ Sea Shells of Tropical West America. Keen.  
Stanford Press.
- ④ Field Guide to the Shells of the Pacific Coast  
and Hawaii. Peterson Field Guide Series.

- (5) Sea of Cortez. Meinbeck and Ricketts
- (6) Handbook to Inverte. of Gulf of Calif. Bruce
- (7) Sponges of Gulf of Calif. Deckermon, Allen  
Hancock Fd.
- (8) Stony corals of the Eastern Pacific. Durham  
& Barnes. Allen Hancock.
- (9) Gulf of California and North Pacific coast  
corals. Durham, Allen Hancock.
- (10) Marine life of So. California. Reich. Long Beach State
- (11) Common Intertidal Inverte. of S. Calif. Allen
- (12) Between Pacific Tides. Ricketts, Colman, Hedgpeth
- (13) Lights Manual.
- (14) Spider crabs. Barth. Allen Hancock
- (15) Canceroid crabs. Rathbun. Smithsonian
- (16) Gapsoid crabs, Rathbun. Smithsonian
- (17) Cryptostomian crabs. Rathbun. Smithsonian
- (18) Porcelain Crabs. Hoig. Hancock
- (19) Galapagos Brachyura. Barth. Hancock
- (20) Leonard Amphipod monographs: Bull. 258 & 271, USNM.
- (21) Schultz & Richardson isopod monographs
- (22) Homatopods. Schmitt. Hancock (5-4)
- (23) Pycnogonids. Helton. Hancock (5-9)
- (24) Hydrocorals. Fisher. Proc. USNM, vol. 84 (1938)
- (25) Sipunculids. Fisher. Proc. USNM, vol. 102 (1952)
- (26) ascidians. Ritter. U.S. Publ. Zool. vol. 16 (1917)
- (27) " " Bull. AMNH, vol. 84 (1945)

4 March 1974 (cont.)



# THE PULMO REEFS



17 March 1974

MEXICO, Golfo de California, Isla Cerralvo  
(Bahía El Limón). water T° = 66° F. (NE tip of  
Island)

Shore collection at Mexican shark  
fishers camp:

Ligia occidentalis

Eryphia squamata

Bunodosoma californica

Tetraclita squamosa

Nerita funiculata

Collisella atrata

Radsiella tridentata (small chitons)

Liocierithium judithae

warm eel (Myrophis vafer?)

SCUBA collection, 80':

Stylatula (elongata?) - abundant

garden eels - abundant

Ptilosarcus sp.

Tubastraea tenuilamellosa - the  
beautiful orange coral  
anemone (column yellow with brown  
spots; tentacles white)

Tivela bryonensis

Amphiaster insignis

sea star (brick red; rigid body; resembles  
a Henricia but w/ sort of a median  
dorsal ridge running the length of  
the arms)

cobble beaches with  
rocky outcroppings.

This is a poor place to collect.

8 March 1974

Mexico, Golfo de California, Isla  
Espiritu Santo, Bay near eastern-most  
point on middle of east side of island.  
water T° = 66° F. (just N. of Pt. Lobos)

SCUBA collection (shore to 30'):

Gorgonian - strange beast indeed - looks  
like just a skinny dead stalk  
with patches of slimy yellow  
zooids dropped on it, at 1st  
resembling some kind of yellow  
sponge on a dead gorgonian  
stalk.

Gorgonia sp. - orange; smaller lace-  
work than G. adamsi

Gorgonian - small, lumpy; white;  
6 cm. tall.

Acanthaster ellisii

Berthellina ilisima

Octopus (fitchi or hubbsorum?)

ectopoda - soft, flesh, red; resembles  
a red algal

Munida sp.

Dendrodoris krebsii

Pteris sterna

Muricopsis armatus

Cylasteris mexicana (Coral)

Geodia



8 March 1974 (cont.)

Calcinus sp. - chelae dark red or green  
with bright red margins; legs  
solid red; all legs smooth,  
hairless.

