scribed with four pairs of branchiae and eyes present; P. pinnata has three pairs of branchiae; eyes were absent in the type material (Ehlers, 1901, p. 163).

P. africana Augener (1918, pp. 402-405, pl. 6, figs. 162-163, textfig. 51) was originally described with a clearly pointed prostomium; the prostomium of P. pinnata is blunt and the widest part of the prostomium is at the anterior margin.

P. pinnata inaequibranchia Caullery (1944, pp. 13-14, figs. 6-7) was described with some slender, narrow auxiliary branchiae arising from the base of the third pair of branchiae. This condition has not been reported from any other population of P. pinnata and the subspecies might be considered a distinct species based on this feature alone.

The differences noted above between P. pinnata and the three species listed are of the order of magnitude normally considered as valid specific characters, and the separation between the four taxa is here maintained.

Distribution: P. pinnata is presently rather badly confused; the species has been reported from world-wide areas in all depths. The known distribution must be considered to be Chile (original record and Hartmann-Schroeder, 1965, p. 211), southern California and western Mexico (Hartman, 1969, p. 161 and the present record), and possibly Angola (Ehlers, 1908, p. 110). All other records are here considered doubtful.

Genus Prionospio Malmgren, 1867

The Prionospio-complex, approximately forty-five named taxa, was reviewed by Foster (1969). She proposed a subdivision of Prionospio Malmgren (1867) into three genera including Apoprionospio Foster (1969), Paraprionospio Caullery (1914) and Prionospio sensu strictu. The generic characters according to Foster should include the development of the first parapodia and the lateral wings on the

peristomium. The distribution and shape of the branchiae were also considered important characters.

Using these characters, Foster recognized Apoprionospio for species with a reduced first setiger, no lateral wings on the peristomium and four pairs of branchiae from the second setiger. The first three pairs of branchiae should be cirriform and only the last should be bipinnate. Paraprionospio was defined by Foster (for P. pinnata Ehlers only) as having distinct and well developed parapodia in the first setiger, well developed peristomial wings, and branchiae present from the first setiger; the number and kinds of branchiae were not included in Foster's definition; presumably three pairs of bipinnate branchiae should be present, since this is the situation in the type species selected (originally by Caullery, 1914).

Left in Prionospio sensu strictu are a number of species with relatively little in common. They all have the first branchiae on setiger 2, but do not otherwise form a coherent group, if the criteria set forth for the two above-mentioned genera are used.

The separation of Paraprionospio from the remainder of the species in the complex appears to be well justified, but the subdivisions proposed by Foster (1969) for the remainder of the genus appear somewhat premature, since several critical species are too poorly known to be fitted well into the system. The separation of Apoprionospio and Prionospio sensu strictu is here retained at the sub-generic level. It is to be hoped that at a later date sufficient material of the different species of Prionospio will become available so that a complete study of the generic groupings of these species can be made.

Prionospio (Apoprionospio) vermillionensis, new species

(Plate 38, Figs. a-d)

Record: 11815 (1, TYPE).

Description: The type is an incomplete specimen which has eighteen setigers; it is 11 mm long and 4 mm wide with setae. It is white and lacks color patterns; the anterior part of the body is slightly flattened; postbranchial segments are cylindrical.

The prostomium (Fig. a) is anteriorly truncate; the lateral sides are parallel and the posterior end is prolonged as a narrow palpode reaching the posterior margin of the first setiger.

The peristomium has well developed lateral wings covering the bases of the palps. The palpal bases are at the level of the posterior part of the wide portion of the prostomium.

The first pair of parapodia is reduced. The notopodium is represented by a few, slender setae only and the neuropodium is a short, laterally directed button without setae.

The second to fourth parapodia (Fig. b) are similar; the notopodium has a truncate to obliquely rounded setal lobe; the presetal lobes follow the outline of the setal lobes closely. The postsetal notopodial lobes increase in size and become more pointed in late branchial segments (Fig. d); each is basally auricular and has a pointed tip which is more distinct in the last than in the first two branchial segments. Branchial neuropodia are all similar; each has a rounded setal lobe, a short, evenly rounded presetal lobe, and a postsetal lobe which varies from evenly rounded to somewhat truncate. The postsetal lobes are more than twice as long as the corresponding setal lobes in all branchial neuropodia.

Postbranchial notopodia (Fig. c) have similar notopodial presetal and setal lobes; each has a rounded setal lobe and a short, rounded presetal lobe. Notopodial postsetal lobes are reduced to short folds from setigers 5-7; from setiger 7 on, they increase in size and in the last segments present, each is a large, auricular slightly folded lobe. Postbranchial neuropodia are all similar; each has oblique setal and presetal lobes, and long, somewhat

irregularly truncate postsetal lobes.

Branchiae are present on setigers 2-5; the first three pairs are thick and digitiform; the last pair is somewhat longer than the others; it is slender and has a double row of fine filaments on the posterolateral margins.

All setae in the present specimen are slender, smooth capillaries; no hooks could be found in any of the segments present.

The sub-genus Apoprionospio as defined by Foster (1969) presently contains six species; these include A. caspersi (Laubier, 1962, pp. 135-148, figs. 1-3), A. dayi Foster (1969, pp. 383-388, figs. 1-11), A. nova (Annenkova, 1938, pp. 175-176, fig. 11), A. pygmaeus (Hartman, 1961, pp. 93-95), and A. saldhana (Day, 1961, pp. 485-497, fig. 3a-h) in addition to A. vermillionensis described above.

A. vermillionensis differs from the other five species in the genus in that the peristomial wings are relatively well developed and the first notopodia are completely reduced, but retain small setal fascicles; the first neuropodia are somewhat better developed, but lack setae. In the other five species, the peristomial wings are very small, sometimes completely absent, and both noto- and neuropodia in the first setiger have at least a few setae.

Distribution: A. vermillionensis is known from one locality in Guaymas Basin, Gulf of California.

Sub-genus Prionospio sensu Foster (1969)

The sub-genus is here accepted to include all species of Prionospio with four or more pairs of branchiae starting on setiger 2 and in which either all branchiae are bipinnate or cirriform or, in species in which both kinds of branchiae occur together, the first three pairs are not cirriform.

As mentioned above, the sub-genus contains a rather varied group of species, which probably are no closer to

each other than they are to members of the other two genera in the Prionospio-complex.

Prionospio (Prionospio) anuncata, new species

(Plate 39, Figs. a-e)

Records: 13743 (1); 13744 (1); 13747 (1); 13755 (1, TYPE); 13756 (2); 13767 (1); 13768 (1); 13774 (1); 13775 (1).

Description: All specimens are posteriorly incomplete; the type, which has 98 setigers, is 45 mm long and 2.5 mm wide without setae. It is whitish yellow and lacks color patterns. Other specimens are light tan.

The prostomium (Fig. a) forms an anteriorly truncate keel; the posterior prolongation reaches the posterior margin of the first setiger; eyes are absent.

The peristomium has a pair of poorly developed lateral wings; the palpal bases are at the posterior corners of the prostomium.

The first parapodia are reduced; both rami have low, truncate setal lobes and rounded postsetal lobes; setae are absent. The second parapodia (Fig. b) are better developed; they have fascicles of setae and the parapodial lobes are well developed in both rami. The setal lobes are truncate, as they are in all other setigers; the presetal lobes follow the outline of the setal lobes closely. The triangular notopodial postsetal lobe is irregularly folded. The neuropodial postsetal lobe is also triangular, but is considerably less folded. The third parapodia are similar to the second. The fourth parapodia (Fig. d) have truncate, digitate dorsal extensions on the notopodial postsetal lobes, but are otherwise similar to the other parapodia. The fifth parapodia (Fig. e) resemble the second and third ones closely. Posterior parapodia have rounded auricular postsetal lobes in both noto- and neuropodia; the notopo-

dial lobes are twice as long as the neuropodial ones.

Branchiae are present on setigers 2-5; the first pair is very long, reaching the fifteenth or sixteenth setiger, each measuring 7 mm in one specimen. There is a double row of fine pinnae on the posterolateral margins. The second and third pairs of branchiae are thick and smooth. The fourth pair has double rows of fine pinnae on the posterior face; it is shorter than the third pair.

Setae include slender capillaries in dense fascicles in both noto- and neuropodia. Hooded hooks are present in the neuropodia from setiger 30 in the type; the first occurrence of the hooks varies from setigers 27-32 in the present specimens. Notopodial hooks are absent. Each hook (Fig. c) has a large main fang and a crest of five to seven teeth; the hoods are short and distally rounded.

P. anuncata resembles P. fallax Söderström (1920, pp. 235-237, figs. 144-145), P. malmgreni dubia Day (1961, pp. 489-490, fig. 3j-n), P. sishaensis Wu and Chen (1964, pp. 54-60, pl. 1, figs. 1-8), P. steenstrupi Malmgren (1867, p. 202, pl. 10, fig. 55), and P. steenstrupi malayensis Caullery (1914, p. 355, fig. 1; see also Caullery, 1944, pp. 14-16, fig. 8). All these species have four pairs of branchiae of which the first and last are bipinnate and the second and third are smooth. Neuropodial hooded hooks are present before setiger 20 in all species mentioned, except in P. anuncata where they are not present before setiger 27.

Distribution: P. anuncata has been found from Punta San Telmo to off Cabo Falso along the Mexican coast in depths greater than 1000 m.

Prionospio (Prionospio) cirrifera Wirén, 1883

Prionospio cirrifera Wirén, 1883, pp. 409-410; Hartman, 1969, p. 155.

Record: 11809 (1).

Remarks: P. cirrifera has five or six pairs of branchiae from the second setiger; all branchiae are cirriform. Neuropodial hooks are present from setiger 20, and the notopodial postsetal lobes in the first setigers are large and distally pointed.

Distribution: P. cirrifera has been reported from the Bering Sea and other areas in the eastern Pacific Ocean; the present record is from the Gulf of California in 1775 m depth.

Prionospio (Prionospio) lobulata, new species

(Plate 40, Figs. a-e)

Record: 7233 (1, TYPE).

Description: The type is an incomplete specimen which has 31 setigers; it is 6 mm long and 1 mm wide with setae. It is white and lacks color patterns, except for the eyes which are dark reddish brown. The branchial region is slightly dorsoventrally flattened; the rest of the body is cylindrical.

The long prostomium (Fig. a) is narrow with a truncate anterior margin and a relatively wide posterior prolongation. Three pairs of eyes are present. The peristomium is narrow and fused with the first setiger; the peristomial wings are completely reduced.

The first setiger (Fig. c) is well developed with neuropodial and notopodial postsetal lobes and setal fascicles in both rami. The notopodial postsetal lobes in the first five setigers have distally a long, slender cirriform prolongation; those in the first two setigers are short, but are otherwise similar to the postsetal lobe further back. The largest notopodial postsetal lobe is on setiger 3 where each lobe is only slightly shorter than the corresponding branchia. Each of the large notopodial postsetal

lobes in the postbranchial region is auricular; the cirriform distal prolongation is absent. The notopodial lobes are slowly reduced posteriorly, but retain the same shape in all setigers present.

The neuropodial postsetal lobes are of the same auricular shape in all setigers, but are reduced to low, barely visible folds by setiger 18. Interramal pouches are present from setiger 6 to the end of the fragment.

There are four pairs of branchiae (Fig. c), starting at setiger 2; The first pair is the largest; each branchia has a large area covered with small, digitiform pinnae on the posterior face. The second and third pairs of branchiae are similar; each is shorter than the first pair and is distinctly bipinnate, with relatively sparse, long pinnae laterally. The fourth pair of branchiae is cirriform; each is nearly as long as the first branchia and slender.

All parapodia have long, slender, capillary setae; hooks are present in the neuropodia from setiger 19. Each hook (Fig. b) has a large main fang and a crest of approximately fifteen teeth; seen from the lateral side, this appears as a crest of five slender teeth.

Species of Prionospio sensu strictu with at least one pair of branchiae covered with short, digitiform pinnae arranged in a large patch include P. bocki Söderström (1920, pp. 234-235, fig. 142), P. heterobranchia Moore (1907, pp. 195-197, pl. 15, figs. 1-6), P. heterobranchia newportensis Reish (1959, pp. 13-15, pl. 6, fig. 5), P. malmgreni Claparède (1870a, pp. 73-76, pl. 22, fig. 3), P. plumosus M. Sars (1872, p. 410, also: 1873, pp. 263-268, pl. 17, figs. 13-29) and P. steenstrupi malayensis Caullery (1914, p. 355, fig. 1, also: 1944, pp. 14-16, fig. 8).

P. heterobranchia and P. heterobranchia newportensis have five pairs of branchiae of which at least the first and last pairs have patches of pinnae; the second and third pairs are smooth and the fourth pair may be bipinnate or may have a patch of smaller pinnae.

P. malmgreni has eight pairs of branchiae of which the first four pairs have patches of pinnae; the last four

pairs are smooth, according to Claparède (1870).

P. bocki has a patch on the first pair; the fourth pair is bipinnate. P. steenstrupi malayensis, which definitely appears to be specifically different from the stem-species, has patches on the first and fourth pairs, and the two median pairs are smooth. Finally, P. plumosus has patches on the first, second and fourth pairs, with only the third pair smooth.

P. lobulata has patches on only the first pair of branchiae; the second and third pairs are bipinnate and the fourth pair smooth. These species can definitely be separated on the basis of the structure of the different pairs of branchiae alone, but differences in the distribution of the neuropodial hooks and the shape of the notopodial postsetal lobes is also noticeable.

Distribution: P. lobulata is known from one locality in the vicinity of Cedros Island, Baja California, in 567 m depth.

Prionospio (Prionospio) malmgreni Claparède, 1870

Prionospio malmgreni Claparède, 1870a, pp. 73-76, pl. 22, fig. 3; Hartman, 1969, p. 159, partim.

Records: 7358 (2); 13767 (1).

Remarks: The species is here accepted as originally defined by Claparède (1870a) who described it as having six to eight pairs of branchiae, of which the anterior four have patches with numerous short pinnae. As described by Hartman (1969) this species should also include forms with less numerous pairs of branchiae and a rather varied branchial structure; it is probable that more than one species has been included in the concept of P. malmgreni as defined by Hartman (1969).

Distribution: P. malmgreni has been reported from world-wide areas; in view of the poor definition of the species, it is difficult at present to define its geographical distribution.

Prionospio, species indeterminable

Records: 6212 (3); 13752 (3).

Remarks: All six specimens have lost all branchiae and are thus indeterminable.

Genus Spiophanes Grube, 1860

Three species of this genus have been found in deep waters off western Mexico.

Spiophanes anoculata Hartman, 1960

Spiophanes anoculata Hartman, 1960, p. 118; Hartman, 1969, p. 179.

Record: 7231 (4).

Remarks: S. anoculata is primarily characterized by the very long, slender, nearly cirriform frontal horns on the prostomium and the marked reduction of the first notopodia. The nuchal ridges are short and the neuropodial hooks are bidentate.

Distribution: S. anoculata is known from deep water off southern California; the present record is from the vicinity of Cedros Island in 2401-2480 m depth.

Spiophanes fimbriata Moore, 1923

Spiophanes fimbriata Moore, 1923, pp. 179-182; Hartman, 1969, p. 183.

Records: 7234 (1); 11807 (1); 11815 (1); 13743 (1); 13767 (1).

Remarks: S. fimbriata has a truncate prostomium without frontal horns; the peristomium is rather wide and the anterior parapodial lobes are large and rounded, except for the notopodial postsetal lobes which are ligulate in anterior parapodia. The neuropodial hooks are quadridentate.

Distribution: S. fimbriata is known from central and southern California in deep water; the present records come from widely separated areas in western Mexico in similar depths.

Spiophanes pallidus Hartman, 1960

Spiophanes pallidus Hartman, 1960, pp. 118-119, pl. 10, figs. 1-2; Hartman, 1969, p. 187.

Record: 6213 (1).

Remarks: S. pallidus has a truncate prostomium without frontal horns; the peristomium is narrow and an antenna is absent. The neuropodial hooks have a crest of several smaller teeth above a large main fang. The identification of the specimen reported above is somewhat dubious in that the first segments have been rather severely crushed and the Spiophanes hooks cannot be identified. It agrees with this species in all other features.

Distribution: S. pallidus is known from southern

California in deep water; the present record is from Bahia de San Cristobal, Baja California in 264 m depth.

Spionidae, indeterminable

Records: 7231; 7236; 11759; 11761; 11792; 11815; 13724; 13727; 13743; 13747; 13753; 13755; 13756; 13767; 13768; 13774; 13775.

Remarks: All these samples contain specimens which are too incomplete or fragmentary to permit closer identification.

Family MAGELONIDAE Cunningham and Ramage, 1888

Genus Magelona Müller, 1858

Magelona californica Hartman, 1944

Magelona californica Hartman, 1944b, pp. 320-321, pl. 28, figs. 10-14; Jones, 1963, p. 23; Hartman, 1969, pp. 191-192, 5 figs.

Record: 13767 (3).

Remarks: The prostomial features, parapodial lobes and setal structures are as described by Hartman (1944b). The prostomium is anteriorly rounded; the parapodial lobes are slightly clavate when seen in full view, and the abdominal hooks are bidentate.

Distribution: M. californica was described from shallow bays off southern California; the present record is the only one known from deep water and comes from the Tres Marias Islands.

Family POECILOCHAETIDAE Hannerz, 1956

Poecilochaetus johnsoni Hartman, 1939

Poecilochaetus johnsoni Hartman, 1939c, pp. 164-166, pl. 30, figs. 14-24; Hartman, 1969, p. 203.

Records: 7234 (1); 13744 (1); 13747 (1).

Remarks: One of the present specimens is a small complete worm. It agrees well with the original description, except that the epithelium appears to be covered with a mucus coat in which sand grains have been caught.

Distribution: P. johnsoni is known from southern California and from areas in the southeastern United States. The present records are from the vicinity of Cedros Island, Baja California, and off Punta San Telmo on the mainland slope of the Central American Trench.

Family CHAETOPTERIDAE Malmgren, 1867

Genus Phyllochaetopterus Grube, 1863

Phyllochaetopterus limicolus Hartman, 1960

Phyllochaetopterus limicolus Hartman, 1960, pp. 120-122, pl. 10, figs. 3-5; Hartman, 1969, pp. 215-216.

Records: Gulf of California, Scripps, GC 26 (2+); L-190 (2+); P 65-59 (2+); P 131-59 (1+).

Remarks: The present specimens are all incomplete; they agree with P. limicolus in the number of segments in the anterior and middle regions and in the shape of the modified setae on segment 4. The tubes are slightly coarser than in specimens from southern California and the annu-

lation of the tube is slightly better developed.

Distribution: P. limicolus is known from basin depths off southern California; the present records are from similar depths in the southern and central parts of the Gulf of California.

Phyllochaetopterus, species indeterminable

Record: P 65-59 (fragments and tubes).

Remarks: These tubes are considerably larger than those of P. limicolus; the fragments of the animals are too incomplete to allow any further identification.

Chaetopteridae, indeterminable

Records: Scripps st. GC 26 (tubes); Stephen Calvert st. 1-184 (fragment and tubes); 11815; ALBATROSS st. 3393 (MCZ, tubes).

