

# SUBMARINE CANYONS OF SOUTHERN CALIFORNIA POLYCHAETOUS ANNELIDS

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This systematic report lists the polychaetes recovered from the submarine canyons of southern California which are given in the ANALYSES (see Part 2). Each is named with its occurrence by canyon, depth in meters and numbers of individuals in a sample. More complete bibliographic citations may be consulted in reports by Hartman (1959-1961). I am indebted to Mr. Anker Petersen for the preparation of the illustrations.

The names and locations of canyons may be consulted in Part 2.

Six new species or subspecies are described; they are:

- Ancistrosyllis breviceps*, n.sp., family PILARGIDAE
- Aricidea lopezi rubra*, n. subsp., family PARAONIDAE
- Chaetozone armata*, n.sp., family CIRRATULIDAE
- Asclerocheilus californicus*, n.sp., family SCALIBREGMIDAE
- Barantolla americana*, n.sp., family CAPITELLIDAE
- Decamastus gracilis*, n.gen. and sp., family CAPITELLIDAE

Four other species are newly recorded from the eastern Pacific Ocean; they are:

- Marphysa belli oculata*, previously known from southern Florida and the West Indian region.
- Dorvillea atlantica*, previously reported off the Azores, in 1000 fms.
- Aricidea (Aedicira)*, nr *fauxveli*, previously reported off Morocco and the Mediterranean Sea.
- Asychis gotoi* Izuka, previously known from Japan.

Some other genera, represented by unknown species are:

- Antinoella*, in longshore canyons, in deep water.
- Harmothoë*, with reticulated elytra, in longshore canyons.
- Harmothoë*, commensal with other polychaetes, in Catalina canyon.
- Pholoë*, in Coronado canyon, deep water.
- Pareurythoë*, in Redondo and La Jolla canyons, deep water.
- Lumbrineris*, in Dume canyon, deep water.
- Aricidea (Aedicira)*, from San Diego trench and Santa Cruz canyon, deep water.

*Prionospio*, in Redondo canyon, deep water.

phyllochaetopterid, in Redondo canyon.

*Flabelligera*, in Santa Cruz canyon, deep water.

flabelligerid, in Redondo and Tanner canyons, deep water.

*Ampharete*, in Tanner canyon, deep water.

#### Family APHRODITIDAE

##### *Aphrodita refulgida* Moore, 1910

Hueneme cn, in 456 m (1).

##### *Aphrodita japonica* Marenzeller, 1879

Redondo cn, axis, in 431 m (1 large), 611 m (1 large posterior end).

Santa Pedro sea valley, in 459 m (1 large, measures 36 by 28 mm).

La Jolla cn, in 121 m (1, measures 23 mm across).

##### *Aphrodita* spp.

Santa Monica cn, in 542 m (1, eviscerated).

San Clemente rift valley, in 1406 m (1 jv).

#### Family POLYNOIDAE

##### *Antinoella anoculata* (Moore) 1910

Santa Cruz cn, in 902 m (3).

##### *Antinoella* sp., probably unknown

Mugu cn, in 367 mm (1), 573 m (6).

Dume cn, in 741 m (1 fragment).

Redondo cn, axis, in 422 m (1 fragment), fan, 652 m (1 fragment).

Santa Pedro sea valley, in 468 m (5).

Newport cn, in 553 m (1), 642 m (1 fragment).

This species is characterized by the presence of prostomial eyes and a patch of small punctate spots on the posterior half of the prostomium; length is usually less than 10 mm.

##### *Evarnella fragilis* (Moore) 1910

Redondo cn, south wall, in 542 m (1).

##### *Harmothoë crassicirrata* Johnson, 1897

San Clemente rift valley, in 950 m (1).

##### *Harmothoë*, nr *lunulata* (delle Chiaje) 1841

Dume cn, in 374 m (1), 398 m (1).

Santa Monica cn, in 362 m (1).

Redondo cn, south wall, in 57 m (10), north wall, 107 m (8), 363 m (1), axis, 148 m (1), 344 m (2), 378 m (2), 503 m (2).

San Pedro sea valley, in 319 m (3).

Newport cn, in 16 m (8), 37 m (5), 178 m (3), 211 m (2).

La Jolla cn, in 79 m (2), 121 m (1).

Coronado cn, in 123 m (3).

Catalina cn, in 362 m (2).

A specimen from Redondo cn, in 344 m, contains an endoparasitic copepod.

#### **Harmothoë priops** Hartman, 1961

Mugu cn, in 119 m (2).

Redondo cn, in 137 m (1).

Newport cn, in 16 m (8), 37 m (2), 85 m (3), 170 m (2).

La Jolla cn, in 79 m (3).

#### **Harmothoë scriptoria** Moore, 1910

Santa Cruz cn, in 89 m (? 3).

#### **Harmothoë imbricata** (Linnaeus) 1767

Catalina cn, in 216 m (? 1).

#### **Harmothoë** sp., with reticulated elytra

Mugu cn, in 378 m (2).

Dume cn, in 398 m (1), 374 m (2), 398 m (1).

Redondo cn, in 232 m (1), 107 m (6), 120 m (9), 122 m (12), 146 m (5 jv), 167 m (4), 310 m (2).

San Pedro sea valley, in 221 m (5).

Newport cn, in 170 m (1), 211 m (3).

This species resembles *Harmothoë*, nr *lunulata*, above, but differs consistently in that elytra have a reticulated color pattern instead of a dark crescent. It is perhaps commensal with a maldanid, *Praxillella affinis pacifica*, with which it is usually associated.

#### **Harmothoë** spp.

Monterey cn, in 168 m (2), 260 m (7).

Hueneme cn, in 209 m (1), 397 m (7).

Mugu cn, in 119 m (1), 177 m (5).

Dume cn, in 299 m (1).

Santa Monica cn, in 268 m (3).

Redondo cn, south wall, in 378 m (1 fragment), north wall, 113 m (1 jv), axis, 239 m (1), 282 m (4), 298 m (1 fragment), slope, 334 m (1).

Newport cn, in 178 m (1), 478 m (1 fragment).

La Jolla cn, in 371 m (1 jv).

Coronado cn, in 177 m (1).

Catalina cn, in 379 m (1 fragment).

Tanner cn, in 496 m (2), 644 m (1 small), 1298 m (1, without eyes).

#### **Harmothoë** sp., unknown commensal

Catalina cn, in 88 m (7).

The body is broadly depressed, very smooth and flat dorsally. Elytra are glistening pearly white and have a slight crescentic dorsal pigment pattern. Under high magnification the margin is slightly fimbriated, with a few widely spaced short filaments along a short outer margin. The entire upper surface is covered with clear lenticles which appear as very minute granules under low magnification. The body is broadly covered with the imbricating elytra except for a short, 2 to 4 segments, posterior end. The body terminates in a pair of long, pygidial filaments.

The prostomium has peaks directed forward. The four equally small eyes are in trapezoidal arrangement, with the anterior pair located in front of the middle and at the sides of the lobe; the posterior eyes are near the posterior margin of the prostomium.

Notopodial setae are all of one kind and coarser and much shorter than the neuropodial setae. Each is acicular, has a straight, blunt tip and the sides are lightly spinous but appear smooth under low power; they form a spreading fascicle. Neuropodial setae are longer, slenderer, all about equally thick and of two kinds. The supra-acicular setae are long, spinose at the free end, and the subacicular setae are much shorter, smoother and have the cutting edge oblique, adorned with a row of short spinules.

#### harmothoid, not generically identified

Santa Monica cn, trawled in 100 fms, rocky bottom (1).

Tanner cn, in 496 m (2).

All elytra have been lost. The prostomium has peaks at its anterior margin. The four eyes are large, with the anterior pair at the midlength of the lobe, and the posterior eyes at the posterior margin of the prostomium. Notopodial setae are much coarser than neuropodial setae and transversely spinous. Neuropodials are of two kinds: the superior are longer, slenderer, distally deeply bifid and spinous along their free length, whereas the inferior ones are much shorter and thicker, distally entire and have few or no spinules along the cutting

edge. They intergrade near the middle of the fascicles, and from anterior to posterior regions of the body.

**Hesperonoë laevis** Hartman, 1961

Monterey cn, in 410 m (5).

Hueneme cn, in 177 m (12+), 373 m (3).

Mugu cn, in 177 m (2), 367 m (? 4).

Santa Monica cn, in 268 m (3).

Redondo cn, axis, in 246 m (1), 431 m (3), slope, 310 m (4), 167 m (1 fragment).

Newport cn, in 420 m (1).

Catalina cn, in 379 m (1).

**Lagisca multisetosa** Moore, 1902

Santa Monica cn, trawled in 200 m, rocky bottom (1+).

**Lagisca** sp.

Redondo cn, in 542 m (1), fan, 810 m (1).

San Pedro sea valley, in 461 m (1).

? **Lepidametria** sp.

Monterey cn, in 260 m (5).

This species is perhaps commensal with *Arhynchite* sp., an echiuroid worm. Elytra are very small. The prostomium has anterior peaks. The middorsum of each body segment has two erect nodes, in tandem; they appear lightly chitinized. Superiormost neuropodial setae are slenderer and more spinous than those in more inferior position. Notopodia are represented by small setal fascicles, as characteristic of *Lepidametria* and so distinguished from *Lepidasthenia*.

**Lepidasthenia interrupta** (Marenzeller) 1902

Redondo cn, in 76 m (2), possibly commensal with the maldanid, *Maldanella robusta* (see below).

**Lepidasthenia ?longicirrata** Berkeley, 1923

Monterey cn, in 168 m (6), possibly commensal with the maldanid, *Asychis disparidentata* (see below).

Hueneme cn, in 183 m (1), 177 m (1).

Dume cn, in 299 m (1).

Santa Monica cn, in 330 m (2).

Redondo cn, axis, in 298 m (1), 137 m (1 jv), 148 m (2 large, perhaps commensal with *Praxillella a. pacifica*, see below).

Newport cn, in 85 m (5 large, in tubes of *Praxillella a. pacifica*), 170 m (10 large, in tubes of the same species of maldanid), 211 m (? 3).

La Jolla cn, in 79 m (1), 121 m (4, in tubes of *Praxillella a. pacifica*).

**Lepidasthenia** spp.

Santa Cruz cn, in 221 m (4), 218 m (3), 459 m (1), 623 m (1).

**Lepidonotus caelorus** Moore, 1903

Dume cn, trawled in 40-50 fms, rocky bottom (many).

Santa Monica cn, trawled in 40-100 fms, rocky (many); 330 m (1).

Redondo cn, in 5+2 m (2).

Santa Cruz cn, in 218 m (10), 221 m (2), 459 m (6).

Catalina cn, in 708 m (1 jv).

**Thormora johnstoni** (Kinberg) 1855

Newport cn, in 97 m (1).

polynoids, unidentified

Redondo cn, in 422 m (2), 465 m (2), 556 m (2), 575 m (1), 686 m (1).

San Pedro sea valley, in 406 m (1).

Family POLYODONTIDAE

**Panthalis pacifica** Treadwell, 1914

Redondo cn, in 120 m (1), 122 m (1).

San Pedro sea valley, in 187 m (2), dredged in 240-280 m (4).

La Jolla cn, in 79 m (2 jv).

Coronado cn, in 123 m (1).

**Peisidice aspera** Johnson, 1897

Dume cn, trawled in 40-50 fms, rocky (many).

Santa Monica cn, trawled in 40-100 fms, rocky (many), 116 m (2).

San Pedro sea valley, in 459 m (1).

La Jolla cn, in 121 m (1), 274 m (1).

Santa Cruz cn, in 218 m (13), 221 m (8).

Family SIGALIONIDAE

**Leanira alba** Moore, 1910

San Diego trench, in 840 m (1).

Coronado cn, in 812 m (1).

***Leanira calcis* Hartman, 1960**

Redondo cn, north wall, in 120 m (? 3).

***Leanira* sp.**

Newport cn, in 741 m (1 fragment).

***Pholoë glabra* Hartman, 1961**

Monterey cn, in 168 m (2).

Hueneme cn, in 98 m (1), 99 m (1), 338 m (1), 456 m (1).

Mugu cn, in 119 m (3), 177 m (13).

Santa Monica cn, in 183 m (2 jv), 268 m (2).

Redondo cn, south wall, in 57 m (149+), 76 m (1), north wall, 107 m (60), 113 m (11), 120 m (22), 122 m (16), axis, 137 m (14), 146 m (2), 148 m (1), slope, 167 m (14), 232 m (2), 282 m (1 fragment), 310 m (7), fan, 652 m (1 fragment).

San Pedro sea valley, in 221 m (13).

Newport cn, in 97 m (8), 170 m (3), 178 m (12), 235 m (1 fragment).

La Jolla cn, in 79 m (6), 121 m (6).

Coronado cn, in 123 m (7), 177 m (5).

Santa Cruz cn, in 89 m (5), 218 m (1), 221 m (1).

Catalina cn, in 88 m (30), 914 m (1 small).

***Pholoë*, perhaps unknown species**

Coronado cn, in 812 m (1).

This specimen lacks prostomial eyes and has unique parapodial setae.

***Sthenelanelia uniformis* Moore, 1910**

Redondo cn, south wall, in 57 m (7+), 76 m (5 jv), fan, 602 m (? 2).

San Pedro sea valley, dredged in 50-150 fms (50+), 221 m (56).

Newport cn, in 16 m (2), 47 m (97).

La Jolla cn, in 79 m (3).

Coronado cn, in 123 m (1).

Santa Cruz cn, in 89 m (3).

***Sthenelais tertiaglabra* Moore, 1910**

Mugu cn, in 119 m (2).

Santa Monica cn, in 454 m (1).

Redondo cn, in 107 m (7), 120 m (1), 122 m (2), 167 m (1).

Newport cn, in 97 m (2).

La Jolla cn, in 79 m (2).

Coronado cn, in 177 m (1).

*Sthenelais verruculosa* Johnson, 1897

Mugu cn, in 119 m (1).

San Pedro sea valley, dredged in 240-280 m (1).

*Sthenelais* sp.

Newport cn, in 16 m (1 jv).

*Thalenessa spinosa* (Hartman) 1939

Hueneme cn, in 373 m (10+, large).

Mugu cn, in 119 m (12).

San Pedro sea valley, dredged in 50-150 fms (4).

Santa Cruz cn, in 89 m (2).

Tanner cn, in 298 m (3).

## Family PISIONIDAE

*Pisione*, nr *remota* (Southern) 1914

Tanner cn, in 298 m (? 1).

## Family AMPHINOMIDAE

*Chloeia pinnata* Moore, 1911

Monterey cn, in 168 m (36), 260 m (14).

Hueneme cn, in 165 m (10 large), 177 m (6), 338 m (5), 376 m (12 large), 456 m (8).

Dume cn, in 374 m (1).

Mugu cn, in 177 m (39), 378 m (27), 676 m (10 large).

Santa Monica cn, in 183 m (1), 268 m (1), 330 m (2), 362 m (14).

Redondo cn, south wall, in 57 m (150+), 76 m (1), 107 m (10), 113 m (1), 120 m (24), 122 m (22), axis, 137 (126 large), 148 m (25), 167 m (33), 232 m (28), 239 m (61), 246 m (4), 298 m (55), 310 m (9), 344 m (20+), 378 m (20 large and small), 378 m (37 small), 422 m (about 90), 431 m (1).

San Pedro sea valley, in 187 m (1), 221 m (410), 240-280 m, dredged (many), 406 m (27 jv), 438 m (11), 459 m (35 large), 461 m (117), 468 m (2), 480 m (116), 522 m (1).

La Jolla cn, in 79 m (31 jv), 121 m (1 jv), 135 m (1 jv), 274 m (1 large and 8 jv), 371 m (1 large), 517 m (3 large), 637 m (5 large), 793 m (1 jv).

Coronado cn, in 177 m (3).

Catalina cn, in 362 m (1 jv).

Tanner cn, in 298 m (15), 813 m (10).



Large individuals measure about 35 mm long. Greatest concentrations occur in Redondo canyon and San Pedro sea valley, in depths of 57 to 480 meters.

***Pareurythoë* sp., perhaps unknown**

Redondo cn, in 137 m (3), 246 m (1).

La Jolla cn, in 274 m (1 juv).

The prostomial caruncle resembles that of *Pareurythoë californica* (Johnson), an intertidal form from southern California; the specific details of setae and branchiae may be different.

Family EUPHROSINIDAE

**Euphrosine spp.**

Dume cn, trawled in 40-50 fms (1).

Redondo cn, in 542 m (1).

Santa Cruz cn, in 218 m (2).

Family PHYLLODOCIDAE

***Anaitides*, cf. *groenlandica* (Oersted) 1843**

Hueneme cn, in 397 m (1 large).

The dorsum is dark iridescent, the ventrum lighter. Dorsal cirri are large, distally truncate, dark in color and have a pale margin. Ventral cirri in median and posterior regions are long, more or less lanceolate and distally pointed. The everted proboscis has 6 paired rows of papillae with up to 8 in a row.

***Anaitides*, nr *madeirensis* (Langerhans) 1880**

Hueneme cn, in 177 m (1), 376 m (13).

Santa Monica cn, in 268 m (1 large), 362 m (1).

Redondo cn, in 113 m (1 large), 167 m (1), 310 m (5).

Newport cn, in 97 m (2), 170 m (1).

Santa Cruz cn, in 459 m (2).

Tanner cn, in 496 m (1).

***Anaitides multiseriata* Rioja, 1941**

San Pedro sea valley, dredged in 240-280 m (7).

***Anaitides* spp.**

Santa Monica cn, in 330 m (1).

Redondo cn, in 107 m (2), 137 m (1), 148 m (2), 232 m (3), 239 m (1), 334 m (3), 344 m (1), 363 m (1), 422 m (4), 542 m (1).

San Pedro sea valley, in 221 m (1), 240-280 m (4), 406 m (1).

***Eteone californica* Hartman, 1936**

Hueneme cn, in 98 m (2), 183 m (1).

Mugu cn, in 119 m (2).

Santa Monica cn, in 330 m (1).

Redondo cn, north wall, in 113 m (1), axis, 344 m (1).

San Pedro sea valley, in 221 m (? 1).

***Eteone dilatae* Hartman, 1936**

Hueneme cn, in 165 m (10), 177 m (7).

***Eteone* spp.**

Hueneme cn, in 456 m (6). The dorsum and ventrum are crossed by dark bars across the middle of segments, with the same color as that on dorsal cirri; the latter are thick and appear inflated. The last segment is followed by a ring with a pair of short, thick lateral cirri and a median, slenderer, distally tapering one.

Redondo cn, axis, in 137 m (1 jv).

Newport cn, in 16 m (1 small white).

La Jolla cn, in 274 m (1 jv). The body is long and slender.

Santa Cruz cn, in 89 m (1). The dorsum has a pair of longitudinal lines.

***Eulalia* spp.**

Santa Monica cn, trawled in 40 fms (1). The body is yellow and the dorsum has 3 longitudinal rows of spots, with those on the sides larger than the middorsal one.

Monterey cn, in 168 m (1). The dorsum has 3 longitudinal rows of dark stripes.

Mugu cn, in 119 m (1).

San Pedro sea valley, dredged in 180-430 m (7).

Redondo cn, in 137 m (1).

***Eumida sanguinea* (Oersted) 1843**

Mugu cn, in 119 m (1), 177 m (1).

Redondo cn, in 57 m (1).

***Eumida bifoliata* (Moore) 1909**

Tanner cn, in 496 m (1). An adult individual with reddish brown ova deposited in an ampharetid tube in which the adult is lodged.

***Eumida tubiformis* Moore, 1909**

Dume cn, in 398 m (? 1).

**Eumida spp.**

Santa Monica cn, in 116 m (3).

Redondo cn, in 57 m (1), 232 m (1), 246 m (1), 310 m (1), 542 m (1).

San Pedro sea valley, in 187 m (1), 459 m (1).

Newport cn, in 16 m (1), 170 m (1), 235 m (1), 211 m (1), 272 m (2).

La Jolla cn, in 79 m (+), 135 m (10).

Santa Cruz cn, in 218 m (1), 221 m (1).

**Genetyllis castanea** (Marenzeller) 1879

San Pedro sea valley, dredged in 100-300 m (4).

**?Genetyllis sp.**

Mugu cn, in 119 m (2).

**Hypoeulalia bilineata** (Johnston) 1840

Santa Monica cn, trawled in 80 m, rocky bottom (1).

Redondo cn, in 542 m (1).

San Pedro sea valley, dredged in 100-300 m (7).

The body is pigmented dark mustard yellow and has a pair of lateral, longitudinal stripes and a paler middorsal one. The fusion of prostomium and first segment is less complete than in typical form.

**Paranaitis polynoides** (Moore) 1909

Santa Monica cn, in 116 m (1).

La Jolla cn, in 121 m (1), 274 m (2 jv).

**Phyllodoce spp.**

Mugu cn, in 119 m (3), 177 m (1).

Redondo cn, in 57 m (3+).

Newport cn, in 37 m (1), 235 m (2).

La Jolla cn, in 79 m (15), 121 m (+), 274 m (9).

Santa Cruz cn, in 218 m (1 jv).

Catalina cn, in 559 m (1 fragment).

## Family LACYDONIIDAE

**Paralacydonia paradoxa** Fauvel, 1913

Tanner cn, in 1298 m (2).

## Family HESIONIDAE

*Amphiduros pacificus* Hartman, 1961

Hueneme cn, in 383 m (? 1 fragment).

Redondo cn, in 246 m (? 1 fragment), 503 m (? 3), 611 m (? 1).

San Pedro sea valley, in 459 m (? 1).

*Ophiodromus pugettensis* (Johnson) 1901

Hueneme cn, in 177 m (2).

Santa Monica cn, in 116 m (12).

Redondo cn, in 146 m (1).

San Pedro sea valley, dredged in 100-300 m (4).

*Oxydromus arenicolus glabrus* Hartman, 1961

Hueneme cn, in 165 m (2), 183 m (1), 271 m (1), 373 m (1), 376 m (1), 397 m (1), 478 m (1).

Dume cn, in 374 m (1).

Mugu cn, in 548 m (8).

Santa Monica cn, in 183 m (2 jv), 330 m (1).

Redondo cn, south wall, in 57 m (3), 232 m (1), 575 m (2), north wall, 107 m (1), 113 m (3), 120 m (1), 363 m (2), axis, 137 m (28), 431 m (2), slope, 556 m (1), fan, 652 m (1), 660 m (4).

San Pedro sea valley, in 319 m (1), 522 m (1), 661 m (4).

Newport cn, in 16 m (1), 37 m (1), 85 m (4), 97 m (15), 235 m (4), 478 m (1), 553 m (5).

La Jolla cn, in 79 m (6), 121 m (3), 274 m (1), 371 m (1).

Coronado cn, in 123 m (2).