Petrolisthes nigrunquiculatus

---

This isn't such a hot place,  
I think from what Jerry Barnard  
and I saw of the island in '71  
the west coast is the best coast.  
(yeah?)

---

Cerionthus sp.

Sertularia sp.

Anthothoe? - a black mussel with 7  
sea anemones on it.

Oreaster occidentalis (very abundant)

14 March 1974

Mexico, Baja California Sur, La Paz  
area.

shore collection at El Mogote:

Callinectes arcuatus

Callinectes bellicosus

Arbacia incisa

Theelothuria paraprinceps (?)

Ostrea palmula

Encope grandis

Gasteracantha (canceriformis?) - mangrove  
spider

Tetraclita squamosa

Cerianthus sp.

Clibanarius panamensis

Clavelina sp.

Anadara odamsi

Chione californiensis

Ventricolaria isocardia

Theodoxus luteofasciatus

Cerithium stercusmuscarum

Crucibulum spinosum

Nassarius leuteostomata

Thais biserialis

Trachycardium panamense

Parapholas sp.

Pachygrapsus transversus

Leptodius occidentalis

Eudendrium (cochleatum?)

14 March 1974 (cont.)

Aglaophenia diagensis

Uca princeps

shore collection at Bahía Pichilingue:

Pinna rugosa

Halichondria sp.

Modiolus capax

Turbo fluctuosus

Eriphia squamata

Neorapana muricata

Acanthochitona exquisita

Tegula sp. (solid brick red)

Ostrea sp.

Diadomene ?

Pentamera chierchia

---

The shore of El Mogote is really nice. Clear sand w/ red & black mangrove. Every so often a channel running into the swamps w/ fiddler crabs, etc.

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IKMWT - night, off east coast of Isla Espiritu Santo, 24°30'N 110°10'W. 300 fms. (1950-2240)

Pleurobranchia sp.

leptocephalus larval

octopus

etc etc.

fish collection made for U of A.

# BAHÍA DE LA PAZ



- - - = denotes shoal
- ▒ = channel
- ▒ = mangrove

15 March 1974

Mexico, El Golfo de California, Isla  
Espiritu Santo (Bahía San Gabriel)

The bay is largely fine, white coral  
sand. A "reef" exists in the center of the  
bay, composed of coral rubble. This area  
is a vast ghost-town of coral. Why did it  
all die? probably changes in water T? Some  
Pocillopora and Perites exist, in very  
small patches, as new growth. A SCUBA  
collection over the "reef" in 2-8' H<sub>2</sub>O  
revealed:

Isostichopus fuscus

Nidorellia armata

Strombus granulatus

Conus archon

Pteria sterna

Euclidaris thoursii

Selenkothuria lebrica

Diadema mexicanum

Brandtothuria impatientis

Chione tumens

Hexapanopeus?

many, many mexican dancers

Shore collection in rock-dike of mangrove-  
oyster bay (S. side bay):

Echinometra vanbrunti

Bunodactis mexicana

Liocerithium judithae

Chione fluctatraga

15 March 1974 (cont.)

Barbita reeveana

Chala indusium (this one is just for the chemists -  
it's Banodactis mexicanus)

Haliclona sp.