Remarks: The tubes are of the diameter usually found in species of Phyllochaetopterus; the fragment from st. L-184 is a posterior fragment resembling the posterior portion of a Phyllochaetopterus, but this cannot be determined with any accuracy since species of other genera have very similar posterior body regions.

Family CIRRATULIDAE Carus, 1863

Four members of this family have been found in the material from western Mexico.

Key to Species from Deep Water off Western Mexico

1. Posterior parapodia with large spines, at least in the neuropodia..... 2.
1. All parapodia with long capillary setae only..... 3.
2. Posterior spines form nearly complete cinctures around the body..... Chaetozone setosa
2. Posterior spines limited to two or three in the neuropodia..... Cirratulus sinincolens
3. Posterior end inflated; median setigers moniliform..... Tharyx monilaris
3. Posterior end tapering; median setigers distinctly shorter than wide..... Tharyx multifilis

Genus Chaetozone Malmgren, 1867

Chaetozone setosa Malmgren, 1867

Chaetozone setosa Malmgren, 1867, p. 206, pl. 15, fig. 84; Hartman, 1969, pp. 241-242, 3 figs.

Records: 7231 (32); 7234 (19); 11769 (1); 13756 (1).

Remarks: The present specimens agree well with C. setosa as described from the north Atlantic Ocean. The spines are first present from approximately setigers 25-35 in the neuropodia and somewhat further back in the notopodia. The posterior spines form nearly complete cinctures around the body; they are interspersed with fine, capillary setae.

Distribution: C. setosa is considered cosmopolitan in shallow waters. The present records are from deep slope and abyssal depths off Cedros Island, Baja California, in the southern end of the Gulf of California, and off Cabo Corrientes.

Chaetozone, species indeterminable

Records: 7234 (fragment); 13755 (fragment).

Remarks: These fragments have the characteristic distribution of setae found in species of Chaetozone, but cannot be further identified.

Genus Cirratulus Lamarck, 1801

Cirratulus sinincolens Chamberlin, 1919

Cirratulus sinincolens Chamberlin, 1919, pp. 377-379, pl. 70, figs. 7-10.

Earlier Records: Chamberlin (1919, p. 379): ALBATROSS st. 3435 (TYPE, USNM No. 19727). Chamberlin (1919, p. 328): ALBATROSS st. 3424 (1, as Lumbrineris bifilaris, USNM No. 19732).

New Records: 11791 (2); 11815 (2).

Remarks: C. sinincolens is a large species; the anterior end is dorsoventrally flattened. The parapodia are well separated and are blunt cones in median and posterior setigers. Spines are present from setigers 17-18 in the neuropodia. Each spine is straight and evenly tapering. Two or three spines may be present in a parapodium. Notopodial spines were not seen, but none of the specimens are complete.

Distribution: C. sinincolens is known from four localities in the middle and upper parts of the Gulf of California.

Genus Tharyx Webster and Benedict, 1887

The separation of the several species of Tharyx is very difficult and the identifications given below must be considered temporary. It is possible that identification of species in this genus will have to depend on the use of live material or be based on developmental or other criteria not usually considered taxonomically.

Tharyx monilaris Hartman, 1960

Tharyx monilaris Hartman, 1960, pp. 127-128, pl. 12, figs. 1-2; Hartman, 1969, pp. 261-262, 2 figs.

Records: 6213 (1); 7231 (1); 11753 (5); 11791 (1); 11792 (2); 11805 (appr. 150); 11826 (1); 12134 (3); 13727 (4); 13731 (4); 13753 (1); 13755 (9); 13774 (4); 13775 (5); 13780 (1); Scripps st. GC 26 (4).

Remarks: The posterior end of T. monilaris is distinctly inflated and the median setigers are moniliform. The setae in sexually mature specimens are at least three times longer than in immature ones.

Distribution: T. monilaris is known from shelf and slope depths off southern California. The present records are from slope and abyssal depths in all areas off western Mexico.

Tharyx multifilis Moore, 1909

Tharyx multifilis Moore, 1909, pp. 267-268, pl. 9, fig. 43; Hartman, 1969, pp. 263-264, 1 fig.

Records: 6213 (1); 7231 (7); 7234 (2); 7358 (3); 11788 (1); 11792 (2); 11793 (2); 11806 (36); 11807 (23);

11808 (8); 11809 (47); 11810 (9); 11812 (2); 11830 (1); 11837 (1); 12135 (2); 13724 (4); 13727 (7); 13733 (2); 13742 (4); 13743 (3); 13744 (4); 13747 (4); 13752 (7); 13753 (7); 13755 (6); 13756 (32); 13767 (4); 13768 (7); 13775 (9); 13782 (3); Stephen Calvert st. L-190 (3).

Remarks: T. multifilis is a large and coarse species with the segments densely crowded in most parts of the body. The posterior end is evenly tapering. The parapodia are usually ventrolateral so that the dorsum is high and strongly arched.

Distribution: T. multifilis has been found in all depths off southern California. The present records indicate that it is equally widespread in deep water off western Mexico.

Cirratulidae, indeterminable

Records: 7231 (fragm.); 7235 (fragm.); 11792 (fragm.); 11809 (fragm.); 13727 (fragm.)

Remarks: These fragments are of median setigers and cannot be further identified.

Family COSSURIDAE Day, 1963

Four species have been found in the material from western Mexico; three of these are newly described below.

Members of this family are simply constructed; each has a pointed or rounded prostomium without appendages, one or two peristomial segments, a single mid-dorsal tentacle on one of the first setigers, and simple, short parapodia. All setae are simple; two or three kinds of setae may be present. The setae are marginally covered with fine spines or hairs in most species, but may be completely smooth.

The thickness of the different kinds of setae and the length and organization of the marginal setation are important specific characters.

One of the species described below, C. sima, has a sharp break between thorax and abdomen at approximately setiger 28; this has not been described for any other member of the family.

Key to all Known Species of Cossura

1. Parapodia posterior to setigers 28-30 with a single, coarse spine and a fine capillary seta in each ramus ..... sima
1. All setae either limbate with marginal serrations or smooth; no abrupt changes in the structure of the setae along the body..... 2.
2. One peristomial segment present..... 3.
2. Two peristomial segments present..... 6.
3. Tentacle inserted in the second setiger..... ..... longocirrata sensu Wesenberg-Lund, 1950
3. Tentacle inserted in the third setiger or later.... 4.
4. Tentacle inserted in setiger 4 or 5; all setae similar..... alba
4. Tentacle inserted in setiger 3; setae of two kinds 5.
5. Coarse setae in neuropodia only; all setae with marginal setation; eyes absent..... ..... delta
5. Coarse setae in both noto- and neuropodia; all setae smooth; eyes present.. laeviseta
6. Tentacle inserted in second setiger..... 7.
6. Tentacle inserted in third setiger..... 9.
7. Only first parapodia uniramous..... ..... soyeri
7. Six or more anterior parapodia uniramous..... 8.
8. Six uniramous anterior parapodia..... ..... pygodactyla

8. Eight uniramous anterior parapodia..... ..... longocirrata sensu Webster and Benedict, 1887
9. All parapodia biramous..... 10.
9. First parapodia uniramous..... 11.
10. Both slender and coarse setae in noto- and neuropodia..... candida
10. Coarse setae in both noto- and neuropodial fascicles; slender setae in notopodial fascicles only..... ..... coasta
11. Coarse setae in neuropodia only..... ..... rostrata
11. Coarse setae in both noto- and neuropodia..... 12.
12. First peristomial segment complete; both peristomial segments together as long as the prostomium..... ..... brunnea
12. First peristomial segment incomplete dorsally and ventrally; both peristomial segments together shorter than the prostomium.. chilensis

Cossura brunnea, new species

(Plate 41, Figs. a-e)

Records: 11807 (1, TYPE); 13733 (2); 13742 (5); 13744 (3); 13747 (2); 13756 (4); 13767 (1); 13774 (5); 13775 (8); 13781 (2); 13782 (3).

Description: The type is an incomplete specimen which has sixty-three setigers; it is 8 mm long and 0.5 mm wide without setae. It is cylindrical; the anterior end is pale yellow and a pale yellow mid-dorsal and mid-ventral band persists through the first twenty setigers. The rest of the body is evenly covered with a dark brown pigment.

The conical prostomium (Fig. e) is anteriorly round-

ed. Both peristomial segments are of the same length and form with the prostomium an evenly tapering cone which is only slightly longer than the length of the first setiger.

The parapodia are low folds; the setae are at the anterior margin of each segment in the first ten to fifteen setigers and are placed more in the middle of the setigers that are in the median and posterior portions of the body. The dorsal body wall is swollen into a low mound above the base of each notopodium in median and posterior setigers.

The tentacle is attached to the third setiger at the level of the parapodia. It is evenly tapering with a wide base. The tip of the tentacle is broken; the remaining portion is as long as the total length of the specimen.

Setae are of four kinds. Anterior setigers to setiger 10 have two kinds of setae. Anteriorly and medially in each fascicle are found three or four thick, marginally coarsely serrated setae (Fig. b) with abruptly tapering tips. The distal portion of the marginal setation is finer than that near the base and may resemble the pilose condition found in other setae. Posteriorly and externally in each fascicle are found three or four slender, evenly tapering setae (Fig. a) which are at least twice as long as the median setae. Each of the slender setae has a very narrow border of fine, evenly spaced hairs.

Median and posterior setigers have two kinds of setae. The coarse, short kind (Fig. c) has a dense, thick border of fine hairs along one side; the slender, long kind (Fig. d) has a narrow border of short, well organized hairs in what resembles a limbate condition.

C. brunnea resembles C. candida Hartman (1955) and C. rostrata, new species closely in that all three species have the tentacle attached to the third setiger and two peristomial segments. Furthermore, all three species have two fascicles of setae in all noto- and neuropodia. The three species differ in the shape and distribution of the different kinds of setae.

C. brunnea has four different kinds of setae, of which two are present in anterior setigers and two in

median and posterior setigers; C. candida and C. rostrata have two kinds of setae each and the setae from anterior setigers resemble those from posterior setigers.

C. brunnea has a dark pigment pattern over the median and posterior parts of the body; C. candida and C. rostrata are white.

Distribution: C. brunnea is known from Guaymas Basin in the Gulf of California and from the mainland slope of the Central American Trench from Bahia Zihuantanejo to off Cabo Falso.

Cossura candida Hartman, 1955

Cossura candida Hartman, 1955, pp. 44-45, pl. 1, figs. 1-5; Hartman, 1969, p. 271.

Records: 6213 (1); 7231 (1); 7234 (1); 13724 (1).

Remarks: C. candida has the tentacle attached to the third setiger; it has two peristomial segments and the body is white. There are two kinds of setae in all fascicles. The short, coarse setae are anterior and have relatively short, stiff hairs along the cutting edge; the longer setae have a dense border of fine hairs. All parapodia are biramous.

Distribution: C. candida is known from southern California in shelf, slope and basin depths; the present records are from the vicinity of Cedros Island, Baja California and off Acapulco in the Central American Trench in slope depths.

Cossura rostrata, new species

(Plate 41, Figs. f-h; Plate 42, Fig. a)

Records: 11744 (1); 11759 (2, TYPE); 13743 (4); 13752 (9).

Description: The type is an incomplete specimen which has 57 setigers; it is 11 mm long and 1.2 mm wide with setae. It is white; a color pattern is absent.

The prostomium (Pl. 41, Fig. f) is approximately as long as wide with a rounded frontal and truncate posterior margin. Both peristomial segments are of the same length; each is approximately as long as the prostomium. The tentacle is inserted in the third setiger. It is distally broken, but the remaining portion is as long as the specimen. The tentacle is evenly tapering with a relatively narrow base.

The parapodia are low mounds; the first one is uniramous; all others are biramous. The setae are arranged in two fascicles in both noto- and neuropodia (Pl. 42, Fig. a). Each fascicle has its own muscle attachments. The anterior fascicle in the neuropodia has three coarse, bluntly tapering setae (Pl. 41, Fig. h); the margin of each seta has a single row of fine, closely appended hairs. The anterior fascicle in each notopodium has seven or eight setae; each seta is more slender than the corresponding seta in the neuropodia, but is otherwise similar. The posterior fascicles consist of four or five setae in both noto- and neuropodia. Each of the posterior setae (Pl. 41, Fig. g) is slender, with a wide, very well defined single row of hairs along the cutting edge.

C. rostrata resembles *C. candida* closely. The first parapodia are uniramous in *C. rostrata* and biramous in *C. candida*. The anterior neuropodial setae are nearly twice as thick as the notopodial ones in *C. rostrata*; in *C. candida* the anterior setae are of the same thickness in both noto- and neuropodia. The marginal setation of the

setae in C. candida consists of a thick, divergent brush border; the hairs are arranged in one plane, making up a single cohesive fan along the cutting edge of each seta in C. rostrata.

Distribution: C. rostrata is known from Mazatlan Basin to off Punta San Telmo in the Central American Trench.

Cossura sima, new species

(Plate 42, Figs. b-d; Plate 43, Figs. a-d)

Records: 11739 (2, TYPE); 11744 (1); 13733 (2); 13753 (1); 13755 (3); 13756 (1); 13765 (1).

Description: The type is an incomplete specimen which has 55 setigers; it is 26 mm long, of which 9 mm is in the thorax, and 1.5 mm wide with setae. It is yellow with dark brown pigment spots at the base of each parapodium in the anterior part of the body; the posterior part of the thorax and abdomen is evenly yellow.

The prostomium (Pl. 43, Fig. a) is shorter than wide with a bluntly rounded anterior margin and a nearly transverse posterior margin. Each of the two peristomial segments is as long as the prostomium. The prostomium and the peristomial segments form a blunt cone.

The short, cylindrical tentacle is attached to the third setiger at the level of the parapodia.

The parapodia are low folds in all setigers. Each is near the anterior margin in the thorax and near the middle of each segment in the abdomen.

The thorax has long, limbate setae. At setiger 29 (Pl. 43, Fig. b) in the type (setiger 29 or 30 in other specimens) the setae become abruptly different. The intersegmental lines are clearly marked in the abdomen where each septum may be seen as a slightly raised ridge on the surface; in the thorax they are visible only laterally.

Setae in the thorax are in three fascicles in both noto- and neuropodia (Pl. 42, Fig. c). The anteriormost fascicle has four or five stout, tapering setae (Pl. 43, Fig. d); each seta has a narrow border of fine hairs arranged in a dense field along the cutting edge. The slender setae of the median fascicle (Pl. 42, Fig. d) are smoothly tapering; each has a narrow border of hairs of approximately the same length as the thickness of the setae at their widest. The posterior fascicles have five to seven setae each; each seta (Pl. 42, Fig. b) is slender and has a dense border of fine, extremely long hairs along the cutting edge.

Setae in the abdomen (Pl. 43, Fig. c) include a thick, externally rifled, dark spine in each noto- and neuropodium. This thick spine is accompanied by a single, long, slender smooth capillary seta.

C. sima differs from all known cossurids in that it has two abruptly different body regions. The thorax has setae resembling those found in other cossurids; the setal configuration found in the abdomen does not resemble anything found in any other cossurid.

Distribution: C. sima is known from the Central American Trench from the Tres Marias Islands to off Bahia Zihuantanejo.

Family FLABELLIGERIDAE Saint-Joseph, 1894

The generic subdivision of this family is unsatisfactory, as already remarked by Chamberlin (1919, p. 397). An attempt is here made to clarify some genera related to or synonymous with Pherusa Oken (1807). The genera included in this survey are, in addition to Pherusa, Diplocirrus Haase (1915), Ilyphagus Chamberlin (1919), Pantoithrix Chamberlin (1919), Piromis Kinberg (1867) and Therochaeta Chamberlin (1919). A survey of species recognized in these genera or described in one of the many genera now considered

synonymous with Pherusa is given in Appendix 3. Species included in the list are those listed in Hartman (1959, 1965a) with the addition of later described species. Species characterized as incompletely known, unrecognizable, or species considered synonyms after a re-examination of the type materials have been omitted.

The most critical generic characters lie in the structure of the prostomium and peristomium, which are retractable in most flabelligerids and are thus often difficult to investigate and interpret. The present revision is considered temporary since the cephalic structures have been inadequately or incompletely described for several species.

The genera can be defined only with difficulty and there appears to be considerable overlap between several of them. The working definitions used here are:

Diplocirrus Haase (1915): Cephalic cage absent or present; all setae cross-barred capillaries; epithelium usually covered with long papillae. Four pairs of branchiae of two different kinds present. Body with a distinct, usually narrow tail. Genotype: D. glaucus (Malmgren, 1867).

Ilyphagus Chamberlin (1919): Similar to Diplocirrus except body usually stout, flattened and nearly disc-shaped. Branchial distribution unknown in genotype. Genotype: I. bythincola Chamberlin (1919).

Pantoithrix Chamberlin (1919): Cephalic cage present; branchial membrane with 6 pairs of branchiae (See Schmarda, 1861, pl. 20, fig. 170); notosetae include serrate and plumose capillaries and bidentate hooks. Genotype: P. chilensis (Schmarda, 1861).

Pherusa Oken (1807): Cephalic cage formed from two or three anterior setigers; short branchial membrane with four to many pairs of branchiae. Neuropodial setae include anterior cross-barred capillaries and median and posterior hooks; the latter may be uni- or bidentate. Genotype: P. plumosa (O.F. Müller, 1776).

Piromis Kinberg (1867): Cephalic cage present; branchial membrane prolonged dorsally in a single or double

tongue; many pairs of branchiae always present. Neuropodial setae include anterior cross-barred capillaries and median and posterior hooks; the latter may be uni- or bidentate. Genotype: P. arenosus Kinberg (1867).

Therochaeta Chamberlin (1919): Cephalic cage present; a distinct incision present behind the setigers forming the cephalic cage; a series of large papillae on the first setigers following the incision. Usually with composite neuropodial hooks in some anterior setigers; more posteriorly with simple hooks in similar positions. Genotype: T. collarifera (Ehlers, 1887).

Key to Species from Deep Water off Western Mexico

1. Some or all neuropodial setae composite..... 2.
1. Neuropodial setae pseudocomposite or simple..... 3.
2. All neuropodial setae composite; cephalic cage absent..... Flabelligella mexicana
2. Neuropodial setae composite in setigers 4-6 only; cephalic cage present..... Therochaeta pacifica
3. Anterior setae prolonged and directed forwards forming a cephalic cage..... 4.
3. Cephalic cage absent..... 7.
4. All setae cross-barred capillaries..... ..... Diplocirrus micans
4. Neuropodial setae in post-cephalic setigers simple hooks..... 5.
5. Branchial membrane prolonged into a tongue; neuropodial setae bifid in median setigers..... ..... Piromis hospitis
5. Branchial membrane short; all neuropodial hooks distally entire..... 6.
6. Neuropodial setae with oblique internal striations..... ..... Pherusa abyssalis
6. Neuropodial setae cross-barred..... ..... Pherusa ?inflata

7. All setae cross-barred capillaries; body densely covered with long papillae... Ilyphagus bythincola
7. Some setae acicular; body with a few large papillae or nearly smooth..... 8.
8. Dorsum with a series of very large papillae..... 9.
8. Dorsum nearly smooth..... 10.
9. Body evenly covered with sand; neuropodial setae with long, slender tips..... Brada pluribranchiata
9. Body with sediments on papillae only; neuropodial setae blunt..... Brada verrucosa
10. Epithelium smooth and iridescent; one large papilla between each noto- and neuropodium..... ..... Fauveliopsis glabra
10. Epithelium rugose and dull; minute papillae on dorsum and ventrum in addition to the large papilla between each noto- and neuropodium... Fauveliopsis rugosa

Genus Brada Stimpson, 1854

Brada pluribranchiata (Moore, 1923)

Stylarioides pluribranchiata Moore, 1923, pp. 222-223.
Brada pluribranchiata Hartman, 1969, pp. 279-280, 7 figs.

