POLYCHAETA FROM HAWAII

BY
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The polychaete material treated in this work is part of the zoological collection made by Dr. Victor Pietschmann in Hawaii in 1928 in the following locations: Pearl and Hermes Reef; French Frigates Shoal (anchorage 1½ nautical miles east of Tern Island, in the lagoon); Lisiansky Island; Laysan Island; Waikiki and Kaneohe Bay, Oahu. Most of the specimens are pelagic forms of nereids which were captured on the surface of the sea, especially by night. The following is a systematic list of the material here considered:

Class: Polychaeta
  Order: Polychaeta errantia
    Suborder: Nereimorpha
      Family: Aphroditidae
        Subfamily: Polynoinae
          Genus: Iphione
            Iphione ovata Kinberg, 1857
          Genus: Lepidonotus
            Lepidonotus species
      Family: Phyllodicidae
        Subfamily: Phyllodocinae
          Genus: Phyllodoce
            Subgenus: Anaitides
              Phyllodoce (Anaitides) madeirensis Langerhans, 1879
      Family: Nereidae
          Genus: Nereis
            Subgenus: Nereis
              Nereis (Nereis) unica new species
              Nereis (Nereis) abbreviata new species
              Nereis (Nereis) mariae new species
              Nereis (Nereis) myersi new species
            Subgenus: Neonereis new subgenus
              Nereis (Neonereis) hawaiiensis new species
              Nereis (Neonereis) nigroaciculata new species
            Subgenus: Herfriedia new subgenus
              Nereis (Herfriedia) waikikiensis new species
            Subgenus: Ceratonereis
              Nereis (Ceratonereis) pietschmanni new species
          Genus: Perinereis
            Perinereis helleri Grube, 1878
            Perinereis curvata new species

* This is the fifth in a series of publications resulting from investigations by Dr. Victor Pietschmann, Bishop Museum Fellow in Yale University, 1927-1928. The first paper is by Anton Böhm, "Distribution and variability of Ceratium in the northern and western Pacific": B. P. Bishop Mus., Bull. 87, 1931. The second paper is by Otto Schindler, "Sexually mature larval Hemiramphidae from the Hawaiian islands": B. P. Bishop Mus., Bull. 97, 1932. The third is by Maximilian Holly, "Echinodermata from Pearl and Hermes Reef": B. P. Bishop Mus., Occ. Papers, vol. 10, no. 1, 1932. The fourth is by F. A. Schilder, "Cypraeacea from Hawaii": B. P. Bishop Mus., Occ. Papers, vol. 10, no. 3, 1933.

Genus: Platynereis
Platynereis pestai new species
Platynereis species
Family: Eunicidae (Lycoridae)
Subfamily: Eunicinae
Genus: Eunice
Eunice australis Quatrefages, 1870
Eunice paupera Grube, 1878
Order: Polychaeta sedentaria
Suborder: Drilomorpha
Family: Opheliidae
Genus: Polyophthalmus
Polyophthalmus pictus Claparède, 1864
Suborder: Terebellomorpha
Family: Terebellidae
Subfamily: Amphitritinae
Genus and species indeterminable

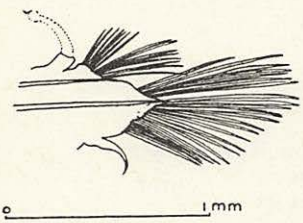

FIGURE 1.—Lepidonotus species, parapodium.

Genus IPHIONE Kinberg, 1854

Iphione ovata Kinberg, 1857.

One specimen from Pearl and Hermes Reef.

Genus LEPIDONOTUS Leach, 1819

Lepidonotus species (fig. 1).

One very badly preserved specimen from Waikiki, Oahu, was observed. The posterior body segments, all the elytra, tentacles, and cirri were lacking, so that an indisputable species assignment was not possible.

Genus PHYLLODOCE Savigny, 1809

Subgenus ANAITIDES Czerniawsky, 1882

Phyllodoce (Anaitides) madeirensis Langerhans, 1879 (fig. 2).

Four broken pieces of an incomplete and very badly preserved specimen, with altogether 172 parapodia-bearing segments. French Frigates Shoal.

Genus NEREIS Linné, 1758

Subgenus NEREIS sensu stricto Kinberg, 1864

Nereis (Nereis) unica, new species (fig. 3; pl. 1, *A*).

The color of the animal is yellowish white; the parapodia are more or less clearly transparent.

The total length of the relatively stout body measures without anal cirri 8.75 mm. The body reaches its greatest width in the nereid region with 1.10 mm, measured without parapodia. The nereid region is approximately 3.00 mm long and is composed of 14 parapodia-bearing segments; its thickness measures about 0.42 mm. The heteronereid region consists of 41 parapodia-bearing segments; it measures 5.75 mm; its greatest width

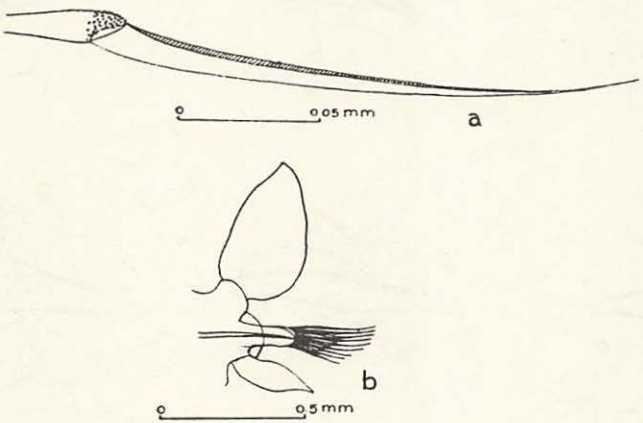

FIGURE 2.—*Phyllodoce (Anaitides) madeirensis: a,* bristle; *b,* parapodium.