Chondrosia reniformis

Geodia mesotriana

Oliva kaleontina

Natica chemnitzii

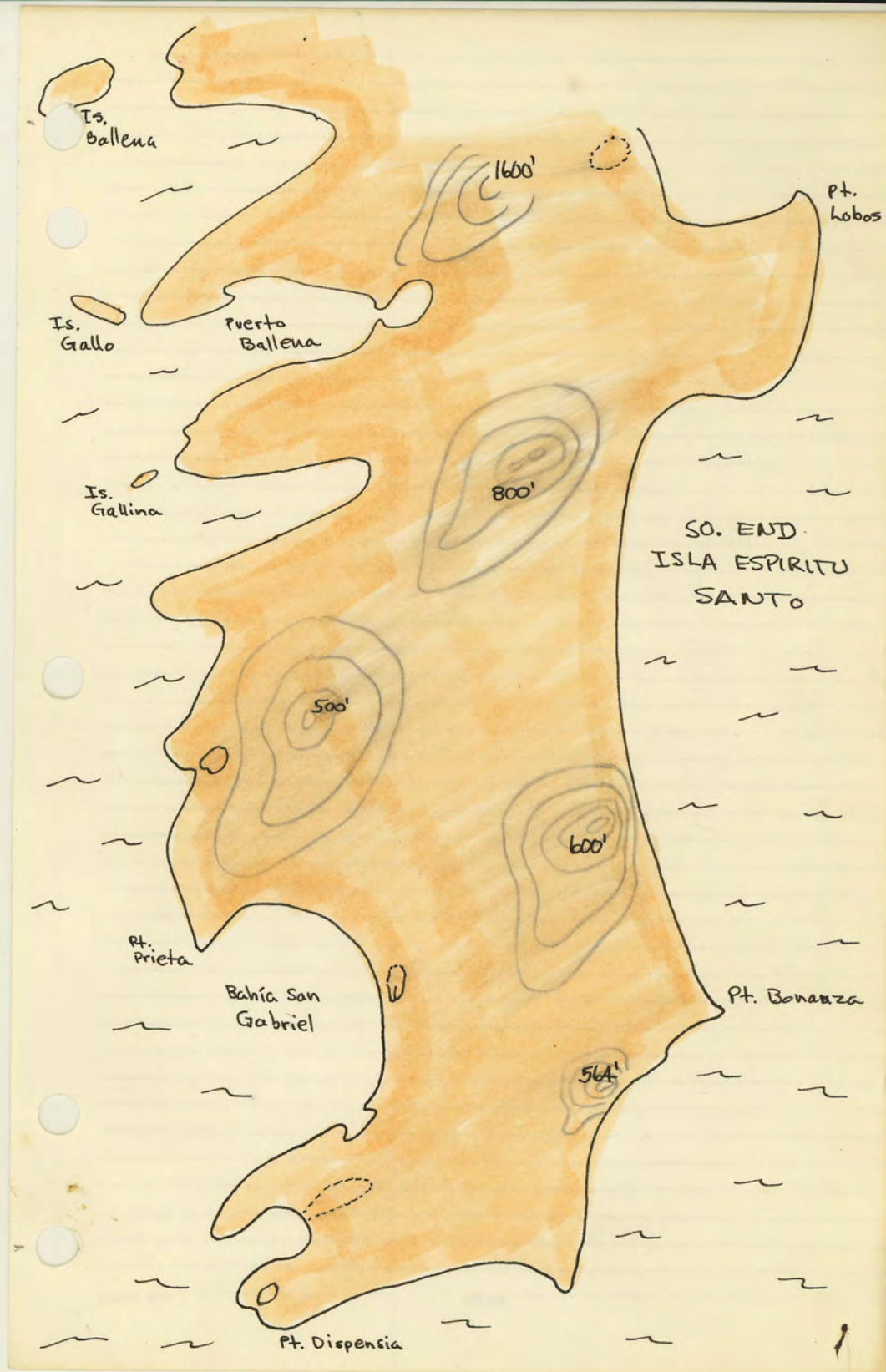
Polinices uber

night light:

many barracuda

Portunus xantusii

Bahia San Gabriel is a good place to shore collect, especially the channels flowing out of the lagoon. It's a lousy place to dive however. It is without a doubt the most picturesque place I've ever visited in the Gulf - the whole area is just beautiful - much too beautiful for words. I shot 40 photos here in 3 hours!



16 March 1974

Mexico, El Golfo de California, Isla  
Espiritu Santo/partida (Bahia Partida)

SCUBA collection - N. rocky point, 40 ft.

Tubastraca tenuilamellosa

Linckia columbiae

Platynereis?