Records: 7231 (1); 7358 (1).

Remarks: B. pluribranchiata has large, hemispherical dorsal papillae with distinct narrow tips; the ventral papillae are similar but smaller. Neuropodial setae are drawn out in very fine tips.

Distribution: B. pluribranchiata is known from southern California in deep slope and canyon depths; the present records are from similar depths off Cedros Island, Baja California.

Brada verrucosa Chamberlin, 1919

Brada verrucosa Chamberlin, 1919, pp. 399-400, pl. 68, figs. 3-6.

Earlier Record: Chamberlin (1919, p. 400): ALBATROSS st. 3417 (4, TYPES, USNM Nos. 19341 and 19342).

Remarks: B. verrucosa is a very large species; the type is 60 mm long for 55 setigers. It is dull brownish lead-colored. Notopodia are reduced in the posterior end; notopodial setae are absent in the last twenty setigers and the notopodia are absent in the last ten to fifteen setigers. The papillae resemble those in B. pluribranchiata; they are soft, not hard as described by Chamberlin (1919, p. 399) who appears to have described the papillae as covered by sediment particles.

Distribution: B. verrucosa is known from one locality off Acapulco, Mexico in deep slope depths.

Genus Diplocirrus Haase, 1915

The genus was described by Haase (1915, pp. 194-195) to include those species formerly considered in Stylarioides delle Chiaje (= Pherusa) which had two different kinds of branchiae. Eight branchiae are present; the four dorsal ones are large and foliose; the four ventral ones are cirriform and slender. Three species, D. glaucus, D. hirsutus and D. longisetosus were originally included in the genus.

The generic definition was emended by Day (1967, pp. 665-666) to include another species, D. capensis from South Africa. According to Day, members of the genus can have the noto- and neurosetae similar as originally stated by Haase, or the neurosetae may be distally slightly hooked. The three species originally assigned to the genus have

weakly developed cephalic cages; this structure is absent in D. capensis.

One species is present in the material from western Mexico. A listing of all species in the genus is given in Appendix 3.

Diplocirrus micans, new species

(Plate 44, Figs. a-e)

Records: 7229 (5, TYPE); 7231 (6); 7234 (5); ? 7249 (1); 13754 (fragments).

Description: The type (Fig. a) is a complete specimen which has 25 setigers; it is 11 mm long and 1.5 mm wide without setae. It is white and lacks color patterns. All setae are strongly iridescent. The anterior end has a very sparse cover of fine sand particles; a mucus coat is absent. Four or five short, slender papillae (Fig. d) are present across the dorsum of each setiger; the ventrum is smooth. Long, slender papillae are present in postsetal positions in the anterior parapodia and along the frontal margin. The frontal papillae are single (Fig. a), and the parapodial papillae (Fig. e) emerge in groups of three or four from the same stem.

Parapodia are low, indistinct buttons in all setigers. The distance between noto- and neuropodia is reduced in posterior setigers so that noto- and neurosetae appear to emerge from the same point.

Noto- and neurosetae are similar throughout the length of the body; neurosetae are generally considerably longer than notosetae. Setae from the first two parapodia form a poorly defined cephalic cage, but are otherwise similar to the setae in median and posterior setigers. Each neuroseta (Fig. c) is slender and tapering with widely spaced cross-bars and a short, smooth tip. Each notoseta (Fig. b) is similar, except that the smooth tip is somewhat

longer than in the neurosetae.

Diplocirrus is presently known for five species. D. glaucus, D. hirsutus and D. longisetosus (for references see Appendix 3) have thick coats of papillae; these occur mostly singly in the first two species and in groups of two or three in D. longisetosus. D. micans has four or five short papillae in a transverse row across each setiger and the papillae associated with the parapodia emerge in groups of three or four, but are present only in anterior setigers. The dorsal papillae are so small that macroscopically D. micans appears smooth.

D. capensis differs from the other four species in that the neurosetae are minutely hooked distally and a cephalic cage is lacking.

Distribution: D. micans is known from off Cedros Island, Baja California and off Cabo Corrientes.

Genus Fauveliopsis McIntosh, 1922

Fauveliopsis differs from Brada in that the cephalic structures are not retractable and the epithelium is smooth with few or no papillae. There is no mucus coating as is characteristic of most members of the family.

The genus was revised by Hartman (1967, pp. 123-124) to include a new species from the Antarctic Ocean. Hartman (1969, pp. 283-284) also assigned F. glabra, described in Brada, to this genus.

Two species are present in the material from western Mexico.

Fauveliopsis glabra (Hartman, 1960)

Brada glabra Hartman, 1960, pp. 129-130, pl. 14, figs. 1-2.
Fauveliopsis glabra Hartman, 1969, pp. 283-284, 2 figs.

Records: 7228 (7); 7229 (13); 7231 (9); 7236 (1); 7249 (3); 13744 (1).

Remarks: F. glabra has a completely smooth, iridescent cuticle, except that a large, nearly spherical papilla is present between each noto- and neuropodium. Setae include large, recurved spines and long, slender companion setae in most segments. The anterior spines are only slightly larger than those further back. The body is cylindrical without distinct inflations.

Distribution: F. glabra is known from southern California in canyon and basin depths. The present records are from the vicinity of Cedros Island, Baja California and off Punta San Telmo on the mainland slope of the Central American Trench.

Fauveliopsis rugosa, new species

(Plate 45, Figs. a-e)

Records: 7229 (5, TYPE); 7234 (1); 7235 (1); 13768 (4); 13775 (1).

Description: The type is a complete specimen which has 35 setigers; it is 5.5 mm long and 0.5 mm wide at the widest. It is light grey and lacks color patterns. The anterior end (Fig. a) is slightly inflated; the median portion of the body is cylindrical and the posterior end is strongly inflated. Anterior segments are approximately one-half as long as wide and the intersegmental grooves are distinct. The setigers are very crowded and short in the posterior end and the intersegmental furrows are indistinct posterior to setiger 13. The dorsum has a row of five or six very small, spherical papillae on each segment in the anterior end and the cuticle is distinctly rugose ventrally in all setigers.

The prostomium (Figs. b and d) is a small transverse, slightly bulbous lobe situated on the anterior face of the body. The dorsal margin of the prostomium is indistinct in all specimens and the detailed structure of the prostomium (as indicated by Fig. d) may be partially erroneous. The peristomium forms two large, slightly folded lateral lips and a low, transverse lower lip; it is incomplete dorsally.

The first two setigers are large and directed anteriorly on both sides of the prostomium. The notopodia are low ridges in both segments, but the neuropodium of the first segment is a distinct cone. A small pear-shaped papilla is present between the noto- and neuropodium near the base of the notopodial setae.

All other setigers have low, more or less laterally directed parapodia; in the first twenty-five setigers the parapodia are slightly dorsal in position and placed near the anterior margin of each setiger. The parapodia are distinctly lateral in the last ten setigers; the notopodia are visible as low ridges on the dorsal sides of these last setigers. The neuropodia remain as low ridges in all setigers. Interramal papillae (Fig. c) are midway between the noto- and neuropodia in anterior and median setigers.

The first setiger has one large spine in each neuropodium; each of the first notopodia has two slightly thinner spines. The second setiger has two thin spines in each of the four fascicles. Setae in the third and all remaining setigers include one thin slightly recurved spine and a long, slender companion seta in each fascicle (Fig. e). Two spines may be present in some setigers; others have two companion setae per spine. The setae are mostly directed forwards along the lateral and dorsal sides of the body; those in the last ten setigers are directed laterally and stand out as a dense brush; the setal structures remain the same in all post-cephalic setigers.

F. rugosa resembles F. challengeriae McIntosh (1922, pp. 5-7, pl. 2, figs. 1-8, pl. 3, fig. 2) in the general shape of the body and in the structure of the setae. It differs from all known species in the genus in that the

epithelium has small dorsal papillae in addition to the large interramal papillae found in all species. All other species are completely smooth dorsally and ventrally, and the cuticle is thick and iridescent.

Distribution: F. rugosa has been found off Cedros Island and Cabo Falso, Baja California and off the Tres Marias Islands.

Genus Flabelliderma Hartman, 1969

Flabelliderma macrochaeta, new species

(Plate 46, Figs. a-b)

Records: 13767 (1, TYPE); 13768 (1).

Description: The type is a complete specimen, which has approximately 50 setigers; it is 15 mm long and 1.2 mm wide without setae. The anterior part of the body is inflated through the fifteenth to twenty-first setigers; the remainder of the body is cylindrical. The body is completely covered with papillae (Fig. b); the papillae are very strong dorsally and laterally while being smaller and less dense ventrally. Each papilla is cylindrical or slightly clavate with a thin covering of mud particles.

The anterior end is completely retracted; the only smooth area visible externally is a large lower lip on the peristomium.

The parapodia are short and papilliform and cannot be distinguished from the lateral papillae except by the presence of setae. The notopodial setae are long, smooth capillaries; the neuropodial ones are very large, coarse hooks. Each hook is distinctly composite (Fig. a); the appendage is distally recurved and covered by two thin flaps which are slightly shorter than the appendage proper. The upper end of the shaft is slightly inflated and continued

as a thin flap covering the base of the appendage.

The genus Flabelliderma was defined for two species, F. commensalis (Moore, 1909, pp. 286-288, pl. 9, figs. 62-63) and F. essenbergae (Hartman, 1961, pp. 118-120, pl. 22, figs. 1-2, pl. 23, figs. 1-4) by Hartman (1969, p. 286).

F. macrochaeta has distinctly composite neuropodial hooks with long, nearly straight appendages; the neuropodial hooks are pseudocomposite and the outer portion is strongly curved in the other two species.

Distribution: F. macrochaeta is known from two localities off the Tres Marias Islands in approximately 1500 m depth.

Genus Flabelligella Hartman, 1965

Species of Flabelligella are small, generally resembling small specimens of Brada, but differ from the latter in that all neurosetae are composite.

One species is present in the material from western Mexico.

Flabelligella mexicana, new species

(Plate 45, Figs. f-g)

Record: 7229 (1, TYPE).

Description: The type is a complete female with large eggs in the body cavity. It is approximately 1.5 mm long and 0.75 mm wide without setae. The body (Fig. g) is densely covered with small, pointed papillae; each papilla (Fig. f) is basally covered with fine sand grains so that it appears rounded macroscopically.

The prostomium is a small, smooth quadrangular lobe nearly hidden below the inflated anterior segments. The

peristomium, which is a short, smooth transverse lip, is incomplete dorsally.

The body consists of nine setigers. No external segmentation is visible and the parapodia are completely reduced so that the setae emerge directly from the body wall. The first four setigers are crowded near the anterior end and the setae are directed forwards so as to cover the anterior end more or less completely. The last five setigers are long.

The first four parapodia are uniramous; the last five are biramous. Notosetae are long, slender capillary setae with distinct cross-bars. Neurosetae, of which there may be as many as seven or eight in each of the first four neuropodia, are all similar; each is composite and has a long, slender, slightly falcate appendage. The tip of the appendage appears to be covered with a fine hood. All appendages have long, slender bristles along the cutting edges.

The genus Flabelligella is known for two additional species, both from the deeper parts of the Atlantic Ocean (Hartman, 1965b, pp. 176-177, pls. 37 and 38). F. mexicana resembles F. papillata in the structure of the papillae and setae. It differs from the latter in that the first four setigers are crowded near the anterior end; in F. papillata all setigers are of approximately the same length.

Neurosetae include seven or eight in a parapodium in F. mexicana and only one or two in F. papillata.

Distribution: F. mexicana is known from one locality off Cedros Island, Baja California in abyssal depths.

Genus Ilyphagus Chamberlin, 1919

Ilyphagus bythincola Chamberlin, 1919

Ilyphagus bythincola Chamberlin, 1919, pp. 402-403, pl. 69, figs. 4-9; Hartman, 1960, p. 131.

Earlier Record: Chamberlin (1919, p. 403): ALBATROSS st. 3415 (2, TYPES, USNM Nos. 19748 and 19384).

New Record: ALBATROSS st. 3415 (1).

Remarks: The type material of I. bythincola was re-examined by Hartman (1960) who made some additional notes on the setal structures and distribution. The genus was revised by Hartman (1965b, pp. 177-178). The newly recorded specimen is from the type locality, but was not identified by Chamberlin.

Distribution: I. bythincola is known from one locality off southwestern Mexico in abyssal depths.

Genus Pherusa Oken, 1807

Most species are relatively large and have well developed cephalic cages formed by the setae of the first two or three setigers. The prostomium has a long, narrow ridge projecting dorsally. The short branchial membrane may have four to many pairs of branchiae. Notosetae are slender, cross-barred capillaries; neurosetae posterior to the cephalic cage include uni- or bidentate hooks.

The relationship between Pherusa and related genera has been indicated above. A survey of all known species with reference to the original description is given in Appendix 3.

The species have been organized into several groups, depending on the number of pairs of branchiae and the distribution of these branchiae on the branchial membrane.

Some species, including the genotype, have four pairs of branchiae; other species have fifteen or more pairs of branchiae. As far as can be ascertained, no species has intermediate numbers. P. monilifera, the genotype for Stylarioides, now usually considered synonymous with Pherusa, belongs to the group with numerous pairs of branchiae.

Species with numerous pairs of branchiae may have these arranged in two different patterns. A number of these species have the branchiae arranged in a single row along the margin of the branchial membrane; the lateral portions of the membrane are frequently (always?) spirally rolled. The other group of species has the branchiae arranged in a dense field on the whole branchial membrane.

The branchial numbers and distribution remain unknown for nine of the thirty-eight species here recognized in Pherusa.

Some species with many pairs of branchiae have firm dorsal shields of closely packed sand particles; these species have here been placed in one group, even if they otherwise appear to have little in common.

The indicated arrangement is here considered a practical subdivision with no taxonomic connotations.

Two species are present in the material from western Mexico.

Pherusa abyssalis, new species

(Plate 47, Figs. a-e)

Records: 11776 (2, TYPE); 13724 (1); 13727 (1); ? 13756 (2).

Description: All specimens are incomplete; the type is 22 mm long and 2.5 mm wide without setae for 24 setigers. The dorsum of each setiger has approximately fourteen low, rounded papillae; each papilla is covered with coarse sand grains. The ventrum has similar but fewer papillae, and the papillae are smaller than on the dorsum.

The prostomium (Fig. a) is a triangular lobe continued dorsally in a narrow ridge; eyes are absent. Posterior to the prostomium a low ridge connects the prostomium to the mouth, fusing into the upper lip. The large palpal scars are situated ventrolateral to the prostomium.

The upper lip is drawn out into two lateral, recurved wings, which appear to be rejection tracts for the feeding apparatus. The two lateral lips are rounded cushions; the lower lip, which is continuous with the lateral lips, is a narrow fold. Dorsally the peristomium is expanded into a large, rounded branchial membrane with numerous branchial scars arranged more or less in longitudinal rows. Approximately fifty pairs of branchiae are present. A pair of low medial ridges continues dorsally and posteriorly to the margin of the branchial membrane.

The first two parapodia are directed anteriorly; all others are directed laterally. The two anterior parapodia have a large number of long, slender papillae at the base of the setae. Each of the parapodia (Fig. d) posterior to the cephalic setigers has the same distribution of papillae; each notopodium has one long slender papilla in presetal and one in postsetal position. Each neuropodium has six or seven long, slender papillae in postsetal positions. Papillae are absent on the presetal side of the neuropodia.

The first two parapodia have a few, long, slender cross-barred setae in each fascicle. Similar setae are found in all notopodia, except that the notopodial setae in other setigers (Figs. b and e) are more slender and have long, clear tips. Neuropodial setae (Fig. c) from setiger 4 are smooth, with an internal oblique striation, but without cross-bars. Each seta is slightly inflated subdistally and has a long, smooth tip.

P. abyssalis belongs to group B.2.b. according to the system suggested in Appendix 3. Other species in this group include P. bengalensis (Fauvel, 1932, for complete references see Appendix 3), P. capulata (Moore, 1909), P. eruca (Claparède, 1870), P. eruca indica (Fauvel, 1928), P. heteropapillata Hartmann-Schroeder (1965), and P. monilifera (delle Chiaje, 1841).

Neuropodial setae are bidentate in median and posterior setigers in P. capulata, P. eruca and P. eruca indica; they are distally entire in P. bengalensis, P. heteropapillata, P. monilifera and P. abyssalis.

The neuropodia have stout, cross-barred, recurved setae tapering smoothly in P. bengalensis, P. heteropapillata and P. monilifera; neuropodial setae are slender and subdistally slightly inflated with internal oblique striations in P. abyssalis.

Distribution: P. abyssalis has been found in one locality in the southern part of the Gulf of California and off Acapulco in the Central American Trench.

Pherusa ?inflata (Treadwell, 1914)

Trophonia inflata Treadwell, 1914, pp. 213-214, pl. 12, fig. 33.
Pherusa inflata Hartman, 1969, pp. 297-298, 4 figs.

Records: 7228 (1); 13727 (1); 13755 (1).

Remarks: The present specimens are slightly mutilated and the identification is considered dubious. The neuropodial setae resemble those illustrated by Hartman (1969) and the distribution of papillae is as described for P. inflata.

Distribution: P. inflata is known from rocky intertidal areas from Oregon to western Mexico. The present records are from deep water in scattered areas off western Mexico.

Genus Piromis Kinberg, 1867

The relationship between this genus and the closely related Pherusa has been indicated above. One species was found in the material from western Mexico.

Piromis hospitis, new species

(Plate 48, Figs. a-e)

Record: 1746 (8, TYPE).

Description: The material consists of eight anterior and eight posterior ends. The type is an incomplete specimen with 28 setigers that is 40 mm long and 8 mm wide. Complete specimens are approximately 90 mm long for sixty setigers. The body (Fig. a) is covered with a thick, stiff mucus coat with imbedded sand grains. The first setiger has one large, blunt dorsal papilla medially; all other setigers have two large dorsal papillae arranged in longitudinal rows; the size of the papillae decreases evenly from the anterior end, but they are still distinct in the last setigers. The ventral side has an irregular arrangement of low pustules. Each of the dorsal papillae is proximally foliose and has a long, slender tip.