Catalina cn, in 266 m (1), 362 m (1), 379 m (2).

? *Oxydromus* sp.

Hueneme cn, in 271 m (1), 373 m (1), 376 m (1), 478 m (1).

Mugu cn, in 573 m (8), 755 m (1).

Santa Monica cn, in 463 m (1), 542 m (1).

Redondo cn, south wall, in 378 m (4 fragments), axis, 282 m (3), 378 m (3 fragments), fan, 602 m (1).

Newport cn, in 741 m (1).

Catalina cn, in 559 m (1 jv).

## hesionids, not identified

Mugu cn, in 721 m (2).

Santa Monica cn, trawled in 200 m, rocks (2).

San Pedro sea valley, in 716 m (1).

Newport cn, in 37 m (4), 478 m (1 fragment).

## Family PILARGIDAE

*Ancistrosyllis tentaculata* Treadwell, 1941

Monterey cn, in 168 m (4).

Hueneme cn, in 177 m (1), 183 m (2), 209 m (2), 338 m (1), 456 m (1).

Mugu cn, in 548 m (4).

Dume cn, in 580 m (1), 905 m (2).

Santa Monica cn, in 116 m (2), 183 m (1), 454 m (1), 542 m (1), 583 m (2).

Redondo cn, south wall, in 232 m (8), 519 m (3), 575 m (1), north wall, 107 m (8), 113 m (17), 122 m (1), 363 m (3), axis, 137 m (more than 238), 148 m (50), 239 m (2), 246 m (12), 209 m (2), 298 m (2), 344 m (1), 503 m (1), fan, 344 m (1), 652 m (1), 786 m (2).

San Pedro sea valley, in 187 m (17), 522 m (1), 661 m (1), 666 m (1), 716 m (1).

Newport cn, in 16 m (8), 37 m (Sta. 5006) (31), 37 m (Sta. 5250) (67), 85 m (265, large and small), 97 m (72), 170 m (19), 178 m (1), 235 m (12), 272 m (2).

La Jolla cn, in 79 m (69), 121 m (2), 545 m (1), 793 m (? 1, very dark), 976 m (? 3, very dark).

Coronado cn, in 566 m (1).

Catalina cn, in 559 m (3).

*Ancistrosyllis breviceps*, new species

Fig. 1a-d

Hueneme cn, in 397 m (1).

Mugu cn, in 177 m (1), 548 m (1 fragment).

Dume cn, in 580 m (2).

Santa Monica cn, in 268 m (1), 475 m (2), 542 m (1 fragment), 583 m (2), 612 m (1 fragment), 695 m (1, HOLOTYPE).

Redondo cn, in 246 m (1 fragment), 282 m (1), 378 m (1), 431 m (1), 503 m (1), 660 m (2), 686 m (2), 751 m (1), 786 m (3, dark green).

San Pedro sea valley, in 319 m (1 fragment), 459 m (1), 661 m (1), 666 m (1), 716 m (1), 740 m (1).

Newport cn, in 215 m (1), 420 m (1).

La Jolla cn, in 545 m (1).

Coronado cn, in 344 m (3), 566 m (2), 960 m (2).

Catalina cn, in 216 m (1), 266 m (1), 362 m (1), 379 m (2+), 559 m (1).

A complete individual in two pieces measures 32 mm long and 4 mm wide with parapodia, in median segments. The body is depressed and resembles a species of *Pilargis* (see below) because antennae and cirri are very short; the median antenna is sometimes difficult to identify. The surface epithelium is minutely papillated; this is most obvious on the dorsum, the superior edges of parapodia and the dorsal cirri.

The prostomium (Fig. 1a) consists of a pair of subtriangular lobes, each a little longer than wide, well separated in front and fused at the base; there are no visible eyes. The three antennae are short, digitate and subequally short; each is about half as long as the prostomium; they are inserted near the posterior margin of the head lobe, with the laterals near the ectal margin and the median one where the prostomium and first segment join.

The first visible segment has a pair of short, subequal tentacular cirri (Fig. 1a); each is longer than an antenna and slightly papillated, seen only under magnification. The second segment, also without parapodia and setae, has a similar dorsal, and a much shorter ventral cirrus, resembling that of the third segment. The third segment, which is the first setigerous, is the most reduced; it has a small dorsal and a smaller ventral cirrus, and its setal fascicle is inconspicuous. From the fourth segment the parapodia are much larger and resemble those of the fifth and successive segments.

In typical parapodia the dorsal cirrophore encloses a slender aciculum or rod; these enlarge in median and posterior segments to form the conspicuous dorsal hooks. They increase gradually in size and are large, distally recurved, yellow crooked at about segment 18, (at segment 3, Redondo cn, fan in 751 m) but are irregular in occurrence through several segments. Where best developed (Fig. 1b) in middle and posterior segments, they emerge from the upper, basal edge of the notopodium, well within the base of the dorsal cirrus. The accompanying neuropodial setae (Fig. 1c) are much slenderer, nearly straight and directed laterally; they number 4 to 7 in a fascicle, but are frequently broken off near the base.

*Ancistrosyllis breviceps* is allied to *A. groenlandica* McIntosh (1879) (see Hartman, 1947, p. 497) from Greenland, in 410 fms, on sandy mud. It also has small prostomial antennae, a papillated epithelium and sharply crooklike notopodial hooks. The two differ in that (1) *A. breviceps* lacks eyes, (2) the first large notopodial hooks are first present at about segment 18 instead of far more anterior, (3) the paired prostomial antennae are inserted more posterior in the first than the second, (4) the dorsal cirri of the first setigerous segment

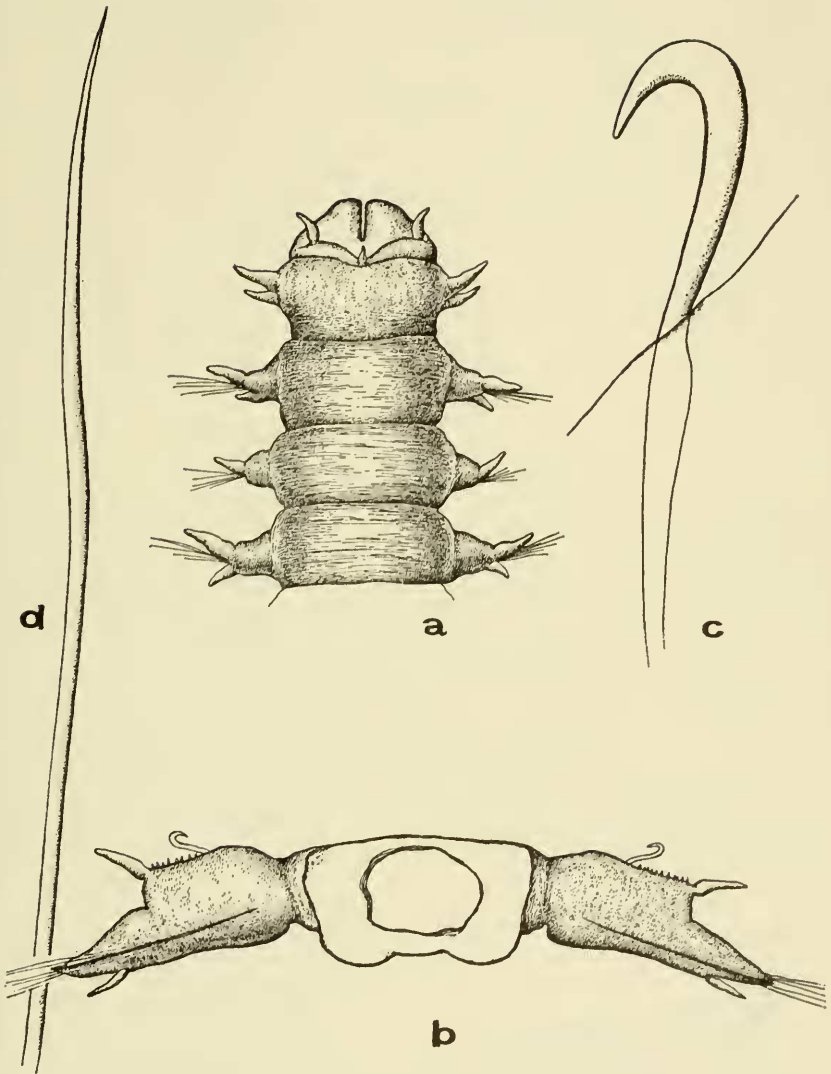


Fig. 1a-d

Fig. 1. *Ancistrosyllis breviceps*, new species (Sta. 7517-60, Santa Monica canyon, in 695 meters)

a, anterior end with prostomium and first four segments, in dorsal view, x 33.5; b, cross section of middle region of body, showing laterally directed parapodia, x 21; c, notopodial hook from median parapodium, x 355; d, neuropodial seta from same parapodium, x 355.

are much reduced in the first, not in the second, and (5) the third segment is greatly reduced in *A. breviceps*, not so in *A. groenlandica*.

The type specimen is selected from Santa Monica canyon, in 695 meters, Sta. 7517-62.

**Loandalia, nr fauveli** Berkeley and Berkeley, 1941

Newport cn, in 37 m (3).

**Pilargis berkeleyi** Monro, 1933

Monterey cn, in 168 m (1).

Redondo cn, in 113 m (1), axis, 246 m (1).

San Pedro sea valley, dredged in 50-150 fms (1), 187 m (4), 319 m (1).

Newport cn, in 85 m (1).

La Jolla cn, in 79 m (2), 121 m (2).

**Pilargis maculata** Hartman, 1947

Hueneme cn, in 209 m (1).

Santa Monica cn, in 362 m (1).

Redondo cn, south wall, in 57 m (1), 232 m (1), north wall, 113 m (1), axis, 148 m (1), slope, 310 m (1).

San Pedro sea valley, in 221 m (1 fragment), 319 m (1), 406 m (1).

Newport cn, in 16 m (1), 37 m (1 fragment).

La Jolla cn, in 79 m (3), 121 m (1).

**Pilargis hamatus** Hartman, 1960

Santa Monica cn, in 431 m (? 1).

Newport cn, in 420 m (2).

La Jolla cn, in 976 m (1).

Family SYLLIDAE

**Autolytus** spp.

Mugu cn, in 119 m (2).

Santa Monica cn, in 612 m (1).

**Calamyzas ?amphictenicola** Arwidsson, 1932

Redondo cn, in 554 m (1), attached to *Amphicteis scaphobranchiata*.

**Exogone uniformis** Hartman, 1961

Mugu cn, in 119 m (3).

Santa Monica cn, in 116 m (1), 183 m (2), 268 m (1), trawled in 200 m (3).



Redondo cn, north wall, in 107 m (12), 120 m (7), south wall, 76 m (2, with long swimming setae).

La Jolla cn, in 121 m (2).

Tanner cn, in 603 m (1), 644 m (1).

*Exogonella brunnea* Hartman, 1961

Santa Monica cn, in 330 m (3).

*Langerhansia heterochaeta* (Moore) 1909

Redondo cn, in 113 m (7).

Newport cn, in 97 m (2).

*Odontosyllis phosphorea* Moore, 1909

San Pedro sea valley, dredged in 240-280 m (4).

odontosyllids, unidentified

Santa Cruz cn, in 89 m (2), 218 m (1 fragment).

*Plakosyllis americana* Hartman, 1961

Santa Cruz cn, in 221 m (1).

*Pionosyllis*, unknown sp.

Redondo cn, slope, in 76 m (10).

*Sphaerosyllis* sp.

Mugu cn, in 119 m (5).

Coronado cn, in 566 m (1).

*Syllis* or *Typosyllis* spp.

Mugu cn, in 119 m (25), 177 m (1).

Redondo cn, north wall, in 465 m (1), south wall, 378 m (2), axis, 137 m (4).

San Pedro sea valley, in 221 m (1).

Coronado cn, in 177 m (1).

Santa Cruz cn, in 459 m (? 1).

*Typosyllis*, nr *hyalina* (Grube) 1863

Santa Monica cn, trawled in 80 m, rocky bottom (3).

syllids, unidentified

Redondo cn, south wall, in 542 m (3), axis, 148 m (1).

La Jolla cn, in 121 m (1).

Coronado cn, in 123 m (2).

Santa Cruz cn, in 218 m (1).

Catalina cn, in 708 m (1 fragment).

## Family NEREIDAE

*Ceratocephala crosslandi americana* Hartman, 1952

Mugu cn, in 177 m (1).

Redondo cn, south wall, in 57 m (2), 232 m (1), axis, 137 m (1).

Newport cn, in 170 m (2), 478 m (1).

La Jolla cn, in 121 m (2).

Coronado cn, in 177 m (1).

*Ceratocephala loveni pacifica* Hartman, 1960

San Diego trench, in 840 m (2).

*Ceratonereis paucidentata* (Moore) 1903

La Jolla cn, in 517 m (2 large).

*Nereis anoculis* Hartman, 1960

Santa Cruz cn, in 1387 m (1).

*Nereis procera* Ehlers, 1868

Monterey cn, in 168 m (4), 260 m (2), 906 m (1).

Hueneme cn, in 383 m (? 1).

Mugu cn, in 119 m (8), 177 m (1).

Dume cn, in 374 m (1).

Santa Monica cn, in 116 m (8), 268 m (1), 330 m (1).

Redondo cn, south wall, 232 m (15), north wall, 107 m (1 small), 113 m (7), 363 m (? 1), axis, 137 m (6 large).

San Pedro sea valley, in 187 m (? 1), dredged in 100-300 m (many).

Newport cn, in 16 m (25), 97 m (5), 170 m (13), 178 m (1 large), 211 m (7 large).

La Jolla cn, in 79 m (43), 121 m (6).

Coronado cn, in 177 m (2).

Santa Cruz cn, in 89 m (1).

*Nereis pelagica neonigripes* Hartman, 1936

Santa Monica cn, in 183 m (5).

Redondo cn, axis, in 298 m (1).

*Nereis* spp.

Redondo cn, south wall, in 542 m (1 small), north wall, 363 m (1, unusually prolonged), axis, 246 m (5), 560 m (1 small), slope, 167 m (1 fragment), 310 m (4).

San Pedro sea valley, in 221 m (8).

Newport cn, in 16 m (1), 85 m (1).

Catalina cn, in 216 m (2), 266 m (1).

**Platynereis bicanaliculata** (Baird) 1863

Mugu cn, in 119 m (4).

Dume cn, dredged in 40-50 fms, rocky bottom (many).

La Jolla cn, in 135 m (12).

## Family NEPHTYIDAE

**Aglaophamus dicirris** Hartman, 1950

Redondo cn, north wall, in 107 m (1), 122 m (1), axis, 503 m (7).

San Pedro sea valley, in 468 m (3).

La Jolla cn, in 121 m (1).

Catalina cn, in 88 m (15).

**Aglaophamus erectans** Hartman, 1950

Santa Monica cn, in 542 m (? 1 jv).

Redondo cn, axis, in 246 m (1 large), 282 m (8), 378 m (9).

San Pedro sea valley, in 319 m (1).

Newport cn, in 420 m (3).

Coronado cn, in 177 m (1), 344 m (1).

Catalina cn, in 379 m (1).

**Aglaophamus** spp.

Hueneme cn, in 397 m (1 fragment).

Dume cn, in 299 m (1 small).

Redondo cn, axis, in 344 m (1), slope, 334 m (2).

Newport cn, in 272 m (? 14 jv).

La Jolla cn, in 371 m (1), 517 m (1 fragment), 545 m (2).

Coronado cn, in 1265 m (1 jv).

San Clemente cn, in 1406 m (1).

**Nephtys assignis** Hartman, 1950

Monterey cn, in 260 m (1), 410 m (2 large and 3 very small, the largest one has a regenerated tail and measures 140 mm long by 10 mm wide).

San Pedro sea valley, in 221 m (1).

Newport cn, in 178 m (2 large).

**Nephtys cornuta** Berkeley and Berkeley, 1945

Monterey cn, in 750 m (17, characterized by bifid ventral prostomial antennae).

Redondo cn, axis, in 560 m (2, ovigerous, only 5.2 mm long by 0.6 mm wide).

***Nephtys caecoides* Hartman, 1938**

Hueneme cn, in 98 m (? 5).

Mugu cn, in 119 m (3).

Newport cn, in 16 m (13).

***Nephtys californiensis* Hartman, 1938**

Redondo cn, south wall, in 57 m (? 21).

***Nephtys ferruginea* Hartman, 1940**

Hueneme cn, in 177 m (2 small), 338 m (3), 376 m (2 small).  
456 m (3).

Mugu cn, in 119 m (1), 367 m (4 small), 378 m (4 small).

Redondo cn, south wall, in 232 m (2), north wall, 107 m (12),  
113 m (2), 120 m (9), 122 m (15), 146 m (21), axis, 148 m (4),  
344 m (? 14), slope, 167 m (10).

San Pedro sea valley, 187 m (2 jv), dredged in 100-300 m (5).  
221 m (16), 319 m (? 7 small).

Newport cn, in 37 m (2), 97 m (2), 178 m (3), 211 m (1),  
235 m (1).

La Jolla cn, in 79 m (2), 121 m (5).

Coronado cn, in 123 m (4 jv), 177 m (9), 344 m (3), 566 m  
(3 small).

Catalina cn, in 216 m (3), 379 m (? 12 jv).

***Nephtys glabra* Hartman, 1950**

Hueneme cn, in 376 m (1 large).

Mugu cn, in 177 m (10).

San Pedro sea valley, dredged in 100-300 m (2 very large).

***Nephtys* spp.**

Hueneme cn, in 209 m (3), 383 m (2 small), 397 m (9 jv),  
456 m (12).

Mugu cn, in 119 m (2), 573 m (1 jv), 676 m (1 jv).

Santa Monica cn, in 268 m (2 jv), 330 m (8 jv).

Redondo cn, south wall, in 378 m (12 jv), 575 m (8), north  
wall, 120 m (15 jv), 363 m (3 small), axis, 137 m (5 jv), 298 m  
(5 jv).

San Pedro sea valley, in 187 m (1 jv).

Newport cn, in 85 m (2 jv), 211 m (15 jv), 235 m (59 jv),  
272 m (11), 478 m (5), 553 m (4 jv).

La Jolla cn, in 637 m (15 small).

Santa Cruz cn, in 221 m (2 jv).

Catalina cn, in 362 m (5 small).

Eight individuals from Redondo canyon, in 575 m, are small, measure 7 to 10 mm long and are ovigerous. Interramal cirri are first present from the fifth setigerous segment. Pre-acicular setae are smooth, not camerated. These, as well as some others named from deep water, may represent an undescribed species.

nephtyids, unidentified

Dume cn, in 530 m (1 small).

Santa Monica cn, in 475 m (1 jv).

Redondo cn, in 431 m (2 jv).

San Pedro sea valley, in 406 m (12 small).

Catalina cn, in 266 m (4 fragments).

#### Family SPHAERODORIDAE

*Sphaerodorium brevicapitis* Moore, 1909

San Clemente rift valley, in 1591 m (1).

*Sphaerodorium papillifer* Moore, 1909

Santa Monica cn, trawled in 200 m, rocky bottom (1).

*Sphaerodorium* spp.

Tanner cn, in 496 m (2), 1298 m (3).

These individuals differ from *Sphaerodorium brevicapitis* (above) in that the large parapodial capsules have a distal papilla, not one near the base. The body is linear and measures about 10 mm long. Small papillae are dispersed over the dorsum and the ventrum.

*Sphaerodoridium*<sup>1</sup> *minutum* (Webster and Benedict) 1887

Redondo cn, north wall, in 107 m (9), 120 m (4).

La Jolla cn, in 121 m (1).

Coronado cn, in 123 m (1), 177 m (2).

*Sphaerodoridium sphaerulifer* (Moore) 1909

San Pedro sea valley, dredged in 240-280 m (5).

#### Family GLYCERIDAE

*Glycera americana* Leidy, 1855

Hueneme cn, in 98 m (1), 165 m (1 large), 177 m (2), 338 m (1), 456 m (2).

Mugu cn, in 119 m (1).

Dume cn, in 398 m (1 large, weight 5 grams, and 1 small).

<sup>1</sup>This genus has been recently erected by Lützen, 1961.

Santa Monica cn, in 116 m (4 large, 1 small).

Redondo cn, south wall, in 232 m (2 large), 378 m (1), north wall, in 113 m (4), axis, 138 m (4, of which 2 are unusually large), 344 m (1 large), 422 m (1 large).

San Pedro sea valley, in 187 m (2 large), 319 m (1 small), dredged in 240-280 m (1 large), dredged in 100-300 m (5).

Newport cn, in 16 m (6 large), 37 m (1), 85 m (4), 97 m (3), 211 m (1).

La Jolla cn, in 79 m (2+), 121 m (1), 274 m (1).

Santa Cruz cn, in 221 m (13), 459 m (3, of which 2 are very large).

### *Glycera capitata* Oersted, 1843

(Some of the following records may refer to *Glycera tenuis*, q.v.)

Monterey cn, in 168 m (7), 410 m (1), 750 m (1).

Hueneme cn, in 165 m (3), 183 m (1), 338 m (1), 376 m (1 jv), 345 m (? 1 jv).

Mugu cn, in 124 m (1), 177 m (1), 367 m (4), 378 m (1).

Dume cn, in 299 m (1), trawled in 40-50 fms (some).

Santa Monica cn, in 268 m (3), 330 m (? 1 fragment).

Redondo cn, south wall, in 57 m (14), 76 m (7 jv), 232 m (12), 378 m (1), 575 m (1 small), north wall, 107 m (8 jv), 113 m (30), 120 m (1 large and 4 small), 122 m (2), 146 m (8), axis, 137 m (10), 148 m (8 large and 6 small), 239 m (2), 246 m (1 fragment), 282 m (1), 298 m (+), 344 m (1 jv), 378 m (2 large), 431 m (? 1 small), 503 m (2), 560 m (? 3 small), slope, 167 m (5), 310 m (3).

San Pedro sea valley, in 187 m (13), 221 m (4), 319 m (1), 406 m (? 2), dredged in 240-280 m (17 small).

Newport cn, in 37 m (44), 97 m (25), 140 m (1), 170 m (18), 178 m (8), 211 m (13), 235 m (26), 272 m (20).

La Jolla cn, in 121 m (13), 135 m (? 23 jv), 517 m (3), 976 m (? 2 jv).

Coronado cn, in 123 m (6), 177 m (17 small), 813 m (? 1 small), 1265 m (? 1).

Catalina cn, in 88 m (2 jv), 216 m (4), 708 m (1 small).

San Clemente rift valley, in 950 m (? 1), 1405 m (? 2).

Tanner cn, in 603 m (2 small), 644 m (1), 1298 m (1).

### *Glycera capitata branchiopoda* Moore, 1911

Mugu cn, in 573 m (1), 676 m (3).

Santa Monica cn, in 583 m (1).