Tylo dina fungia

Murexiella lappa

Ophioderma teres

Shore collection, channel between islands:

Stylatula (elongata?)

Baseodiscus mexicanus

Plocamionida igzo?

Ligia (occidentalis?)

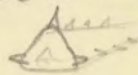
Carythoe complanata

Helioaster kubiniji

Selenkothuria lubrica

Pteris sterna

A sea-star from the SCUBA collection  
was put in paraffin with the 2 cucumbers  
and the 3 sand dollars. The star  
is brick-red with paler red mottling.  
The legs are triangular in X-section  
w/a dorsal row of very large, movable  
spines, and two lateral rows





16 March 1974 (cont.)

Issacs Kidd Midwater Trawl ran up the  
110<sup>th</sup> parallel, around 24°50' N

Fish saved in Formalin for D.A.T. & L.T.F.

The heteropod Pterotrachea coronata

The ctenophore Beroë sp.

17. March 1974

Mexico, El Golfo de California, Isla Cayo (between Isla San Jose and mainland of Baja). SCUBA collection made - damn good diving (might be bad in heavy seas).

Oreaster occidentalis

Nidorellia armata

Acanthaster ellisii

Pharia pyramidata

Phataria unifascialis

Mithrodia bradleyi

Isostichopus fuscus

some new gorgonians

Heteractis cerebella (yellow sponge - see  
Dickinson, 1945)

Neorapana muricata

the black murex & the purple murex

Nembrotha elora

" sp.

Cerianthus sp.

a hairy Clibanarius?

Aplysia sp. (ID to californica but with  
a truncate posterior end and a very rigid body  
wall. not A. Vaccaria)

Aglaophenia

Phyllactis

Pocillopora (capitata?)

Ophiocoma alexandri

Eucidaris thourasii

Brandtothuria impatientis

17 March 1974 (cont.)

Brandtothuria arenicola

Jaegerothuria inhabilis - dominant cucumber

same day - afternoon shore collection  
at Bahía San Everisto, on Baja, across from  
Isla San José.

many brittle stars

Lagenipora

Polyspongia ritleri

Spondylus uripes (clown)

Thais speciosa

Plocamionida 1920 ? (red sponge)

My god-damn thumb has been sore a  
week and a half from when the Acanthaster  
ellisii struck me. The trip with the chemists  
is getting to be a little bit of a strain. Rinehart  
is just too heavy to take day after day.  
Must remember to take a job like  
this again. I hope so, and I mean it.

18 March 1974

Mexico, Baja California Sur, Bahía  
Concepcion (mouth of bay - Punta San Domingo).  
SCUBA collection, 5'-45'. H<sub>2</sub>O T° = 64°F.

Fasciolaria princeps

Encope micropora

Petrochirus californiensis

Eugorgia aurantica

Stenodax magdalenensis

Aeolidia papillosa

Navanax inermis

Terebra robusta

Pseudostylochus burchami

Crucibulum spinosum

Anachis scalarina

Pentamera chierchia

Echinaster tunuispina

Spondylus princeps

Trachycardium consors

Chione undatella (abundant)

Sigmadocia edaphus? (sponge)

Oenone fulgida (polychaete)

lots of Sargassum and other algae

Other Trawls in northern 1/3 of Bahía  
Concepción:

Sicyonia sp.

Ruidia phragma

18 March 1974 (cont.)

Loligo sp.  
Hepatus lineatus  
Arion ruber (abundant)  
Penaeus californiensis  
Astropecten armatus  
Argopecten circularis (very abundant)  
Hexaplex erythrostomus  
Pagurus albus  
Squilla dubia  
Fusinus dupetitthouarsi  
Polinices bifasciatus  
Luidia foliata  
Collodes tenuirostris  
Octopus sp.  
Armina californica  
Bulla punctulata  
Chione kelletii  
Cassis centiquadrata  
Solenosterra capitanea & S. gatesi  
Turritella clarionensis  
Pagurus sp.  
Gonodactylus oerstedii  
Brissus latecarinatus  
Cymopolia sp.  
Cantharus sp.