The prostomium is quadrangular with a long, slender dorsal prolongation between the two parts of the branchial membrane. The upper lip is thick; the lateral and lower lips are confluent as a hemicircle around the mouth. The branchial membrane is prolonged dorsally as a long, narrow tongue and carries numerous branchiae. The palps are ventrolateral to the prostomium.

The first three parapodia are directed anteriorly (Fig. a); the notopodial setal lobes are blunt; a distinct, blunt postsetal lobe is present. Neuropodia are low welts with a few papillae in postsetal positions. Other anterior notopodia have distinct, narrowly tapering postsetal lobes; these lobes are reduced to low folds in median and posterior parapodia. Neuropodia (Fig. e) are similar in all parapodia except for the first three; each is a low welt with three large, foliose papillae in postsetal positions.

Setae from the first three parapodia form a cage; both noto- and neurosetae are prolonged in the first two

parapodia. Only the notosetae are directed forwards in the third parapodia; the long neurosetae are directed laterally. Each of the setae in the cephalic cage is a long, slender capillary with distinct, narrowly spaced cross-bars. The remaining notosetae are slender, cross-barred capillaries. Bifid falcigers (Fig. b) are present in the neuropodia from setiger 7. Each of the anterior falcigers is cross-barred with the cross-bars spaced at a distance roughly similar to the width of the seta. Entire falcigers (Fig. c) are present from approximately setiger 30; each of these falcigers has very narrowly spaced cross-bars and a smooth tip. The inferiormost falcigers retain (Fig. d) a bifid tip in all setigers, but are otherwise similar to the kind with entire tips.

Eight species are presently assigned to Piromis; of these P. bifidus (Fauvel, 1932) and P. hamocarens (Monro, 1937) have distinctly bifid branchial membranes. The branchial membranes are entire in P. americana (Monro, 1928), P. arenosus Kinberg (1867), P. roberti (Hartman, 1951), P. tropica (Augener, 1918) and P. hospitis.

The genotype P. arenosus resembles P. hospitis in that both have uni- and bidentate falcigers in the neuropodia. P. arenosus differs from P. hospitis in that the former has small, evenly distributed papillae on the dorsum; the dorsal papillae are large and are arranged in two distinct rows in the latter.

All neuropodial falcigers have entire tips in P. americana, P. gracilis and P. tropica; some neuropodial falcigers are distinctly bifid in P. hospitis.

P. roberti has bifid neurosetae in all median and posterior parapodia and the small dorsal papillae are not arranged in any pattern. Neurosetae in P. hospitis are unidentate posteriorly and the large papillae are arranged in two rows on the dorsum.

A large number of commensal hydroids are present on the setae forming the cephalic cage; thus the name P. hospitis.

Distribution: P. hospitis is known from one locality in upper slope depths in the middle portion of the Gulf of California.

Genus Therochaeta Chamberlin, 1919

The genus is here accepted as revised by Hartman (1965b, pp. 179-180); a survey of all species assigned to the genus is given in Appendix 3.

One species is present in the material from western Mexico and has also been found in the basins off southern California.

Therochaeta pacifica, new species

(Plate 49, Figs. a-c)

Records: 6812 (3); 6834 (1); 7047 (2, TYPE); 7234 (1).

Description: The type is a complete specimen which has 21 setigers; it is 9 mm long and 3 mm wide without setae. The body is spindle-shaped and widest near setiger 10. The first two setigers (Fig. b) are strongly dorsoventrally flattened and form a flat, stiff anterior end separated from the remainder of the body by a slight incision. The first three setigers, however, participate in the formation of the cephalic cage. The integument is completely covered with sand grains. The sand grains form a well organized, single-layered sheet on the first two setigers; the median and posterior parts of the body are covered with a single row of five to seven large papillae to which the sand grains adhere. These parts of the body appear somewhat ragged. Numerous long papillae are found at the anterior end and between the noto- and neuropodia along the body. The prostomium is inverted in all specimens.

The prostomium (seen in dissection, Fig. a) is a square plaque with a narrow anterodorsal ridge projecting between the two parts of the tentacular membrane. The tentacular membrane curves around laterally to enclose the bases of the palps. The number of branchiae could not be definitely determined, but apparently four pairs have been present. The two palpal bases form large scars lateral to the prostomium. The peristomium also forms two very large, nearly hemispherical lateral lips and a transverse, somewhat lower and thinner posterior lip. The mouth is triangular.

The first two parapodia are larger than the others and are directed forwards; each has a low, button-shaped noto- and neuropodium with several papillae. The dorsum between the first notopodia is drawn out into an anteriorly directed, triangular lobe covering the retractable anterior end. The third and all setigers following have short, distally truncate noto- and neuropodia; each has a few long, slender papillae.

Setae include a series of long, slender capillary ones in both noto- and neuropodia in the first three setigers; these setae form the cephalic cage over the anterior end. Notosetae in all other setigers are similar; each is a long, slender and densely cross-barred capillary. Neurosetae in setigers 4-6 are composite with long, slender widely cross-barred shafts and long, slender, smooth, distally slightly falcate appendages (Fig. c). The hinge has a slight swelling opposite the cutting edge. Neurosetae in the remaining neuropodia are all similar; each is simple, strongly falcate and proximally cross-barred. These falcigers become thicker in the last few setigers.

The six species presently assigned to Therochaeta (see Appendix 3 for lists and complete references) differ mainly in the distribution of the large papillae on the dorsum posterior to the cephalic setigers and in the distribution of composite setae on a few anterior setigers.

T. collarifera (Ehlers, 1887), T. flabellata (M. Sars, 1872) and T. pacifica have papillae that appear to be

roughly the same size in all median and posterior setigers, with no distinct circlet of large papillae just posterior to the cephalic setigers.

T. coronata (Ehlers, 1908), T. scutigera (Ehlers, 1887) and T. scutigeroides (Augener, 1918) each have a circlet of very large papillae on the first setiger following the last cephalic setiger. The remainder of the body has either very much smaller papillae or appears smooth.

T. flabellata, here considered in Therochaeta under considerable doubt, has only two setigers involved in the head formation and the papillae are small and scattered evenly along the body.

T. collarifera, which is the genotype, has four setigers involved in the head formation and transverse rows of papillae on the dorsum; those in the posterior part of the body appear to be as large as those near the junction between the head formation and the remainder of the body.

T. pacifica has three setigers in the head and the anterior papillae are slightly larger than the posterior ones; the papillae are arranged in transverse rows on the dorsum.

The number of setigers involved in the head formation appears to determine the start of the composite setae in the neuropodia. Thus, T. collarifera, which has four setigers in the head, has composite setae on setigers 5-7; T. pacifica, which has three setigers in the head formation, has similar setae on setigers 4-6.

Distribution: T. pacifica has been found in canyon and upper slope depths from southern California to the vicinity of Cedros Island, Baja California. The type comes from La Jolla canyon, southern California in 793 m depth.

Family SCALIBREGMIDAE Malmgren, 1867

Scalibregma Rathke, 1843

Scalibregma inflatum Rathke, 1843

Scalibregma inflatum Fauvel, 1927, pp. 123-124, fig. 44a-f; Hartman, 1969, p. 313.

Records: 11829 (1); 11830 (1); 13742 (1); 13743 (1); 13767 (1).

Remarks: A few short, slender acicular spines are present in each of the first parapodia; such setae have not been described for this species previously, but the spines are so small that they can easily have been overlooked.

Distribution: S. inflatum is known from world-wide areas; the present records are from Sal si Puedes Basin and from three localities along the mainland slope of the Central American Trench.

Family OPHELIIDAE Malmgren, 1867

Five members of this family have been found in the material from western Mexico; none have been reported from deep water in the median and upper portions of the Gulf of California.

Key to Species from Deep Water off Western Mexico

1. Midventral groove present along most of the ventrum. 2.
1. Midventral groove absent..... 4.
2. Branchiae present..... 3.
2. Branchiae absent..... Polyophthalmus translucens

3. Anal cone present; eversible proboscis distally smooth..... Ammotrypane aulogaster
3. Anal cone absent; eversible proboscis with fifteen to eighteen distal lappets..... ..... Ammotrypane pallida
4. 23-25 setigers present... Travisia brevis
4. 27 setigers present..... Travisia foetida

Genus Ammotrypane Rathke, 1843

Ammotrypane aulogaster Rathke, 1843

Ammotrypane aulogaster Fauvel, 1927, p. 133, fig. 47a-e; Hartman, 1969, pp. 319-320.

Record: 7358 (1).

Remarks: A. aulogaster has a clearly defined, ventrally slit anal cone with numerous short, marginal lobes and three longer, basal anal cirri. The proboscis is a rounded, distally smooth pouch. The present specimen agrees well with the description given by Fauvel (1927, p. 133).

Distribution: A. aulogaster is found on both sides of the north Atlantic Ocean; in the eastern Pacific Ocean it is known from Alaska to western Mexico in shelf and slope depths. The present record is from near Cedros Island, Baja California in slope depths.

Ammotrypane pallida Hartman, 1960

Ammotrypane pallida Hartman, 1960, pp. 133-135, pl. 14, fig. 3; Hartman, 1969, pp. 321-322.

Records: 7228 (6); 7229 (1); 7231 (3); 13724 (3);

13743 (1); 13747 (1); 13774 (1); 13775 (1).

Remarks: The distal end of the proboscis has fifteen to eighteen narrow lappets in A. pallida. An anal cone is absent and the posterior setigers are crowded.

Distribution: A. pallida is known from offshore basins off southern California; the present records are from slope and abyssal depths off Cedros Island, Baja California and from the Central American Trench from off Acapulco to the tip of Baja California.

Genus Polyophthalmus Quatrefages, 1850

Polyophthalmus translucens Hartman, 1960

Polyophthalmus translucens Hartman, 1960, p. 135; Hartman, 1969, pp. 341-342.

Record: 7229 (1).

Remarks: P. translucens differs from P. pictus (Dujardin, 1839), which is common in shallow water off western Mexico, in that pigmented spots on the body and anal cones are absent. The posterior end has numerous crowded segments and tapers abruptly to a blunt anal end with the anus opening terminally or nearly so.

Distribution: P. translucens is known from off-shore areas off southern California; the present record is from off Cedros Island, Baja California in abyssal depths.

Genus Travisia Johnston, 1840

Travisia brevis Moore, 1923

Travisia brevis Moore, 1923, pp. 220-221; Hartman, 1969, pp. 343-344, 1 fig.

Records: 13755 (1); 13767 (4); 13768 (1); 13782 (1).

Remarks: The main character separating T. brevis from the related T. foetida is given (in the key above) as the number of setigers. The two species can be separated at a glance by the difference in the shape of the body; T. brevis is definitely evenly spindle-shaped; the anterior end of T. foetida is considerably more abruptly tapering than the posterior end.

Distribution: T. brevis is known from Alaska to southern California in shelf and slope depths; the present records are all from slope and abyssal depths along the mainland slope of the Central American Trench and off Cabo Falso, Baja California.

Travisia foetida Hartman, 1969

(Plate 49, Fig. d)

Travisia foetida Hartman, 1969, pp. 345-346, 3 figs.

Records: 7231 (1); 11753 (2); 12134 (3); 12135 (2); 13727 (1); 13743 (1); 13747 (1); 13754 (1); 13756 (1); 13774 (3); P 3-59 (1); P 41-59 (3); P 287-61 (27).

Remarks: T. foetida was previously confused with T. pupa Moore (1906). T. foetida has twenty-seven setigers and the first segment is smooth; T. pupa has thirty-one

setigers and the first segment is distinctly crenulated. All present specimens have twenty-seven setigers, with the first segment smooth. Paired, eversible nuchal organs (Fig. d) are present at the junction of the pro- and peristomium. The peristomium has a dorsally and anteriorly directed lappet overlying the posterior margin of the prostomium medially. The prostomium is connected to the nuchal organs laterally by two raised ridges.

Live specimens of T. foetida are characterized by a strong and rather unpleasant smell; the presence of only a few specimens in a haul can be detected before the sediments have been washed away.

Distribution: T. foetida is known from southern California in shelf and slope depths. The present records are from off Baja California, in the southern part of the Gulf of California and along the mainland slope of the Central American Trench in slope and abyssal depths.

Opheliidae, indeterminable

Record: 7234 (1).

Remarks: The specimen is an anterior fragment, probably belonging to the genus Ammotrypane; it is in very poor condition and cannot be identified further.

Family STERNASPIDAE Carus, 1863

Genus Sternaspis Otto, 1821

Sternaspis fossor Stimpson, 1853

Sternaspis fossor Stimpson, 1853, p. 29, fig. 19; Berkeley and Berkeley, 1952, pp. 59-60, fig. 123; Hartman, 1969, pp. 351-352.

Records: 1746 (7); 7358 (6); 13755 (10); 13756 (6); 13780 (1); P 167-60 (10); P 201-60 (1).

Remarks: S. fossor is nearly indistinguishable from S. scutata Renier (reviewed by Fauvel, 1927, pp. 216-218, fig. 76) as noted by Hartman (1969, p. 351). The two species appear to differ in that S. fossor has the skin papillae concentrated in rows in posterior segments whereas S. scutata has the papillae evenly distributed on the surface.

The number of setal bundles associated with the ventral caudal shield varies from thirteen to fifteen, a fact apparently unrelated to the size of the specimens.

Distribution: S. fossor was originally described from eastern Canada and has been reported from the eastern Pacific Ocean from Alaska to southern California in shelf and slope depths. The present records come from similar depths off Baja California, in the southern end of the Gulf of California and off Cabo Corrientes.

Family CAPITELLIDAE Grube, 1862

Genera in this family are based largely on the distribution of pointed setae and long-handled uncini in anterior segments and on the number of thoracic setigers present. The transition from thorax to abdomen may be marked only by the change in setal structures, but is usually also visible as a marked change in the structure of the segments.

The anterior end is frequently strongly areolated; such areolation is nearly always absent in the abdomen. The anterior segments are frequently bi-annulated; most species have no distinct annulation in the abdominal segments. In a few cases, the anterior part of the body is completely smooth, whereas the posterior end is bi- or multi-annulated. The abdominal segments are often considerably shorter and stouter than the thoracal ones, so that

the specimens look as if they have an anterior zone of regeneration.

The capitellids have few other structures that can be used taxonomically. The parapodia are poorly developed and rather uniform in each part of the body. The notopodia may be reduced in posterior segments or they may be fused medially. The neuropodia are usually developed as long ridges in the abdomen and these ridges may be fused medially or with the notopodia on each side. Posterior ends are often absent in preserved material, so the presence or absence of branchiae cannot be decided, nor can the structure of the anal end be described.

The structure of the long-handled uncini in the abdomen is characteristic for each species, but the uncini are small and are often difficult to analyze since they are internally striated. The striation may appear as teeth in the crest when seen in optical section and it may be very difficult to decide the exact number and shape of the teeth in the crests.

The generic subdivision suggested by Hartman (1947) based on Eisig (1887) has been followed here. Nine species are present in the material from western Mexico; three of these are newly described and two new genera have been added.

Key to Species from Deep Water off Western Mexico

1. Thorax with ten setigers..... 2.
1. Thorax with at least eleven setigers..... 3.
2. All thoracic setigers with pointed setae only..... ..... Neonotomastus glabrus
2. First six thoracic setigers with pointed setae, the rest with long-handled uncini..... ..... Neomediomastus glabrus
3. Thorax with eleven setigers..... 5.
3. Thorax with more than eleven setigers..... 4.

4. Thorax with twelve setigers..... ..... Leiochrides hemipodus
4. Thorax with thirteen setigers..... ..... Dasybranchus lumbricoides
5. All thoracic setigers with pointed setae only..... 7.
5. At least last two neuropodia with long-handled uncini..... 6.
6. Last two or three thoracic neuropodia with long-handled hooks..... Notomastus precocis
6. Last four notopodia and last five neuropodia in the thorax with long-handled uncini..... ..... Neoheteromastus lineus
7. The first two abdominal setigers with pointed setae... ..... Notodasus magnus
7. All abdominal setigers with long-handled uncini.... 8.
8. Notopodia fused medially in median and posterior abdominal setigers..... Notomastus abyssalis
8. Notopodia not fused medially, but may be connected by a fleshy ridge..... 9.
9. Parapodia form complete raised rings around all abdominal segments..... Notomastus cinctus
9. Parapodia at least dorsally and ventrally separated in abdominal setigers..... 10.
10. Posterior notopodia large, rounded welts with only a few uncini; branchiae absent..... ..... Notomastus (Clistomastus) tenuis
10. Posterior notopodia low ridges with numerous uncini; dendritic branchiae present..... ..... Notomastus magnus

Genus Dasybranchus Grube

Dasybranchus lumbricoides Grube, 1878

Dasybranchus lumbricoides Grube, 1878, pp. 190-191, pl. 10, fig. 4; Hartman, 1969, pp. 373-374, 3 figs.

Record: 1746 (1).

Remarks: D. lumbricoides has thirteen thoracic segments with bilimbate, pointed setae and numerous abdominal segments with long-handled uncini. Each uncinus has a large main fang and three teeth in a single curved row in the crest.

Distribution: D. lumbricoides is widely distributed in shallow warm water areas. It is known from central California to the Galapagos Islands in the eastern Pacific Ocean. The present record is from upper slope depths in the central part of the Gulf of California.

Dasybranchus, species indeterminable

Record: 13755 (3).

Remarks: The specimens resemble D. glabrus Moore (1909, pp. 280-281, pl. 9, fig. 58) in that the body is completely smooth, but differ in the shape of the long-handled uncini. Posterior ends are absent.

Genus Leiochrides Augener, 1914

Leiochrides hemipodus Hartman, 1960

Leiochrides hemipodus Hartman, 1960, pp. 136-137; Hartman, 1969, pp. 381-382, 1 fig., emended.

Records: 13753 (1); 13756 (1); 13775 (1).

Remarks: None of the present specimens are posteriorly complete, but otherwise show the characters of this species as indicated by Hartman (1969).

Distribution: L. hemipodus was originally described from offshore basins off southern California; the present records are from off Cabo Corrientes and off Cabo Falso in western Mexico.

Genus Neoheteromastus Hartman, 1960

Neoheteromastus lineus Hartman, 1960

Neoheteromastus lineus Hartman, 1960, pp. 137-138; Hartman, 1969, pp. 389-390, 2 figs., emended.

Records: 11806 (1); 11809 (4); 11810 (2); 11812 (1); 11813 (1); 13765 (1).

Remarks: N. lineus has no traces of areolation on the thorax. The first eight notopodia have pointed setae only. Neurosetae are absent in the first setiger; setigers 2-7 have pointed setae in the neuropodia. Long-handled uncini are present from setiger 8 in the neuropodia and from setiger 9 in the notopodia.

Distribution: N. lineus is known from basins off southern California in deep slope and abyssal depths. The present records are from Guaymas Basin, Gulf of California and off the Tres Marias Islands in similar depths.

Genus Neomediomastus Hartman, 1969

Neomediomastus glabrus (Hartman, 1960)

Mediomastus glabrus Hartman, 1960, pp. 138-139.
Neomediomastus glabrus Hartman, 1969, pp. 391-392, 1 fig.

Records: 7234 (1); 13767 (1); 13768 (1); 13774 (3).