Redondo cn, fan, in 825 m (1).

San Pedro sea valley, in 468 m (1 large), 716 m (1).

Newport cn, in 235 m (4), 553 m (4), 235 m (4), 642 m (3), 741 m (4).

La Jolla cn, in 793 m (3).

San Diego trough, taken in all samples.

Santa Cruz cn, in 459 m (1).

***Glycera convoluta* Keferstein, 1862**

Mugu cn, in 119 m (2).

***Glycera oxycephala* Ehlers, 1887**

Santa Cruz cn, in 89 m (4).

***Glycera robusta* Ehlers, 1868**

Hueneme cn, in 183 m (1).

Redondo cn, axis, in 137 m (1 very large), 298 m (1 jv).

San Pedro sea valley, in 221 m (? 1 fragment).

Newport cn, in 37 m (1 large and 1 small), 37 m (2 large), 85 m (2 large), 170 m (2 large), 211 m (1 giant, measures 250 mm long by 13 mm wide and weighs 13.4 grams).

Coronado cn, in 177 m (1 very large).

***Glycera tenuis* Hartman, 1944**

Hueneme cn, in 397 m (2).

Santa Monica cn, in 612 m (2), trawled in 200 m, rocky (4).

Newport cn, in 85 m (? 11 small).

***Glycera tessellata* Grube, 1863**

Redondo cn, south wall, in 76 m (3), 542 m (3).

La Jolla cn, in 637 m (? 7).

Santa Cruz cn, in 218 m (14).

Tanner cn, in 496 m (2).

***Glycera* spp.**

Redondo cn, axis, in 422 m (1), slope, 556 m (1 small).

Newport cn, in 38 m (15 small).

La Jolla cn, in 79 m (30 or more jv), 274 m (5 jv), 371 m (1).

Catalina cn, in 549 m (1 jv).

Tanner cn, in 298 m (2 jv), 813 m (1 jv).

**Family GONIADIDAE**

***Glycinde armigera* Moore, 1911**

Santa Monica cn, in 268 m (? 2).

Redondo cn, in 148 m (2), 344 m (1), 363 m (2 large).

Newport cn, in 140 m (2).

**Glycinde, nr polygnatha** Hartman, 1950

Hueneme cn, in 177 m (2).

**Glycinde wireni** Arwidsson, 1899

Santa Monica cn, in 454 m (? 1).

**Glycinde** spp.

Redondo cn, axis, in 378 m (7), 422 m (1), 611 m (2 small).

San Pedro sea valley, in 406 m (3).

La Jolla cn, in 274 m (1 jv).

**Goniada acicula** Hartman, 1940

Mugu cn, in 119 m (1).

**Goniada annulata** Moore, 1905

Hueneme cn, in 373 m (2).

Santa Monica cn, in 454 m (1 large), 542 m (1).

Newport cn, in 420 m (1), 478 m (1 large and 2 small).

Anterior and median notopodial lobes are large and cordate in shape. Proboscoidal papillae are tall, slender and chitinized. This species has not previously been recorded from California.

**Goniada brunnea** Treadwell, 1906

Hueneme cn, in 98 m (1), 271 m (1 large and 2 small), 338 m (3), 373 m (2), 376 m (9 large), 397 m (5).

Mugu cn, in 119 m (7), 124 m (1), 177 m (3), 367 m (3), 573 m (8).

Dume cn, in 299 m (2), 374 m (1), 398 m (3).

Santa Monica cn, in 116 m (2), 330 m (1).

Redondo cn, south wall, in 57 m (7), 76 m (2), 232 m (3), north wall, 107 m (5), 113 m (4), 120 m (2), 122 m (1 large), 146 m (2), 363 m (1 jv), axis, 137 m (9), 148 m (1), 239 m (2), 282 m (3), 298 m (2), 344 m (2), 431 m (? 7 large), 503 m (7), 560 m (? 5 jv), slope, 167 m (1), 310 m (3), 334 m (1), fan, 652 m (1).

San Pedro sea valley, in 187 m (9), 221 m (8), 319 m (1), 406 m (1), dredged in 100-300 m (44 large), dredged in 240-280 m (5+).

Newport cn, in 16 m (1), 38 m (2), 85 m (6), 170 m (9), 211 m (2), 235 m (5), 272 m (? 4).

La Jolla cn, in 79 m (4), 121 m (4), 135 m (3), 274 m (1 jv).

Coronado cn, in 177 m (2), 344 m (2), 812 m (1), 1105 m (1).

Catalina cn, in 88 m (1 large and 1 small), 216 m (4), 559 m (1), 914 m (4).

Tanner cn, in 1298 m (2).



**Goniada littorea** Hartman, 1950

Newport cn, in 16 m (61).

Coronado cn, in 123 m (1).

**Goniada** sp.

Santa Cruz cn, in 221 m (1).

## Family ONUPHIDAE

**Diopatra ornata** Moore, 1911

Mugu cn, in 119 m (25 large).

Redondo cn, south wall, in 57 m (1).

San Pedro sea valley, in 221 m (1 jv), dredged in 100-300 m (3 jv).

**Diopatra** sp.

San Pedro sea valley, in 187 m (3).

**Hyalinoecia juvenalis** Moore, 1911

Newport cn, in 97 m (1).

**Nothria conchylega** (Sars) 1835

Catalina cn, in 708 m (1).

Tanner cn, in 813 m (1).

**Nothria elegans** (Johnson) 1901

Hueneme cn, in 177 m (1).

Newport cn, in 16 m (2 large).

La Jolla cn, in 121 m (1).

*Nothria elegans*, *N. iridescens* and *N. pallida* are closely related. Ecologically they may be recognized as follows: *N. elegans* occupies a limp, thin-walled, sand-covered tube and occurs in shallowest benthic bottoms. *N. iridescens* constructs a tough, chitinized, tightly fitting tube and exists in deeper bottoms. *N. pallida* constructs a thick walled, mud-covered tube and occurs in considerable depths.

**Nothria iridescens** (Johnson) 1901

Monterey cn, in 168 m (5+), 410 m (34 large).

Hueneme cn, in 383 m (6), 376 m (23), 397 m (42 large), 456 m (? 2 jv).

Mugu cn, in 177 m (25), 367 m (5 large), 378 m (6).

Dume cn, in 398 m (14 large).

Santa Monica cn, in 268 m (15), 330 m (36), 362 m (24), 431 m (3).

Redondo cn, slope, in 167 m (? 1 fragment).



San Pedro sea valley, in 221 m (1), 461 m (3 large), dredged in 100 to 300 m (43+).

Newport cn, in 170 m (14).

La Jolla cn, in 517 m (? 1), 976 m (? 1 small).

Coronado cn, in 344 m (24).

Catalina cn, in 266 m (5 large), 362 m (6), 379 m (5), 914 m (5 moderately large).

#### *Nothria pallida* Moore, 1911

Monterey cn, in 260 m (17).

Hueneme cn, in 209 m (46), 373 m (40+).

Dume cn, in 299 m (3), 374 m (14), 530 m (1).

Redondo cn, south wall, in 232 m (10), 378 m (3), north wall, 113 m (25), 148 m (12), 239 m (2), 246 m (6), 282 m (2), 298 m (2 jv), 378 m (1), slope, 310 m (6), 334 m (many).

San Pedro sea valley, dredged in 50-100 fms (43+), 459 m (2), 522 m (1).

Newport cn, in 211 m (14), 235 m (5 large), Coronado cn, in 1105 m (3).

Catalina cn, in 216 m (9).

Largest tubes are from Redondo canyon, south wall, in 378 m; they measure 450 mm long by 8 mm across.

#### *Nothria* spp.

Hueneme cn, in 183 m (2), 338 m (1).

Mugu cn, in 119 m (4).

Redondo cn, axis, 503 m (1 fragment), slope, 556 m (1 fragment).

Newport cn, in 85 m (1 fragment).

La Jolla cn, in 79 m (1), 371 m (1).

Coronado cn, in 177 m (9 jv).

San Clemente rift valley, in 1406 m (1).

#### *Onuphis eremita* Audouin and M. Edwards, 1833

Hueneme cn, in 383 m (1).

#### *Onuphis nebulosa* Moore, 1911

Redondo cn, north wall, in 107 m (15).

San Pedro sea valley, dredged in 240-280 m (several), 319 m (1).

Santa Cruz cn, in 89 m (6).

Tanner cn, in 298 m (1).

#### *Onuphis parva* Moore, 1911

Mugu cn, in 177 m (22), 367 m (1).

Dume cn, in 374 m (3), 398 m (7).

Santa Monica cn, in 268 m (1), 330 m (6), 362 m (3).

Redondo cn, south wall, in 76 m (2), north wall, 107 m (2), 120 m (9), 122 m (15), 146 m (3), axis, 148 m (1), 344 m (1), slope, 167 m (15+), 310 m (6).

San Pedro sea valley, in 187 m (1).

Newport cn, in 97 m (1), 140 m (1), 170 m (1), 272 m (12).

La Jolla cn, in 121 m (9).

Coronado cn, in 123 m (4).

Catalina cn, in 88 m (3), 216 m (10), 362 m (? 7), 379 m (1).

#### *Onuphis vexillaria* Moore, 1911

Hueneme cn, in 373 m (30+), 376 m (2), 397 m (6), 478 m (4 large).

Mugu cn, in 378 m (12), 507 m (2), 530 m (1).

Dume cn, in 398 m (12), 507 m (2), 530 m (1).

Santa Monica cn, in 431 m (8 large), 454 m (5 large), 463 (3 large), 583 m (1 large).

Redondo cn, north wall, in 465 m (1), axis, 137 m (1 jv), 378 m (3 jv), 431 m (2), 560 m (8 large), 611 m (3 large, measure to 150 mm long).

San Pedro sea valley, in 437 m (1 large), 459 m (1 +), 468 m (1 large).

Newport cn, in 211 m (1 fragment), 235 m (1 fragment), 478 m (1).

Coronado cn, in 812 m (1).

Tanner cn, in 1298 m (2 small).

#### *Onuphis* spp.

Redondo cn, south wall, in 519 m (1 fragment), 542 m (1), axis, 282 m (1 fragment), 422 m (1 fragment), 503 m (1 fragment), slope, 334 m (1), fan, 715 m (1 jv).

Santa Cruz cn, in 89 m (248 jv).

Tanner cn, in 298 m (12 jv).

#### *Rhamphobrachium longisetosum* Berkeley and Berkeley, 1938

Santa Cruz cn, in 89 m (2).

#### Family EUNICIDAE

##### *Eunice americana* Hartman, 1944

Hueneme cn, in 397 m (1).

Mugu cn, in 378 m (3).

Dume cn, in 398 m (1 large).

Santa Monica cn, in 116 m (1 large), 268 m (+), 330 m (3), 362 m (1).

Redondo cn, south wall, in 57 m (1), 378 m (? 1), north wall, 113 m (1), axis, 246 m (1 large), 344 m (1 jv), slope, 310 m (2 large).

San Pedro sea valley, in 221 m (1 fragment), dredged in 100-300 m (1 small), dredged in 240-280 m (1).

Newport cn, in 97 m (1).

La Jolla cn, in 79 m (1).

Coronado cn, in 123 m (1 jv), 177 m (1 jv), 344 m (1).

Santa Cruz cn, in 89 m (1).

Catalina cn, in 266 m (1 large).

#### *Eunice multiplectinata* Moore, 1911

Santa Monica cn, trawled in 80-200 m, rocky bottom (3 large).

This species constructs parchmentlike tubes which follow rocky crevices; the tube adheres fully to the rocky surfaces.

#### *Eunice* sp.

Catalina cn, in 218 m (1 fragment). Prostomial antennae are smooth; branchiae are first present from the third setigerous segment, and acicular hooks are yellow; the characteristics agree with those of *Eunice filamentosa* Grube, 1856.

#### *Marphysa belli oculata* Treadwell, 1921

##### Fig. 2a-e

Treadwell, 1921, pp. 61-64, pl. 5, fig. 13.

San Pedro sea valley, in 221 m (1), dredged in 406 m (1), dredged in 240-280 m (2).

La Jolla cn, in 79 m (2).

Catalina cn, in 373 m (3).

The description and illustrations (Fig. 2) are based on the lot from Catalina canyon. Length does not exceed 12 mm and width 1.1 mm; this is conspicuously less than originally reported, 70 mm, for specimens from Key West Harbor, West Indies, the type locality. Branchiae are first present from the 10th setigerous segment and continue abruptly large and unipinnately divided through 12 segments; they have up to 8 filaments in single series at greatest development. Middle and posterior segments lack branchiae.

The prostomium is rounded in front (Fig. a) and has a pair of reddish circular eyes located between the bases of the outermost and mediolateral antennae. The 5 similar antennae are tapering, smooth,

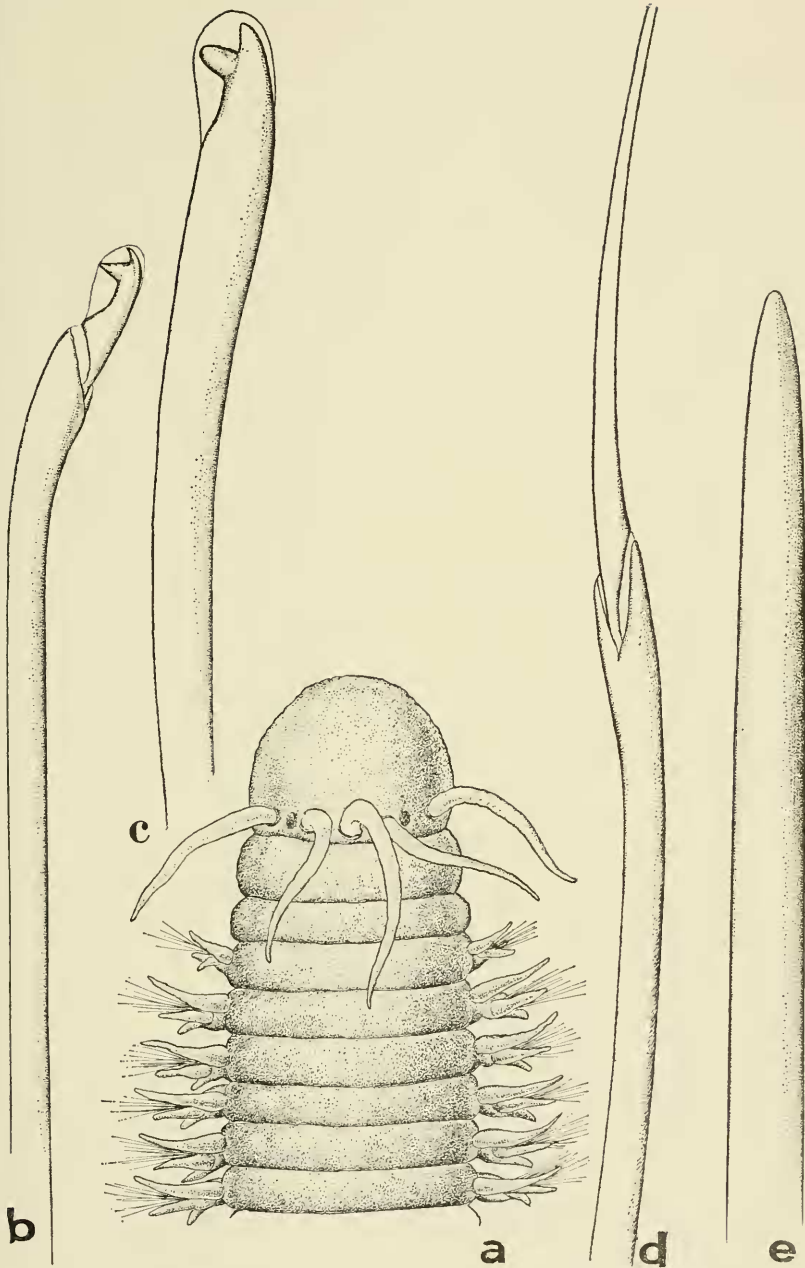


Fig. 2. *Marphysa belli oculata*, Sta. 6819-60, Catalina canyon, in 379 meters

a, anterior end in dorsal view, showing entire margin of prostomium and first 6 setigerous segments, x 31; b, composite, falcigerous, distally bifid hook; c, subacicular, distally bifid, hooded hook; d, composite spiniger; e, aciculum (all setae and aciculum to the same magnification).

longer than the prostomium and inserted in a broad crescent at the posterior margin of the head lobe.

Parapodia have 5 kinds of setae: (1) long, slender, capillary setae are present in most fascicles; (2) similarly long, somewhat thicker composite spinigers (Fig. d) occur in anterior, branchial and postbranchial segments; (3) shorter, about as thick composite falcigers (Fig. b) are present in postbranchial parapodia; (4) subacicular bifid hooded hooks (Fig. c) singly in a fascicle are first present from postbranchial segments, and (5) comb setae in postbranchial segments. In addition, thick, rodlike embedded acicula (Fig. e) are pale at the tip and dark in the embedded portion.

The mandibles are well developed, oblique at the cutting edge and slightly excavate. The maxillae have the following formula: forceps are falcate; II has 6 teeth right and 7 left; III has 7 teeth right and 6 left, IV has 5 teeth left, and none on the right side; carriers are short and narrow.

The stem species is best known as a Mediterranean and west Atlantic coastal species, where it occurs in sandy sediments in the *Zostera* zone (Fauvel, 1923, p. 410). Ehlers (1887) recorded it off southern Florida in 230 fms, and Treadwell (1921) described the subspecies from Mangrove Key in southern Florida. The present records are the first from the eastern Pacific Ocean and the sixth species of the genus from California. The specimens originate in depths of 79 to 373 meters.

#### ***Marphysa disjuncta* Hartman, 1960**

Santa Monica cn, in 268 m (1).

Redondo cn, south wall, in 57 m (8), north wall, 113 m (4), 363 m (1), axis, 422 m (1).

San Pedro sea valley, in 221 m (7).

#### ***Marphysa conferta* Moore, 1911**

Santa Monica cn, trawled in 80 m, rocky (1, ovigerous).

San Pedro sea valley, in 187 m (1 jv).

#### Family LUMBRINERIDAE

#### ***Lumbrineris acuta* Verrill, 1875**

Newport cn, in 37 m (2).

Santa Cruz cn, in 89 m (3).

#### ***Lumbrineris bassi* Hartman, 1944**

Newport cn, in 272 m (? 5).

**Lumbrineris bicirrata** Treadwell, 1929

Hueneme cn, in 338 m (1 large), 376 m (1 large).

Santa Monica cn, 330 m (1 large).

Redondo cn, south wall, in 57 m (3 large), 76 m (8), 378 m (1), north wall, 107 m (2 large), 113 m (1), 122 m (1), axis, 137 m (1), 148 m (1), 282 m (1), 344 m (1 large), 378 m (5), 431 m (1 large), 503 m (1 small), 560 m (1).

San Pedro sea valley, in 187 m (5).

Newport cn, in 211 m (1).

La Jolla cn, in 121 m (2).

Coronado cn, in 177 m (1 fragment).

Santa Cruz cn, in 221 m (1), 319 m (1 small).

Catalina cn, in 88 m (2 large), 216 m (? 1 large), 379 m (1 large).

**Lumbrineris bifilaris** (Ehlers) 1901

Redondo cn, north wall, in 120 m (1), axis, 282 m (2).

**Lumbrineris californiensis** Hartman, 1944

Hueneme cn, in 98 m (4 small).

Mugu cn, in 15 m (2 large).

Santa Monica cn, in 431 m (? 1).

Redondo cn, north wall, in 146 m (1 fragment).

San Pedro sea valley, in 221 m (18).

Newport cn, in 97 m (1).

**Lumbrineris cruzensis** Hartman, 1944

Hueneme cn, in 177 m (1), 456 m (1 fragment).

Mugu cn, in 124 m (2).

Santa Monica cn, in 268 m (3 small), 362 m (2), 463 m (? 2 jv).

Redondo cn, south wall, in 57 m (many), 76 m (5), 232 m (73), north wall, 113 m (18), 120 m (12), 122 m (21), 363 m (1), 465 m (3), 554 m (1 fragment), axis, 137 m (12 small, ovigerous), 148 m (23, some ovigerous), 239 m (3), 282 m (2), 298 m (4), 344 m (1), 431 m (5), basin slope, 334 m (1), 652 m (? 1).

San Pedro sea valley, in 221 m (5), 522 m (2), dredged in 100-300 m (1).

Newport cn, in 37 m (18), 85 m (10), 170 m (5), 178 m (7), 211 m (8), 272 m (19), 478 m (1 fragment), 553 m (1 fragment).

La Jolla cn, in 79 m (about 30), 121 m (35), 135 m (13), 274 m (2).

Coronado cn, in 123 m (6), 177 m (17).

Santa Cruz cn, in 218 m (2), 221 m (? 3), 459 m (33).

Catalina cn, in 216 m (21 small), 266 m (19 small), 362 m (6), 379 m (14), 914 m (1).

**Lumbrineris index** Moore, 1911

Monterey cn, in 168 m (1 large and 2 small).

Dume cn, in 299 m (? 1), 530 m (10 large, ovigerous).

Santa Monica cn, trawled in 200 m, rocky (1 fragment), 454 m (1 large).

Redondo cn, south wall, in 232 m (6 large), axis, 137 m (5 large), 148 m (1), 239 m (6 large), 246 m (3), 282 m (2), 298 m (1 large), 378 m (5 large), 503 m (4 large, ovigerous), 560 m (17).

San Pedro sea valley, in 187 m (12 large), 221 m (2), 319 m (2 large, ovigerous), 406 m (2 large), 437 m (1), dredged in 100-300 m (1 large).

Newport cn, in 37 m (1 large), 37 m (5).

La Jolla cn, in 79 m (1 large).

Santa Cruz cn, in 459 m (3).

Catalina cn, in 216 m (1), 1272 m (1 large).

**Lumbrineris inflata** Moore, 1911

Santa Monica cn, trawled in 80 m, rocky bottom (3).

**Lumbrineris latreilli** Audouin and M. Edwards, 1834

San Pedro sea valley, dredged in 100-300 m (15 or more).

Newport cn, in 97 m (4).

Catalina cn, in 1282 m (? 1 fragment).

**Lumbrineris limicola** Hartman, 1944

Santa Monica cn, in 330 m (1).

Redondo cn, north wall, in 107 m (54, very small and slender), 146 m (? 7 jv, as in 107 m), basin slope, 310 m (5 small).

Newport cn, in 235 m (? 6 small).

Coronado cn, in 1105 m (1).

San Clemente rift valley, in 950 m (1), 1406 m (1).

Tanner cn, in 1298 m (5 small).

**Lumbrineris longensis** Hartman, 1960

Mugu cn, in 676 m (? 3 jv), 755 m (3).

Coronado cn, in 1265 m (? 1).

Catalina cn, in 88 m (? 15, very small and slender).