Nassarinus inaequalis

Fusinus colpeicus

Knemastia walkeri

many unidentified Crab and  
fish part in 10% formalin

19 March 1974

Mexico, Baja California Sur, Bahía  
Concepción

SCUBA collection - Coyote Bay

sponge (Hircinia?) - yellow, dark red or  
purple exterior on upper 2/3; erect  
tall, finger-like, with large oscula  
at top of each finger. Photo and  
specimen taken.

Aplysia californica

Thyonacta mexicana (cucumber)

meatier sponge

octopus digneti

Tedania sp.

Ala cornuta

Naupanax inermis

Other trawls - around mouth of Concepción  
Bay:

Arca (mutabilis?)

Vaneyothuria zacae (abundant)

Pilumnus townsendi

Chione gnidia

Clypeaster sp.

Tethyaster gigas

Pagurus sp.

Chloecia sp.

19 March 1974 (cont.)

Fusinus panamensis

Strombina solidula

Mulegé - Rio Rosalia - shore collection  
the beautiful red (w/white borders)  
nemertine Cerebratulus californensis

Before we leave the SW I will take  
Casa Mary near Mulegé. The  
most beautiful pueblo on Baja

similar  
twins  
geminata  
cognate

= analogous species

21 March 1974

Mexico, El Golfo de California, Isla  
Angel de la Guarda (Puerto Refugio).

SCUBA collection made at window  
rock in middle of Bay. 40'-100'.  $H_2O T = 54^\circ F$ .  
Cold but really clear and really good  
diving. Algae and gorgonians dominated  
the scene. Collected for photos the  
following (preserved):

Roll 18 (Kodachrome X)

#22 new little basket stars,

20-100 mm, expanded; tan, aboral  
surface with black stripes running  
across arms. Always collected  
on gorgonians, especially  
Muricea californica

#23 new sea star, solid orange but  
with pale green spots on aboral  
surface. Very rigid.

#24 ectoproct - Membranipora sp.

shore photos of bryozoa: white = Thalamoporella  
gothica  
dark = Membranipora sp.

SCUBA collection, cont.

Melongena patula

Diadema mexicanum

Luidia superba (not known north of Colima, Mexico)



21 March 1974 (cont.)

Palythoa sp.

Othilia tenuispina

Membranipora sp. (samples in formalin & photographed)

Thalamoporella gothica

Antiopella barbarensis (nudi branch)

Nembrotha eliora

Navanax inermis

Pseudoceros mexicanus

Leucekta losangelensis (photographed)

Mytella guyanensis (155 mm. long)

Craniella arb

Linkia ?? (samples in formalin)

Terpios zeteki (photographed)

6 gorgonians - all photographed:

1) red?

2) Muricea californica

3) Eugorgia aurantica

4) white?

5) red? (Muricea?)

6) Lophogorgia sp.

Pseudosuberites pseudos  
abundant - 3 colors photographed  
Choanites mineri - red  
sponge; photographed

Shore collection:

Pseudosuberites pseudos

Aplysia californica

Navanax inermis

Ophionereis annulata

Ophiocoma alexandri

Ophioderma panamensi

Echinaster tenuispina

Callianassa (uncinata?)

21 March 1974 (cont.)

Pilumnus gonzalensis

Onchidella binneyi

Bugula sp.

Acanthochiton exquisita

Petrolisthes hirtipes

Chiton virgulatus

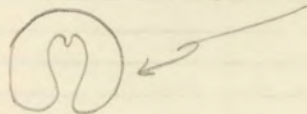
Cardita affinis

Radiella tridentata

Neothyone gibbosa

Collisella dalliana

The water in this bay is full of floating life - the Pleurobranchia are thick, as are floating chains of colonial jellyfish (like Muggia). Also some "Aquaria-like" jellyfish, and the 2-flapped tenopore (Colinopsis?)



The carbon and elephant trees stand bleak and surreal on the landscape of this island, like giant's bones against a deep blue sky.