Remarks: N. glabrus has capillary setae in six of the ten thoracic setigers; the other four have long-handled uncini, both in noto- and neuropodia. The thorax is smooth with only faint traces of bi-annulations.

Distribution: N. glabrus is known from basins off southern California in abyssal depths. The present records are from off Cedros Island, the Tres Marias Islands and Cabo Falso in similar depths.

Neonotomastus, new genus

The thorax has ten setigers of which the first setiger has notopodial setae only. The first two abdominal setigers are transitional. The first abdominal notopodium has pointed setae and the first neuropodium has both pointed setae and long-handled uncini. The second abdominal notopodium has both long-handled uncini and pointed setae and the neuropodia have long-handled uncini only. All remaining abdominal setigers have long-handled uncini only.

Neonotomastus resembles Notomastus Grube (1850) in general body proportions, but differs in the number of thoracic setigers and in the distribution of setae. Notomastus has eleven thoracic setigers with pointed setae only and all abdominal setigers have long-handled uncini.

Other genera with ten thoracic setigers include Decamastus Hartman (1963, p. 61) and Neomediomastus Hartman (1969, p. 392). Decamastus has long-handled uncini in all abdominal setigers and Neomediomastus has long-handled uncini also in four thoracic setigers.

Genotype is Neonotomastus glabrus, new species.

Neonotomastus glabrus, new species

(Plate 50, Figs. a-c)

Records: 11792 (1, TYPE); 11793 (1); 13752 (5).

Description: The type is an incomplete specimen which has 28 setigers; it is 15 mm long and 0.5 mm wide, without setae. It is tan-colored and the anterior end has scattered areas of darker brown pigment. The anterior end is completely smooth without any traces of areolation; all thoracic segments consist of a single ring; the abdominal segments are bi- and multi-annulated.

The prostomium (Fig. a) is short and has a broad, truncate palpode. The peristomium is a completely smooth ring which is not clearly separated from the first setiger. The proboscis is inverted in both specimens.

The first four setigers are completely smooth and not clearly separated from each other. Intersegmental lines are distinct from setiger 5. Noto- and neuropodia are low ridges that are barely raised above the surface of each segment.

The first two abdominal setigers are double-ringed; all others are multi-annulated with as many as six rings. The parapodia are on the posteriormost ring. Each abdominal notopodium is a short, slightly raised ridge; each neuropodium is a somewhat longer ridge.

The first parapodium is uniramous with a few pointed setae in the notopodium. All other parapodia are biramous. The first twelve notopodia, including the first abdominal one, have pointed finely bilimbate setae. The thoracic neuropodia have similar setae. The first abdominal neuropodium has both pointed setae and long-handled uncini and the notopodium of the second abdominal segment has a similar mixture of both kinds of setae. All other abdominal parapodia have long-handled uncini in both rami. Each uncinus (Figs. b-c) has a very distinct shoulder at the skin-line and a rather slender shaft. The main fang is

large and there are four teeth in the crest. Three of these teeth are arranged in a transverse row above the main fang, and the fourth tooth, which is somewhat larger than the others, is apical. The hood is short and has a smooth edge along the opening.

N. glabrus differs from other capitellids as indicated for the genus.

Distribution: N. glabrus is known from two localities in the central part of the Gulf of California in abyssal depths and off Cabo Corrientes in similar depths.

Notodasus, new genus

The thorax has eleven setigers with pointed setae only; the first setiger has setae only in the neuropodium; all other parapodia are biramous. The first two abdominal setigers have pointed setae only; all others have long-handled uncini.

Notodasus resembles Notomastus in that both have eleven thoracic setigers with pointed setae. In Notomastus, all abdominal setigers have long-handled uncini; the first two setigers in Notodasus have pointed setae.

Dasybranchus has thirteen setigers with pointed setae, but the transition from thorax to abdomen corresponds to the change in structure of the setae in this genus.

Genotype is Notodasus magnus, new species.

Notodasus magnus, new species

(Plate 51, Figs. a-c)

Record: 1746 (1, TYPE).

Description: The type is a nearly complete specimen

which has 94 setigers; it is 105 mm long and 7 mm wide at the widest part of the abdomen. The posterior end is somewhat ragged and the structure of the anal end cannot be determined. The specimen is light brown with no distinct color patterns. The first five to six segments are very strongly areolated (Fig. a) with a strong pattern of longitudinally arranged polygonals. The areolation is less distinct on the remaining thoracal segments; the abdomen is smooth. All thoracic setigers are bi-annulate and the anteriormost ones may appear tri- or quadri-annulate because of the patterning in the areolation; abdominal segments are not annulated.

All parapodia are low welts; the notopodia are considerably shorter than the neuropodia in all setigers, but both groups of parapodial rami are well separated dorsally, ventrally and laterally.

The first thirteen parapodia have bilimbate, pointed setae; setae are present only in the neuropodium of the first setiger, but all other parapodia are biramous. Uncini are present in all but the first two abdominal parapodia. They are deeply imbedded in folds in the parapodia. Each uncinus (Figs. b-c) has a slender shaft which is somewhat expanded subdistally. The crest consists of three small teeth sub-apically and approximately thirteen very small teeth in a curved apical line above the main fang. The hood is short and has a strongly oblique opening which is finely frilled or torn along the margin in all hooks examined.

N. magnus differs from other capitellids as indicated for the genus.

Distribution: N. magnus is known from one locality in upper slope depths in the central part of the Gulf of California.

Genus Notomastus Sars, 1851

Subgenus Clistomastus Eisig, 1887

Notomastus (Clistomastus) tenuis Moore, 1909

Notomastus tenuis Moore, 1909, pp. 277-278, pl. 9, fig. 55.
Notomastus (Clistomastus) tenuis Hartman, 1947, pp. 420-422, pl. 47, figs. 1-5; Hartman, 1969, pp. 397-398, 5 figs.

Records: 11831 (2); 13756 (1); 13768 (1); 13774 (1).

Remarks: N. tenuis is areolated on the anterior thoracic setigers; the remainder of the body is smooth. Posterior notopodia are large rounded welts with only a few long-handled uncini in each segment.

Distribution: N. tenuis is known from shelf and slope depths off southern California and western Canada. The present records are from Sal si Puedes Basin, and from an area near the mouth of the Gulf of California.

Genus Notomastus Sars, 1851, s. str.

Notomastus abyssalis, new species

(Plate 51, Figs. d-g)

Records: 11761 (2); 11788 (1, TYPE); 11792 (1); 11793 (2); 13752 (1); 13765 (1); 13774 (1); 13775 (1).

Description: All specimens are incomplete posteriorly; the type has 44 setigers and is 30 mm long and 5 mm wide with setae. Other specimens are considerably smaller. All specimens are light yellowish brown without distinct

color patterns. The anterior thoracal segments are strongly and irregularly areolated; posterior thoracal segments are less areolated and the abdomen is smooth.

The prostomium (Fig. g) is a very short, broad lobe with a nearly spherical palpode. The peristomium is a smooth ring which is clearly separated from the first setiger.

All parapodia are biramous; they are low, deeply embedded folds in the thorax and barely distinct welts in the abdomen. The neuropodia are distinctly lateral in all thoracal setigers. Anterior notopodia are dorsolateral, but late thoracal notopodia are in a nearly dorsal position and close to the mid-line. Abdominal notopodia are dorsal and fuse medially at approximately setiger 25 (Fig. d). Abdominal neuropodia are very long and nearly meet ventrally, where they are separated only by the depression for the ventral nerve chord.

Thoracal setigers have bilimbate, pointed setae; abdominal setigers have long-handled uncini. Each uncinus (Figs. e-f) has a small main fang and a crest of approximately ten teeth in a single curved line. Each hood is very large and covers the tip of the uncinus completely; the opening is distinctly dentate.

Branchiae were not seen.

N. abyssalis resembles N. precocis Hartman (1960, pp. 139-140) in the structure of the abdominal notopodia, which in both species is nearly dorsal. The notopodia fuse medially in N. abyssalis and remain separate in N. precocis. The structure of the uncini and the distribution of the parapodial rami in posterior setigers appear unique.

Distribution: N. abyssalis is known from off Cabo Falso and the Tres Marias Islands through the southern and central parts of the Gulf of California.

Notomastus cinctus, new species

(Plate 50, Figs. d-h)

Records: 11744 (1); 11753 (2); 13733 (1); 13775 (1); P 41-59 (1, TYPE).

Description: The type is an incomplete specimen which has 31 setigers; it is 30 mm long and 3 mm wide without setae. It is light brown and lacks color patterns. Eyes are absent. The peristomium and the first four setigers are strongly areolated in an irregular pattern; later thoracal setigers are much more weakly areolated and the abdomen is completely smooth.

The prostomium (Fig. h) is a narrow, triangular lobe with a short, spherical palpode. The peristomium is a short, complete ring.

The thoracic setigers are weakly bi-annulated; the parapodia are low welts which are deeply embedded below the areolated surface. Abdominal setigers are divided into two parts by a high ridge (Figs. f-g) carrying the noto- and neuropodia. The ridge is continuous around the body and is only slightly expanded at the sites of the noto- and neuropodia. All abdominal setae are in a deep furrow that runs the whole length of these ridges.

Thoracic setigers have bilimbate, pointed setae; all abdominal setae are long-handled uncini. Each uncinus (Fig. e) is hooded and has a large main fang and a crest of seven teeth in a single, strongly curved row. The hood is short and rather closely appended to the uncinus.

N. cinctus differs from all other species named in Notomastus in that the noto- and neuropodia are on a continuous ring in the abdomen forming a raised ridge. Ridges are known in several species, but they are always broken up into distinct noto- and neuropodial fragments and are usually also interrupted dorsally and ventrally.

Distribution: N. cinctus is known from the Central American Trench from off Bahia Zihuantanejo to the upper end near the Tres Marias Islands and Cabo Falso.

Notomastus magnus Hartman, 1947

Notomastus magnus Hartman, 1947, pp. 412-415, pl. 50, figs. 1-6; Hartman, 1969, pp. 401-402, 6 figs.

Records: 11830 (1); 11831 (3).

Remarks: N. magnus has a strong areolation on all thoracic setigers and short, dendritic branchiae on posterior abdominal setigers. The uncini have long, open hoods and double crests of numerous short teeth.

Distribution: N. magnus is found off central and southern California in shelf, slope and canyon depths. The present records are from Sal si Puedes Basin in approximately 800 m depth.

Notomastus precocis Hartman, 1960

Notomastus precocis Hartman, 1960, pp. 139-140; Hartman, 1969, pp. 403-404.

Records: 7358 (3); 13754 (2); 13767 (1).

Remarks: The present specimens fit well with the original description by Hartman (1960) except that the two specimens from st. 13754 have two thoracic neuropodia with long-handled uncini rather than three, as originally described.

Distribution: N. precocis is known from the deeper basins off southern California. The present records are

from off Cedros Island, Baja California and off Cabo Corrientes and the Tres Marias Islands on the mainland slope of the Central American Trench.

Notomastus, species indeterminable

Records: 7228 (1); 7234 (2); 11738 (1); 13744 (3); 13753 (1); 13775 (1).

Remarks: These specimens are anterior fragments broken off near the junction between the thorax and abdomen and cannot be further identified.

Capitellidae, indeterminable

Records: 11790; 11793; 11806; 11834; 13731; 13755; 13767; 13775; 13776; P 65-59.

Remarks: These specimens are fragments, mostly of median abdominal setigers, and cannot be further identified.

Family MALDANIDAE Malmgren, 1867

The generic subdivision made by Arwidsson (1907) has been followed here. Certain genera can be separated only with difficulty, but are considered valid for practical reasons.

Fifteen species in nine genera are present in the material from western Mexico; three species are newly described.

Key to Species from Deep Water off Western Mexico

1. Anus dorsal..... 2.

1. Anus terminal..... 9.
2. Anterior setigers with single large spines in the neuropodia..... Clymaldane laevis
2. Anterior setigers without neurosetae or with a series of rostrate uncini..... 3.
3. Prostomial palpode low and usually shorter than the length of the cephalic plaque..... 4.
3. Prostomial palpode forms a high ridge continued under the posterior margin of the cephalic plaque.. 7.
4. Margin of anal plaque smooth..... 5.
4. Margin of anal plaque crenulated or with anal cirri..... 6.
5. Margin of cephalic plaque weakly and indistinctly crenulated..... Asychis ?amphiglypta
5. Margin of cephalic plaque with a series of digitiform cirri..... Asychis disparidentata
6. Margin of anal plaque partially crenulated, partially smooth..... Asychis lobata
6. Margin of anal plaque with three multifid anal cirri..... Asychis ramosus
7. Anterior edge of first setiger forms a quadrilobate collar..... Maldane monilata
7. Anterior edge of first setiger without collar..... 8.
8. Posterior margin of cephalic plaque forms a deep pocket..... Maldane cristata
8. Posterior margin of cephalic plaque barely covers the posterior part of the prostomial palpode..... Maldane sarsi
9. Cephalic plaque absent..... 10.
9. Cephalic plaque present..... 12.
10. Anal plaque present..... Petaloproctus ornatus
10. Anal plaque absent..... 11.
11. First two segments with well developed collars..... Rhodine bitorquata
11. Setiger 4 with a deep collar..... Clymenopsis californica

12. All anal cirri of the same length; prostomial palpode terminates at the anterior margin of the cephalic plaque..... 13.
12. Ventral anal cirrus considerably longer and stouter than all other anal cirri; prostomial palpode prolonged beyond the margin of the cephalic plaque..... ..... Praxillella gracilis
13. Only three anal cirri present..... ..... Praxillella trifila
13. Numerous anal cirri present..... 14.
14. Cephalic plaque dorsally evenly rounded; prostomial palpode at least one-fourth the length of the cephalic plaque..... Euclymene reticulata
14. Cephalic plaque pointed dorsally; prostomial palpode less than one-fifth the length of the cephalic plaque..... Isocirrus longiceps

Genus Asychis Kinberg, 1867

The genus is here accepted as defined by Arwidsson (1907, p. 261). Asychis differs from Maldane in that the prostomial palpode is relatively short and low in the former and forms a high, long ridge in the latter. This distinction may be difficult to make and it is possible that some species should be re-assigned to genus.

An attempt was made to survey other characters, but no consistent system was found. Several species of Asychis have collars on the first setiger; such collars are absent in all but one of the species presently assigned to Maldane (for a listing see Hartman, 1959, pp. 450 and 460-461), but it can be difficult to decide whether an apparent collar is truly a distinct development or is a result of the state of contraction of the specimen.

Four species are present in the material from western Mexico; one of these is newly described.

Asychis ?amphiglypta (Ehlers, 1897)

Maldane amphiglypta Ehlers, 1897, pp. 119-122, pl. 8, figs. 187-193.
Asychis amphiglypta Hartman, 1969, pp. 421-422, 5 figs.

Record: ALBATROSS st. 3376 (1).

Remarks: The present specimen differs from A. amphiglypta as originally described in the structure of the cephalic plaque. A. amphiglypta has the dorsal part of the cephalic margin weakly crenulated and the ventral part smooth. The present specimen has the dorsal margin distinctly serrated and the ventral part has six small marginal filaments. The specimen cannot be safely assigned to species without access to more material.

Distribution: A. amphiglypta is known from antarctic waters and has been recorded once from shallow water in San Francisco Bay. The present record is from deep water off Panama.

Asychis disparidentata (Moore, 1904)

Maldane disparidentata Moore, 1904, pp. 494-496, pl. 28, figs. 32-35.
Asychis disparidentata Hartman, 1969, pp. 423-424, 5 figs.

Records: 11829 (3); 11834 (1); P 218-60 (1).

Remarks: A. disparidentata has a series of distinct, digitiform cirri along the margin of the cephalic plaque. The anal plaque has a smooth margin; it is deeply incised laterally and has a very deep central depression.

Distribution: A. disparidentata has been reported from western Canada to southern California in shelf and

canyon depths. The present records are from southwest of San Diego in canyon depths and from Sal si Puedes Basin, Gulf of California in basin depths.

Asychis lobata, new species

(Plate 52, Figs. a-f)

Maldane similis Treadwell, 1923, p. 9 (not Moore, 1906, pp. 233-236, pl. 11, figs. 26-30).

Earlier Record: Treadwell (1923, p. 9): ALBATROSS st. D 5683 (7).

New Records: 7235 (1); 13767 (1); P 135-59 (1, TYPE).

Description: The type is a complete specimen with 19 setigers and an asetigerous preanal segment. It is 55 mm long and 2.5 mm wide without setae and is tan-colored with white neuropodia.

The cephalic plaque has a distinct, relatively long, but low prostomial palpode (Fig. c) which is anteriorly broadly rounded. The nuchal grooves are short and strongly recurved. The margin of the cephalic plaque (Figs. a and c) is separated into two parts by deep lateral incisions. The dorsal part has approximately ten somewhat irregular lobes; the ventral part has four or five strongly irregular lobes on each side.

The first setiger has a well developed anterior collar (Fig. a), which especially laterally projects over the peristomial region; it is slightly incised ventrally.

The first six setigers are double-ringed; all others are single. The notopodia are low, truncate cones. The neuropodia are thick welts in all setigers. The first setiger has notopodial setae only; all other setigers have series of uncini in the neuropodia as well. Each noto-

podial seta (Fig. b) is slender and has a series of fine, long spines arranged in a spiral around the central stem. Each uncinus (Fig. e) has one distinct tooth above the large main fang and approximately ten teeth in two rows on each side of the main fang as a crest.

The anal plaque (Figs. d and f) has a highly developed, folded margin with the center of the plaque deeply depressed. The margin is separated into two parts by deep lateral incisions. The ventral part has four large lobes. The dorsal part is irregularly lobed.

A. lobata resembles A. gotoi (Izuka, 1902, pp. 109-111, pl. 3, figs. 1-8), A. lacera (Moore, 1923, pp. 235-237) and A. similis (Moore, 1906, pp. 233-236, pl. 11, figs. 26-30).

A. gotoi has long, slender digitiform cirri along the ventral margin of the cephalic plaque and the anal plaque has a series of long, slender cirri. Anal cirri are completely absent in A. lobata and the cirri on the ventral part of the cephalic plaque are no longer than those on the dorsal part. Collars of the same general shape are present in both species (see Izuka, 1902, pl. 3, fig. 3).

A. lacera has a high collar on the first setiger; this collar has distinct lateral incisions. The collar of A. lobata is relatively low and has lateral projections rather than incisions.

A. similis has twenty to twenty-five lobes along the dorsal part of the cephalic margin; the ventral part is nearly smooth or only slightly crenulated. A collar is developed only ventrally on the first setiger in A. similis. The anal plaque has four lobes along the ventral part of the margin and the dorsal part is smooth in A. similis. A. lobata has approximately ten lobes along the dorsal part of the cephalic plaque; the ventral part has at least four distinctly formed lobes. The collar is well developed both ventrally and dorsally in A. lobata. The ventral part of the anal plaque in A. lobata resembles that in A. similis, but the dorsal part is distinctly, if irregularly, lobed in A. lobata, and not smooth as in A. similis.