**Lumbrineris minima** Hartman, 1944

Newport cn, in 16 m (20 or more).



**Lumbrineris, nr sarsi** (Kinberg) 1865

Hueneme cn, in 177 m (3).

**Lumbrineris simplicis** Hartman, 1959

Hueneme cn, in 383 m (2 large).

**Lumbrineris tetraura** (Schmarda) 1861

Redondo cn, axis, in 282 m (? 4 small).

Newport cn, in 16 m (? 5).

They differ from typical *Lumbrineris tetraura* in having black, not pale acicula; though small they are ovigerous.

**Lumbrineris, unknown sp.**

Dume cn, in 507 m (1). This is a small, conspicuously moniliform species.

**Lumbrineris spp.**

Hueneme cn, in 98 m (2), 209 m (1), 271 m (1), 338 m (2 small).

Mugu cn, in 119 m (32), 177 m (10 jv), 573 m (1 jv), 755 m (1).

Santa Monica cn, in 116 m (3 small), 330 m (2 fragments), 475 m (1 fragment).

Redondo cn, south wall, in 57 m (some), 542 m (9), axis, 611 m (1 jv), basin slope, 167 m (1 fragment), 334 m (1), fan, 602 m (1), 660 m (3 small), 715 m (several small), 751 m (1 anterior end).

Newport cn, in 16 m (5), 140 m (1 fragment), 741 m (2 jv).

La Jolla cn, in 708 m (1 fragment, with very long setae).

Coronado cn, in 812 m (5 small, with long setae).

Santa Cruz cn, in 89 m (8 fragments).

Catalina cn, in 549 m (3 small), 559 m (2 small fragments).

Tanner cn, in 603 m (1 fragment), 644 m (1 jv).

**Ninoë gemmea** Moore, 1911

Hueneme cn, in 165 m (1), 177 m (1 fragment).

Mugu cn, in 124 m (1).

Dume cn, in 299 m (1).

Santa Monica cn, in 116 m (4), 183 m (2).

Redondo cn, south wall, in 575 m (1), north wall, 113 m (5), axis, 137 m (4), 148 m (1).

San Pedro sea valley, in 187 m (3).

Newport cn, in 85 m (2).

La Jolla cn, in 79 m (1), 121 m (3), 793 m (1), 986 m (? 12).

Coronado cn, in 812 m (15), 960 m (1), 1105 m (1).

Santa Cruz cn, in 1387 m (2, ovigerous).

Catalina cn, in 914 m (1), 1272 m (1).

This species attains its maximum numbers in La Jolla and Coronado canyons, below depths of 800 meters.

#### Family ARABELLIDAE

##### *Arabella iricolor* (Montagu) 1804

Newport cn, in 16 m (? 1 fragment).

##### *Drilonereis ?longa* Webster, 1879

Redondo cn, slope, in 167 m (5), 310 m (3).

La Jolla cn, in 79 m (2 or more).

Coronado cn, in 1105 m (2).

The body is long and slender; posterior parapodia have elongated pre- and post-setal lobes.

##### *Drilonereis ?nuda* Moore, 1909

Redondo cn, south wall, in 76 m (1), north wall, 107 m (2), 113 m (1), 120 m (1 fragment), 146 m (2 jv).

Newport cn, in 97 m (1).

La Jolla cn, in 79 m (5), 121 m (2).

Coronado cn, in 123 m (2 jv), 177 m (3), 812 m (1 large).

Santa Cruz cn, in 89 m (6).

Catalina cn, in 362 m (1).

In these specimens, posterior parapodial lobes are not elongated; they differ from the original account in that the mandibular apparatus is present instead of absent.

##### *Drilonereis* spp.

Mugu cn, in 119 m (1).

Santa Monica cn, trawled in 200 m (1, drab green with pale prostomium), 268 m (3 jv), 330 m (2 fragments), 454 m (1 jv).

Redondo cn, slope, in 334 m (1), fan, 751 m (1).

San Diego trough, in 840 m (1), 844 m (1).

Coronado cn, in 1265 m (1).

Santa Cruz cn, in 221 m (1 jv).

Catalina cn, in 216 m (2), 914 m (1 small).

Tanner cn, in 644 m (2 jv), 813 m (1 jv).

## Family DORVILLEIDAE

*Dorvillea articulata* (Hartman) 1938

Hueneme cn, in 376 m (1).

Santa Monica cn, in 116 m (112), 183 m (38 small), 330 m (7).

Redondo cn, south wall, in 232 m (2), 378 m (14), 575 m (1), north wall, 113 m (1), axis, 137 m (57), 148 m (1), 239 m (2), 246 m (13), 298 m (1), 378 m (4), 431 m (7).

San Pedro sea valley, in 187 m (2), 221 m (3), 319 m (12), 406 m (1), dredged in 100-300 m (5).

Newport cn, in 97 m (1), 178 m (2), 272 m (1 jv).

Catalina cn, in 362 m (1 fragment).

Tanner cn, in 298 m (1).

*Dorvillea gracilis* (Hartman) 1938

Santa Monica cn, in 116 m (some).

*Dorvillea moniloceras* (Moore) 1909

Redondo cn, axis, in 282 m (3).

*Dorvillea atlantica* (McIntosh) 1885

Coronado cn, in 344 m (7). This is a long, linear species measuring 35 mm long by 1.7 mm wide. The prostomium has a pair of large eyes, located in front of the articulated antennae, and a pair of much smaller ones near the posterior margin of the lobe. The long dorsal cirrophore is penetrated by a slender aciculum. The neuropodium is distally truncate and shortest along its dorsal edge. The ventral cirrus extends beyond the setigerous lobe. Dorsalmost neuropodial setae are furcate spines accompanied by long, slender capillary setae. The composite falcigers have an appendage in which length/width proportions are in the ratio of 20 to 40.1, considerably longer than those typical of *Dorvillea atlantica*, from the Atlantic Ocean (see Fauvel, 1923, p. 449).

This is the first record of the species from the eastern Pacific Ocean.

*Dorvillea* sp.

Hueneme cn, in 478 m (1).

Catalina cn, in 216 m (1).

## ORBINIIDAE

*Califa calida* Hartman, 1957

Mugu cn, in 580 m (3), 755 m (1).

Dume cn, in 507 m (4 large), 652 m (7), 741 m (4).

Santa Monica cn, in 542 m (1), 612 m (1 large).

Redondo cn, north wall, in 554 m (1), slope, 556 m (1 large), fan, 602 m (several), 652 m (1), 660 m (3 large), 686 m (1), 706 m (? 1), 751 m (1), 786 m (1 large).

San Pedro sea valley, in 437 m (1 large), 459 m (1), 522 m (2 large), 666 m (1), 716 m (1 large).

Newport cn, in 741 m (1).

San Diego trough, in 844 m (1).

La Jolla cn, in 545 m (2 large).

Coronado cn, in 1105 m (2), 1265 m (1).

Catalina cn, in 549 m (2 large), 559 m (3 large).

#### *Haploscoloplos elongatus* (Johnson) 1901

Hueneme cn, in 98 m (3), 165 m (103), 177 m (32 large), 183 m (2), 209 m (4), 271 m (2 jv), 376 m (2), 455 m (1).

Mugu cn, in 119 m (13), 367 m (3), 378 m (1).

Dume cn, in 299 m (1).

Redondo cn, south wall, in 57 m (11), 378 m (1), north wall, 107 m (12 jv), 113 m (1 jv), 120 m (1 jv), 363 m (3), axis, 137 m (1), 148 m (2), 239 m (6), 246 m (1), 282 m (10), 298 m (2), 344 m (1), 378 m (8), 422 m (1), 431 m (4), 503 m (1), slope, 310 m (2).

San Pedro sea valley, in 220 m (2), 461 m (1), dredged in 100-300 m (3).

Newport cn, in 16 m (132), 97 m (1), 235 m (5), 272 m (2), 420 m (2), 478 m (3), 741 m (1 small).

San Diego trough, in 840 m (1), 686 m (1).

La Jolla cn, in 79 m (23), 135 m (3 jv), 274 m (5 jv), 371 m (3), 517 m (2), 793 m (6), 976 m (4).

Coronado cn, in 344 m (1), 812 m (3), 960 m (2 small).

Santa Cruz cn, in 902 m (8).

Catalina cn, in 216 m (4 jv), 266 m (6), 362 m (23), 379 m (38), 549 m (1), 559 m (44).

Tanner cn, in 644 m (4), 813 m (4 jv), 1298 m (1).

#### *Naineris uncinata* Hartman, 1957

Santa Cruz cn, in 89 m (1), 218 m (1), 221 m (4).

#### *Naineris* sp.

Catalina cn, in 914 m (2 very small, ovigerous).

#### *Phylo nudus* (Moore) 1911

Coronado cn, in 566 m (1 large).

**Phylo sp.**

Dume cn, in 530 m (1 large).

**Scoloplos acmeiceps profundus** Hartman, 1960

Santa Cruz cn, in 623 m (1).

**Scoloplos armiger** (Müller) 1776

Tanner cn, in 298 m (7 small).

**Scoloplos sp.**

La Jolla cn, in 79 m (2 or more).

## Family PARAONIDAE

**Aricidea (Aedicira) ramosa** Annenkova, 1934

Santa Monica cn, in 583 m (2), 612 m (1).

Redondo cn, in 107 m (4).

Newport cn, in 741 m (3).

La Jolla cn, in 793 m (37), 976 m (30).

Catalina cn, in 1272 m (1).

Tanner cn, in 644 m (3), 603 m (4).

The prostomial antenna is dendritically branched. Branchiae number about 10 pairs. Dorsal cirri are long, very slender and threadlike, continued on segments through the postbranchial regions. Parapodia have only slender, distally pointed setae, as in the subgenus *Aedicira*. This species occurs frequently with *A. lopezi rubra*, below, from which it differs in being white instead of rust-colored.

**Aricidea (Aedicira)**, unknown species

San Diego trench, in 768 m (2).

Santa Cruz cn, in 623 m (6).

Specimens from San Diego trench measure less than 10 mm long; the body narrows abruptly behind the branchial region. Setae are all capillary, as characteristic of the subgenus. The prostomium is short and truncate in front. Its median antenna is slender and inconspicuous. Branchiae number 9 pairs; they are first present from the fourth setigerous segment and those of the second to fourth pairs are largest; thereafter they diminish in size to the last smallest pair. Large white ova are present in the body behind the branchial segments.

Specimens from Santa Cruz canyon are small, white, and measure 6 to 8 mm long and about 0.3 mm wide. The body is widest in the region of the second to fifth branchial pairs. The prostomium is bluntly depressed, conical and lacks eyes. The median antenna is slender,

digitate, shorter than the lobe and inserted near its middle. The prostomial lobe consists of 3 sections set off by a pair of diagonally oblique lines extending from the midlength at the sides to the posterior margin of the lobe.

The first postoral segment is the first setigerous one; its parapodia are biramous and provided with simple, distally pointed setae, as are all others. Branchiae are present from the fourth setigerous segment; the first pair are largest, and there is gradual decrease in size to the last, or tenth pair. Branchiae taper distally without an abruptly slender end; they are much larger than the parapodial postsetal lobes, straplike and directed upward and forward. Notopodial postsetal lobes are slender, digitate, present on all segments. Ventral cirri are slender, inconspicuous, digitate lobes, and visible on all parapodial segments.

#### *Aricidea* (*Aricidea*), nr *fauveli* Hartman, 1957

Tanner cn, in 496 m (4).

These specimens differ from *Aricidea fauveli* from the Mediterranean Sea in the following respects: branchiae number 10 instead of 12 to 50 pairs; eyes are absent. They agree in that posterior neuropodial setae are acicular and have a long, slender arista inserted subdistally. Notopodial setae are entirely slender and capillary. Dorsal cirri are very long and slender. The prostomial lobe is elongate, triangular, provided with a median antenna that is long, slender and tapers distally.

#### *Aricidea* (*Aricidea*) *lopezi* Berkeley and Berkeley, 1956

Hueneme cn, in 397 m (1 small).

Mugu cn, in 119 m (2).

Dume cn, in 652 m (? 3).

Santa Monica cn, in 268 m (1), 330 m (1).

Redondo cn, south wall, in 76 m (1), north wall, 107 m (3), 113 m (20), 120 m (6), 146 m (5), axis, 137 m (6), 148 m (44), 282 m (2), slope, 167 m (7), 310 m (1).

San Pedro sea valley, in 661 m (2), 666 m (2).

Newport cn, in 16 m (1), 37 m (2), 85 m (4), 235 m (6), 272 m (3), 420 m (? 1), 478 m (1).

La Jolla cn, in 79 m (310+), 274 m (1), 637 m (22 small, some ovigerous).

Santa Cruz cn, in 89 m (3), 459 m (3).

Catalina cn, in 559 m (2), 1272 m (2).

Tanner cn, in 298 m (2).

**Aricidea (Aricidea) lopezi rubra**, new subspecies

Newport cn, in 553 m (105), 642 m (17), 741 m (1).

Santa Cruz cn, in 676 m (10)

Tanner cn, in 603 m (13), 644 m (26), 1298 m (2).

In size, color and general appearance these specimens resemble *Aricidea (Cirrophorus) furcata* (see below). They agree with the stem species, *A. lopezi*, in their neuropodial modified hooks; the branchiae increase in length posteriorly and they are distally prolonged as a slender filament; they number 9 to 11 pairs and the last 2 pairs are slenderest. The red color of the body is intensest in thoracic segments; farther back it is diffuse so that it forms transverse bars across the dorsum. Neuropodia have transverse series of hooks distally capped by a pointed hood.

Some individuals are ovigerous; ova are present in most segments behind the second to fourth postbranchial segment. The subspecies differs from the stem chiefly in color, and comes from deep instead of shallow sea bottoms.

*Aricidea lopezi rubra* is associated with other deepwater paraeonids, *A. ramosa* and *Paraonis gracilis*, and other polychaetes including *Melinnexis*, *Lysippe*, *Antinoella* and *Glycera capitata branchiopoda*.

**Aricidea (Aricidea) nr suecica** Hartman, 1957

Mugu cn, in 119 m (4).

Santa Monica cn, in 330 m (7).

Redondo cn, north wall, in 120 m (2).

Newport cn, in 16 m (1+), 97 m (1).

La Jolla cn, in 79 m (2).

Coronado cn, in 123 m (6).

Catalina cn, in 914 m (154 large).

Tanner cn, in 298 m (1).

The largest, most abundant specimens come from Catalina canyon, in 914 meters. They have long, hairlike setae in full tufts in notopodia and neuropodia and may be in swarming stage. Length is about 20 mm and width to 2 mm. The everted pharynx in some individuals is a large smooth sack. The prostomial antenna is short and club-shaped. Abdominal neuropodia have transverse series of simple acicular hooks, slightly sigmoid in the free length, in addition to slender, capillary setae.

**Aricidea (Aricidea) uschakowi** Zachs, 1925

Mugu cn, in 721 m (3), 755 m (3).

Santa Monica cn, in 463 m (2), 612 m (4).

Redondo cn, slope, in 310 m (2), fan, 652 m (3 fragments).

San Pedro sea valley, in 461 m (1 large).

Newport cn, in 16 m (17), 85 m (1), 211 m (1), 272 m (6), 420 m (? 2).

La Jolla cn, in 79 m (2), 545 m (? 1 jv), 793 m (4), 976 m (4).

Coronado cn, in 812 m (1), 1265 m (1).

Santa Cruz cn, in 89 m (3), 1387 m (1).

Catalina cn, in 88 m (2), 549 m (6 jv), 559 m (2 jv).

San Clemente cn, in 1406 m (1).

#### *Aricidea* spp.

Santa Monica cn, trawled in 80 m (2), 431 m (1), 542 m (1).

Redondo cn, south wall, in 519 m (1+), 575 m (1), slope, 556 m (1), fan, 602 m (2), 810 m (many).

Newport cn, in 741 m (7).

Santa Cruz cn, in 623 m (2).

Catalina cn, in 216 m (1).

#### *Aricidea (Cirrophorus) aciculata* Hartman, 1957

Mugu cn, in 177 m (1).

Redondo cn, north wall, in 107 m (6), 122 m (5), 146 m (2), slope, 167 m (6), 310 m (7), 556 m (1).

Newport cn, in 420 m (1), 478 m (1).

La Jolla cn, in 976 m (3).

#### *Aricidea (Cirrophorus) furcata* Hartman, 1957

Santa Cruz cn, in 89 m (4).

#### *Paraonis gracilis* (Tauber) 1879

Monterey cn, in 168 m (2), 260 m (3), 410 m (14).

Hueneme cn, in 209 m (1), 373 m (3) and (1), 397 m (6).

Mugu cn, in 119 m (1), 177 m (2), 378 m (1)

Santa Monica cn, in 268 m (3), 330 m (2), 454 m (3), 463 m (5), 542 m (1).

Redondo cn, south wall, in 76 m (1), 232 m (1), north wall, 107 m (4+), 113 m (12), 120 m (25), 122 m (6), 146 m (10), 465 m (2), 554 m (1), axis, 246 m (1), 282 m (1), 298 m (2), 344 m (4), slope, 167 m (8), 310 m (9), 556 m (2).

San Pedro sea valley, in 319 m (3), 437 m (1), 461 m (1), 468 m (1), 522 m (1), 661 m (1).

Newport cn, in 16 m (12+), 85 m (12), 170 m (1), 178 m (1), 211 m (2), 235 m (13), 272 m (3), 420 m (1 jv), 478 m (57), 553 m (5), 642 m (3), 741 m (4).

La Jolla cn, in 79 m (37+), 121 m (8), 637 m (2), 793 m (6).



Coronado cn, in 177 m (+), 960 m (1).

Santa Cruz cn, in 89 m (1), 902 m (2).

Catalina cn, in 88 m (2), 216 m (+), 266 m (1), 549 m (+), 559 m (1).

Tanner cn, in 603 m (6), 644 m (5), 1298 m (1).

***Paraonis gracilis oculata* Hartman, 1957**

La Jolla cn, in 976 m (77).

Coronado cn, in 812 m (2).

Catalina cn, in 914 m (2), 1272 m (4).

***Paraonis* spp.**

Redondo cn, axis, in 611 m (1), fan, 602 m (3).

San Diego trench, in 734 m (1).

Santa Cruz cn, in 676 m (5).

Family APISTOBRANCHIDAE

***Apistobranchnus* sp.**

Redondo cn, south wall, in 76 m (1).

Family SPIONIDAE

***Laonice ?cirrata* (Sars) 1851**

Mugu cn, in 119 m (5).

Redondo cn, north wall, in 107 m (+).

Newport cn, in 16 m (8).

***Laonice foliata* (Moore) 1923**

Hueneme cn, in 209 m (1), 373 m (1), 376 m (1).

Redondo cn, south wall, in 54 m (1), north wall, 113 m (1), 120 m (1 large), axis, 137 m (+ large), 148 m (1 very large), 246 m (2 large), 378 m (+), 560 m (1).

San Pedro sea valley, in 221 m (1), 319 m (1 fragment).

Newport cn, in 37 m (1 and 1), 170 m (6), 178 m (1 large), 211 m (5), 235 m (6), 272 m (? 3).

La Jolla cn, in 79 m (1), 121 m (18), 517 m (1 fragment).

Coronado cn, in 177 m (+).

Santa Cruz cn, in 218 m (1).

Catalina cn, in 88 m (2), 216 m (5 large), 379 m (1).

San Clemente rift valley, in 950 m (1).

Interramal pouches are first present at segment 20 (Redondo cn, in 246 m), or not before segment 35-36, in a large specimen from Catalina canyon.

**Laonice** spp.

Redondo cn, south wall, in 57 m (1), 76 m (12 jv), 232 m (5 large), north wall, 122 m (7), 146 m (3 fragments), axis, 298 m (2), slope, 167 m (4), 334 m (1), fan, 686 m (1), 715 m (1 large) (with unusually long branchiae).

La Jolla cn, in 793 m (1 fragment).

Santa Cruz cn, in 459 m (22).

Tanner cn, in 496 m (16), 603 m (1 fragment), 644 m (2 jv), 813 m (3 anterior ends).

**Nerinides maculata** Hartman, 1961

Redondo cn, south wall, in 76 m (1), north wall, 120 m (2).

**Nerinides pigmentata** (Reish) 1959

Redondo cn, north wall, in 107 m (1).

Newport cn, in 16 m (12).

La Jolla cn, in 79 m (1).

**Polydora**, cf. *caulleryi* Mesnil, 1897

Newport cn, in 553 m (3).

Santa Cruz cn, in 623 m (2 jv).

**Polydora** spp.

Dume cn, trawled in 40-50 fms, in U-shaped burrows on rocky surfaces.

Redondo cn, south wall, in 57 m (many, in tubes fully attached to tube of *Diopatra ornata*), 542 m (10 or more), north wall, 107 m (2 jv), 554 m (1), axis, 422 m (1), slope, 556 m (1), fan, 652 m (1 fragment), 660 m (4 jv), 810 m (1).

Newport cn, in 37 m (1), 211 m (1), 553 m (3).

La Jolla cn, in 79 m (1 jv), 371 m (1).

Coronado cn, in 177 m (1 jv).

Santa Cruz cn, in 218 m (1), 459 m (2).

Tanner cn, in 496 m (7).

Some specimens from Santa Cruz canyon resemble *Polydora socialis* (Schmarda); the first parapodia are biramous; branchiae are first present from the eighth setigerous segment and well developed; hooded hooks occur from the seventh neuropodium and each hook has a large fang nearly at right angles to the main shaft.

Specimens from Tanner canyon are small, measure 10 mm long or less. The prostomium is deeply bifid at its frontal margin; it is without eyes and a median antenna. Nuchal ridges extend to the modified fifth segment. The first segment is biramous; the second

parapodia are much larger. Branchiae are first present from the eighth setiger and present on more than 20 segments. The modified fifth segment has three kinds of setae; the largest, numbering about 6 on a side, are thick and acicular; they terminate in an oblique concavity and a subterminal thick shoulder. The companion setae are much slenderer, distally pointed and subdistally expanded. A fascicle of stiff, distally pointed geniculate setae forms a lower tuft, some distance below the curved series of large hooks. Anterior neuropodia, from the seventh segment, have hooded hooks in which the main fang is larger than the subdistal tooth and nearly at right angles to the shaft. In posterior segments these hooks have a main fang obtuse to the shaft and the subdistal tooth is much smaller and shorter.

### *Prionospio pinnata* Ehlers, 1901

Monterey cn, in 168 m (5), 260 m (? 1).

Hueneme cn, in 165 m (16), 177 m (14 large, measure to 85 mm long), 183 m (4), 383 m (1 small), 373 m (4), 376 m (2), 397 m (6, lack eyes and branchiae are firmly attached), 456 m (2).

Mugu cn, in 119 m (4), 177 m (15), 367 m (5).