23 March 1974

Mexico, Sonora, Punta Doble (N. point of Bahía San Carlos, ±10mi. N. Guaymas). H<sub>2</sub>O T° = 65° F. SCUBA collection = 5' - 45'.

many gorgonians; Muricea californica,  
Gorgonia sp., others.

Leucosolenia sp. (photographed)

Aglaophenia diazensis

Othelia tenuispina

Spirobranchus sp. (photographed)

Isostichopus fuscus

Pentamera chierchia (photographed)

Pseudosuberites pseudos

Aplysia californica

Hypselidoris californicus

strange, miniscule, colonial tube-worms  
(saved for J.K.)

Oreaster occidentalis



GUAYMAS  
 AREA

- = sandy shore
- = rocky shore
- ~ = roads
- = mangrove swamps

24 March 1974

Mexico, Sonora, Guaymas Area.

Collection #1: Estero Soldado, in Bahía  
San Francisco,  $\pm$  10 mi. N. Guaymas.

Uca princeps

Uca crenulata

Phyllactis sp.

Polythoa sp.

Cerithidea mazatlanica

Diadomea?

Ophitaspongia?

Leptodius occidentalis

Modiolus capax

Eurytium affine

Eurytium albidigitum

Pickens has begun his destruction  
of Estero Soldado. Many buildings are  
now going up where we used to  
camp. The entire margin of the  
estero is dotted with Mexican and  
gringo visitors. There is a dirt road  
running the entire length of the small  
arm, between it and the ocean  
berm, and it is littered with  
toilet paper, beer bottles, etc.

The days of Soldado are over, all  
that's left are the memories of  
some good times, the heyday of the  
Houston-Wellman era, tequila, L.S.D.,  
and the roots of P.E.C.

24 March 1974 (cont.)

Collection #2: SCUBA collection on "Bird rock", off Lalo Beach (near Punta Doble, N. of San Carlos). 10'-65'. T° = 64°F.

Flabellinopsis iodinea - photographed

Psolidium dorsipes? - photographed

Leucosolenia

Aglaophenia diageensis

the gorgonians

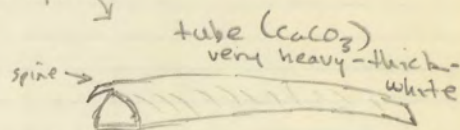
oreaster occidentalis - abundant

large octopus, mottled brown & black, no particularly distinctive markings. in formalin. sitting on a rock. not too active. about 60'

Pseudosuberites pseudos - abundant

Terpios zeteki - abundant

spirobranchus sp.



Isostichopus fuscus - abundant

25 March 1974

Mexico, El Golfo de California, Isla San Ignacio Farallone (off Topolobampo, Sinaloa). SCUBA - 20'-80'. A big rock sticking up out of the Sea of Cortez, covered in places with 2-3 feet of guano. 1000's of Brown Boobies and many sea lions. Sitting on the bottom in 80' of water the sea lions surrounded us, 10-20 of them, and played at us, making passes at us, turning away at the last second before ramming us. They nipped each other, played tag, and yelled under water, having a general good time of the excitement of our presence. Tubastral tenuilamellosa is here (latitude 25° 30' N), very unusual. So is Toxopneustes roclus and some echinirids, probably Thalassema steinbecki Fisher, living under boulders in the pebble bottom (50'-80').

25 March 1974 (cont.)

Toxopneustes rosellus

Body about twice as wide as high (50 mm. x 100 mm average); covered by short tan spines and many brown, stalked pedicellariae. These pedicellariae are petaloid when open, tan w/ a dark brown central spot. They close as 3 corners fold in to form a cone. Tube feet occur in 5 double rows (10 rows total).

Tubastraea tenuilamellosa

Brilliant orange flesh covers the opaque, white  $\text{CaCO}_3$  base of the zooids. Each zooid is 15-30 mm. tall, joined to the others at their base.