is approximately in its anterior one-fourth and measures 0.75 mm; posteriorly it tapers off gradually but continually; the greatest thickness of the heteronereid region measures 0.31 mm. The frontal section of the prostomium is somewhat shorter than its posterior section, which bears two pairs of large blackish lilac eyes that almost touch. On the frontal section there is a low median protuberance upon which the tentacles rest; the tentacles are conically tapered and relatively short since they are shorter than the thick palps, which, inclusive of their terminal joints, are about as long as the frontal part of the prostomium. On the dorsal side the peristomium is approximately as long as one third of the prostomium and somewhat longer than the second body segment. The ventral half of the peristomium is thick and torous, marked by indentations parallel to the long axis of the body. There are four pairs of tactile cirri: the first ventral pair of cirri reach when extended backward ventrally approximately to the caudal border of the 1st parapodia-bearing segment; the second ventral pair of cirri reach slightly beyond the front border of the 2d parapodia-bearing segment. The dorsal cirri are longer than the ventral; the anterior pair of cirri reach, when directed backward, beyond the third; the posterior pair reach to the middle of the 7th parapodia-bearing segment. The segments of the nereid region are dorsally convex. Ventrally they are somewhat flattened. The parapodia are flattened cephalocaudally; the first two are single branched with only one acicula; all other parapodia are two-branched, with two aciculae; the height of the parapodia increases continually from the first up to the seventh, then from there to the fourteenth tapers off again gradually. The two first parapodia are, as said, single-

branched; their acicula lies in a relatively large lobe, which, however, is overhung by both ligulae, especially by the ventral one which is the larger. The notocirrus is well developed, bent downward and club-shaped; it bears on its distal end a small conical tip which seems attached to it; the neurocirrus is of the same shape only smaller; it arises close at the base of the parapodium. The parapodium of the 3rd parapodia-bearing segment is the first two-branched one; its aciculae lie in short, broad conically blunted lobes; the ligulae are well and strongly developed and drawn out conically; the notocirrus is elongated; it is thickened like a knob at its distal end and bears also a little attached tip. The neurocirrus is quite differently constructed; it is elongated and thickened club-

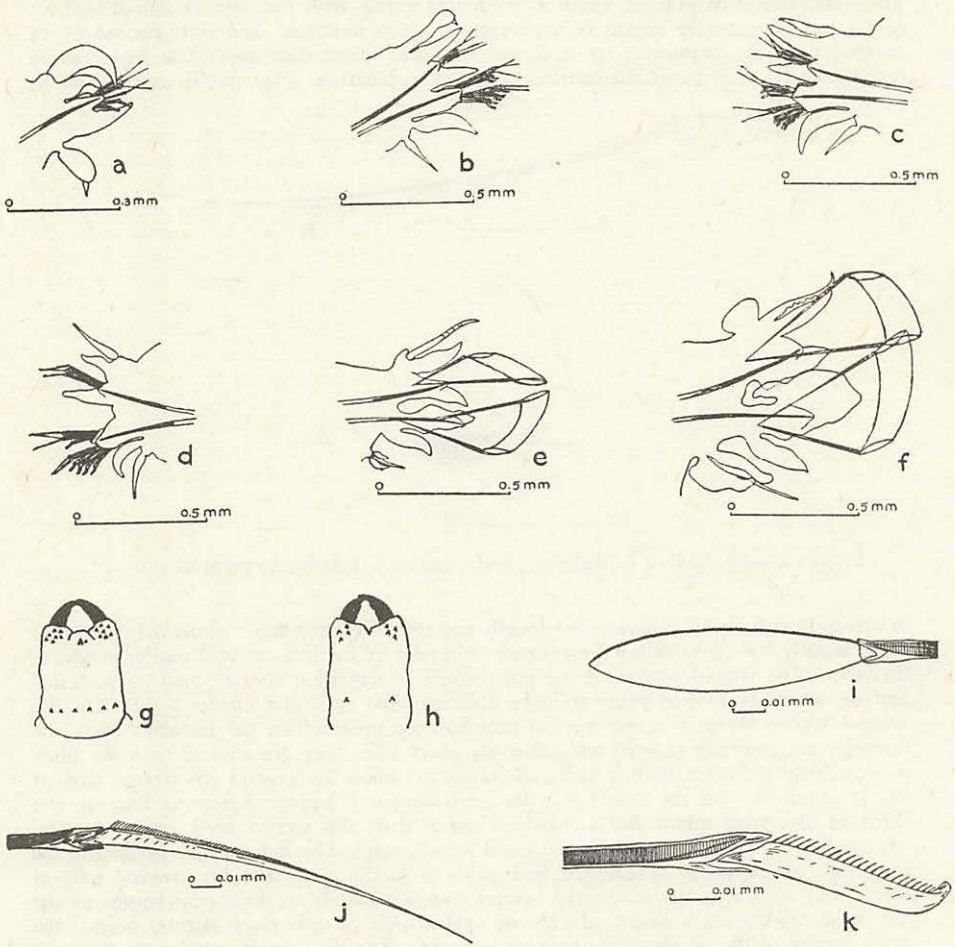

FIGURE 3.—*Nereis (Nereis) unica*, new species; *a*, single-branched parapodium of the 1st parapodia-bearing segment; *b*, parapodium of the 7th parapodia-bearing segment; *c*, parapodium of the 8th parapodia-bearing segment; *d*, parapodium of the 14th parapodia-bearing segment; *e*, parapodium of the 15th parapodia-bearing segment; *f*, parapodium of the 30th parapodia-bearing segment; *g*, proboscis from below; *h*, proboscis from above; *i*, bladelike swimming bristle; *j*, homogomphe setiferous bristle; *k*, heterogomphe falcate bristle.