Dume cn, in 299 m (3), 374 m (3), 398 m (4), 580 m (2 small).

Santa Monica cn, in 268 m (3), 330 m (1 small), 362 m (3 fragments), 454 m (1, lacks eyes), 542 m (1, lacks eyes).

Redondo cn, south wall, in 232 m (8), 378 m (1), 519 m (2), 575 m (2), north wall, 107 m (8), 113 m (12), 120 m (10), 130 m (5), 146 m (7), 554 m (1), axis, in 137 m (7 large), 148 m (33), 239 m (2), 246 m (4), 282 m (12), 344 m (6 large), 378 m (5), 422 m (8), 431 m (13), 503 m (22 large, measure to 150 mm long, prostomial eyes reduced or invisible, branchiae firmly attached); 560 m (13), 611 m (6 large, branchiae firmly attached), slope, 310 m (10), 334 m (several), 560 m (15), 652 m (2 small).

San Pedro sea valley, in 187 m (13), 221 m (47), 319 m (2 small), 406 m (5), 459 m (7 small), 522 m (5).

Newport cn, in 16 m (32), 37 m (28 large, and 16), 85 m (4 large), 97 m (15), 140 m (1), 170 m (6), 178 m (5), 211 m (15), 235 m (24), 272 m (15), 420 m (8, lack eyes), 553 m (2 jv).

La Jolla cn, in 79 m (7), 121 m (2), 135 m (2), 274 m (2 large), 371 m (1 large and 3 small).

Coronado cn, in 123 m (1 jv), 177 m (2), 344 m (3).

Santa Cruz cn, in 89 m (2, with 4 very small eyes).

Catalina cn, in 88 m (2), 216 m (1), 266 m (12), 362 m (5 small) 379 m (4 small), 549 m (2 fragments), 559 m (1).

Tanner cn, in 603 m (? 1), 1298 m (1 jv or small).

**Prionospio pygmaeus** Hartman, 1961

Redondo cn, north wall, in 107 m (63).

Tanner cn, in 298 m (? 5).

**Prionospio malmgreni** Claparède, 1870

Hueneme cn, in 165 m (5), 338 m (2 small), 456 m (1).

Mugu cn, in 119 m (34), 177 m (5).

Santa Monica cn, in 116 m (1), 268 m (1), 330 m (? 2).

Redondo cn, south wall, in 57 m (60), 76 m (12 jv), 232 m (5), 378 m (2), north wall, 113 m (8 small), 120 m (35), 122 m (9), 146 m (22), axis, 137 m (7), 148 m (26), 282 m (3), 344 m (4), slope, 167 m (10), 310 m (6).

San Pedro sea valley, in 187 m (1), 468 m (5 jv).

Newport cn, in 16 m (2), 37 m (2), 97 m (7), 211 m (3), 235 m (2), 272 m (3 jv).

La Jolla cn, in 79 m (12), 274 m (2 jv).

Coronado cn, in 177 m (1).

Santa Cruz cn, in 89 m (2).

Catalina cn, in 218 m (2 jv).

**Prionospio cirrifera** Wirén, 1883

Monterey cn, in 410 m (1).

Hueneme cn, in 177 m (26 very small, ovigerous), 183 m (3), 373 m (6).

Dume cn, in 530 m (? 1).

Santa Monica cn, in 268 m (1), 612 m (? 3 fragments).

Redondo cn, south wall, in 57 m (24), north wall, 120 m (5), 363 m (? 7), axis, 137 m (8), 148 m (46, ovigerous), 298 m (40), 344 m (39), 422 m (8), 503 m (4), 560 m (? 3 small, ovigerous), slope, in 167 m (7).

Newport cn, in 16 m (168+), 37 m (285), 85 m (12), 235 m (? 35).

Catalina cn, in 88 m (3).

**Prionospio**, unknown species

Redondo cn, slope, in 556 m (2).

Newport cn, in 478 m (8).

The diagnosis is based on specimens from Newport canyon. Branchiae are first present from the second setigerous segment and number 4 pairs; the first are bipinnate, the second and third pairs are broad, laterally fimbriated, and the fourth pair are much slenderer, longer and directed upward. The prostomium has 2 pairs of small

black eyespots located at the sides and about midlength of the lobe; they can be seen only in lateral view. Lateral, interramal pouches, resembling those in species of *Laonice*, are present from the first postbranchial segments, or between segments 4 and 5. A thin, foliaceous transverse fold extends across the dorsum of about 7 or 8 segments, behind the branchial region. Neuropodia have hooded hooks, first present at about segment 20 to 22. The species is unique for having *Laonice*-like interramal pouches.

#### Prionospio spp.

Hueneme cn, in 271 m (1).

Dume cn, in 507 m (2).

Santa Monica cn, in 475 m (1 fragment).

Redondo cn, south wall, in 378 m (5 jv), north wall, 465 m (2), slope, 334 m (2).

San Pedro sea valley, in 467 m (3, this has the first branchiae pinnate and all others are cirriform).

La Jolla cn, in 121 m (+).

Coronado cn, in 124 m (6 small).

Santa Cruz cn, in 221 m (3 jv).

#### *Spio punctata* Hartman, 1961

Santa Monica cn, in 268 m (3).

Newport cn, in 37 m (3 jv).

La Jolla cn, in 121 m (1).

Santa Cruz cn, in 89 m (? 9).

#### *Spio* sp.

Newport cn, in 37 m (3 jv).

#### *Spiophanes bombyx* (Claparède) 1870

Hueneme cn, in 98 m (1).

Mugu cn, in 119 m (2).

Santa Cruz cn, in 89 m (1).

#### *Spiophanes fimbriata* Moore, 1923

Hueneme cn, in 376 m (about 150, with tubes).

Mugu cn, in 367 m (3).

Santa Monica cn, in 268 m (16), 362 m (1).

Redondo cn, south wall, in 232 m (2), north wall, 107 m (3), 113 m (9), axis, 137 m (8 large), 148 m (3), 239 m (1), 246 m (3), 344 m (4), 378 m (119 large), 431 m (17), 503 m (2), slope, 167 m (5), 310 m (12 jv), fan, 751 m (1, with dark, short

nuchal organs, extending back not quite to the third setigerous segment).

San Pedro sea valley, in 187 m (1), 221 m (127), 522 m (1 fragment), 716 m (3 fragments).

Newport cn, in 85 m (15 large and 4 small), 97 m (3), 140 m (3), 170 m (3), 211 m (10), 235 m (1), 272 m (10), 533 m (1).

La Jolla cn, in 79 m (14), 371 m (1).

Santa Cruz cn, in 1624 m (2).

Tanner cn, in 603 m (2).

#### *Spiophanes pallidus* Hartman, 1960

Hueneme cn, in 478 m (2).

Mugu cn, in 573 m (2), 676 m (? 2 large and 6 small).

Redondo cn, axis, in 282 m (? 2).

San Pedro sea valley, in 461 m (1).

Newport cn, in 553 m (1).

San Diego trench, in 686-844 m (1, with long, flowing setal tuft).

Coronado cn, in 1105 m (1), 1265 m (1).

Catalina cn, in 559 m (? 10), 914 m (4, with interramal pouches first present from setigerous segment 4/5).

#### *Spiophanes anoculata* Hartman, 1960

Redondo cn, fan, in 660 m (1).

Santa Monica cn, in 463 m (1).

Catalina cn, in 1272 m (3).

San Clemente rift valley, in 950 m (3), 1406 m (1).

#### *Spiophanes missionensis* Hartman, 1941

Mugu cn, in 119 m (4), 177 m (3).

Santa Monica cn, in 330 m (2 jv).

Redondo cn, south wall, in 57 m (some), 76 m (5), 232 m (12), 378 m (3), north wall, 107 m (12), 120 m (30), 122 m (4), 146 m (33).

San Pedro sea valley, in 187 m (14).

Newport cn, in 97 m (8).

La Jolla cn, in 79 m (2), 121 m (34).

Coronado cn, in 123 m (2), 177 m (100+).

Santa Cruz cn, in 89 m (? 1).

#### *Spiophanes* spp.

Monterey cn, in 410 m (1).

Hueneme cn, in 338 m (1), 373 m (1 fragment).

- Mugu cn, in 755 m (10).  
Dume cn, in 580 m (2).  
Redondo cn, in 519 m (1+), north wall, 363 m (3), fan, 715 m (1), 825 m (1).  
San Pedro sea valley, in 740 m (4).  
Newport cn, in 178 m (4).  
La Jolla cn, in 545 m (1 fragment).  
Santa Cruz cn, in 623 m (1 jv).  
Catalina cn, in 266 m (2 fragments).  
Tanner cn, in 644 m (1 jv).

#### Family MAGELONIDAE

##### *Magelona californica* Hartman, 1944

- Santa Cruz cn, in 89 m (2).

##### *Magelona pacifica* Monro, 1933

- Monterey cn, in 168 m (? 4).  
Mugu cn, in 119 m (7 jv).  
Redondo cn, slope, in 167 m (? 1).  
Newport cn, in 97 m (4).  
La Jolla cn, in 79 m (5), 121 m (1).

##### *Magelona sacculata* Hartman, 1961

- Mugu cn, in 119 m (21), 171 m (1).  
Redondo cn, axis, in 148 m (1).

##### *Magelona* sp.

- Newport cn, in 16 m (22, unusually small form).

#### Family DISOMIDAE

##### *Disoma franciscanum* Hartman, 1947

- Monterey cn, in 168 m (1), 410 m (2 large), 906 m (1).  
Redondo cn, north wall, in 113 m (2), axis, 137 m (2).

##### *Poecilochaetus johnsoni* Hartman, 1939

- Mugu cn, in 119 m (3).  
Santa Monica cn, in 268 m (1).  
San Pedro sea valley, in 221 m (1), dredged in 240-280 m (2).  
Newport cn, in 37 m (1), and (? 4), 97 m (3).  
La Jolla cn, in 121 m (6).

## Family HETEROSPIONIDAE, new

Includes LONGOSOMIDAE Hartman, 1944

**Heterospio** Ehlers, 1875Includes *Longosoma* Hartman, 1944**Heterospio** sp.

San Diego trench, in 420 m (palp only)

The family LONGOSOMIDAE Hartman (1944, p. 322) is here referred to the family HETEROSPIONDAE, new, because its only genus, *Longosoma* Hartman (1944, p. 322) previously known only from southern California in shallow depths, is believed generically referable to *Heterospio* Ehlers (1875, p. 60) known only through a single species, *H. longissima* Ehlers (1875, p. 60) dredged off western Ireland in 426 fms; it has remained unknown except through its first find in 1869. The author has recently seen specimens taken east off Bermuda, in deep water, which are generically identical with *Longosoma catalinensis* Hartman (1944, p. 322). A more complete account of the north Atlantic species will be forthcoming in a later report.

## Family CHAETOPTERIDAE

**Phyllochaetopterus limicolus** Hartman, 1960

Dume cn, in 299 m (1 in large tube, measures 200 mm long by 6 mm wide).

Mugu cn, in 119 m (3), 177 m (1), 367 m (1 with large tube).

Redondo cn, south wall, in 76 m (1 fragment), 232 m (2 large with tubes), 378 m (1 large anterior end and tube measuring 530 mm long), 542 m (3 with tubes), north wall, 107 m (1), 120 m (3+), 122 m (1), axis, 239 m (1), 246 m (1 large tube), 282 m (1), 378 m (1 large), 503 m (large empty tube), fan, 652 m (1 fragment), 660 m (2, with large tubes), 686 m (1+), 715 m (1 large), 751 m (2 with tubes), 786 m (1), 810 m (tubes only).

San Pedro sea valley, in 221 m (1).

La Jolla cn, in 793 m (1).

Coronado cn, in 177 m (1), 812 m (tube fragment 5 mm across).

Santa Cruz cn, in 902 m (tubes only), 1387 m (1 large).

Tanner cn, in 298 m (1), 644 m (2).

**Phyllochaetopterus prolifica** Potts, 1914

Dume cn, trawled in 80-100 m, rocky (several).

Santa Monica cn, trawled in about 80 m, rocky (many).

Santa Cruz cn, in 89 m (1).



## ?phyllochaetopterid, unknown

Redondo cn, in 146 m (1, with 4 to 6 large dark hooks on each side of the modified segment; tube somewhat calcified and covered with sand).

**Telepsavus costarum** Claparède, 1870

Mugu cn, in 119 m (6).

Santa Monica cn, in 116 m (1).

Redondo cn, south wall, in 57 m (1+), 76 m (3), 232 m (1), north wall, 107 m (1), 122 m (1), axis, 246 m (1, in tube 155 mm long by 1.5 mm across), 344 m (1), 378 m (3), slope, in 167 m (1).

Newport cn, in 16 m (1 jr), 97 m (2).

La Jolla cn, in 79 m (1).

Santa Cruz cn, in 89 m (2).

## Family CIRRATULIDAE

**Acrocirrus crassifilis** Moore, 1923

Redondo cn, in 542 m (15).

**Caulleriella** sp.

La Jolla cn, in 79 m (2).

**Chaetozone corona** Berkeley and Berkeley, 1941

Mugu cn, in 119 m (19).

Newport cn, in 16 m (121), 37 m (5), 97 m (1).

**Chaetozone gracilis** (Moore) 1923

Santa Monica cn, in 542 m (1).

La Jolla cn, in 708 m (2), 976 m (? 2).

Catalina cn, in 708 m (1 fragment), 853 m (1), 914 m (3).

**Chaetozone setosa** Malmgren, 1867

Redondo cn, in 120 m (? 1), 146 m (7), 556 m (9).

**Chaetozone**, nr **spinosa** Moore, 1903

Mugu cn, in 15 m (2), 119 m (2).

Coronado cn, in 812 m (? 4).

Santa Cruz cn, in 89 m (1 fragment), 221 m (? 4).

Tanner cn, in 644 m (8), 813 m (5), 1298 m (3).

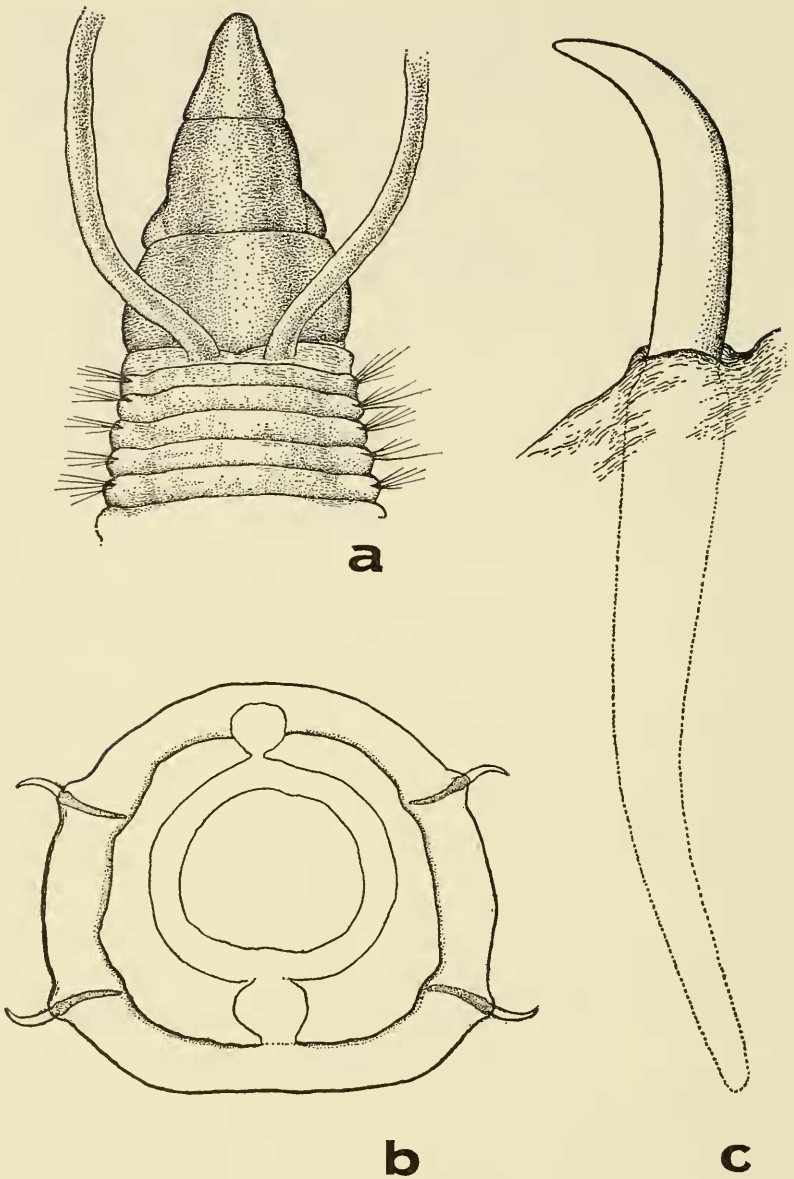


Fig. 3. *Chaetozone armata*, n. sp. (Sta. 7175-60)

a, anterior end in dorsal view, x 137.6; b, a postero-median segment in cross section, showing arrangement of parapodial setae, x 168; c, a neuropodial spine from the same segment, showing the curved tip and the embedded shoulder, x 960.

***Chaetozone armata*, new species**

Fig. 3 a-c

San Pedro sea valley, dredged in 180-430 m (1, HOLOTYPE), 522 m (1).

This is a small, linear form; it measures 13.5 mm long for 72 segments (a posterior end is missing). It is widest in the anterior fourth of the body where it is about 0.68 mm across, and 0.48 mm wide in the postmedian region. The anterior region (Fig. 3a) is depressed cylindrical in cross section and its setal fascicles are directed laterally. In posterior segments the body appears moniliform because it is slenderer and the individual segments are proportionately longer; in cross section (Fig. 3b) the segments are subquadrate because the acicular spinelike setae are directed outward from the ectal margins.

The prostomium is long, triangular, about 3 times as long as wide. A pair of small black eyespots, one on either side of the raised median prostomial ridge but not visible in dorsal view; they are embedded and located near the posterior end of the lobe. The paired palpi for which the bases can be distinguished are inserted dorsally on a short segment in front of the first setigerous one.

Setal fascicles are first present behind the palpal ring. The first 16 segments have only slender, distally pointed setae that number six or more in a fascicle. Thicker, shorter yellow acicular setae are first present in segment 17, together with slender pointed setae, and within a few segments the pointed setae are almost completely replaced by single acicular spines. An occasional long, slender seta is present farther back, to segment 25 or to 36, but it is very slender and inconspicuous.

The posterior, moniliform segments are armed with single, curved spines in notopodia and neuropodia; they project obliquely upward and downward (Fig. 3b) from the setal fascicle. Seen individually (Fig. 3c) they have an entire tip and a slight shoulder in the embedded part.

*Chaetozone armata* may be distinguished from other species of the genus (Hartman, 1961, p. 104) by having moniliform posterior segments, and parapodia provided with single, acicular, distally curved spines in which the free end is curved. The type specimen originates in San Pedro sea valley (Velero IV Sta. 7175-60) in depths below 180 meters.

***Chaetozone* spp.**

Monterey cn, in 260 m (1).

Redondo cn, axis, in 344 m (2 jv).

Newport cn, in 16 m (12 small), 6+2 m (1 fragment).

Coronado cn, in 1265 m (1).

Santa Cruz cn, in 459 m (244). Neuropodial spines are present from segment 15; notopodial spines from postmedian segments. The transverse series of spines do not nearly encircle the body. A small species, length 15 to 20 mm, has a short, thick appearance, is anteriorly dusky. The prostomium is short, blunt and directed ventrally.

Santa Cruz cn, in 902 m (2). This differs from others in that notopodia lack acicular setae.

Catalina cn, in 1272 m (1).

**Cirratulus cirratus** (Müller) 1776

Santa Monica cn, trawled in 80 m, rocky bottom (1).

**Cirratulus** spp.

Dume cn, in 652 m (2), 711 m (2). Both lots are pale specimens.  
Santa Monica cn, in 542 m (2 jv), 583 m (2).

Redondo cn, south wall, in 542 m (1), axis, 611 m (1), fan, 652 m (5 large), 660 m (about 30).

Newport cn, in 553 m (1 jv), 741 m (1).

Catalina cn, in 549 m (1 large and 2 small).

cirratulids, not identified

Redondo cn, south wall, in 542 m (4 large), axis, 422 m (several), slope, 334 m (1), fan, 602 m (several), 706 m (1), 715 m (several), 810 m (4).

San Clemente rift valley, in 1591 m (1, lacks lateral branchiae and has yellow acicular spines).

**Cossura candida** Hartman, 1955

Santa Monica cn, in 330 m (1).

Redondo cn, south wall, in 57 m (4), north wall, 107 m (1 jv), 113 m (23), 120 m (1 jv), 122 m (2), 363 m (1), 554 m (1 jv), axis, 148 m (2), 239 m (1), 422 m (2), fan, 652 m (4), 660 m (3).

San Pedro sea valley, in 187 m (13), 522 m (1), 666 m (1).

Newport cn, in 16 m (182), 37 m (8), and (3), 85 m (1), 97 m (15), 170 m (3), 211 m (1), 235 m (9), 272 m (9).

San Diego trough, in all depths (some).

La Jolla cn, in 79 m (86), 121 m (15), 274 m (1), 708 m (1), 793 m (? 4 small), 976 m (? 2 small).

Coronado cn, in 123 m (1), 177 m (1).

Santa Cruz cn, in 676 m (1 jv), 1387 m (1).

Catalina cn, in 559 m (2).

Tanner cn, in 644 m (1 jv).

*Cossura pygodactylata* Jones, 1956

Hueneme cn, in 165 m (1); 177 m (54 small, ovigerous).

*Cossura* spp.

Hueneme cn, in 373 m (2).

Mugu cn, in 177 m (2).

Dume cn, in 711 m (2).

Santa Monica cn, in 583 m (1).

Redondo cn, axis, in 137 m (8 small).

San Pedro sea valley, in 461 m (1 fragment), 468 m (1 fragment).

*Dodecaceria* sp.

Santa Monica cn, in 80 m, trawled from rocky bottom (5 small).

Santa Cruz cn, in 218 m (1 jv).

*Tharyx monilaris* Hartman, 1960

Mugu cn, in 177 m (2), 755 m (1).

Santa Monica cn, in 268 m (2).

Redondo cn, south wall, in 575 m (1), north wall, 107 m (8), 113 m (2), 120 m (5), 122 m (2), 146 m (4), axis, 282 m (6), 344 m (2), slope, 167 m (2), 310 m (9).

San Pedro sea valley, in 187 m (2), 221 m (2), 319 m (2), 666 m (1).

Newport cn, in 79 m (7 or more), 121 m (6), 135 m (10), 274 m (12), 793 m (many), 986 m (12).

Coronado cn, in 123 m (5), 177 m (5), 812 m (? 2).