Distribution: A. lobata has been found in three localities from the Tres Marias Islands to San Diego, California in abyssal depths.

Asychis ramosus Levenstein, 1961

Asychis ramosus Levenstein, 1961, pp. 165-166, fig. 9a-e.

Records: 11739 (1); 11744 (1); 11760 (1); 13742 (1); P 131-60 (1); ALBATROSS st. 3393 (6, USNM).

Remarks: The present specimens agree with A. ramosus as described by Levenstein (1961) except that the prostomial palpode is broadly rounded anteriorly rather than pointed as illustrated by Levenstein (1961, fig. 9a-b). A. ramosus has three multi-branched anal cirri. The uncini are distinctly less curved than is usual in members of this genus. Collars are absent on the first setiger.

Distribution: A. ramosus is known from the Sea of Ohkotsk in 2416-3940 m depth. The present records are from the southern part of the Gulf of California and from the Central American Trench off Mexico, Guatemala and Panama in similar depths.

Asychis, species indeterminable

Records: 13752 (1); ALBATROSS st. 3392 (1, MCZ).

Remarks: The specimens are anterior fragments, resembling in structure A. lobata; they cannot be further identified since posterior ends are absent.

Genus Clymaldane Mesnil and Fauvel, 1939

Clymaldane laevis, new species

(Plate 53, Figs. a-d)

Records: 7358 (1); P 42-59 (1, TYPE).

Description: The type is a complete specimen with 19 setigers and 2 asetigerous preanal segments. It is 65 mm long and 2 mm wide without setae and is tan-colored without distinct color patterns. The neuropodia tend to be somewhat lighter in color than the remainder of the body.

The cephalic plaque (Fig. a) is poorly marked with a weakly developed ridge around the margin; the prostomial palpode is indistinct. The nuchal organs form short, transversely arranged arches near the anterior end of the cephalic plaque.

The notopodia are short, truncate cones in all setigers. The neuropodia are large glandular welts. The first four neuropodia, including the first setigerous segment, have single thick, straight spines; all other neuropodia, except the last two asetigerous segments, have rostrate, distinctly recurved hooks. Each uncinus (Figs. b-c) has a large main fang and three or four smaller teeth in an irregular crest. Each uncinus has a distinct shoulder just below the skin-line. All notopodia have long, slender capillary setae.

The anal plaque (Fig. d) has a distinct, smooth ridge; the center of the plaque is raised slightly to form a low, smoothly rounded cone. The anus is dorsal.

The tube has a thick inner lining and is covered with coarse sand grains and foraminiferan tests.

C. laevis belongs to the genus Clymaldane in that it has distinct cephalic and anal plaques with the dorsal anus and spines in the anterior neuropodia.

C. laevis differs from the genotype and the only other known species in the genus, C. sibogae Mesnil and

Fauvel (1939, pp. 7-9, fig. 5) in that the anterior cephalic plaque is poorly developed in C. laevis and very well developed in C. sibogae.

Distribution: C. laevis is known from one locality off the tip of Baja California and from near Cedros Island, Baja California in abyssal depths.

Genus Clymenopsis Verrill, 1900

Clymenopsis californiensis Hartman, 1969

Clymenopsis californiensis Hartman, 1969, pp. 437-438, 4 figs.

Record: P 135-59 (1).

Remarks: The present specimen agrees well with C. californiensis. The deep collar on the fourth setiger is deepest dorsally where it reaches back to the notopodia. The nuchal grooves are slightly longer than as originally illustrated.

Distribution: C. californiensis is known from the outer basins off southern California in slope depths. The present record is from off San Diego, California in 1190 m depth.

Genus Euclymene Verrill, 1900

Euclymene reticulata Moore, 1923

(Plate 54, Figs. a-b)

Euclymene reticulata Moore, 1923, pp. 230-231, pl. 18, figs. 37-38; Hartman, 1969, pp. 449-450, 2 figs.

Records: 7358 (2); 11829 (1); 11833 (1).

Remarks: E. reticulata was described from an anterior fragment and no illustrations were given of the anterior and posterior ends. The cephalic plaque (Fig. a) in the present specimens is much as originally described, except that the prostomial palpode is approximately one-fourth the length of the cephalic plaque, rather than one-third as originally mentioned. The anal plaque (Fig. b) is a shallowly depressed disc with twenty-five to thirty short, distally abruptly tapering anal cirri. All three specimens have the characteristic reticulated pattern of fine lines and grooves on anterior and posterior segments; the median segments are smooth.

Distribution: E. reticulata is known from southern California in shelf and slope depths. The present records come from near Cedros Island, Baja California, in slope depths and from basin depths in Sal si Puedes Basin, Gulf of California.

Euclymene, species indeterminable

Records: P 65-59 (1); P 218-60 (1).

Remarks: Both specimens are anterior fragments that agree with Euclymene in the structure of the cephalic plaque and in the distribution of setae in anterior segments. Anal ends are absent so the specimens cannot be further identified.

Genus Isocirrus Arwidsson, 1907

Isocirrus longiceps (Moore, 1923)

Pseudoclymene longiceps Moore, 1923, pp. 227-229, pl. 18,

figs. 33-34.

Isocirrus longiceps Hartman, 1969, pp. 453-454, 4 figs.

Record: 11831 (1).

Remarks: I. longiceps has a very long, narrow cephalic plaque which ends dorsally in a sharp point. The prostomial palpode is very short and limited to the anterior one-fifth of the cephalic plaque. The anal plaque has a series of short, blunt cirri.

Distribution: I. longiceps is known from shelf and canyon depths from western Canada to southern California. The present record is from basin depths in Sal si Puedes Basin, Gulf of California.

Genus Maldane Grube, 1860

The relationship between this genus and the closely related Asychis has been discussed above.

Three species are present in the material from western Mexico; one of these is newly described below.

Maldane cristata Treadwell, 1923

Maldane cristata Treadwell, 1923, pp. 9-10, figs. 5-8; Hartman, 1969, pp. 457-458, 4 figs.

Records: 6213 (2); 7231 (2); 7234 (3); 12135 (4); 13743 (1); 13775 (1); 13780 (2); 13781 (9); 13782 (5); P 39-59 (1); P 41-59 (5); P 65-59 (2); P 135-59 (1); ALBATROSS st. 3354 (1, USNM); st. 3393 (1, MCZ).

Remarks: The dorsal part of the cephalic margin covers the posterior end of the prostomial palpode completely and forms a deep pocket in M. cristata. This dorsal

margin barely covers the posterior end of the palpode in M. sarsi.

Collars are completely absent in M. cristata and the anal plaque tends to have slight crenulations along the ventral margin. The center of the anal plaque is usually distinctly depressed.

Distribution: M. cristata is common in deep water off southern California and Baja California. The present records extend its distribution to deep-water areas off Panama in the Central American Trench.

Maldane monilata, new species

(Plate 54, Figs. c-g)

Records: 11738 (1); 11743 (1, TYPE); 11744 (2); 11758 (1); 11760 (5); 11761 (2); 13756 (9); 13774 (1); 13775 (1); 13776 (1); 13780 (2); ALBATROSS st. 3393 (6, USNM); st. 3399 (1, USNM).

Description: The type is a complete specimen with 19 setigers and an asetigerous preanal segment. It is approximately 45 mm long and 2 mm wide without setae; larger specimens are present in the collection. All specimens are tan-colored without distinct color patterns.

The cephalic plaque (Figs. c-d) has a long, highly ridged prostomial palpode which is anteriorly expanded and broadly rounded. Two indistinct transverse furrows are on the posterior part of the ridge. The margin of the cephalic plaque is smooth; it is divided into two parts by deep lateral incisions. The dorsal part is low and barely covers the posterior end of the prostomial palpode. The ventral part is somewhat higher and ends anteriorly slightly ventral to the lateral corners of the prostomial palpode on each side.

The first setiger has a well developed anterior

collar consisting of four parts. The collar is highest ventrolaterally. Incisions are found laterally, ventrally and dorsally. The two dorsal lobes are low and evenly rounded; the two ventrolateral lobes are considerably higher and obliquely truncate.

The first setiger is uniramous; all other setigers are biramous with short, truncate notopodia and large, welt-shaped neuropodia. The first six setigers are double-ringed; all others are simple.

All notosetae are long, slender and finely bilimbate. Uncini (Fig. f) are present from the second setiger; each has a large main fang and a crest of four or five smaller teeth.

The anal plaque (Figs. e and g) is at right angles to the long axis of the animal. The margin of the plaque is only slightly raised above the completely flat floor. The margin is separated into two parts by lateral incisions; the dorsal part is completely smooth; the ventral part has five to seven crenulations which may be more or less distinct.

Tubes are absent.

The only other species of Maldane, as presently accepted, which has collar developments is M. cuculligera Ehlers (1887, pp. 178-182, pl. 46, figs. 1-9) which has collars on the first and sixth setigers. The collar on the first setiger in this species appears to be best developed ventrally, and reduced or absent dorsally (Ehlers, 1887, pl. 46, figs. 1-4), whereas the collar on the sixth setiger forms a high ridge around the body. A collar is absent on the sixth setiger in M. monilata. The anal plaque is smooth in M. cuculligera and has crenulations on the ventral part in M. monilata.

M. monilata also resembles M. cristata, from which it differs by the presence of the collar on the first setiger.

Distribution: M. monilata has been found in several

localities in the southern part of the Gulf of California, in the upper end of the Central American Trench, and in the same trench off Panama.

Maldane sarsi Malmgren, 1865

Maldane sarsi Malmgren, 1865, p. 188; Arwidsson, 1907, pp. 251-261, pl. 6, figs. 192-199, pl. 10, figs. 333-338; Hartman, 1969, pp. 461-462, 5 figs.

Record: P 131-58 (46).

Remarks: The present specimens fit well with M. sarsi as described by Arwidsson (1907). The characteristic color pattern could not be observed in the preserved material. Most of the specimens are considerably larger than is usual in this species; some specimens are as much as 200 mm long.

Distribution: M. sarsi is presently considered cosmopolitan in colder waters. The present record is from the Central American Trench off Guatemala.

Genus Nicomache Malmgren, 1865

Nicomache, species indeterminable

Record: 13776 (fragments).

Remarks: These fragments resemble N. personata Johnson (1901, pp. 419-420, pl. 13, figs. 134-139) in that only one pre-anal asetigerous segment is present, but the fragments are too incomplete to be completely identified.

Genus Petaloproctus Quatrefages, 1865

Petaloproctus ornatus Hartman, 1969

Petaloproctus ornatus Hartman, 1969, pp. 473-474, 4 figs.

Record: 13775 (1).

Remarks: The specimen is in several fragments, but appears to have been considerably larger than the type. It otherwise resembles the type except that the prostomial palpode is somewhat more sloping and the nuchal organs slightly longer than in the type.

Distribution: P. ornatus is known from the San Pedro sea valley off southern California; the present record is from the continental slope off Baja California.

Genus Praxillella Verrill, 1881

Praxillella gracilis (Sars, 1862)

Clymene gracilis Sars, 1862b, p. 91.
Clymene (Praxillella) gracilis Fauvel, 1927, p. 178, fig. 62m-p.
Praxillella gracilis Hartman, 1969, pp. 477-478, 2 figs.

Records: 7234 (4); 13767 (1); 13780 (1).

Remarks: The present specimens agree well with P. gracilis as described from Europe. The characteristic anterior prolongation of the prostomial palpode and the enlarged ventral anal cirrus is present in all specimens.

Distribution: P. gracilis is found along both shores of the north Atlantic Ocean; in the eastern Pacific Ocean it is found from Canada to southern California in shelf,

canyon and basin depths. The present records are from off Cedros Island, Baja California and near the mouth of the Gulf of California.

Praxillella trifila Hartman, 1960

Praxillella trifila Hartman, 1960, p. 146, pl. 15, figs. 2 and 4; Hartman, 1969, 2 figs.

Records: 13774 (6); 13775 (3).

Remarks: The posterior segments of P. trifila are elongated and very clearly separated, giving a moniliform impression. The anal cone has a thickened ridge carrying three slender anal cirri.

Distribution: P. trifila is known from the offshore basins off southern California; the present records are from off Cabo Falso, Baja California.

Genus Rhodine Malmgren, 1865

Rhodine bitorquata Moore, 1923

Rhodine bitorquata Moore, 1923, pp. 223-225, pl. 18, fig. 30; Hartman, 1969, pp. 483-484, 3 figs.

Records: 7358 (1); 11830 (2); 11831 (1); 13774 (2).

Remarks: All present specimens are incomplete posteriorly. R. bitorquata has deep collars on the first two setigers. The prostomium is sharply pointed and has short V-shaped nuchal organs near the anterior end. The uncini are very small and have large bulges sub-distally on the cutting edges.

Distribution: R. bitorquata is found from western Canada to southern California in all depths. The present records are from slope depths off Cedros Island and Cabo Falso, Baja California and from Sal si Puedes Basin, Gulf of California in basin depths.

Rhodine, species indeterminable

Records: 13731 (fragments); 13733 (fragments); 13744 (1).

Remarks: The present specimen and fragments have strongly crenulated posterior collars; similar collars have been reported in R. gracilior (see Arwidsson, 1907, pl. 2, fig. 57), but none of the present specimens are sufficiently complete to be identified. The tubes are copper-colored.

Maldanidae, indeterminable

Records: 7231; 7358; 11743; 11744; 11758; 11776; 11813; 11815; 11832; 11833; 11837; 12135; 13727; 13733; 13742; 13754; 13755; 13756; 13765; 13767; 13768; 13774; 13775; 13776; P 65-59; P 127-58; P 128-58; P 131-59; P 274-61; Scripps st. GC 26; ALBATROSS st. 3393 (USNM); st. 3424 (USNM); st. D 5673 (AMNH); st. D 5691 (AMNH).

Remarks: Most of the fragments belong to the subfamily EUCLYMENINAE; several samples contain more than one species, but they cannot be further identified.

Family OWENIIDAE Rioja, 1917

Three species of the genus Myriochele have been

found in the material taken off the west coast of Baja California; oweniids have not yet been reported from deep water in the Gulf of California.

Key to Species from Deep Water off Western Mexico

1. Posterior end with seven to nine short, thick anal papillae..... Myriochele pygidialis
1. Posterior end blunt and unadorned..... 2.
2. Prostomium spherical; first three segments clearly separated from each other; uncini with distal tooth shorter than the proximal one..... ..... Myriochele gracilis
2. Prostomium cylindrical; first three segments short and appear fused; uncini with both teeth of the same length..... Myriochele heeri

Genus Myriochele Malmgren, 1867

Myriochele gracilis Hartman, 1955

Myriochele gracilis Hartman, 1955, pp. 47-48, pl. 2, figs. 1-5.

Records: 6212 (2); 12134 (1).

Remarks: The tubes of this species are covered with a uniform layer of siliceous spicules with a few black sand grains arranged in tight spirals. The specimens fit the original description.

Distribution: M. gracilis is known from shelf and slope depths off southern California; the present records come from slope and abyssal depths off Cedros Island and Bahia de la Magdalena, Baja California.

Myriochele heeri Malmgren, 1867

Myriochele heeri Malmgren 1867, pp. 101-102, pl. 7, fig. 37; Berkeley and Berkeley, 1952, pp. 41-42, figs. 74-78.

Records: 7231 (1); 7358 (1).

Remarks: M. heeri has both teeth of the uncini of the same size. The prostomium is cylindrical and the first three setigers are very short and appear fused upon superficial examination. The tubes resemble those of M. gracilis, but the covering material is not as well sorted and arranged as in M. gracilis.

Distribution: M. heeri is known from cold water from world-wide areas. The present records come from 1098-2480 m depth in the vicinity of Cedros Island, Baja California.

Myriochele pygidialis Hartman, 1960

Myriochele pygidialis Hartman, 1960, pp. 149-150, pl. 16, figs. 1-4.

Record: 7228 (2).

Remarks: The present specimens fit the original description. The tube has a thick, chitinous lining and an even covering of fine, dark particles. The pygidium has eight large, blunt papillae.

Distribution: M. pygidialis is common in the outer, deep basins off southern California; the present record is from 3726-4396 m depth off Cedros Island, Baja California.

Oweniidae, genus and species indeterminable

Record: 6213 (1).

Remarks: The specimen is a median fragment with a few remnants of the tube covering it. Hooks resemble those of Myriochele gracilis, but certain identification is not possible.

Family SABELLARIIDAE Johnston, 1865

Genus Idanthyrsus Kinberg, 1867

Idanthyrsus armatopsis, new species

(Plate 55, Figs. a-g)

Records: 11830 (1); 11831 (1, TYPE).

Description: The type is a complete specimen that is 24 mm long, with cauda, but without opercular palae; the cauda is 5 mm long. It is pale yellow and lacks color patterns.

The prostomium (Fig. a) is a broad, truncate fold that has a pair of palps attached dorsolaterally near the base. The lateral lips are flared and each has a shallow lateral incision. The lower lip is pad-shaped. The tube-building organ is horseshoe-shaped and has two posterior prolongations near the postectal corners. The opercular stalk is a pair of large, flaring folds. A dorsal membrane connects the two parts of the stalk. This membrane has a thickened mid-dorsal ridge which is prolonged anteriorly into a long, palpode-like process. The ventrolateral edges of the ridge have ten pairs of dark, reddish-brown eyespots. The edges of the paleal stalk have a number of slender, digitate processes. The oral tentacles number approximately twenty on each side and are arranged in groups along the

edge of the operculum.

The fourth setiger (the first three setigers participate in the formation of the operculum) is uniramous (Fig. f) with a short truncate neuropodium. A short, digitate lobe is present on the anterior edge of this neuropodium. The fifth and all following parapodia are biramous; both rami in the fifth setiger have short truncate setal lobes and short, digitate anterior lobes. The three parathoracic setigers have large, truncate notopodial and short, button-shaped neuropodial lobes. The first five abdominal setigers have very large, distally expanded double notopodial lobes; the two long free edges are equipped with a long series of uncini; the neuropodial lobes are very short. The posterior fourteen abdominal notopodia are prolonged and slender with short, truncate distal edges; they have only one single row of uncini each.

Opercular palae are arranged in two rows; the outer row numbers seventeen or eighteen long, coarsely dentate setae (Figs. b-c) with prolonged slender tips. The inner and median teeth are straight and projecting from the setae; the distal teeth are very slender and closely apressed to the stem of the setae. The inner opercular setae number thirteen or fourteen; each (Figs. d-e) is blunt and has thirty to forty transverse rows of numerous, very fine teeth. Thoracic setae are all similar, except for the parathoracic palae; each is slender and has long, sharply pointed teeth. The parathoracic palae (Fig. g) are short and bluntly rounded, with a deeply and finely fringed distal edge. The companion setae are twice as long as the palae; each is finely dentate with the teeth closely apressed to the stem of the setae.

The uncini are in a single row; each has seven or eight teeth in a single row and is attached at both ends with slender filaments that are prolonged through the whole length of the notopodium. Abdominal neuropodial setae are long and slender; each has a series of slender, sharply pointed teeth.

Tubes were not seen.