shape in its basal part. Both neurocirrus and notocirrus are in general shorter than the ligulae; only in the 7th parapodia-bearing segment, which also produces the largest parapodia, the notocirrus reaches the point of the highest ligula. The eighth and the following pairs of parapodia of the nereid region are similarly constructed, except that their size decreases regularly as already said; they are different from the anterior parapodia in that the notocirrus possesses the same shape as all neurocirri—that is, it is elongated and thick, clublike in its basal part; from the eighth to the last pair of parapodia of the nereid region the cirri lengthen in proportion to the ligulae, so that toward the end of this body region they become longer than the ligulae. The parapodia of the heteronereid region are in their construction somewhat more strongly developed than those of the nereid region; they are much more compressed in cephalocaudal direction and more elongated distally. From the first pair of parapodia the notocirrus is provided with a small protuberance at its base which toward the middle of the heteronereid region of the body becomes larger and is flabbily developed; the cirrus itself is long and thin, projects beyond the conical ligula, and bears papillae; the lobes in which the aciculae lie are bluntly conical; the neuropodium bears a large leaf-shaped dorsal ligula; the ventral one is considerably smaller and lancet-shaped. The neurocirrus is long, thin, and smooth; it possesses in all parapodia an upper conical lobe originating at the base, and a lower larger one likewise arising at the base, slightly bent, tapering conically distally. The aciculae are in all parapodia somewhat long and slightly bent; in their basal third they are colorless and transparent; the other two thirds are colored deep blackish brown. In the notopodia of the nereid region are found only homogomphe long-pointed setiferous bristles (*Grätenborsten*) with somewhat long shafts and partly haired edges; the neuropodia of the same region bear homogomphe setiferous bristles and heterogomphe falcate bristles (*Sichelborsten*); the edge of the blade bears bristle-like hairs; the shaft of the heterogomphe falcate bristles is colored brownish and stouter than that of the homogomphe setiferous bristles; this and the blades of the falcate bristles are colorless and transparent. The swimming bristles of the heteronereid parapodia are homogomphe knifelike bristles (*Messerborsten*), the blade of which is serrate on one side. The anal segment bears styliform papillae and two anal cirri, of which, however, in the present specimen, one cirrus is altogether lacking; the other is broken to pieces, so that its length could not be measured. The protruded proboscis is approximately twice as long as thick; the paragnatha are all conical, chitinous, and of dark brown color; they are distributed upon the individual proboscis areas as follows: area I, without paragnatha; area II, 4 paragnatha in two diagonal rows; area III, 1 paragnath, a little to the right of it a small one; area IV, a group of 6 to 7 paragnatha; area V, without paragnatha; area VI, 1 small paragnath; areas VII and VIII, together 6 paragnatha. The jaws are large and strong and their inner margin bears six strong serrated teeth.

One epitokal specimen from Pearl and Hermes Reef.

Nereis (Nereis) abbreviata, new species (fig. 4; pl. 1, *B*).

The body, which is colored whitish to yellowish white, reaches its greatest width somewhat anterior of its middle and narrows from there caudally. The nereid region is sharply separated from the heteronereid and extends over 14 parapodia-bearing segments. The heteronereid region consists of 38 to 47 parapodia-bearing segments. The body of a large specimen measures as follows: total length, 9 mm; length of the nereid part of the body, 2 mm; length of the heteronereid part of the body, 7 mm; greatest width of the nereid region, 1.10 mm; greatest width of the heteronereid region, 0.80 mm; thickness of the nereid region, 0.39 mm; thickness of the heteronereid region, 0.28 mm.

The prostomium is roundish; its anterior region is much shorter than its posterior part, which bears the two large violet-black eyes which almost touch each other; the palps are short, with a thick basal segment and a roundish terminal segment; between the palps there rises a relatively large, median notched protuberance of elongated shape,

from which the two tentacles spring; these reach approximately a quarter of their length beyond the terminal joints of the palps. The peristomium is dorsally scarcely longer than the 1st parapodia-bearing segment; ventrally torous, twice as long as the next body segment and furrowed with numerous shallow grooves running parallel to the long axis of the body. There are four pairs of tactile cirri: the anterior ventral pair of cirri reaches, extended backward ventrally, scarcely over the peristomium; the posterior pair reach the middle of the 2d parapodia-bearinig segment; the anterior dorsal pair of cirri reach to the end of the 2d parapodia-bearing segment; the posterior pair to the end of the 8th or to the middle of the 9th parapodia-bearing segment; the cirri are slightly ringed. The segments of the nereid region are dorsally convex, ventrally flattened. The