Santa Cruz cn, in 623 m (1 jv), 902 m (3).

Catalina cn, in 216 m (2 jv), 379 m (4, in dead *Pectinaria* tubes, filled with silt), 1272 m (2).

*Tharyx tessellata* Hartman, 1960

Monterey cn, in 410 m (? 5).

Hueneme cn, in 165 m (1), 397 m (tube only).

Mugu cn, in 119 m (71), 177 m (12).

Dume cn, in 374 m (3).

Santa Monica cn, in 268 m (4), 330 m (3), 542 m (? 1).

Redondo cn, south wall, in 76 m (3), 232 m (2 jv), north wall, 107 m (10), 113 m (9), 120 m (10), 122 m (5), 146 m (4), axis, in 148 m (5), 239 m (2), 246 m (empty tube), 344 m (1), slope, 167 m (6), 310 m (18).

San Pedro sea valley, in 221 m (2).

Newport cn, in 16 m (68+), 37 m (300+), 85 m (22), 170 m (3),

178 m (8), 211 m (6), 272 m (11), 553 m (6 small), 642 m (4), 741 m (24).

**Tharyx** spp., including **T. monilaris** and **T. tessellata** (see above)

Hueneme cn, in 165 m (1, very dark).

Mugu cn, in 378 m (2 jv).

Santa Monica cn, in 116 m (several), 431 m (1).

Redondo cn, north wall, 554 m (2), axis, 137 m (1 fragment), 246 m (1 jv).

Newport cn, in 37 m (10), 97 m (10), 170 m (6).

La Jolla cn, in 79 m (2 or more), 121 m (2), 274 m (2), 371 m (? 1 jv), 545 m (1).

Coronado cn, in 123 m (6), 177 m (5).

Santa Cruz cn, in 623 m (1 jv), 902 m (3).

Catalina cn, in 216 m (2 jv).

#### Family FLABELLIGERIDAE

##### **Brada glabra** Hartman, 1960

Redondo cn, north wall, in 113 m (1).

Newport cn, in 420 m (1, in old *Cadulus* shell).

La Jolla cn, in 545 m (2, one in old *Cadulus*, other in old *Mitrella* shell), 708 m (4), 793 m (2), 976 m (12, in old *Cadulus* shells).

Coronado cn, in 123 m (1), 177 m (1), 566 m (2), 960 m (5).

Catalina cn, in 362 m (4, in *Cadulus* shells), 379 m (15, in *Cadulus* shells), 549 m (10, some in *Cadulus*, others in *Mitrella* shells), 559 m (2, one in *Mitrella* shell), 853 m (1).

Tanner cn, in 644 m (5).

##### **Brada pilosa** Moore, 1906, perhaps the same as

##### **Brada villosa** (Rathke), 1843

Monterey cn, in 410 m (? 1 fragment).

Dume cn, in 507 m (2), 530 m (1), 741 m (1).

Mugu cn, in 573 m (? 15), 676 m (? 3).

Santa Monica cn, in 454 m (1 jv), 463 m (1 jv).

Redondo cn, south wall, in 519 m (16, some ovigerous), 575 m (25, largest measure 22 mm long), north wall, 107 m (1 jv), 120 m (7), 363 m (1), 554 m (1), axis, 148 m (2), 344 m (3 small), 503 m (61), slope, 310 m (1), 556 m (36).

San Pedro sea valley, in 459 m (17, some have well extended oral tentacles; body measures 20 mm long by 3.5 mm wide), 468 m (4), 522 m (7).

Newport cn, in 16 m (7), 37 m (7 and 7), 97 m (2), 272 m (1), 478 m (7, moderately large).

San Diego trough, in 840 and 846 m (several).

La Jolla cn, in 79 m (5).

Coronado cn, in 566 m (63+), 812 m (? 1, eviscerated).

Santa Cruz cn, in 218 m (? 1), 623 m (2).

Catalina cn, in 362 m (1 fragment), 549 m (17).

San Clemente rift valley, in 1591 m (1).

Tanner cn, in 603 m (5, in dead *Cadulus* shell and *Rhodine* tube).

#### **Brada pluribranchiata** (Moore) 1923

Monterey cn, in 168 m (2), 410 m (4 large).

Hueneme cn, in 373 m (2), 376 m (5).

Mugu cn, in 177 m (4).

Redondo cn, south wall, in 378 m (4 large), north wall, 107 m (2 jv), 122 m (1), 146 m (2), axis, 246 m (3), 378 m (1), 431 m (1 large), slope, 310 m (1).

San Pedro sea valley, in 221 m (1), 319 m (1).

Newport cn, in 140 m (1), 170 m (4), 178 m (2), 211 m (1), 420 m (3 large).

Coronado cn, in 123 m (2).

Catalina cn, in 88 m (1), 379 m (7).

#### **Brada** spp.

Redondo cn, south wall, in 57 m (4), 422 m (5).

#### ? **Diplocirrus** sp.

Redondo cn, north wall, in 146 m (2).

#### **Flabelligera infundibularis** Johnson, 1901

Dume cn, trawled in 80-100 m (1, in thick mucus sheath).

#### ? **Flabelligera** sp., unknown

Santa Cruz cn, in 623 m (1 fragment).

#### flabelligerid, genus and species unknown

Redondo cn, in 344 m (1), axis, in 611 m (1, lemon yellow, translucent, surface of body smooth).

Tanner cn, in 644 m (6).

#### **Pherusa capulata** (Moore) 1909

Redondo cn, in 76 m (2 jv).

San Pedro sea valley, in 406 m (2), 100-300 m, dredged (6 large).

Newport cn, in 97 m (1).

La Jolla cn, in 79 m (2 jv), 121 m (1).

Coronado cn, in 123 m (1).  
 Santa Cruz cn, in 221 m (1).

***Pherusa inflata* (Treadwell) 1914**

Dume cn, trawled in 80-100 m, in shaley rock (1).  
 Santa Monica cn, trawled in 80 m, rocks (3).

***Pherusa papillata* (Johnson) 1901**

Mugu cn, in 119 m (2), 378 m (1).  
 Santa Monica cn, trawled in 80 m (3), and 200 m, rocky bottom (4).  
 Coronado cn, in 177 m (2 jv).

***Pherusa neopapillata* Hartman, 1960**

Redondo cn, in 232 m (1), north wall, in 107 m (4 jv), 113 m (2), axis, 239 m (1), 298 m (2), 344 m (5), 378 m (2), slope, 556 m (2).  
 San Pedro sea valley, in 221 m (2), 319 m (1 jv), dredged in 100-300 m (5).

Newport cn, in 97 m (1).

La Jolla cn, in 121 m (2).

Coronado cn, in 123 m (1), 566 m (1).

***Pherusa*, nr *collarifera* (Ehlers) 1887**

La Jolla cn, in 793 m (2 jv).

Santa Cruz cn, in 676 m (1 fragment).

Tanner cn, in 603 m (1), 644 m (2), 813 m (3).

***Pherusa* spp.**

Mugu cn, in 352 m (1 jv).

Santa Monica cn, in 362 m (1 jv).

Redondo cn, south wall, in 57 m (18), 542 m (3), north wall, 120 m (1 jv), 363 m (1 small), 465 m (2), axis, 422 m (several), slope, 310 m (4).

San Pedro sea valley, in 461 m (2 large).

Newport cn, in 85 m (1 jv).

Catalina cn, in 914 m (3 small).

**Family SCALIBREGMIDAE**

***Asclerocheilus californicus*, new species**

Santa Monica cn, in 695 m (1, HOLOTYPE).

Redondo cn, south wall, in 542 m (4).

San Pedro sea valley, in 661 m (1 median fragment).

This is a large, linear species and appears ragged because of the



long parapodial lobes; it measures 43 mm long by 6 mm wide, and consists of more than 70 segments. The prostomium is nearly equiangular, widest in front and continuous with the frontal antennae which are directed obliquely forward; there are no eyes. The first segment is a short, smooth ring without parapodia. The next two segments are longer and wider and similar to each other; each is provided with thick, acicular spines together with slender capillary setae. The spines are sigmoid in their free length and terminate distally in a smooth rounded tip.

The third segment resembles the first two but has transitional setae in which the spines are slenderer, longer and resemble the smooth, long setae of more posterior segments; in addition there are many shorter furcate spines like those in more posterior segments. Dorsal and ventral cirri are absent throughout, as characteristic of the genus. From the sixth neuropodium and the seventh notopodium a long, fleshy parapodial lobe is present, located along the suprasetal neuropodial and subsetal notopodial fascicle, and from the eighth parapodium there are four such long lobes, above and below the parapodial fascicles; they are cylindrical, fleshy and extend laterally for a distance surpassing half the setal length.

Two species have been attributed to this genus; they are *Asclerocheilus intermedius* (St. Joseph) from France and *A. beringianus* Uschakov, from Bering Sea, in 986 meters (see Hartman, 1959, p. 424). The genus was recorded from western Canada, in 10 fms, by Berkeley (1930, p. 68). These species may be distinguished as follows:

Acicular spines present in first 3 segments; body length 10-15 mm . . . . .	<i>intermedius</i>
Acicular spines present in first 2 segments; length 25 mm . . . . .	<i>beringianus</i>
Acicular spines present in first 2 segments, transitional in third segment; body length to 43 mm . . . . .	<i>californicus</i>

*Asclerocheilus californicus* has been recovered only from Santa Monica and Redondo canyons, in depths of 695 and 542 meters, and San Pedro sea valley, in 661 m.

#### **Oncoscolex pacificus** (Moore) 1909

Santa Monica cn, trawled in 200 m, rocky bottom (1).

#### **Scalibregma inflatum** Rathke, 1843

Hueneme cn, in 98 m (2 jv).

Mugu cn, in 124 m (1 jv).

Redondo cn, south wall, in 57 m (5 small, ovigerous), 519 m

(1 giant, weight 900 mg), 575 m (5 mature, to 10 mm long), north wall, 107 m (16), 122 m (1 jv), 363 m (1), axis, 344 m (1), 422 m (3), 503 m (1), fan, 652 m (1 small).

Newport cn, in 140 m (1).

La Jolla cn, in 79 m (1), 121 m (3 small), 517 m (1).

Santa Cruz cn, in 89 m (1 fragment), 221 m (3 jv), 459 m (7), 623 m (1).

Catalina cn, in 362 m (1 fragment), 559 m (1 fragment).

San Clemente rift valley, in 1406 m (1).

#### Family OPHELIIDAE

##### *Ammotrypane aulogaster* Rathke, 1843

Mugu cn, in 177 m (1).

Redondo cn, south wall, in 57 m (1), north wall, 465 m (1).

San Pedro sea valley, in 459 m (1), dredged in 240-280 m (15).

Newport cn, in 420 m (3).

La Jolla cn, in 79 m (1), 121 m (2).

Coronado cn, in 177 m (5).

Santa Cruz cn, in 89 m (? 2).

Catalina cn, in 88 m (1 large), 288 m (1 large), 362 m (8 large), 379 m (5 large), 708 m (1, with 21 setigerous segments), 1272 m (1).

Tanner cn, in 496 m (6), 644 m (1), 813 m (1 fragment).

It is possible that some of these records, from deep bottoms, may refer to *Ammotrypane pallida*, below.

##### *Ammotrypane pallida* Hartman, 1960

Newport cn, in 553 m (? 1).

San Clemente rift valley, in 950 m (1), 1406 m (2).

##### *Armandia bioculata* Hartman, 1938

Redondo cn, in 57 m (1).

Tanner cn, in 298 m (? 4).

##### *Ophelia magna* (Treadwell) 1914

Redondo cn, in 120 m (1 large, with 46 pairs of branchiae, anal hood voluminous and marginally fringed).

##### *Polyophthalmus translucens* Hartman, 1960

Catalina cn, in 914 m (1).

##### *Travisia pupa* Moore, 1906

Hueneme cn, in 209 m (1 large and 1 small, the larger 56 mm long and weight 8.3 grams), 373 m (1 large), 397 m (1).

Mugu cn, in 177 m (1).

Redondo cn, north wall, in 146 m (1 large), axis, 282 m (1 large, measures 70 by 22 mm), slope, 167 m (2 large, 1 small).

La Jolla cn, in 121 m (1).

Coronado cn, in 123 m (2 jr).

Catalina cn, in 88 m (2), 216 m (4 large), 362 m (2), 379 m (3 large).

*Travisia gigas* Hartman, 1938

Hueneme cn, in 177 m (1).

*Travisia* spp.

Redondo cn, south wall, in 57 m (3), north wall, 120 m (1 jr, with lateral lappets from segment 16), 122 m (1 jr), axis, 298 m (1), slope, 310 m (2).

Newport cn, in 178 m (1, measures only 10 mm long).

Family STERNASPIDAE

*Sternaspis fossor* Stimpson, 1854

Monterey cn, in 168 m (32).

Hueneme cn, in 338 m (1).

Mugu cn, in 177 m (7).

Dume cn, in 711 m (1).

Redondo cn, north wall, in 107 m (2), 120 m (1), 122 m (1), 146 m (1).

San Pedro sea valley, in 221 m (3 large).

Newport cn, in 97 m (5), 170 m (2).

La Jolla cn, in 79 m (46), 121 m (3).

Coronado cn, in 123 m (3), 177 m (5), 344 m (2), 812 m (2).

Santa Cruz cn, in 902 m (? 16).

Catalina cn, in 88 m (24), 216 m (1), 914 m (3 small), 1272 m (? 1, sternal plates greatly reduced).

San Clemente rift valley, in 1406 m (1 small).

Family CAPITELLIDAE

*Anotomastus gordiodes* (Moore) 1909

Mugu cn, in 119 m (3).

Newport cn, in 16 m (2).

*Barantolla americana*, new species

Monterey cn, in 260 m (8, HOLOTYPE).

La Jolla cn, in 976 m (6).

Tanner cn, in 603 m (1).

Based on the type collection from Monterey canyon (Sta. 6498-

59), length is 30 mm, width 1.2 mm and segments number more than 100. The body is smooth, linear and there are no visible branchiae. The first ring is smooth, without parapodia. The thorax consists of 12 segments of which 11 are setigerous (Hartman, 1947, p. 402); the first 6 notopodia have only setae, the next one has mixed setae and hooks and the last 4 have long handled hooks. Thoracic neuropodia have setae in the first 8 segments and hooks in the last 3 segments. The formula may be expressed as follows:

$$\text{peristomium} + \left\{ \frac{6s + 1 \text{ mixed} + 4h}{8s + 3h} \right.$$

The prostomium is transversely divided into a small, globular palpode and a posterior, shorter though wider part; there are no visible eyes. The peristomium is about as long as the next segment but somewhat narrower. The everted proboscis is globular and covered with inconspicuous low papillae. The thoracic region is smooth, not reticulate and broadest in the region of the second setigerous segment. Separation between thorax and abdomen is visible as a groove, because the body is abruptly wider in the abdomen.

The only other species in the genus is *Barantolla sculpta* Southern, from Salt Lake near Calcutta, India, in brackish, shallow water. This differs from *B. americana* in having the thorax reticulated, segments with a membranous collar from which parapodial lobes originate, and branchiae present.

#### Capitella capitata subsp.<sup>1</sup>

Hueneme cn, in 338 m (1), 456 m (52).

Mugu cn, in 119 m (9).

Santa Monica cn, in 116 m (more than 9200), 183 m (55).

Redondo cn, south wall, in 575 m (1), north wall, 113 m (1), axis, 137 m (1), 148 m (17), 298 m (27), 344 m (133).

Newport cn, in 85 m (2), 97 m (2), 235 m (7), 272 m (1).

La Jolla cn, in 135 m (595), 274 m (14,145), 371 m (948), 517 m (36), 545 m (1), 637 m (3), 793 m (5).

#### capitellids, not identified

Catalina cn, in 1272 m (4). The thorax has 13 segments; the first ring is smooth and followed by 8 notopodia with setae and 4 with long handled hooks; thoracic neuropodia absent from the first, followed by 6 with setae and 5 with hooks.

Catalina cn, in 1272 m (2). The thorax has 14 segments; the first

<sup>1</sup>The subspecies and some of their records are published in Hartman, 1961, p. 333.

ring is smooth and followed by 6 segments with setae in notopodia and neuropodia, and 8 segments with long handled hooks in notopodia and neuropodia.

Redondo cn, south wall, in 57 m (1+), 542 m (2), north wall, 363 m (1 small), axis, 422 m (1), fan, 602 m (1), 715 m (1).

Coronado cn, in 566 m (19), 812 m (4).

?*Dasybranchus* sp.

Redondo cn, in 519 m (5).

*Decamastus*, new genus

Type *D. gracilis*, new species

This genus differs from *Notomastus* (see Hartman, 1947, p. 402) in having 10 instead of 11 thoracic setigerous segments. Posterior parapodia are biramous; neuropodia have reduced numbers of hooks and notopodia have few or none. It differs from *Mediomastus*, which also has 10 thoracic setigers, in having only pointed setae, instead of setae and hooks, in the thorax.

*Decamastus gracilis*, new species

Redondo cn, south wall, in 232 m (100+, HOLOTYPE), north wall, 113 m (4).

Mugu cn, in 676 m (15+), 755 m (2).

Length of a nearly complete individual, from Sta. 2191-52, is 47 mm and width is 1.1 mm in the widest part, or between the second and fourth thoracic segments. The thorax consists of a short, triangular prostomium without eyes, a complete peristomial ring which is nearly as wide as the following segment and slightly longer, and 10 setigerous segments with only pointed setae. The abdomen is much longer and narrower, and has many more segments.

The epithelium of the peristomium and first 2 or 3 segments is slightly reticulated; it is smooth farther back. Median and posterior abdominal segments appear somewhat moniliform and collared because the parapodial ridges are constricted and have narrow, encircling flanges behind the emergence of the setae, whereas the space between successive parapodia is inflated. In cross section the thorax is cylindrical, anterior abdominal segments are trapezoidal with the longest side ventral, and posteriormost segments are again subcylindrical but slenderer than those in front.

Thoracic notopodia and neuropodia are similar to one another in having spreading fascicles of distally pointed setae, located at ectal margins and slightly behind the middle of the segment. The transition from thorax to abdomen is marked only by change from setae to long handled

hooks, and the middorsal approachment of the paired notopodia. They are somewhat elevated, nearly proximal, whereas the corresponding neuropodia are lateral, located at the widest part of the segment. Abdominal notopodial hooks in anterior and middle segments number only 4 or 5 in a transverse series, whereas their corresponding neuropodia have about 12 hooks in a series; they are disposed so that the distal fang of all notopodial hooks is directed toward the distal fang of all neuropodial ones.

In middle segments a short, collarlike flange surrounds the segments; this is located just behind the setigerous elevations. The flange enlarges at postsetal positions to form a pair of semicircular lobes, longer in dorsal and shorter in ventral parapodia. The presence of hooks in these parapodia is obscured by the lobes, but they can be distinguished in neuropodia, where they number 4 or 5 in a series; notopodia have few (2 or 3) to no hooks.

*Decamastus gracilis* has been recovered only from deep parts of longshore canyons, Redondo and Mugu, in depths of 232 to 755 meters, in muds.

#### **Heteromastus filobranchus** Berkeley and Berkeley, 1932

Monterey cn, in 168 m (153), 410 m (47), 750 m (2), 906 m (7).

Hueneme cn, in 98 m (4), 165 m (26), 177 m (225), 183 m (245), 209 m (45), 338 m (2), 373 m (11 and 3), 376 m (8), 478 m (9).

Dume cn, in 507 m (6).

Mugu cn, in 177 m (2), 367 m (18 large), 573 m (71), 676 m (3).

Santa Monica cn, in 475 m (1 fragment).

Redondo cn, south wall, in 378 m (16 large), 232 m (98+), 575 m (1), north wall, 113 m (1), 363 m (102), 554 m (1 fragment), axis, 148 m (24 large), 239 m (10+), 246 m (6), 298 m (54), 344 m (22), 378 m (6), 431 m (4), 503 m (28 large).

San Pedro sea valley, in 319 m (1), 406 m (14), 437 m (1).

Newport cn, in 16 m (? 4), 37 m (1), 83 m (23 large), 97 m (12), 140 m (8), 235 m (24 large), 478 m (6).

La Jolla cn, in 637 m (1 large).

#### **Heteromastus** sp.

Mugu cn, in 171 m (2 fragments).

Santa Monica cn, in 542 m (1 fragment).

Catalina cn, in 216 m (1 jv).

#### **Leiochrides hemipodus** Hartman, 1960

Dume cn, in 530 m (1), 652 m (1), 711 m (1).

Redondo cn, slope, in 556 m (5), fan, 652 m (3), 660 m (4), 706 m (1), 751 m (? 1).

San Pedro sea valley, in 459 m (3), 661 m (2), 666 m (? 7), 716 m (1).

Newport cn, in 741 m (2).

La Jolla cn, in 545 m (2), 793 m (8), 976 m (1).

Coronado cn, in 566 m (3), 1265 m (1).

Santa Cruz cn, in 902 m (25).

Catalina cn, in 549 m (4), 559 m (4).

San Clemente rift valley, in 950 m (2), 1406 m (1).

#### *Leiochrides* sp.

Tanner cn, in 603 m (1). This specimen differs from *Leiochrides hemipodus* (see above) in that thoracic neuropodia have setae in the first setigerous segment and the last 2 thoracic neuropodia have long handled hooks instead of pointed setae.

#### *Mediomastus glabrus* Hartman, 1960

Hueneme cn, in 271 m (1).

#### *Mediomastus californiensis* Hartman, 1944

Hueneme cn, in 177 m (18).

Mugu cn, in 119 m (1).

Redondo cn, south wall, in 76 m (2), 232 m (5), north wall, 107 m (8), 113 m (3), 120 m (7), 146 m (1 fragment), axis, 137 m (8), 148 m (4), 282 m (4), 298 m (1), 344 m (1), slope, 310 m (2).

Newport cn, in 16 m (114+), 37 m (33) (28), 85 m (12), 170 m (162), 178 m (1), 211 m (1), 235 m (7), 272 m (160+).

La Jolla cn, in 79 m (45), 121 m (+), 517 m (1 small).

Coronado cn, in 123 m (3).

#### *Neoheteromastus lineus* Hartman, 1960

Monterey cn, in 260 m (1).

#### *Notomastus hemipodus* Hartman, 1947

Newport cn, in 97 m (10).

#### *Notomastus ?lineatus* Claparède, 1870

Hueneme cn, in 98 m (3).

Santa Cruz cn, in 89 m (1 fragment), 218 m (3), 221 m (8).

Tanner cn, in 298 m (2).

#### *Notomastus magnus* Hartman, 1947

Redondo cn, in 113 m (1 large).

San Pedro sea valley, dredged in 100-300 m (2).

Newport cn, in 272 m (? 1 fragment).

La Jolla cn, in 79 m (2 large).