I. armatopsis closely resembles I. armatus Kinberg (1867, p. 350, see also Hartman, 1944b, pp. 336-337, pl. 31, fig. 36). The two specimens of I. armatopsis have been compared directly with three specimens of I. armatus which came from 30 m depth at Canal Calbuco (41° 46' 30" S, 73 06' 45" W) in sand and rock (coll. Lund University Chile Expedition, iden. E. Wesenberg-Lund, courtesy Hans O. Brattström, Biological Station, Espegrend, Norway). The type locality of I. armatus is at Valparaiso, Chile, which is nearly 10° latitude north of the present locality, but the three specimens agree in all details with the species as redescribed by Hartman (1944b). Illustrations of certain features of the three specimens are given in Plate 55, Figs. h-j.

I. armatopsis has a palpode-like process on the median ridge of the dorsal connective web between the two parts of the opercular stalk; such a process is absent in I. armatus. The median ridge has a series of ten pairs of eyespots on the ventrolateral edges in I. armatopsis; such eyespots are absent in I. armatus. The outer opercular palae have prolonged slender tips with long, closely apressed teeth in I. armatopsis; they have short, bluntly tapering tips in I. armatus and the teeth are not apressed to the stems. The parathoracic palae have deeply fringed tips and are shorter than the companion setae in I. armatopsis; they have a few coarse teeth on the tips and are more than twice as long as the companion setae in I. armatopsis.

Distribution: I. armatopsis is known from two localities in Sal si Puedes Basin, Gulf of California in 1200-1400 m depth.

Family PECTINARIIDAE Quatrefages, 1865

Pectinariidae, indeterminable

Records: 6212 (tube); 6213 (tube-fragment);

P 218-60 (tube).

Remarks: These tubes and tube-fragments cannot be further identified.

Family AMPHARETIDAE Malmgren, 1867

Twenty-two species have been found in the material from western Mexico; of these twelve species and three genera are newly described.

The prostomium in the subfamily MELINNINAE is relatively simple with a rounded or distally truncate lobe, usually with two distinct longitudinal folds. The prostomium of the AMPHARETINAE, on the other hand, is complex; it is composed of two distinct parts in all species investigated here. Mid-dorsally, usually anteriorly, is found a central part, referred to here as the mid-superior part; this part may be simple, bifid or have a central cleft. Laterally and posteriorly is found the inferior part of the prostomium; the lateral portions are usually in the form of a pair of thickened cushions connected to each other across the dorsum posterior to the mid-superior part. The cross-connection between the two lateral parts may be hidden below the branchial membrane; this is usually referred to as trilobed, with the two lateral lobes and the mid-superior part making up the three lobes (see Hessle, 1917 and Day, 1964). Glandular ridges may be associated with the posterior edge of the mid-superior part; the ridge may be simple and transverse, or may be separated into two parts depending on the development of the mid-superior part of the prostomium.

Eyes, when present, may be on the mid-superior part or on the lateral lobes.

The peristomium usually forms a conspicuous lower lip and is usually more or less reduced dorsally. It may be fused to the lateral sides of the prostomium and thus be visible dorsally as two lateral cushions, or the lateral

edges may be free. The peristomium often extends under the prostomium on the dorsal side of the mouth and may thus also form an upper lip. Posteriorly the peristomium may be more or less fused with one or more anterior segments.

One of the new genera, Mexamage, (see description below) has all branchiae segmentally arranged; there is no evidence of any missing anterior parapodia. The first parapodium is a short asetigerous lobe; all other anterior parapodia are setigerous; the four branchial segments are distinct ventrally. This is here considered a primitive condition. The degree of fusion of the anterior segments with corresponding compression of the branchial region and loss of anterior parapodia is to a certain degree characteristic of each genus. The presence or absence of a strongly reduced notopodium may in some cases be difficult to see. Day (1964) noted that the number of setigerous neuropodia may in the subfamily AMPHARETINAE be a more conservative character. The paleal segment has here been considered the first setigerous segment of the AMPHARETINAE; it is assumed that the paleae always develop on the same segment. It is thus possible to account for missing notopodia by comparing the distribution of notopodia dorsally with the remnants of intersegmental furrows ventrally.

It is here suggested that the prostomial features, when analyzed for a larger number of species, will give valuable taxonomic characters on the generic level. It is felt that a fusion of the many monotypic genera in the family, as suggested by Day (1964), may be unfortunate; the different genera have here been kept intact as described.

Key to Species from Deep Water off Western Mexico

1. Two pairs of branchiae..... 2.
1. Three or four pairs of branchiae..... 3.
2. Paleae present, lower lip crenulated.....
..... Ecamphicteis elongata

2. Paleae absent, lower lip smooth..... ..... Egamella quadribranchiata
3. Anterior neuropodia with needle-setae; a large nuchal hook present posterior to the branchiae..... 4.
3. Anterior neuropodia without setae or with uncini; nuchal hooks absent..... 7.
4. Thorax with fifteen setigers; transverse membrane smooth..... Melinna plana
4. Thorax with eighteen setigers; transverse membrane dentate..... 5.
5. Transverse membrane forms a deep narrow-mouthed funnel with dentate portion less than ¼ of the width of the body..... Melinna exilia
5. Transverse membrane forms at most a very shallow pocket, with dentate portion more than ½ the width of the body..... 6.
6. Branchial bases completely fused to each other in two groups; one pair of large and numerous smaller oral tentacles..... Melinna tentaculata
6. Each side with three branchiae in a crescent and one anterior; all more or less free to the base; all oral tentacles short... Melinna heterodonta
7. Paleal setae distinctly larger than the other notopodial setae..... 12.
7. Paleal setae no larger than the other notopodial setae..... 8.
8. Three pairs of branchiae present..... 9.
8. Four pairs of branchiae present..... 10.
9. Branchiae widely separated in two groups; thirteen abdominal setigers..... Samythella interrupta
9. Branchial groups separated by a very narrow space; twenty abdominal setigers..... ..... Samythella pala
10. All four pairs of branchiae segmentally arranged; lower lip and branchial membrane deeply crenulated.... ..... Mexamage corrugata
10. First two pairs of branchiae appear to be on the same segment; lower lip and branchial membrane

smooth or weakly lobed..... 11.
11. Ten abdominal setigers.. Amage scutata
11. Twelve abdominal setigers..... Amage delus
12. Paleae poorly developed; prostomium arrow-shaped with a thickened median ridge; usually with a glandular ridge across the dorsum of the fourth setiger..... Melinnampharete gracilis
12. Paleae well developed; prostomium otherwise; a glandular ridge, if present, on setiger 10..... 13.
13. Setiger 10 with slender pilose setae; all other thoracic setigers with bilimbate setae..... 14.
13. All thoracic setigers with bilimbate setae..... 15.
14. Setiger 10 with a glandular ridge; second notopodia missing..... Anobothrus mancus
14. Setiger 10 without a glandular ridge; second notopodia present..... Anobothrus bimaculatus
15. Fourteen thoracic setigers present..... Ampharete ?arctica
15. At least sixteen thoracic setigers present..... 16.
16. Sixteen or seventeen thoracic setigers present, if seventeen then the lower lip crenulated..... 17.
16. Seventeen or eighteen thoracic setigers present; lower lip smooth..... 18.
17. Lower lip crenulated; seventeen thoracic setigers..... Lysippe annectens
17. Lower lip smooth; sixteen thoracic setigers..... Lysippe mexicana
18. Distal end of paleal setae with a long, slender mucron..... Amphicteis mucronata
18. Distal end of paleal setae blunt or recurved..... 19.
19. Pro- and peristomium connected to the body by a distinctly narrowed neck..... 20.
19. Pro- and peristomium broadly fused to the rest of the body..... 21.
20. Distal end of paleal setae recurved; median lobe of mid-superior part of prostomium split medially..... Amphicteis uncopalea

20. Distal end of paleal setae blunt and straight, median lobe of mid-superior part of prostomium split anteriorly..... Amphicteis orphnius
21. One pair of branchiae expanded sub-distally..... ..... Amphicteis scaphobranchiata
21. All branchiae digitiform..... ..... Amphicteis obscurior

Genus Amage Malmgren, 1866

Two species were found in the material from western Mexico. An attempt was made to subdivide the members of the genus on the basis of the branchial distribution, but it was found that the descriptions in the literature were inadequate for the purpose. The genus as presently accepted appears to contain several disparate elements in that some species have all branchiae clearly segmentally arranged; in others the first two branchiae appear to be on the same segment.

The prostomium in some species is divided into two parts as described above for the family; in others it appears that the prostomium forms a simple, distally truncate lobe similar to the prostomial lobes in the MELINNINAE.

Amage inhamata Hoagland (1919, p. 577, pl. 30, figs. 7-9) is not an ampharetid; it resembles species in the genus Dodecaceria of the cirratulids.

A survey of all species in the genus is given as Appendix 4.

Amage delus (Chamberlin, 1919)

(Plate 56, Figs. a-c)

Sabellides delus Chamberlin, 1919, pp. 455-456, pl. 77, fig. 13.

?Amage perfecta Moore, 1923, p. 210.

Earlier Record: Chamberlin (1919, p. 456): ALBATROSS st. 3435 (HOLOTYPE, USNM 19174).

New Records: 11815 (appr. 100); P 127-58 (1).

Remarks: The type is a complete specimen with fourteen thoracic and twelve abdominal setigers. The description given below is based partially on the type and partially on fresh material. The mid-superior part of the prostomium (Fig. a) is slightly bifid anteriorly (cf. Chamberlin, 1919, p. 356). Posteriorly it is bordered by a transverse glandular ridge (a deep transverse sulcus according to Chamberlin). The inferior part forms lateral lobes which are pustulate and somewhat folded anteriorly. The peristomium is a large lower lip which is visible dorsally as two narrow lateral folds.

Four pairs of branchiae are present. The first two on each side appear to be associated with the first setiger and are placed side by side; the last two pairs on each side are associated with setigers 2 and 3 respectively. The last pair of branchiae is connected to the base of the notopodia by a thickened ridge.

The setae (Figs. b-c) are as described by Chamberlin (1919, p. 356, pl. 77, fig. 13).

The tubes have a thin inner lining of mucoid material covered with a thick, firm layer of mud particles.

A. delus was described in Sabellides which Chamberlin (1919, p. 443) defined as resembling Amage, but different in having ciliated rather than smooth tentacles. He nevertheless stated (p. 356) that the tentacles in Sabellides delus are wholly smooth, so the species should have been described in Amage by his own definition.

A. delus resembles A. perfecta as described by Moore (1923, p. 210) in the number of abdominal setigers. Moore considered his species a synonym of A. anops (Johnson, 1901, for complete reference see Appendix 4).

A. delus differs from A. anops in that it has twelve instead of fourteen or fifteen abdominal setigers. The number of abdominal setigers was counted on a large number of specimens of varying sizes in the present material and does not appear to vary. The only other species that has twelve abdominal and fourteen thoracic setigers is A. arieticornuta Moore (1923).

The prostomium in A. arieticornuta was described as being trilobate, consisting of a quadrate, petalliform median plate and a pair of flaring lateral lobes; the median lobe should be broader than long, widest at the anterior border and saddle-shaped. The mid-superior lobe of A. delus is longer than wide, anteriorly bifid, and is broadest near the middle. The anterior parapodia have broadly flattened parapodial lobes in A. arieticornuta and are truncate cone-shaped in A. delus. The structure of the setae appears similar in both species.

Distribution: A. delus is known from two localities in the upper end of the Gulf of California and possibly near San Diego off southern California.

Amage scutata Moore, 1923

(Plate 56, Fig. d)

Amage scutata Moore, 1923, pp. 210-212, pl. 17, figs. 19-24; Hartman, 1969, p. 529.

Records: 7358 (1); Scripps st. GC 26 (1).

Remarks: A. scutata has a very high, distally truncate branchial membrane (Fig. d). The prostomium has a bilobed mid-superior part and two lateral lobes of the inferior part which are evenly rounded. The peristomium is complete dorsally, but is hidden under the large branchial membrane.

Four pairs of branchiae are present; these are placed in the usual pattern with two on the first setiger and the last two on setigers 2 and 3 respectively; the last branchia is connected to setiger 3 by a thickened ridge.

A. scutata has ten abdominal setigers; the only other species in the genus that has this number is A. sculpta Ehlers (1908). The prostomium is simple and quadrangular and not clearly separated into a mid-superior and an inferior lobe in the latter; the prostomium of A. scutata was described above.

Distribution: A. scutata is known from central California in shelf depths; the present records are from slope depths in the Gulf of California and off Cedros Island, Baja California.

Genus Ampharete Malmgren, 1866

Ampharete ?arctica Malmgren, 1866

(Plate 57, Fig. a)

Ampharete arctica Malmgren, 1866, pp. 364-365, pl. 26; Berkeley and Berkeley, 1952, pp. 65-66, figs. 133-135; Hartman, 1969, p. 539.

Records: 6212 (2); 6213 (1).

Remarks: The three specimens are assigned to A. arctica with considerable doubt. The prostomium (Fig. a) is separated into two parts; the inferior part is a cushion which surrounds the mid-superior rounded part of the prostomium on all sides except dorsally and anteriorly. The prostomium of A. arctica as originally described consists of two short lateral lobes and a median, somewhat pointed lobe. The lateral lobes are not connected dorsally

according to Malmgren (1866, pl. 26, fig. 77) and Berkeley and Berkeley (1952, fig. 133).

The present specimens have the branchiae arranged with the three anterior ones in a row and the fourth nearly medially behind the others. The high branchial membrane is barely visible medially between the two groups of branchiae. Paleae are well developed.

Distribution: A. arctica has been reported from cosmopolitan areas; the present specimens come from slope depths near Bahia de San Cristobal, Baja California.

Genus Amphicteis Grube, 1851

The prostomium of species in this genus is usually described as trilobed (Hessle, 1917, p. 115) with two glandular ridges (for a complete review, see Day, 1964, pp. 98-99). The five species present in the collections from western Mexico all have very complex anterior structures.

The prostomium consists of an inferior part, usually as a distally rounded cushion; the peristomium may extend anteriorly under this cushion or may be restricted to the posteroventral aspects of the head. Dorsal and anterior to the inferior part of the prostomium is found a trilobed structure representing the mid-superior part. The paired lateral lobes of this mid-superior part may extend forwards on both sides of the median structure or may be situated posterior to the median lobe. The glandular ridge is at the posteromedial edges of the lateral lobes and usually meets medially with a posteriorly directed prolongation. The two lateral lobes are otherwise simple, usually pustulate lobes. The median lobe, however, is usually more or less deeply cleft. The two parts thus formed may be fused anteriorly (A. uncopalea) or may be separated (A. scaphobranchiata).

The peristomium may be visible dorsally as a cushion under the inferior part of the prostomium or may not be

visible dorsally except posteriorly and laterally. The dorsal part of the peristomium is visible as a folded ridge projecting dorsally from the posterolateral corners of the prostomium. The peristomium appears to be partially eversible in all five species.

The head may be connected to the rest of the body by a more or less distinct neck region (A. orphnius, A. uncopalea); this neck region represents the posterior part of the peristomium both dorsally and ventrally and the first of the two asetigerous segments. The second asetigerous segment appears dorsally as the posterior edge of the neck region and as the juncture to the large, expanded third segment, which here is interpreted as the paleal or first setigerous segment.

The head is broadly fused to the body in other species (A. obscurior, A. scaphobranchiata), but the two asetigerous segments are usually visible as ridges across the posterior part of the head.

The branchiae in Amphicteis represent four successive segments that have been more or less telescoped over each other anteriorly. The four pairs are always arranged in two groups with a median gap. This gap is covered by a small, thickened branchial membrane which may represent the reduced dorsal portion of the paleal segment. Each group of branchiae is arranged in an anterior group of two and a similar posterior one. The posterior medial branchiae belong to the paleal segment and the anterior medial ones to the second setigerous segment. The anterior lateral ones belong to the third setigerous segment and the posterior lateral ones are always connected by a thickened ridge to the base of the notopodia of the fourth setigerous segment.

There are thus in Amphicteis two anterior segments which lack both branchiae and parapodia; this is in contrast to the situation in other genera, where the asetigerous anterior segments can be related to the branchial distribution. This may indicate that the cephalization of the ampharetids has taken place separately along several different lines.

The lateral portions of the first few setigerous segments, apart from the paleal segment, are raised and form weakly marked lateral flanges along the anterior end in three of the five species here reported.

The genus is restricted to include ampharetids with seventeen or eighteen thoracic setigers of which one or two anterior ones may be strongly reduced. Fourteen uncinigerous segments are present in the thorax. Four pairs of smooth branchiae are present; paleae are usually strongly developed. The prostomium has a pair of glandular ridges and is separated into two parts, an inferior rounded cushion and a mid-superior trilobed part. Notopodial cirri are present and rudiments of the notopodia are present in the abdomen.

Amphicteis mucronata Moore, 1923

(Plate 58, Fig. a)

Amphicteis mucronata Moore, 1923, pp. 203-206; Hartman, 1969, pp. 547-548.

Record: 6213 (3).

Remarks: A. mucronata has long mucrons on the paleal setae and thus differs markedly from all other species of the genus in this area.

The prostomium (Fig. a) consists of a large, cushion-shaped inferior part and a trilobed mid-superior part. The paired lateral lobes of the mid-superior part are short and rounded; the median lobe is bifid and consists of two sharply pointed ridges and a median rounded cushion. The glandular ridges form the posterior edge of the mid-superior part and are prolonged over the inferior part as a short, slightly elevated ridge.

The branchial membrane is narrow and triangular.

Distribution: A. mucronata is known from Washington and western Canada to southern California in shelf and slope depths. The present record is from Bahia de San Cristobal, Baja California in upper slope depths.

Amphicteis obscurior Chamberlin, 1919

(Plate 58, Fig. b)

Amphicteis obscurior Chamberlin, 1919, pp. 447-448, pl. 76, figs. 1-2; pl. 77, fig. 3.

Earlier Record: Chamberlin (1919, p. 448): ALBATROSS st. 3417 (HOLOTYPE, USNM No. 19327).

Remarks: The holotype and only specimen of A. obscurior has been re-examined. The prostomium (Fig. b) is in two parts; the inferior part is rounded conical and broadly attached posteriorly to the wide peristomium. The mid-superior part is trifid. The two lateral lobes are shorter than the median lobe and rounded. The median lobe is anteriorly bifid. The glandular ridges are short. The two asetigerous anterior segments are visible both dorsally and ventrally as poorly marked ridges. The paleal setae are strong and distally pointed, but without a distal mucron or narrow prolongation as in A. uncopalea.

Distribution: A. obscurior is known only from the type locality off southwestern Mexico.

Amphicteis orphnius Chamberlin, 1919

(Plate 57, Fig. b)

Amphicteis orphnius Chamberlin, 1919, pp. 450-451, pl. 76, figs. 3-4, pl. 77, figs. 1-2.

Earlier Record: Chamberlin (1919, p. 451): ALBATROSS st. 3417 (HOLOTYPE, USNM No. 19759).