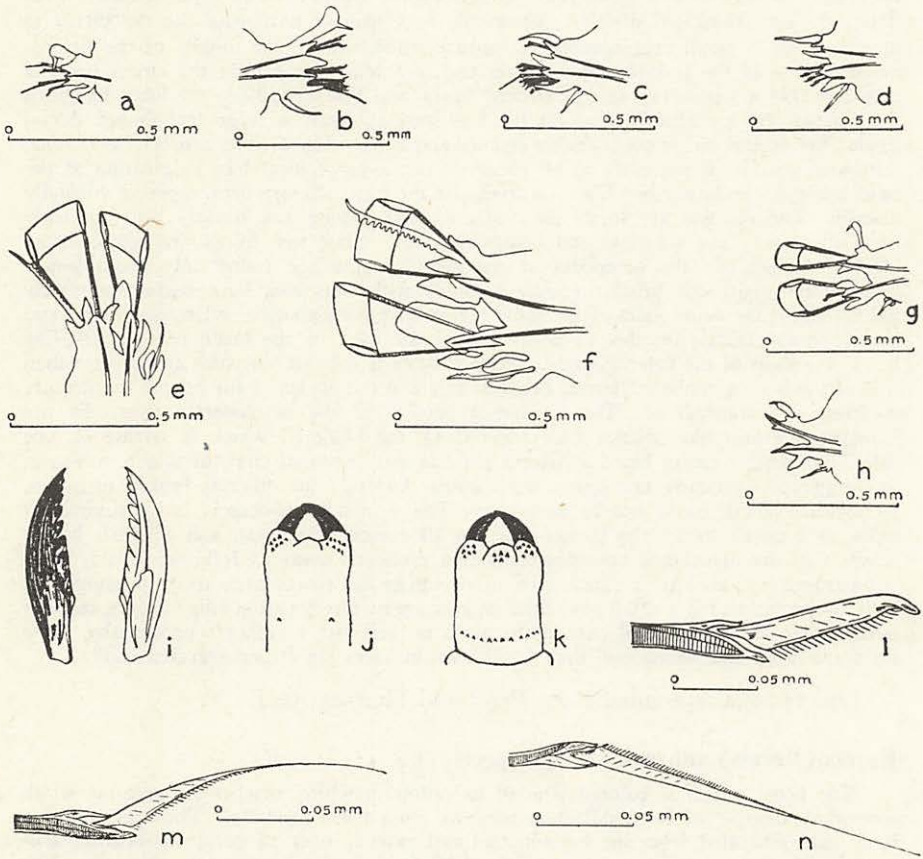

FIGURE 4.—*Nereis (Nereis) abbreviata,* new species: *a,* single-branched parapodium of the 1st parapodia-bearing segment; *b,* parapodium of the 7th parapodia-bearing segment; *c,* parapodium of the 8th parapodia-bearing segment; *d,* parapodium of the 14th parapodia-bearing segment; *e,* parapodium of the 15th parapodia-bearing segment; *f,* parapodium of the 25th parapodia-bearing segment; *g,* parapodium of the 45th parapodia-bearing segment; *h,* parapodium of the 57th parapodia-bearing segment; *i,* jaws; *j,* proboscis from above; *k,* proboscis from below; l, heterogomphe falcate bristle; *m,* heterogomphe setiferous bristle; *n,* homogomphe setiferous bristle.

parapodia of the nereid region are from the third pair of two-branched and the first two single-branched; they are distinctly set off from the body and much longer than high, as well as cephalocaudally flattened. Their size increases rapidly from the first up to the seventh, then just as rapidly diminishes up to the fourteenth, the last of the region. Their ligulae are relatively short, only a little longer than their width at the base. The notocirrus is club-shaped and has distally a ventrally directed tip attached; this cirrus does not retain its club-shaped form, but its basal part is elongated cylindrically; its distal part, which in the beginning appeared clublike, becomes dorsally higher, and in the seventh parapodium, the largest of the nereid region, takes on a helmetlike form; this cirrus extends by half its length over the ligulae. From the 8th parapodia-bearing segment the notocirrus is of spindle-shaped form. The neurocirrus of the anterior parapodia-bearing segments of the nereid body region shows the same structure as the notocirrus, only it is somewhat smaller and reaches distally at the highest the outer quarter of the ventral ligula of the neuropodium. Approximately from the middle out to the end of the nereid region the neurocirri of the parapodia have another form; they are thin, basally somewhat inflated flask-shaped, and reach in general to the tip of the ventral ligula of the neuropodium. The parapodia of the hereronereid region are typical, normally developed swimming parapodia, cephalocaudally strongly compressed; their length is not much greater than their height at the base and they reach their greatest development approximately in the middle of the heteronereid region; in the first swimming parapodia the notocirrus is likewise strongly developed, thin, and long; on the side which is situated toward the caudal end of the animal it is furnished with clearly visible, conical papillae for almost its entire length; distally this cirrus reaches out more than half of its length over the ligulae of the notopodium; the latter are relatively small, conical, and tapered to a point. By the increasing size of the swimming parapodia, also by that of the body middle and the parapodia lying over it, there develops a conical, short, flabby appendage on the base dorsal of the notocirrus. The dorsal ligula of the neuropodium is broadened, leaf-shaped, tapering to a point and longer than broad; the ventral ligula is much shorter, tongue-shaped, and conical. The neurocirrus is considerably shorter than the notocirrus but in construction quite the same; also on it the cephalocaudally located conical papilla is considerably more weakly developed than on the notocirrus and limited to only its distal third or fourth; it arises from a lobe, which it divides into two longish ellipses. The ligulae reach distally scarcely over the first quarter of the total length of the swimming bristles, only the dorsal ligula of the neuropodium reaches with its point half the length of the bristle shaft. The preceding description concerns itself with the heteronereid region in general. In the present species, however, this region consists of two parts—that is, the parapodia of the last 9 to 11 segments of this region are again of nereid type. The transition from the swimming parapodia to the nereid form is a rather sudden one; only the last two, at most three, segments of the true heteronereid region exhibit in the neuropodium beside the normal swimming bristles a heterogomphe falcate bristle. The pure nereid parapodia of the posterior caudal region of the body are either entirely without bristles, or there are barely two or at most three heterogomphe falcate bristles present in the neuropodium. In the notopodium I found no single bristle in all specimens studied. The notocirrus and neurocirrus of these parapodia are of the same character, only differing in size—the neurocirrus is much shorter than the notocirrus; their form is club-shaped, distally slightly thickened, without the vesicular helmet-shaped elevations of the corresponding cirri of the anterior nereid region, and they also have attached distally a conically pointed tip. The posterior segment is circular; the anus is surrounded by blunt, conical papillae; ventral of the anus are two transversely furrowed anal cirri which reach, when laid forward, over 6 to 8 segments. Each parapodium possesses two dark-brown aciculae which are only very slightly curved; only the first two parapodia-bearing segments exhibit but one acicula. The notopodial bristles of a parapodium are exclusively homogomphe setiferous bristles; their edges are finely haired. The dorsal bristle-bundle of the neuropodium consists of homogomphe setiferous bristles and heterogomphe falcate