Coronado cn, in 960 m (4).

Santa Cruz cn, in 902 m (? 1 fragment).

*Notomastus lobatus* Hartman, 1947

Tanner cn, in 603 m (? 5, large); 644 m (? 7). The questionable identification refers to the fact that lobed branchiae were not observed.

*Notomastus tenuis* Moore, 1909

Mugu cn, in 378 m (1).

Santa Monica cn, in 116 m (? 14), 183 m (6), 268 m (2), 330 m (1), 362 m (2).

Redondo cn, north wall, in 113 m (8), axis, 282 m (1), slope, 167 m (6), 310 m (3).

San Pedro sea valley, in 187 m (? 17), dredged in 100-300 m (4).

Newport cn, in 178 m (4).

La Jolla cn, in 121 m (2).

Catalina cn, in 88 m (1), 379 m (3).

*Notomastus* spp.

Mugu cn, in 755 m (1).

Redondo cn, north wall, in 146 m (2 jv).

San Pedro sea valley, in 221 m (4 fragments).

Newport cn, in 37 m (2 large), 272 m (1 fragment).

La Jolla cn, in 79 m (2).

Coronado cn, in 177 m (3 jv).

Santa Cruz cn, in 459 m (3).

Catalina cn, in 559 m (2 large, anterior fragments).

Tanner cn, in 1298 m (10 fragments).

Family MALDANIDAE

*Asychis disparidentata* (Moore) 1904

Monterey cn, in 168 m (10 large, measure to 240 mm long by 9 mm across, in a tube measuring 7 to 10 mm in diameter).

Hueneme cn, in 165 m (1), 177 m (3), 209 m (3).

Santa Monica cn, in 330 m (1 large).

Redondo cn, axis, in 246 m (1).

San Pedro sea valley, in 187 m (1 large, 80 mm long), 221 m (1), 437 m (1).

Newport cn, in 85 m (2 large), 170 m (1).

La Jolla cn, in 121 m (1 large, 126 mm long by 8 mm wide).

Catalina cn, in 266 m (1), 362 m (1 large and 1 small), 559 m (1).



*Asychis*, nr *gotoi* (Izuka) 1902

Coronado cn, in 1265 m (1 large, in thick tube measuring 8 mm across, animal 4 mm wide). This species is previously recorded from Japan.

*Asychis* spp.

Dume cn, in 652 m (1 large and 1 juvenile).  
San Pedro sea valley, in 459 m (1 fragment, lacks anterior end).  
Coronado cn, in 1265 m (1 small, anal plaque with 3 long filaments).  
San Clemente rift valley, in 1406 m (1 fragment).

*Axiothella rubrocincta* (Johnson) 1901

Hueneme cn, in 183 m (2).  
Mugu cn, in 177 m (18).  
Newport cn, in 97 m (2).

*Axiothella* spp.

Hueneme cn, in 478 m (4).  
Mugu cn, in 119 m (6, chiefly posterior ends).  
Dume cn, in 374 m (1).  
Santa Monica cn, in 463 m (1 fragment).  
Redondo cn, south wall, in 232 m (1 fragment), north wall, 107 m (2 jv), axis, 344 m (1 jv).  
San Pedro sea valley, in 221 m (1).  
La Jolla cn, in 79 m (20).  
Coronado cn, in 123 m (3), 177 m (2).  
Santa Cruz cn, in 221 m (? 1).  
Catalina cn, in 362 m (? 1 fragment), 379 m (1), 914 m (15, in cylindrical tubes, their basal ends loosely coiled).

*Clymenopsis cingulata* (Ehlers) 1887

Santa Cruz cn, in 623 m (3 large).  
Tanner cn, in 644 m (2).

*Euclymene reticulata* Moore, 1923

Coronado cn, in 960 m (? 3, in arenaceous, thin-walled tubes).

*Euclymene* sp. or euclymenid

Redondo cn, north wall, in 363 m (1 posterior fragment), axis, 137 m (1 large and 1 small).  
La Jolla cn, in 793 m (21), 976 m (6).  
Santa Cruz cn, in 1387 m (? 1 fragment).  
Catalina cn, in 379 m (1).

**Euclymeninae**

Mugu cn, in 573 m (1).

Redondo cn, axis, in 378 m (? 1 posterior end), fan, in 602 m (2).

Newport cn, in 553 m (10 jv).

Santa Cruz cn, in 459 m (14 fragments).

**Isocirrus longiceps (Moore) 1923**

Hueneme cn, in 456 m (? 1 fragment).

Santa Monica cn, trawled in 80 m, rocky bottom (1 fragment).

San Pedro sea valley, dredged in 100-300 m (1 fragment).

Newport cn, in 170 m (1).

La Jolla cn, in 79 m (1).

**Lumbriclymene lineus Hartman, 1960**

Newport cn, in 553 m (? 1 fragment).

San Clemente rift valley, in 1591 m (1).

Tanner cn, in 644 m (2), 1298 m (2).

**Lumbriclymene sp.**

San Diego trench, in 844 m (1).

Coronado cn, in 1265 m (1).

**Maldane cristata Treadwell, 1923**

San Diego trough, in 768 m (5).

La Jolla cn, in 545 m (6), 708 m (5), 793 m (8), 976 m (13).

The tube is thick walled, covered with mud and has lateral branches or vents, in alternate arrangement.

**Maldane, nr sarsi Malmgren, 1865**

Monterey cn, in 168 m (1), 410 m (165).

Hueneme cn, in 373 m (2 jv), 397 m (2 jv).

Dume cn, in 374 m (3 jv), 398 m (? 3), 530 m (2) (the last two lots lack pigment).

Mugu cn, in 119 m (1), 177 m (58), 378 m (1), 573 m (1).

Santa Monica cn, in 268 m (6), 330 m (39), 362 m (43), 431 m (64), 463 m (17), 475 m (36 jv), 583 m (1).

San Pedro sea valley, dredged in 100-300 m (many), 480 m (310 large).

Redondo cn, south wall, in 232 m (14 large), north wall, 107 m (2), 113 m (10), 120 m (1 jv), 146 m (? 2 jv), 363 m (+), 465 m (? 50+), axis, 239 m (2), 246 m (1), 282 m (1), 344 m (1 jv), 611 m (1), slope, 310 m (161), 334 m (many), 556 m (+), fan, 652 m (1 large and 2 small).

San Pedro sea valley, in 187 m (1), 221 m (3), 406 m (1),

437 m (14), 459 m (2), 461 m (322 large and small), 468 m (14 jv), 522 m (1 jv), 666 m (1).

Newport cn, in 37 m (1), 140 m (1), 170 m (6), 211 m (22), 235 m (18), 420 m (1 large), 553 m (2 jv), 741 m (3).

San Diego trough, in 840 m (1).

Coronado cn, in 177 m (1 jv), 812 m (6), 960 m (4 large and 14 small), 812 m (6), 1105 m (1 small), 1265 m (1).

Catalina cn, in 216 m (6), 266 m (87), 362 m (6), 379 m (15), 549 m (3), 914 m (2 or more).

**?Maldanella robusta** Moore, 1906

Redondo cn, in 76 m (2 large).

Santa Cruz cn, in 218 m (? 1).

maldanids, not identified

Santa Monica cn, in 330 m (2, fragmented).

Redondo cn, axis, in 422 m (10 or more), fan, 715 m (several).

Coronado cn, in 123 m (2 jv).

Santa Cruz cn, in 623 m (5 or more, fragmented).

Tanner cn, in 813 m (4 anterior ends and tail of another one).

**Nicomache ?lumbricalis** (Fabricius) 1780

San Pedro sea valley, in 522 m (?1).

Tanner cn, in 603 m (1 jv).

**Nicomache personata** Johnson, 1901

Santa Monica cn, trawled in 80 and 200 m, rocky bottom (many).

San Pedro sea valley, dredged in 100-300 m (1+).

**Nicomache** spp.

Redondo cn, fan, in 652 m (1 anterior end).

Santa Cruz cn, in 218 m (1 fragment).

Catalina cn, in 853 m (3 jv), 1272 m (1 anterior end).

Tanner cn, in 603 m (1, in arenaceous, friable tube).

**Notoproctus pacificus** (Moore) 1906

Santa Monica cn, trawled in about 200 m, rocky bottom (1 fragment, nearly white, in arenaceous tube in rocky crevice).

Tanner cn, in 644 m (5).

**Petaloproctus** sp.

Redondo cn, north wall, in 465 m (2).

**Praxillella affinis pacifica** Berkeley, 1929

Hueneme cn, in 177 m (1).

Mugu cn, in 378 m (1 large, harbors commensal *Harmothoe* sp.)

Dume cn, in 398 m (3).

Santa Monica cn, in 362 m (1), 454 m (2).

Redondo cn, south wall, in 57 m (6 or more), 232 m (3), north wall, 107 m (1), 113 m (4), 122 m (1), axis, 148 m (1), slope, 167 m (1), 310 m (3), fan, 652 m (3 fragments).

San Pedro sea valley, in 187 m (3 large).

Newport cn, in 16 m (2 large), 85 m (5 large), 97 m (2), 170 m (8), 211 m (4 large), 420 m (1), 553 m (2).

#### *Praxillella gracilis* (Sars) 1861

Santa Monica cn, in 268 m (1), 330 m (1).

Redondo cn, north wall, in 107 m (1), 120 m (1), 122 m (2), slope, 167 m (1).

San Pedro sea valley, in 221 m (2 large, tube 220 mm long).

La Jolla cn, in 121 m (1).

Catalina cn, in 88 m (4 large), 708 m (1 fragment).

San Clemente rift valley, in 950 m (1).

Tanner cn, in 813 m (2 anterior ends).

#### *Praxillella* spp.

Mugu cn, in 119 m (1), 177 m (3 fragments).

Santa Monica cn, in 475 m (1 fragment).

Redondo cn, north wall, in 146 m (2 jv), 363 m (1).

San Pedro sea valley, in 468 m (? 1 fragment).

Newport cn, in 140 m (1), 420 m (1 large, with 5, instead of 4 preanal, asetigerous segments), 642 m (? 12), 741 m (1 fragment).

Coronado cn, in 812 m (10).

Catalina cn, in 266 m (1 fragment).

Tanner cn, in 813 m (1 posterior end). It has 10 long, flattened cirri in a circlet about the anal flange.

#### *Praxillella trifila* Hartman, 1960

Coronado cn, in 1105 m (2).

Tanner cn, in 603 m (? 1).

#### *Praxillura maculata* Moore, 1923

Catalina cn, in 914 m (15 or more).

#### *Rhodine bitorquata* Moore, 1923

Monterey cn, in 260 m (1 fragment).

Mugu cn, in 177 m (31).

Redondo cn, north wall, in 146 m (1 fragment).

- San Pedro sea valley, in 221 m (1).  
Newport cn, in 97 m (1), 178 m (2), 741 m (1 fragment).  
La Jolla cn, in 79 m (1 fragment), 708 m (? 1 fragment).  
Coronado cn, in 812 m (1 fragment), 916 m (8).  
Santa Cruz cn, in 902 m (1), 1387 m (2).  
Tanner cn, in 603 m (1), 1298 m (1).

#### Family OWENIIDAE

##### *Myriochele gracilis* Hartman, 1955

- Hueneme cn, in 338 m (4), 373 m (? 8), 397 m (27).  
Mugu cn, in 177 m (4), 378 m (2 jv).  
Dume cn, in 652 m (1).  
Santa Monica cn, in 330 m (2), 583 m (? 4).  
Redondo cn, south wall, in 57 m (1), 232 m (2), north wall,  
107 m (1), 122 m (2), 146 m (2), 465 m (1), axis, 422 m (8),  
611 m (3), slope, 167 m (1), 556 m (2).  
San Pedro sea valley, in 480 m (1).  
San Diego trough, in 846 m (27).  
La Jolla cn, in 121 m (1).  
Coronado cn, in 123 m (2), 177 m (7), 566 m (1), 1265 m (1).  
Santa Cruz cn, in 89 m (2), 676 m (? 6).  
Catalina cn, in 88 m (5), 266 m (5), 549 m (1), 559 m (3).

##### *Myriochele pygidialis* Hartman, 1960

- San Diego trough, in 844 m (45).  
Tanner cn, in 496 m (3).

##### *Myriochele* spp.

- Mugu cn, in 721 m (1).  
Santa Monica cn, in 542 m (1).  
Newport cn, in 478 m (1), 553 m (3).  
LaJolla cn, in 545 m (1), 976 m (1).  
Santa Cruz cn, in 623 m (3), 676 m (6), 902 m (2).  
Catalina cn, in 1272 m (1).  
Tanner cn, in 603 m (1), 644 m (2).

##### *Myriowenia californiensis* Hartman, 1960

- Mugu cn, in 177 m (1).  
Santa Cruz cn, in 89 m (1 fragment).

**Owenia fusiformis collaris** Hartman, 1955

- Hueneme cn, in 373 m (5 jv), 456 m (2 jv).  
 Mugu cn, in 119 m (1), 177 m (58 jv).  
 Redondo cn, slope, in 167 m (1 fragment).  
 Santa Cruz cn, in 89 m (1), 221 m (1).  
 Catalina cn, in 362 m (5 jv).

**Owenia** spp.

- Monterey cn, in 168 m (2).  
 Hueneme cn, in 373 m (5 jv), 456 m (2 jv).  
 Santa Monica cn, in 268 m (1).  
 Redondo cn, north wall, in 120 m (12).  
 Coronado cn, in 123 m (2).

## oweniid, unidentified

- Newport cn, in 16 m (79).

## Family PECTINARIIDAE

**Pectinaria californiensis** Hartman, 1941

- Monterey cn, in 168 m (43), 260 m (16), 397 m (10), 410 m (1).  
 Hueneme cn, in 165 m (65), 177 m (2), 209 m (16), 338 m (84), 373 m (200 and 123), 376 m (24), 456 (1 jv).  
 Dume cn, in 299 m (1), 374 m (21 large), 398 m (10), 507 m (1).  
 Mugu cn, in 177 m (25), 378 m (19), 573 m (1).  
 Santa Monica cn, in 116 m (1 fragment), 183 m (5 dead tubes), 268 m (4), 330 m (2), 362 m (1), 454 m (2 small).  
 Redondo cn, south wall, in 76 m (4), 232 m (28), 378 m (44 and 65 tubes), 519 m (1), north wall, 107 m (53 jv), 113 m (312), 120 m (34), 122 m (10), 146 m (68), 363 m (more than 500), 465 m (1), axis, 137 m (580 large), 148 m (96), 239 m (5), 246 m (dead tubes only), 282 m (6), 344 m (63 of which 41 are jv), 378 (195), 422 (more than 50), 431 m (136), 503 m (5 small), slope, 167 m (26), 310 m (12), 334 m (many).  
 San Pedro sea valley, in 187 m (14), 221 m (70), 319 m (24), 406 m (20, and many dead blackened tubes), 437 m (1), 459 m (2), 461 m (17 large), 468 m (7), dredged in 100-300 m (1), dredged in 240-280 m (few).

- Newport cn, in 16 m (14 small), 37 m, sand (2), 37 m, silt (23), 85

m (315 large and small), 97 m (47), 140 m (58), 170 m (23), 178 m (32), 211 m (55), 235 m (169 large and small), 272 m (+6), 420 m (36), 478 m (15).

La Jolla cn, in 121 m (5), 135 m (206 jv), 274 m (195 jv), 371 m (774 jv, measure to 4.2 mm long).

Coronado cn, in 123 m (15), 177 m (17), 344 m (3).

Santa Cruz cn, in 218 m (1).

Catalina cn, in 88 m (12), 218 m (12 small), 266 m (10), 362 m (63), 379 m (118), 559 m (3).

#### Family SABELLARIIDAE

##### *Sabellaria cementarium* Moore, 1906

Santa Monica cn, trawled in 80 m, rocky bottom (several).

##### *Sabellaria* sp.

La Jolla cn, in 135 m (1 jv).

#### Family AMPHARETIDAE

##### *Amage anops* (Johnson) 1901

Hueneme cn, in 209 m (? 1).

Mugu cn, in 171 m (6).

Santa Monica cn, in 268 m (1), 330 m (1).

Redondo cn, slope, in 167 m (1).

San Pedro sea valley, in 522 m (+).

Santa Cruz cn, in 218 m (1).

Catalina cn, in 88 m (+).

##### *Amage* spp.

Redondo cn, fan, in 825 m (7).

San Pedro sea valley, in 221 m (2).

La Jolla cn, in 79 m (1).

Coronado cn, in 177 m (3).

##### *Ampharete arctica* Malmgren, 1866

Mugu cn, in 119 m (2).

Santa Monica cn, in 330 m (+).

Redondo cn, slope, in 167 m (? 1), 310 m (1).

Catalina cn, in 379 m (15).

**?Ampharete spp.**

Mugu cn, in 352 m (1).

Santa Monica cn, in 268 m (1).

San Pedro sea valley, in 459 m (2).

Santa Cruz cn, in 221 m (? 4).

San Clemente cn, in 950 m (1), 1591 m (1).

Tanner cn, in 813 m (10 large). In mud tubes adorned with siliceous sponge spicules which project out to form a spinous tube.

**Amphicteis mucronata Moore, 1923**

Santa Monica cn, in 583 m (1).

San Pedro sea valley, in 221 m (? 7).

Tanner cn, in 496 m (2).

**Amphicteis scaphobranchiata Moore, 1906**

Mugu cn, in 119 m (2), 177 m (3).

Santa Monica cn, in 268 m (1), 330 m (1), 454 m (1).

Redondo cn, north wall, in 554 m (1 large), axis, in 611 m (2 large), fan, 810 m (several).

La Jolla cn, in 79 m (2).

Coronado cn, in 344 m (3).

Santa Cruz cn, in 218 m (2).

Catalina cn, in 362 m (1 fragment).

**Amphisamytha bioculata (Moore) 1906**

Santa Monica cn, in 612 m (? 1 small, white and ovigerous).

**Amphicteis spp.**

Hueneme cn, in 373 m (1 fragment).

Redondo cn, in 542 m (1).

Newport cn, in 741 m (7).

Coronado cn, in 177 m (1 fragment).

**?Anobothrus gracilis (Malmgren) 1866**

Monterey cn, in 168 m (10 small).

Mugu cn, in 676 m (6).

Redondo cn, in 554 m (50 or more), axis, 246 m (1).

Catalina cn, in 549 m (4).

**Anobothrus, unknown species**

Tanner cn, in 813 m (about 35).

Length of ovigerous specimens is 9 mm, width in thorax or widest



part is 0.8 mm. Setae of the tenth setigerous segment are modified, as characteristic of the genus. The prostomium is broadly trilobed at its frontal margin and has a pair of conspicuous black transverse eye patches, occurring along the posterior margin of the lateral lobes. Branchiae number 4 pairs; they are subulate and attached to form an anterior row of 3 pairs with the medial pair nearly touching at the base, and a fourth pair behind, inserted between and behind the 2 innermost pairs. Each branchia is long and tapers distally. Oral tentacles are cirriform and pennate.

The setae of the tenth setigerous segment are mucronate, slightly shorter than those in front or behind. Each is a broad blade and terminates in a long, slender mucron. Other thoracic setae are simple and tapering distally. Paleae of the first segment form a conspicuous pair of spreading fascicles with about 10 on a side; they are broad bladed and taper distally to a prolonged tip. The tube is close fitting, lined with a smooth, chitinized sheath and externally covered with rounded sand and foraminiferan particles of uniform size.

These specimens differ from *Anobothrus gracilis* (see above) in having the modified setae smooth, not spinous, and the paleae mucronate, not merely tapering distally.

#### *Anobothrus* spp.

Coronado cn, in 566 m (more than 100), 1265 m (1).

Santa Cruz cn, in 89 m (10).

Tanner cn, in 496 m (12).

#### *Glyphanostomum* ?*pallescens* (Theel) 1878

Redondo cn, north wall, in 554 m (2). The tube is thin, smooth, cylindrical but flaccid when empty; it measures 62 mm long by 0.6 mm wide and has transverse dark and light tan bars and is externally adorned with slender siliceous sponge spicules at its distal end. The specimens are ovigerous, and measure about 14 mm long by 0.5 mm wide. Paleae are absent. Oral tentacles are smooth, filiform, numerous and all of one kind. Branchiae number 3 pairs, are inserted in a straight line; each is long, slender or cirriform. The thorax consists of 13 setigerous segments and the abdomen of about 24.

#### *Lysippe annectens* Moore, 1923

Redondo cn, south wall, in 76 m (2, measure only 6 mm long and are ovigerous), north wall, 120 m (1), 146 m (1 jv), 554 m (10), axis, 611 m (4), fan, 652 m (3), 751 m (59), 786 m (4 small).

San Pedro sea valley, in 522 m (33), 661 m (37), 666 m (6), 716 m (1), dredged in 100-300 m (about 15).

Newport cn, in 553 m (12).

La Jolla cn, in 793 m (3).

Santa Cruz cn, in 221 m (1), 676 m (3).

Catalina cn, in 88 m (1), 559 m (8), 1272 m (8).

Tanner cn, in 603 m (5), 644 m (12), 813 m (2), 1298 m (1).

#### *Lysippe* sp.

Newport cn, in 642 m (24). Thoracic setigerous segments number 17 instead of 16.

#### *Melinna heterodonta* Moore, 1923

Hueneme cn, in 373 m (2), 376 m (1), 397 m (1 large).

Dume cn, in 398 m (1).

Santa Monica cn, in 268 m (1), 330 m (3), 454 m (1).

Redondo cn, south wall, in 378 m (2), 363 m (2 or more), 465 m (2), axis, 246 m (1 large with tube 112 mm long and animal 50 mm long) 344 m (1 jr), 378 m (1), 431 m (5 large).

San Pedro sea valley, in 459 m (2), 522 m (1 large), 661 m (1 large).

Newport cn, in 16 m (1), 170 m (2), 272 m (2).

Coronado cn, in 344 m (36 large, in mud-walled tubes), 566 m (6, body drab green, pygidium a short white lobe), 812 m (1 large).

Catalina cn, in 288 m (2), 362 m (1), 379 m (36).

#### *Melinna* sp., with elongated branchiae

San Diego trench, in 734 m (1).

Coronado cn, in 123 m (1 small).

Catalina cn, in 216 m (4).

#### *Melinnexis moorei* Hartman, 1960

Dume cn, in 711 m (1 large, in tube 320 mm long).

Santa Monica cn, in 583 m (? 1 large).

Redondo cn, slope, in 556 m (? 5, in tubes resembling black rubber hose), fan, 706 m (1 large, in tube 500 mm long).

San Pedro sea valley, in 461 m (1), 480 m (1 large).

Newport cn, in 478 m (4 large, tubes measure 140 mm long and the contained animal about 50 mm long. Tubes are externally adorned with brown arenaceous foraminiferans and have attached snail egg cases).