Remarks: A. orphnius has a bipartite prostomium (Fig. b); the inferior part is a thick, rounded cushion; the mid-superior part is trifid with the two lateral lobes small and rounded. The median lobe of the mid-superior part is deeply bifid, with each lobe slightly produced laterally at the anterior end. The posterior part of the prostomium is narrower than the median part and the peristomium and the two asetigerous segments form a neck region connected to the expanded third segment. The glandular ridges are short. The paleal setae are abruptly tapering without mucrons.

Distribution: A. orphnius is known from the type locality off southwestern Mexico.

Amphicteis scaphobranchiata Moore, 1906

(Plate 58, Fig. c)

Amphicteis scaphobranchiata Moore, 1906, pp. 255-257, pl. 12, figs. 54-61; Hartman, 1969, pp. 549-550.

Records: 6212 (3); 7358 (6).

Remarks: Each of the anterior medial branchiae in A. scaphobranchiata is strongly expanded subdistally to form a large, foliaceous lobe with a short, digitiform tip. The branchial membrane (Fig. c) is nearly quadrangular and has a short, anteriorly directed ridge.

The inferior part of the prostomium is very large and expanded ventrally like a cushion; the mid-superior part is relatively small; it is trilobed, with the two lateral lobes prolonged anteriorly to cover the sides of the median lobe. The glandular ridge is relatively short and does not

reach the lateral margins of the mid-superior part. The median lobe is deeply cleft anteriorly and forms two elevated ridges separated by a deep groove. The peristomium is visible dorsally only as a narrow folded ridge lateral to the prostomium.

Distribution: A. scaphobranchiata is known from southern California in all depths from shelf to abyssal areas; the present records come from slope depths off the west coast of Baja California in the vicinity of Cedros Island.

Amphicteis uncopalea Chamberlin, 1919

(Plate 57, Fig. c)

Amphicteis uncopalea Chamberlin, 1919, pp. 448-450, pl. 76, figs. 5-6; pl. 77, fig. 4.

Earlier Record: ALBATROSS st. 3424 (1, HOLOTYPE, USNM No. 19328).

New Records: 11815 (13); Stephen Calvert st. L-184 (1).

Remarks: A. uncopalea is characterized by long, slender paleal setae which are distally recurved into a loop. It is a very large species; the largest specimen in the present collection is incomplete posteriorly, but measures nearly 110 mm in length.

The details of the prostomium were partially described by Chamberlin (1919, p. 449) who further remarked that the prostomial features were highly characteristic for this species. The present specimens all have the inferior part of the prostomium, (Fig. c) which is a large cushion, anteriorly interrupted by a ridge stretching from the median lobe of the mid-superior part of the prostomium to the

mouth. The two lateral lobes of the mid-superior part are visible only as small buttons under the lateral ends of the glandular ridges. The median lobe is medially split into two ridges which are fused anteriorly and which posteriorly disappear under the glandular ridges. The peristomium is visible from the dorsal side as a cushion under the inferior part of the prostomium; it is as mentioned above, split anteriorly to make room for the prostomial ridge from the median lobe to the mouth. Posteriorly the head is strongly narrowed in a distinct neck region formed by parts of the peristomium and the two asetigerous segments. A reexamination of the type shows these features to be present also in the type.

The branchial membrane is quadrangular with more or less distinct anterolateral horns.

The massive paleal parapodia project over the posterior parts of the head.

Distribution: A. uncopalea was first described from the southern part of the Gulf of California in slope depths. The present records are from Guaymas Basin in the upper end of the Gulf of California in slightly greater depths.

Genus Anobothrus Levinsen, 1883

The genus was erected to accommodate A. gracilis (Malmgren, 1866) originally described in Ampharete. The prostomial features in members of the genus resemble the conditions in Ampharete closely, from which Anobothrus differs externally mainly in having some of the posterior thoracal segments modified. There are, however, important differences in the internal anatomy of the two genera (see Hessle, 1917 and Day, 1964).

The only other genus in the AMPHARETINAE that has modified posterior thoracal segments and which otherwise resembles Anobothrus is Sosane Malmgren (1866). This was noted by Day (1964, p. 115) who synonymized the two genera.

The modifications of the posterior thoracal notopodia may be an expansion of the notopodial parapodial lobes as in A. nasuta (Ehlers, 1887, pp. 232-236, pl. 49, figs. 1-6) and A. trilobatus Hartman (1969, pp. 557-558). Another kind of modification may be that the notopodium is in a more dorsal position than the other notopodia; this is found in A. occidentalis Hartman (1969, pp. 555-556) and to a degree in the genotype, A. gracilis (Malmgren, 1866, p. 365, pl. 26, fig. 75). The latter kind of modification is similar to that found in the last thoracal segment of Sosane sulcata Malmgren (1866, p. 368, pl. 26, fig. 79). Finally, the modification may consist of a change in the kind of setae present without any obvious modifications of the notopodial lobes. This is the case in one of the two species represented in the present material. The other species has, in addition to the modified setae, a thick glandular ridge across the modified segment.

It appears that the genus as presently accepted contains several different elements with different kinds of modification of median and posterior thoracal segments. In view of this, it was decided to retain Sosane and Anobothrus temporarily as distinct genera, at least until the function and origin of the modification of the segment could be investigated. It is possible that the two genera contain similar assemblages of species, but present information is too scanty to permit any safe conclusions.

Anobothrus bimaculatus, new species

(Plate 59, Figs. a-f)

Records: ?6213 (3); 11814 (1); 11829 (5); 11834 (2); 11837 (36, TYPE).

Description: The type is a complete specimen that is 65 mm long and 2 mm wide with setae. The body is widest anteriorly at or near the branchial segments and is evenly

tapering posteriorly; it is more or less cylindrical. The pygidium has a pair of thickened cushions surrounding the anus.

The prostomium (Fig. c) has a thick, distally blunt or truncate mid-superior part which has more or less parallel lateral sides. The inferior part laterally forms a pair of thick lobes which are connected posteriorly in a ridge. A pair of dark, elongated eyespots is present near the posterior corners of the mid-superior part. The peristomium is represented ventrally by a large, anteriorly smooth, lower lip; dorsally it is visible as a pair of lateral cushions.

The first three segments are fused dorsally and ventrally; the paleal parapodia are large with foliose postsetal lobes. Setigers 2 and 3 have small, cylindrical notopodial lobes. Setiger 4 and all following thoracic setigers have similar notopodia. Each is cylindrical with a poorly marked depression distally. The last eleven thoracal segments are uncinigerous; the neuropodia are low welts. Abdominal neuropodia are cylindrical and distally truncate.

Four pairs of branchiae (Fig. d) are present; six branchiae are in a single transverse row; the last two branchiae are placed posterior to the others and are connected to the fourth setiger by a ridge. Each branchia is long and slender; the longer branchiae reach setiger 8 when stretched over the back.

Notopodial thoracic setae are slender with poorly marked bilimbation, except in setiger 10 where they are modified. Each modified seta (Fig. a) is cylindrical with an obliquely tapered distal end; this distal portion of the seta is finely pilose. Thoracal uncini (Fig. b) have four pairs of long, slender teeth and a large, sharply recurved base with a large attachment point. Abdominal uncini (Figs. e-f) are slightly smaller; each has two rows of slender teeth with six teeth in each row and a median row of four larger teeth.

The tubes have thick linings of poorly arranged mucoid material covered with a layer of mud particles of

varying thickness; the upper end of the tube usually also has transversely arranged shell fragments.

A. bimaculatus resembles A. gracilis (Malmgren, see complete reference above) closely. It differs from the latter in that the tenth setiger is modified instead of the thirteenth and in that it has fifteen rather than sixteen thoracic setigers. The notopodia of the modified segment are in the normal position in A. bimaculatus and have been moved dorsally in A. gracilis.

The specimens from st. 6213 agree with A. bimaculatus in the shape and configuration of the prostomium and peristomium; all three are posteriorly incomplete and the degree of modification of the tenth segment cannot be determined. The identification of these specimens is by no means certain; they should perhaps be referred to A. gracilis, which is known from southern California, rather than to the present species.

Distribution: A. bimaculatus is known from several localities in the upper end of the Gulf of California. The record from Bahia de San Cristobal, Baja California, is considered very doubtful.

Anobothrus mancus, new species

(Plate 59, Figs. g-i)

Records: 11773 (3); 11774 (2, TYPE); 13743 (1); 13744 (1); 13752 (1); 13767 (3); 13774 (1).

Description: The type is an incomplete specimen with fourteen thoracic and four abdominal setigers; it is 8 mm long and 1.5 mm wide without setae. It is white and lacks color patterns except for two large dark fields on the prostomium.

The mid-superior part of the prostomium (Fig. i) is shaped like an inverted T with the cross-bar of the T pos-

teriorly. The anterior portion of the mid-superior part is flattened and foliose with the two lateral margins rolled ventrally. The inferior part of the prostomium forms two thick lateral lobes connected by a raised ridge posterior to the mid-superior part. At the lateral corners of this ridge are found two large, diffuse pigment patches. Between these patches is found a small, clearly defined glandular patch. The peristomium forms ventrally a rather large, distally smooth lower lip; it is continuous dorsally posterior to the prostomium as a thick ridge.

The paleal segment has large parapodia with foliose postsetal lobes; the second and third segments are dorsally fused to the paleal segment, but are visible as faint lines ventrally. The second segment lacks parapodia completely; the third parapodia are represented by cylindrical notopodia similar to those in the more posterior thoracic segments. Neuropodia are present from the fourth setiger; each is a low welt. A thick glandular ridge is present on the dorsum between the notopodia of the tenth setiger. The flattened abdominal neuropodia are distally truncate.

Four pairs of branchiae arranged in two groups are present. Three branchiae on each side are in a transverse row, with the fourth posterior to the others. The fourth branchia is connected to the fourth setiger by a distinct ridge. Each branchia is long and slender.

There are slender, weakly bilimbate notopodial setae in all thoracic notopodia except in setiger 10. The modified setae (Fig. g) of setiger 10 are long and slender capillaries with the distal portion finely pilose; they are evenly tapering. The distal and proximal teeth of the thoracic uncini (Fig. h) are single; the other twelve teeth are in double rows. The attachment area is poorly marked and the proximal portion of the uncinus is strongly recurved. Abdominal uncini are similar, but usually lack one pair of double teeth so that the dentition consists of a single tooth, five double, and a single tooth.

Tubes are absent.

A. mancus lacks notopodia on segment 2; the modified segment (setiger 10) has a thick glandular ridge dorsally; the notopodium is in the normal position, but has finely pilose capillary setae instead of the normal bilimbate setae found in other notopodia. A. mancus differs from all other species in the genus in the structure of the modified segment.

Distribution: A. mancus is known from two localities in the southern part of the Gulf of California and from several localities in the Central American Trench.

Ecamphicteis, new genus

This genus includes ampharetids with two pairs of branchiae on the first two setigerous segments. The thorax has eighteen setigers including a well developed paleal segment. The prostomium has a well developed superior part; the inferior part forms a large upper lip in addition to a large horseshoe-shaped cushion dorsally. The lower lip is deeply crenulated.

The two pairs of branchiae are at the postectal corners of the prostomium; they are separated by a narrow, distally smooth branchial membrane attached to the medial sides of the second pair of branchiae.

Setae include notopodial capillaries and neuropodial uncini with teeth in several rows.

Ecamphicteis resembles Amphicteis (see above) in that both genera have eighteen thoracic setigers and well developed paleae. Ecamphicteis has two pairs of branchiae; Amphicteis has four. The lower part of the prostomium forms a large upper lip in Ecamphicteis; this is not the case in Amphicteis.

Crenulated lower lips are known in Lysippe and Mexamage (see below). Ecamphicteis differs from these genera in the number of pairs of branchiae and in the number of segments in the thorax.

Other genera with two pairs of branchiae include Auchenoplax Ehlers (1887, p. 208, pl. 44, figs. 10-16), Egamella, new genus and Melinnoides Benham (1927, pp. 115-117, pl. 3, figs. 73-81). Ecamphicteis differs from these genera in that it has well developed paleae. The relationship between the three genera cited is indicated below.

Genotype is E. elongata, new species.

Ecamphicteis elongata, new species

(Plate 60, Figs. a-d)

Records: 13742 (1); 13743 (1); 13747 (1); 13753 (1); 13768 (2); 13774 (3); 13775 (9, TYPE).

Description: The type is an incomplete specimen with eighteen thoracic and two abdominal segments. It is 14 mm long and 1.2 mm wide without setae. The segments are elongated both in the thorax and the abdomen. Two dark spots are present on the edge of the superior part of the prostomium; otherwise the specimens are white.

The prostomium (Fig. b) is divided into two parts. The superior part is posteriorly rounded and slightly inflated; anteriorly it is deeply cleft and the two lateral corners form distinct horns. The inferior part dorsally forms a large, horseshoe-shaped cushion supporting the superior part. The inferior part ventrally forms (Fig. c) a large upper lip.

The peristomium is a thick ventrolateral ring below the prostomium; it is visible from the dorsal side as two large folds lateral to the prostomium. The peristomium is ventrally divided into two parts; the anterior part is a strongly crenulated lower lip; the posterior part is smooth.

The paleal notopodia are twice as wide, but no longer than the other thoracal notopodia. The second and third notopodia are short and dorsolateral in position;

the other thoracacal notopodia are more strictly lateral. Notopodial rudiments are absent from the abdomen. Neuropodia are present from setiger 5; each thoracal neuropodium is a low welt; abdominal neuropodia are somewhat larger, but similar in shape.

All notopodial setae are long, smooth capillaries. Uncini, which are present from setiger 5, are similar in the thorax and the abdomen. Each uncinus (Figs. a and d) is short and rounded; the cutting edge has eleven to thirteen teeth in several rows. The abdominal uncini are slightly smaller than the thoracal ones.

The branchiae, which are in two groups on either side of the low, smooth branchial membrane, are very long and slender. Each of the medial branchiae is as long as the thorax in all specimens where the branchiae have been retained; the outer branchiae are slightly shorter.

E. elongata differs from other ampharetids as indicated for the genus.

Distribution: E. elongata has been found along the mainland slope of the Central American Trench from Punta San Telmo to the Tres Marias Islands and off Cabo Falso, Baja California.

Eqamella, new genus

These are ampharetids with two pairs of branchiae on the first two setigerous segments. The prostomium has a well developed mid-superior part with laterally produced frontal horns. The peristomium is complete dorsally but hidden below the large, flattened, laterally free branchial membrane. The thorax has twelve setigers; the abdomen has seven. Clavate notopodial rudiments are present in abdominal setigers. The oral tentacles are smooth.

Eqamella resembles Amage and related genera in that the branchiae are clearly segmentally arranged; Amage,

however, has at least three pairs of branchiae and the prostomium is completely different structurally (see above).

Other genera with two pairs of branchiae include, as indicated above, Auchenoplax, Ecamphicteis and Melinnoides. Ecamphicteis has well developed paleae and is thus completely different from the other three genera. Auchenoplax and Melinnoides were considered synonymous by Day (1964, p. 118). Both have two pairs of branchiae in a transverse row or arranged in groups with well developed branchial membranes attached to the bases of the branchiae. The branchiae are in longitudinal rows in Eqamella and the branchial membrane is laterally free from the bases of the branchiae.

The prostomium in Auchenoplax is anteriorly pointed and the mid-superior part has been pushed posteriorly so that the inferior part is fused anteriorly to form a pointed palpode. Melinnoides appears to have a simple, quadrate, anteriorly truncate prostomium (Benham, 1927, pl. 3, fig. 73); it is possible that a division into a superior and inferior part is present, but it is not clear from the illustration given.

Genotype for Eqamella is E. quadribranchiata, new species.

Eqamella quadribranchiata, new species

(Plate 60, Fig. a)

Record: 7358 (1, TYPE).

Description: The type is a complete female with large eggs in the body cavity. It is 4 mm long and 1 mm wide and is white without any color patterns. The anterior part of the body including the thorax is inflated; the posterior part is slender and cylindrical. The anus is surrounded by low, thickened mounds. The thorax consists of twelve setigers, the abdomen of seven.

The prostomium (Fig. a) has two parts; the mid-superior part is quadrangular with two frontal horns; it is posteriorly fitted into a pocket in the inferior part. The latter consists of two thick, lateral cushions which posteriorly are connected by a transverse ridge. The peristomium is visible dorsally as two large lateral cushions; it is continuous across the dorsum as a slightly thickened ridge hidden under the branchial membrane. The short oral tentacles are smooth and club-shaped. The lower lip is broad and distally smooth.

The first two thoracal setigers are narrow and have small, sharply pointed parapodia; all other thoracal setigers are similar and have relatively long, narrow notopodia which are distally bluntly conical or pointed. Neuropodia are visible from the fourth setiger; the thoracic neuropodia are low welts; the long abdominal ones are strongly flattened and have truncate distal edges. Short clavate notopodial rudiments are present in all abdominal setigers.

Two pairs of branchiae are present, one on each of the first two setigers. Only the bases of the branchiae are left. The anterior ones are considerably larger than the posterior ones and may indicate that the structure of the two pairs is different. Each base is a truncate cone; the anterior pair is placed slightly medially to the posterior one. A high, distally smooth branchial membrane is attached near the anterior margin of the first setiger. The branchial membrane is free from the branchiae laterally.

Setae comprise simple, bilimbate ones in the thoracic notopodia and uncini in both thoracic and abdominal neuropodia. The thoracic uncini have five or six teeth in a single row. Each abdominal uncinus has a large main fang and a crest of seven or eight smaller teeth.

Tubes are absent.

The relationship between E. quadribranchiata and possibly related forms has been discussed above.

Distribution: E. quadribranchiata is known from one locality near Cedros Island, Baja California.

Genus Lysippe Malmgren, 1866

The genus was defined by Malmgren (1866, p. 367) for L. labiata as having a sub-rectangular prostomium, small paleae, smooth tentacles, four pairs of filiform branchiae, sixteen thoracic setigers and uncini from the fourth setiger.

This definition was revised by Hessle (1917, p. 109) as follows: prostomium clearly trilobed; tentacles smooth; four pairs of branchiae; paleae present, but small and with clearly defined notopodial rudiments on the abdomen. Hessle also included the number of nephridia in his diagnosis.

A third definition of the genus was given by Day (1964, p. 114). According to Day, the genus should include ampharetids with a prostomium without glandular ridges and with smooth oral tentacles and four pairs of branchiae. Small notosetae should be present on segments III and IV (the paleal segment and the one immediately behind it) and are always present on segments V and VI. Uncini should be present from segment VII according to Day. There should be thirteen uncinigerous thoracic segments. Uncini should have two or three rows of teeth.

There is thus little agreement on the definition of the genus, despite the fact that as of now, only five species are assigned to it.

The genus is here accepted to include ampharetids with broadly quadrangular prostomia with poorly marked longitudinal depressions laterally. Four pairs of branchiae are present; the paleae are developed lateral to the base of the branchiae, but are usually only slightly larger than the setae of the fully developed notopodia. The thorax includes fifteen to eighteen setigers (counting the paleal segment) of which eleven to twelve are uncinigerous. The uncini have teeth in two or more rows and may appear crested.

This definition is somewhat broader than any of the ones cited above, but it is impossible to give a more