bristles; the ventral bristle-bundle is composed of heterogomphe falcate bristles and heterogomphe setiferous bristles; in the nereid part of the caudal region I found only heterogomphe falcate bristles in the neuropodium. The lancet-shaped parts of the swimming bristles are serrate on one side and as said, are found in the neuropodia ventral of their aciculae; in the very last swimming parapodia, in front of the caudal nereid body region, there are a few isolated heterogomphe falcate bristles. The proboscis is thick, muscular, and bears two strong jaws whose inner margin is provided with 9 or 10 small teeth. The paragnatha are distributed as follows: area I, without paragnatha; area II, 6 to 8 paragnatha in two rows; area III, a group of 4 to 5 paragnatha; area IV, a group of 4 to 6 paragnatha; area V, without paragnatha; area VI, 1 small paragnath; areas VII and VIII, one row of 8 to 12 paragnatha.

Numerous epitokal specimens from Pearl and Hermes Reef.

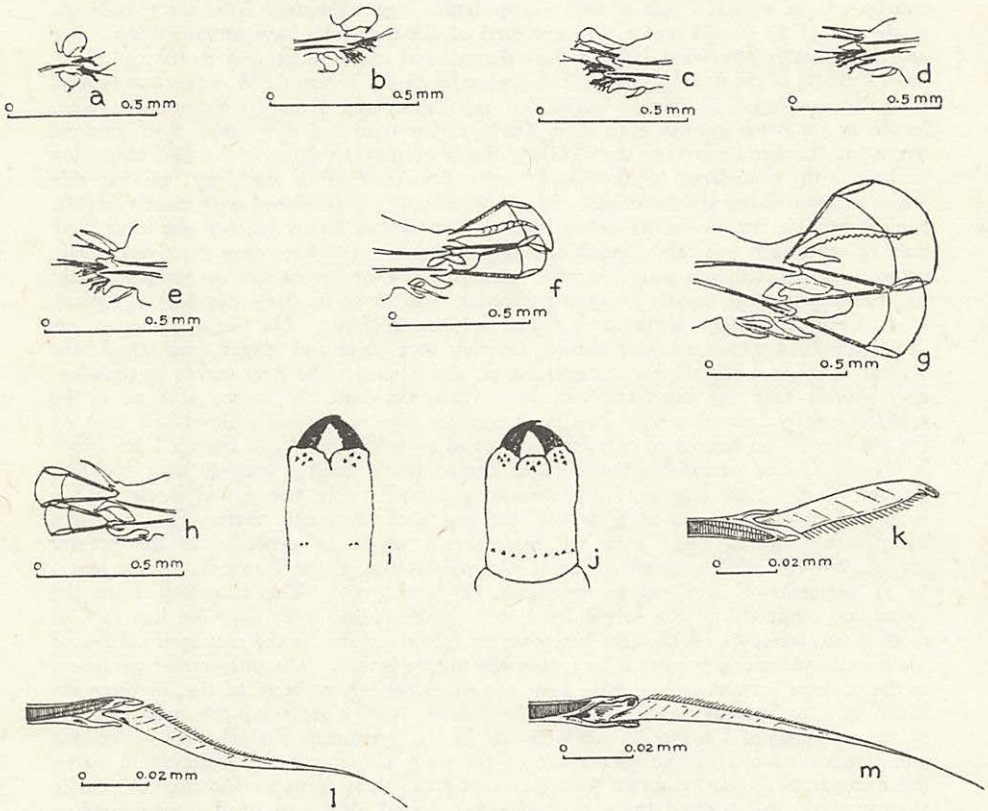

FIGURE 5.—*Nereis (Nereis) mariae*, new species: *a*, single-branched parapodium of the 1st parapodia-bearing segment; *b*, parapodium of the 3d parapodia-bearing segment; *c*, parapodium of the 7th parapodia-bearing segment; *d*, parapodium of the 8th parapodia-bearing segment; *e*, parapodium of the 14th parapodia-bearing segment; *f*, parapodium of the 15th parapodia-bearing segment; *g*, parapodium of the 29th parapodia-bearing segment; *h*, parapodium of the 45th parapodia-bearing segment; *i*, proboscis from above; *j*, proboscis from below; *k*, heterogomphe falcate bristle; *l*, heterogomphe setiferous bristle; *m*, homogomphe setiferous bristle.

Nereis (Nereis) mariae, new species (fig. 5; pl. 1, G).

The body color is whitish and the body measurements of individual specimens range between the following limits: total length, 6.90 to 8.05 mm; length of the nereid part of the body, 1.65 to 1.75 mm; length of the heteronereid region, 5.25 to 6.30 mm; greatest width of nereid region, 0.62 to 0.70 mm; greatest width of heteronereid region, 0.42 to 0.45 mm; thickness of heteronereid region, 0.18 to 0.23 mm. The nereid region is sharply set off from the heteronereid and extends without exception over 14 parapodia-bearing segments. The heteronereid region is composed of 44 to 49 parapodia-bearing segments.