Santa Cruz cn, in 218 m (? 1).

San Clemente rift valley, in 950 m (tubes), 1406 m (1, tube

adorned with sponge spicules attached on end), 1591 m (1), 1620 m (tubes).

Tanner cn, in 603 m (1 large and 2 very small).

*Schistocomus hiltoni* Chamberlin, 1919

Mugu cn, in 119 m (4).

*Schistocomus* sp.

Dume cn, in 299 m (empty tube which is thin, rust colored and papyraceous).

San Pedro sea valley, in 100-300 m (2).

La Jolla cn, in 793 m (3).

Santa Cruz cn, in 89 m (2, in tubes).

ampharetids, not identified

Mugu cn, in 573 m (1).

Dume cn, in 652 m (1).

Santa Monica cn, in 542 m (3 small).

Redondo cn, south wall, in 57 m (1+), 232 m (3), north wall, 107 m (4), 465 m (2), axis, 344 m (5 jv), 422 m (more than 2), 611 m (78 small, ovigerous), slope, 556 m (4 small), fan, 686 m (many small), 706 m (about 20), 715 m (many).

Newport cn, in 97 m (4 small).

Coronado cn, in 123 m (3 jv), 566 m (12 large), 812 m (5+).

Catalina cn, in 708 m (2 small), 914 m (6 small).

Clemente cn, in 1406 m (12 small).

Tanner cn, in 644 m (12 jv).

Family TERESELLIDAE

*Amaeana occidentalis* (Hartman) 1944

Monterey cn, in 260 m (1).

Hueneme cn, in 98 m (1).

Redondo cn, south wall, in 57 m (2), axis, 148 m (1 jv).

Newport cn, in 16 m (10), 37 m (6), 97 m (1).

La Jolla cn, in 79 m (4), 121 m (1), 274 m (1).

Coronado cn, in 123 m (1).

*Artacamella hancocki* Hartman, 1955

Redondo cn, south wall, in 76 m (10 jv), north wall, 107 m (2), slope, 167 m (2).

*Eupolymnia* sp.

Newport cn, in 85 m (5 jv).

**?Hauchiella sp.**

Redondo cn, in 542 m (1).

**Leaena caeca Hartman, 1960**

Catalina cn, in 853 m (1).

**Lanice spp.**

Hueneme cn, in 456 m (tubes).

Redondo cn, in 107 m (1 fragment), 120 m (1 fragment), 465 m (? 1).

Newport cn, in 553 m (? 1 fragment).

Santa Cruz cn, in 89 m (1), 459 m (2 or more).

Catalina cn, in 216 m (? 1 fragment).

San Clemente rift valley, in 950 m (? 1).

Tanner cn, in 496 m (1 and 5 tops of tubes).

**Pista disjuncta Moore, 1923**

Hueneme cn, in 209 m (20 or more), 373 m (many).

Dume cn, in 299 m (2), 374 m (5 large), 398 m (9).

Mugu cn, in 119 m (12), 177 m (2).

Santa Monica cn, in 268 m (1), 542 m (1 large).

Redondo cn, north wall, in 113 m (2), axis, 137 m (12 large), 378 m (1 fragment), slope, 310 m (7 large).

San Pedro sea valley, in 221 m (1), 437 m (7 large), 459 m (17).

Newport cn, in 16 m (12), 97 m (1), 140 m (7 large), 170 m (73 large), 178 m (14 large), 211 m (68), 235 m (71), 272 m (35).

La Jolla cn, in 121 m (3 large).

Coronado cn, in 123 m (1 small).

Catalina cn, in 88 m (30 large), 1282 m (1).

Tanner cn, in 1298 m (? 1 fragment).

**Pista, cf. cristata (Müller) 1776**

Redondo cn, south wall, in 57 m (many), north wall, 107 m (5), 120 m (20), 122 m (10), 146 m (2 small), slope, 167 m (31).

Newport cn, in 97 m (2).

La Jolla cn, in 79 m (2).

**Pista elongata Moore, 1909**

Dume cn, trawled in 80-100 m, rocky bottom (1).

**Pista fasciata (Grube) 1870**

San Pedro sea valley, in 459 m (? 6).

**Pista spp.**

- Redondo cn, north wall, in 554 m (1), slope, 556 m (2).  
 San Pedro sea valley, in 716 m (1 fragment).  
 Tanner cn, in 1298 m (1 fragment).  
 Coronado cn, in 566 m (2 small).

**Polycirrus spp.**

- Dume cn, trawled in 80-100 m, rocky bottom (1).  
 Mugu cn, in 177 m (2).  
 Santa Monica cn, in 362 m (3).  
 Redondo cn, slope, in 310 m (4).  
 Newport cn, in 97 m (1).  
 Tanner cn, in 298 m (1).

**Scionella japonica Moore, 1903**

- San Clemente rift valley, in 950 m (1).

**Streblosoma crassibranchia Treadwell, 1914**

- Monterey cn, in 168 m (1), 260 m (1).  
 Mugu cn, in 119 m (3).  
 Dume cn, in 299 m (1 large, empty tube).  
 Santa Monica cn, in 268 m (1), 475 m (1 large).  
 Redondo cn, axis, in 422 m (1 fragment).  
 Newport cn, in 97 m (1).  
 Santa Cruz cn, in 218 m (? 2).

**?Thelepus sp.**

- Redondo cn, north wall, in 465 m (1).  
 Santa Cruz cn, in 221 m (4 fragments, host of *Lepidasthenia* sp.)

## terebellids, not identified

- Redondo cn, fan, in 810 m (1).  
 Newport cn, in 741 m (4, perhaps unknown genus and species).  
 Santa Cruz cn, in 623 m (1 large, host of *Lepidasthenia* sp.)  
 Catalina cn, in 708 m (1 posterior fragment).

## Family TRICHOBRANCHIDAE

**Terebellides stroemi Sars, 1835, or var.**

- Hueneme cn, in 338 m (1 jv).  
 Mugu cn, in 177 m (1).  
 Santa Monica cn, in 268 m (3), 330 m (1), 542 m (1 jv), 612 m (1 small).  
 Redondo cn, south wall, in 57 m (5), 542 m (1), 575 m (1),

north wall, 107 m (10), 120 m (4), 122 m (1), 146 m (2), 554 m (2), axis, 239 m (1), slope, 167 m (2).

San Pedro sea valley, in 187 m (1), 221 m (1), 459 m (1).

Newport cn, in 170 m (1), 178 m (1), 272 m (3), 553 m (1 small).

La Jolla cn, in 121 m (2), 545 m (1), 793 m (4 or more), 976 m (1 jv).

Coronado cn, in 177 m (16).

Santa Cruz cn, in 218 m (1 small), 221 m (1), 676 m (3).

Catalina cn, in 216 m (4 small), 288 m (8), 559 m (2), 914 m (1).

San Clemente rift valley, in 1406 m (1).

Tanner cn, in 298 m (2), 603 m (16), 1298 m (1 large, ovigerous).

It is likely that the deepwater form is specifically different from the shallow one.

#### Family SABELLIDAE

##### *Chone gracilis* Moore, 1906

Mugu cn, in 119 m (11).

##### *Chone infundibuliformis* Kröyer, 1856

Hueneme cn, in 183 m (1).

Mugu cn, in 119 m (1).

##### *Chone* spp.

Santa Monica cn, in 463 m (1, lacks crown).

Redondo cn, north wall, in 120 m (2), 146 m (1 jv), 554 m (2), axis, 344 m (1 jv), 611 m (1), slope, 310 m (2), 334 m (1).

San Pedro sea valley, in 522 m (1).

Newport cn, in 235 m (1).

Coronado cn, in 123 m (1).

Santa Cruz cn, in 89 m (8).

Catalina cn, in 379 m (2 jv).

##### ?*Euchone* sp.

Mugu cn, in 119 m (1).

Redondo cn, slope, in 556 m (1), fan, 660 m (1).

San Pedro sea valley, in 221 m (1).

Santa Cruz cn, in 89 m (? 1 posterior end).

##### *Hypsicomus* sp.

Dume cn, trawled in 80-100 m (1).

##### *Megalomma splendida* (Moore) 1905

Redondo cn, north wall, in 122 m (2 large), slope, 167 m (2, in cartilaginous, sand-covered tubes).

**Megalomma** spp.

Redondo cn, north wall, in 107 m (1 jv).

Tanner cn, in 496 m (2), 644 m (? 1).

**Myxicola infundibulum** (Renier) 1804

San Pedro sea valley, dredged in 100-300 m (1).

**Potamethus mucronatus** (Moore) 1923

Santa Monica cn, in 583 m (? 1).

Redondo cn, fan, in 652 m (5, in tubes), 751 m (1, in cylindrical tube 95 mm long, resembling a rubber hose).

**Potamethus** sp.

Redondo cn, slope, in 167 m (?6).

Catalina cn, in 379 m (1 fragment).

Tanner cn, in 603 m (1 small, in silt covered tube).

**Pseudopotamilla** sp.

Dume cn, trawled in 80-100 m, rocky bottom (1).

## sabellid, not identified

Redondo cn, south wall, in 575 m (1, radioles lack filaments), axis, 422 m (2), fan, 602 m (2), 706 m (2).

La Jolla cn, in 976 m (1 jv).

Santa Cruz cn, in 218 m (2 jv).

Catalina cn, in 559 m (1 jv).

San Clemente rift valley, in 1591 m (1), 1620 m (1).

## Family SERPULIDAE

**Apomatus** sp.

Dume cn, trawled in 80-100 m (1, in white cylindrical tube, its base attached to a rock).

**Protis pacifica** Moore, 1923

Santa Monica cn, in 583 m (tubes).

Redondo cn, in 554 m (? 1, tube attached to mollusk shell).

San Pedro sea valley, in 480 m (2), 461 m (2), 666 m (1).

## protulid

Redondo cn, in 542 m (1), fan, 686 m (1), 706 m (several), 715 m (1 or more).

**Vermiliopsis spp.**

Dume cn, trawled in 80-100 m, rocky bottom (1 or more, attached to rocks).

Santa Monica cn, trawled in 80 m, rocky bottom (1 or more).

## spirorbids

La Jolla cn, in 371 m (1), 637 m (100 or more, on algal strands).

## Polychaete, unknown

Coronado cn, in 812 m (1). A very long, slender, threadlike specimen has parapodia consisting of a small orbicular lobe and setae consisting of single acicular spines and a few limbate setae in each fascicle. It is associated with a deepwater fauna.

## Additional notes on SOLENOGASTERS

These wormlike mollusks have been most frequent in depths below 200 meters, in offshore canyons. Fifteen species in three genera are named by Schwabl (1963, in press). Most numerous are species of *Crystallophrisson*, followed by *Prochaetoderma* and *Limifossor*.

**Limifossor fratula** Heath, 1911

Schwabl, 1963, in press

Redondo cn, 310 m (4), 344 m (1), 422 m (9), 459 m (1), 602 m (2), 652 m (2), 810 m (1).

San Pedro sea valley, 459 m (1).

**Crystallophrisson hartmani** Schwabl, 1963, in press

Redondo cn, 310 m (2), 422 m (1), 459 m (1), 575 m (3), 602 m (1), 652 m (1).

**Crystallophrisson riedli** Schwabl, 1963, in press

Redondo cn, 575 m (2).

**Crystallophrisson rubrum** Schwabl, 1963, in press

Redondo cn, 575 m (1).

**Crystallophrisson scabrum** Heath, 1911

Redondo cn, 422 m (3), 465 m (2).

**Crystallophrisson spp.**

Monterey cn, 211 m (7).

Dume cn, 299 m (1), 374 m (1), 398 m (1), 507 m (1), 530 m (9), 580 m (6).

San Pedro sea valley, 50-150 fms (2), 461 m (7).

Redondo cn, 378 m (1), 422 m (2), 437 m (1), 503 m (6), 560 m (1).



Newport cn, 170 m (1), 211 m (4), 272 m (1), 420 m (5), 478 m (2), 553 m (1), 642 m (3).

La Jolla cn, 793 m (12).

Coronado cn, 566 m (8).

**Prochaetoderma californicum** Schwabl, 1963, in press

Dume cn, 374 m (5), 580 m (6).

Newport cn, 170 m (3), 178 m (2), 478 m (1), 553 m (10).

Coronado cn, 566 m (36).

Catalina cn, 379 m (6).

Additional Notes on PELECYPODS.

**Dacrydium pacificum** Dall, 1916

Fig. 4a-c.

Soot-Ryen, 1955, p. 86 (review of the genus).

Newport cn, 553 m (1).

San Diego trough, 343 m (1), 381 m (1), 420 m (1).

San Clemente rift valley, 1620 m (? 5).

All specimens are dead valves, but some fresh as though not long dead. Specific identity has been verified by Dr. Myra Keen, Stanford University and Dr. Harald Rehder, United States National Museum. Its occurrence from the type locality, Bering Sea in 1401 fms, is of some interest since it suggests affinities of the deepwater fauna of southern California with that of Arctic seas.

**Lyonsiella alaskana** Dall, 1894

Fig. 4d.

(Some of the collections were identified by Dr. Myra Keen).

Newport cn, 553 m (1).

Coronado cn, 566 m (3).

Catalina cn, 379 m (1).

This species was first described from the Gulf of Alaska, in 1569 fms, in green ooze. Its present distribution is limited to the deeper parts of submarine canyons. The valves are characteristic (Fig. 4d), cordate in shape, thin and delicate, and externally sculptured with radiating ridges.

**Saxicavella pacifica** Dall, 1916

This species is given special notice because it occurs in peak numbers at some places.

Monterey cn, 211 m (6).

Hueneme cn, 177 m (99), 373 m (9), 376 m (12).

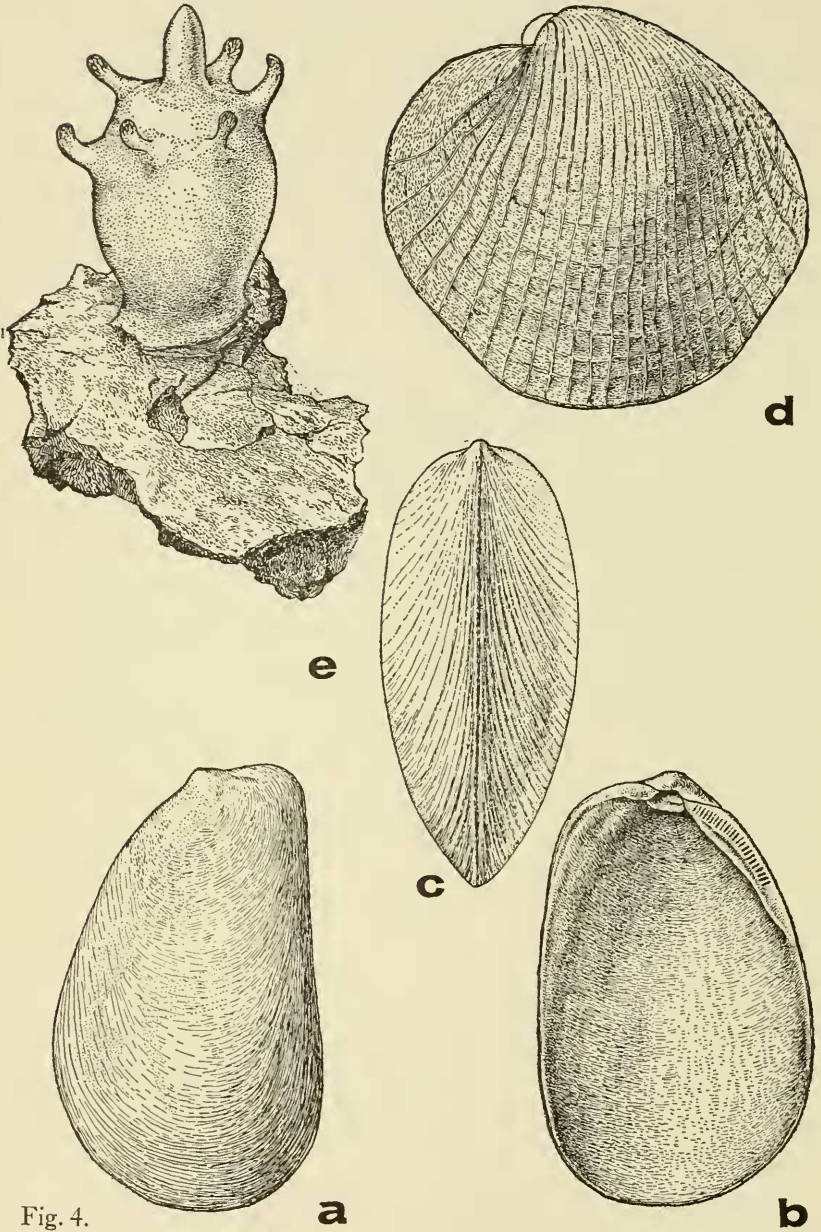


Fig. 4.

a, *Dacrydium pacificum* Dall, Sta. 6820, San Diego trough, shell in outer, left lateral view, x 11; b, same, shell seen from within, x 13; c, connected valves seen in posterior edge, x 13; d, *Lyonsiella alaskana* Dall, Sta. 6852, Coronado canyon, shell in exterior view, x 11; e, Gastropod egg capsule attached to a rock, Sta. 6805, Santa Cruz canyon, x 0.92.

San Pedro sea valley, 319 m (21).

Newport cn, 272 m (7), 420 m (10), 478 m (17).

*Amygdalum pallidulum* (Dall) 1916

Redondo cn, 76 m (240).

La Jolla cn, 545 m (8).

This nest-building mytilid was redescribed by Soot-Ryen (1955, p. 69).

*Yoldia scissurata* Dall, 1898

Redondo cn, 148 m (27).

Newport cn, 170 m (2 large), 211 m (2) measure 30 by 14 mm.

*Solemya panamensis* Dall, 1908

Santa Monica cn, 116 m (21 large).

Its occurrence in polluted areas is of some interest, since it thrives where few other mollusks are found.

*Macoma incongrua* (Martens) 1865

The greatest concentration of this deepwater pelecypod occurred in Redondo cn, 148 m (323).

*Acila castrensis* (Hinds) 1843

Hueneme cn, 177 m (4).

Mugu cn, 177 m (68).

Newport cn, 170 m (26), 211 m (110, measure about 11.5 mm long; some are penetrated by a drill).

Additional Notes on GASTROPODS.

*Mitrella permodesta* (Dall), 1890

Redondo cn, 611 m (30).

Newport cn, 553 m (27), 642 m (49).

La Jolla cn, 545 m (1), 637 m (10 or more).

Additional Notes on SCAPHOPODS.

*Dentalium rectius* Carpenter, 1864

Monterey cn, 168 m (5); 260 m (present); 410 m (16 living and many dead shells).

Hueneme cn, 209 m (47), 478 m (5).

Mugu cn, 177 m (37).

Redondo cn, axis, 246 m (32).

San Pedro sea valley, 817 m (150 tubes of which some are dead).

Newport cn, 85 m (1), 97 m (3), 140 m (8), 170 m (34), 178 m (50 or more, some large to 20-30 mm long), 272 m (1 large), 420 m (1).

#### Gastropod egg case.

##### Fig. 4e

Santa Cruz cn, in 218 m (3 cases), 221 m (1 case).

Several large opaque white or cream-colored egg cases were taken in two samples, both in Santa Cruz canyon. Each is broadly flask shaped, with a maximum diameter of 21 mm, and 20 mm wide at the base. The largest one measures 40 mm high to the base of the tubules and 23 mm across at its widest part. The flask is slightly constricted near the base, flares distally and gives rise to a larger distal tube and 6 to 13 smaller, slenderer tubules around the distal periphery. The capsule is thick, somewhat chitinized and tough to tear. None of the contents revealed developing young, and since the tubules were entirely opened at their distal ends, it is assumed that the young had escaped before the capsules were taken.

### ECHIUROIDEA

Three or more kinds of echiuroids were taken, only one in abundance. They are summarized here with their occurrences in the canyons. All references may be consulted in Fisher (1949, pp. 479-497).

#### *Arhynchite californicus* Fisher, 1949

Fisher, 1949, pp. 486-487, pl. 30.

as *Arhynchite* sp., in the List of stations and APPENDIX

Monterey cn, in 260 m (3 large); 410 m (4 large).

Hueneme cn, in 373 m (1 and 2 large), 376 m (2).

Dume cn, in 711 m (2).

Santa Monica cn, in 268 m (3 large), 330 m (2), 31 m (1 large), 463 m (1 small).

Redondo cn, in 146 m (2 large), 363 m (2 large), 465 m (2 large), 298 m (4 large).

The largest, from Redondo canyon, measure 140 mm long by 20 mm wide, and are dark blood red in life. The surface is opaque, papillated most intensely at anterior and posterior ends and the middle region of the body obscurely papillated. A single pair of brassy yellow, spinous, distally hooked setae is visible at the anterior ventral end of the body. The proboscis, frequently detached or lost, is long, slender, ribbonlike, distally expanded and pale or white in life. On dissection a

pair of long nephridia can be seen. The anal vesicles are very long. The fecal pellets in the alimentary tract are cylindrical, capsule-shaped, measure (in largest individuals) about 1.72 mm long and 0.64 mm across; when extruded these pellets are slightly annular.

Specimens from Redondo canyon, and perhaps also other canyons, harbor a commensal crab.

The species was first named from Monterey Bay, California, in 222 fms, in soft gray mud. The present specimens are from 146 to 711 meters, southern California.

#### Echiuroid, not identified

Coll.—Newport cn, in 555 m (2), 478 m (tongue of a large one).

La Jolla cn, in 637 m (5).

Catalina cn, in 362 m (1 large), 379 m (1 large).

These individuals differ from *Arhynchite californicus* (above) in having the surface epithelium distinctly papillate throughout and the epithelium is thinner, somewhat translucent.

#### Listriolobus pelodes Fisher, 1946

Coll.—Hueneme cn, in 177 m (75), 183 m (3).

Redondo cn, in 107 m (1 large).

This species is most concentrated in shelflands along the Santa Barbara-Ventura shelf (Barnard and Hartman, 1959, p. 6). The present specimens come from the upper ends of northern canyons. In life specimens are pale or grayish green and somewhat translucent.

### BRACHIOPODA

#### Glottidia albida (Hinds) 1844

Mugu cn, 119 m (41).

Santa Monica cn, in 463 m (2 jv).

Redondo cn, 57 m (7), 741 m (2).

Newport cn, 16 m (1 small), 85 m (1 small), 97 m (2), 170 m (1 small).

This is typically a shelf species, in sandy bottoms; its occurrence in canyons is occasional.

### OLIGOCHAETA

Hueneme cn, in 397 m (5).

Mugu cn, in 573 m (12).

Redondo cn, axis, in 560 m (7).

Coronado cn, in 960 m (2).

The surface epithelium is minutely prickly.

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