The prostomium is roundish; its anterior region is somewhat shorter than its posterior part; the latter bears two moderately large, clear lilac-rose-colored eyes (in a very few specimens they are dark violet) which are separated from each other by a small intervening space; the palps are short, with a thick basal joint and a roundish terminal joint; in the middle of the anterior part arises a median, slightly indented, elongate protuberance from which the two tentacles spring; the tentacles reach approximately a ninth of their length beyond the ends of the palps. The peristomium is dorsally as long as the 1st parapodia-bearing segment; ventrally it is somewhat longer than the next segment, torous and furrowed with numerous grooves running parallel to the long axis of the body. There are four pairs of tactile cirri; the anterior ventral pair of cirri reaches when laid back ventrally to the last quarter of the 1st parapodia-bearing segment; the posterior pair reaches the middle of the 2d parapodia-bearing segment; the anterior dorsal pair of cirri reaches when laid back dorsally approximately to the anterior border of the third; the posterior pair to the posterior border of the 5th or to the middle of the 6th parapodia-bearing segment; the cirri are slightly ringed. The segments of the nereid region are dorsally convex. Ventrally they are flattened. The first two nereid pairs of parapodia are single-branched, with one acicula; all others are two-branched with two aciculae; they are clearly set off from the body and longer than high, as well as cephalocaudally compressed. Their size increases from the first up to the seventh, and from there to the fourteenth, the last of the nereid region, again reduces. The ligulae are blunt-conically pointed and longer than their width at the base; the notocirrus and neurocirrus of the first two nereid parapodia are thick and distally inflated club-shaped; on this distal end is attached a ventrally directed pointed tip; from the third nereid pair of parapodia on the neurocirri themselves are somewhat slender, distally pointed and inflated, at their base flask-shaped; the notocirri of the eighth to the last nereid pairs of parapodia show also the same form; the notocirri of the third to the 7th parapodia-bearing segments of the nereid region are more extended in length in their basal part; distally they exhibit a helmet-like, roundish protuberance to which a ventrally directed tip is attached; in the seventh pair of parapodia of the nereid region, the largest of this region, the notocirrus extends distally far over the other parts of the parapodium. The parapodia of the heteronereid region are typical swimming parapodia, cephalocaudally strongly compressed and approximately as long as high; the notocirrus shows dorsally a very faintly vesicular elevation, which toward the middle of the heteronereid region is slightly enlarged; it is long drawn out, filiform, and, on the side which lies toward the caudal end of the body, furnished with papillae; distally this cirrus extends by two thirds of its length over the ligulae of the notopodium, which are small, conically pointed. The dorsal ligula of the neuropodium is moderately enlarged and leaf-shaped; the ventral ligula of the neuropodia is small and lancet-shaped; the neurocirrus of the swimming parapodia is considerably smaller than the notocirrus and without papillae; it arises from a flap which it divides into an upper conical part and a lower more or less lancet-shaped part. The nereid parapodia possess in notopodial bristle-bundles without exception homogomphe setiferous bristles, whose edges are thickly finely haired; the dorsal neuropodial bristle-bundle shows the same bristle arrangement, while the ventral bristle-bundle of the neuropodium exhibits heterogomphe setiferous bristles and heterogomphe falcate bristles; not

only the edge of the heterogomphe setiferous bristles, but also the blade of the falcate bristles is furnished with hairs. The parapodia of the heteronereid region contain exclusively bladelike swimming bristles whose bladelike part is furnished on one side with serrations. The anal segment bears a pair of ringed anal cirri whose length is approximately the same as that of the posterior tactile cirri. The anus is surrounded by very small styliform papillae, and also are found here, though not always visible, four large, elongated conical papillae. The proboscis is thick, muscular, and bears two strong jaws which on the inner margin are provided with 7 to 8 serrated teeth. The paragnatha are distributed as follows: area I, without paragnatha; area II, 3 to 4 paragnatha; area III, 3 paragnatha; area IV, a group of 4 to 5 paragnatha; area V, without paragnatha; area VI, 2 small paragnatha; areas VII and VIII, a row of 9 to 11 paragnatha. The paragnatha themselves are only very light brownish and very difficult to see.

Twenty-three epitokal specimens from Pearl and Hermes Reef.

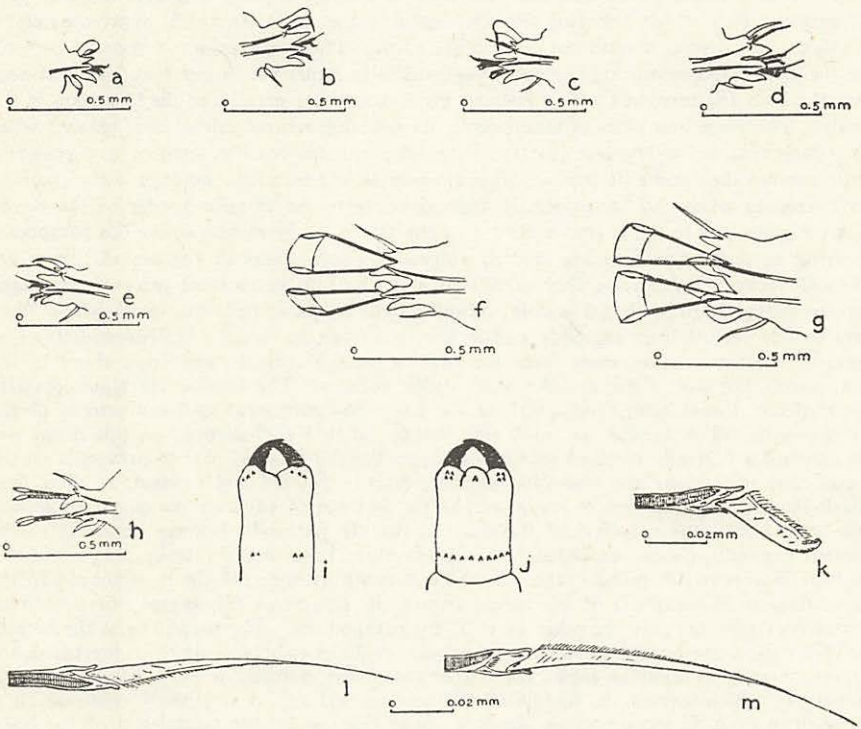

FIGURE 6.—*Nereis (Nereis) myersi*, new species: *a*, single-branched parapodium of the 1st parapodia-bearing segment; *b*, parapodium of the 3d parapodia-bearing segment; *c*, parapodium of the 5th parapodia-bearing segment; *d*, parapodium of the 6th parapodia-bearing segment; *e*, parapodium of the 16th parapodia-bearing segment; *f*, parapodium of the 17th parapodia-bearing segment; *g*, parapodium of the 27th parapodia-bearing segment; *h*, parapodium of the 54th parapodia-bearing segment; *i*, proboscis from above; *j*, proboscis from below; *k*, heterogomphe falcate bristle; *l*, heterogomphe setiferous bristle; *m*, homogomphe setiferous bristle.

Nereis (Nereis) myersi, new species (fig. 6; pl. 1, *D*).

There are two specimens, of which one has regenerated the posterior part of the body, so that for body measurements, the number of segments, etc., it cannot be considered.

The body is white and measurements of the normal specimens are as follows: total length, 8.20 mm; length of the nereid region, 2.00 mm; length of the heteronereid region, 6.29 mm; greatest width of the nereid region, 0.48 mm; greatest width of the heteronereid region, 0.55 mm; thickness of the nereid region, 0.27 mm; thickness of the heteronereid region, 0.25 mm. The nereid region is clearly separated from the heteronereid and consists of 16 parapodia-bearing segments; the remaining part of the body consists of 44 parapodia-bearing segments which bear typical swimming parapodia.

The prostomium is roundish, its anterior region somewhat shorter than its posterior part, which bears two pairs of moderately large dark-violet eyes; the eyes of one side are separated from each other by a clearly discernible intervening space; the palps are short, with a thick spherical basal segment and a similar small terminal segment; in the middle of the anterior section there rises a somewhat squarish, median notched protuberance, which bears the two tentacles; the tentacles extend over the palps for about one fourth of their length. The peristomium is dorsally approximately as long as the 1st parapodia-bearing segment. Ventrally it is twice as long, torous, and furrowed by numerous shallow indentations running parallel to the long axis of the body. There are four pairs of tactile cirri: the anterior ventral pair of cirri laid back ventrally reach to the posterior border of the 1st parapodia-bearing segment; the posterior pair reach to the middle of the 2d parapodia-bearing segment; the anterior dorsal pair of cirri laid back dorsally reach to the posterior border of the third; the posterior dorsal pair of cirri reach to the middle of the 5th parapodia-bearing segment; the cirri are transversely ringed. The segments of the nereid region are dorsally somewhat convex. Ventrally they are flattened. The first two pairs of parapodia are single-branched, with only one acicula; all other nereid parapodia and also the swimming parapodia are two-branched, with two aciculae; the aciculae are transparent, light brownish (in their distal two thirds), and slightly curved. The nereid parapodia are cephalocaudally somewhat compressed and approximately as long as high; the first two pairs are, as said, single-branched; they are of the same structure but differ only in size; their moderately large lobe is somewhat widely overhung by the lower ligula, which is conical; the upper ligula is very small, which surprising characteristic belongs to all others, also the two-branched parapodia; the notocirrus is strongly developed, club-shaped, and bent ventrally; at its distal end is attached a somewhat long, slenderly drawn out, pointed tip; the neurocirrus is exactly so constructed only much smaller; the two-branched nereid parapodia, up to the fifth pair, resemble the single-branched except that the basal part of the cirrus stretches itself cylindrically in length and the distal part, with the attached slender tip, becomes globular; the entire form appears like a bird's head with a long neck; the neurocirrus of the anterior two-branched parapodia modifies its club-shaped form gradually; it becomes longer, tapering off thin and pointed, widened, at its base flask-shaped; from the sixth nereid pair of parapodia on the notocirrus also assumes suddenly the thinner, basally swelled flask-shaped, distally pointed form; in supplement be it said that the nereid parapodia from the first pair on to the fifth increase regularly in size, and from there on to the sixteenth, the last, again regularly become smaller. The swimming parapodia of the heteronereid region are largest approximately in the middle and reduce steadily in size toward the caudal end; they are strongly compressed cephalocaudally and are provided with long knife-shaped swimming bristles; the notocirrus is moderately long, thin, and perfectly smooth, and sits directly upon the parapodium and has at its base no kind of vesicular embossment; the neurocirrus is of the same form and lacks likewise at its base any flaps; the ligulae of the notopodium are conical, the upper remarkably small; also conical is the ventral ligula of the neuropodium, while the dorsal ligula is only slightly widened leaf-shaped. The posterior segment bears two cirri which are slightly ringed and reach when laid forward approximately over six segments. The nereid parapodia bear in the noto-

podium homogomphe setiferous bristles whose edge on one side is set with hairs. The bristle-bundles of the neuropodium consist of heterogomphe and homogomphe setiferous bristles and heterogomphe falcate bristles, whose blade is set on the edge with hairs. The muscular proboscis bears two strong jaws which on the inner side are provided with seven serrated teeth; the paragnatha are distributed as follows: area I, without paragnatha; area II, one slanting row of 3 paragnatha; area III, 1 paragnath; area IV, one group of 4 paragnatha; area V, without paragnatha; area VI, 2 paragnatha; areas VII and VIII, one row of 10 paragnatha. The paragnatha are very slightly brownish and scarcely visible.

Two epitokal specimens from Pearl and Hermes Reef.

Subgenus NEONEREIS, new subgenus

The body is made up of numerous segments, its dorsal side more convex than its ventral side, which bears a median furrow. At the end of the body two anal cirri rise on the ventral side under the anus.

The prostomium is clearly set off from the body; its posterior part is wider than the anterior, which reduces toward the front. At the frontal border of the prostomium there arise two simple tentacles. Behind them on the side border two palps, which are composed of a wide basal section and a small head-shaped terminal section. The anterior part of the prostomium bears two pairs of large eyes.

The peristomium is widened toward the 1st parapodia-bearing segment. Between the prostomium and the peristomium stand four pairs of tactile cirri.

The proboscis is strongly developed, thick, muscular, and of a cylindrical form. It is provided with strong jaws and bears paragnatha which are found only upon areas II, III, IV, VII and VIII; upon areas I, V, and VI they are lacking.

The parapodia are two-branched, with always one lobe and two ligulae; one dorsal and ventral cirrus is present. A bundle of homogomphe setiferous bristles widens the notopodium, a bundle of homogomphe setiferous bristles and heterogomphe falcate bristles the neuropodium.

The type of the new subgenus is *Nereis* (*Neonereis*) *hawaiiensis,* new species.

The subgenus *Neonereis,* new subgenus of the genus *Nereis* Linné, is allied closely to the subgenus *Cirronereis* Kinberg and *Nereis* sensu stricto Kinberg of the same genus, but differs from these especially in the arming of the proboscis and in the form of the parapodia.

Nereis (Neonereis) hawaiiensis, new species (figs. 7, 8; pl. 1, *E*).

The numerous specimens of this species are almost all of the same body color, which is whitish, yellowish to brownish white. The bristles of the nereid body region are brownish transparent, the bladelike bristles of the heteronereid region colorless and likewise transparent. The body reaches its greatest width approximately in the middle, and from there on to the caudal end slowly tapers off; this is the heteronereid region, which consists of 41 to 57 swimming segments. The anterior, nereid region is always composed

of 14 parapodia-bearing segments. The anterior part of the prostomium is moderately long and shorter than its posterior part, which bears two pairs of very large eyes; the eyes are black-violet and the two on each side touch each other. Between the palps lies a short protuberance which bears the tentacles; the palps themselves are very thick and including their short terminal segments almost as long as the tentacles when they are laid down forward. The peristomium is on the upper side approximately as wide as one third of the prostomium and one and one fourth times as wide as the 1st parapodia-bearing

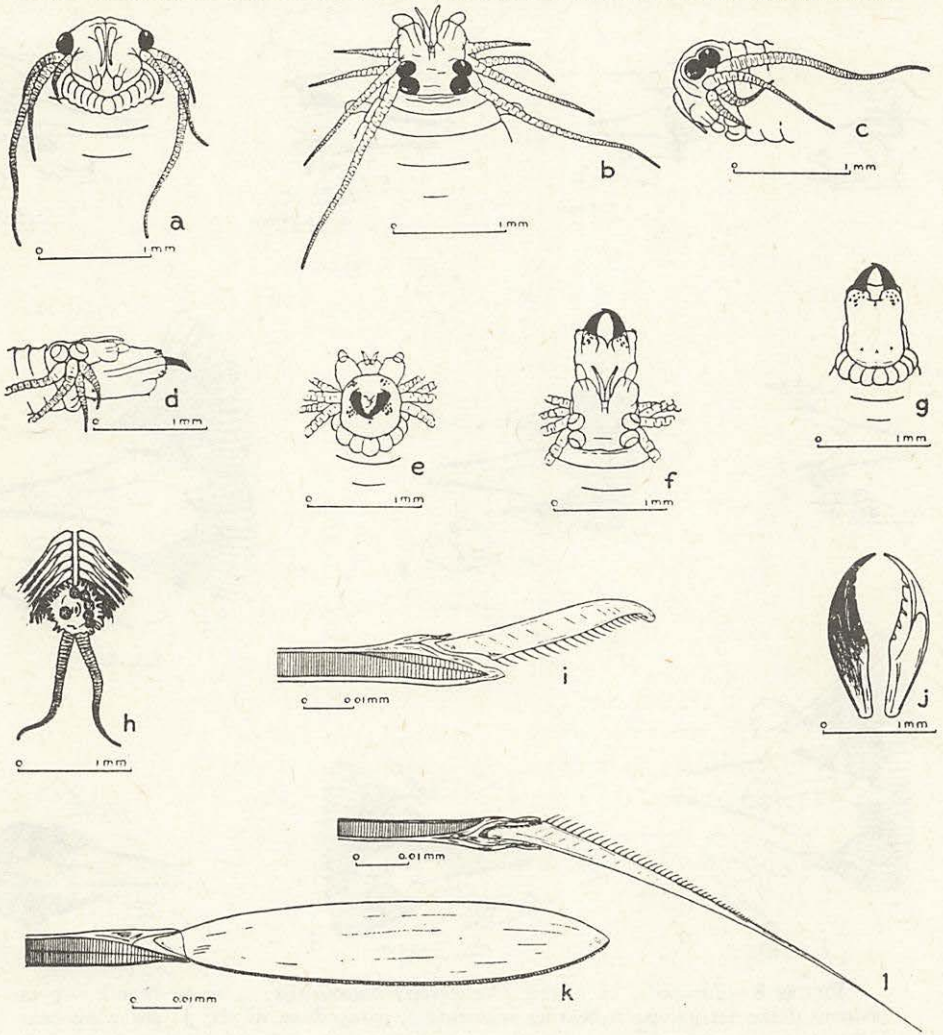

FIGURE 7.—*Nereis (Neonereis) hawaiiensis,* new subgenus, new species: *a,* head from below; *b,* head from above; *c,* head from the side; *d,* proboscis from the side; *e,* proboscis from the front; *f,* proboscis from above; *g,* proboscis from below; *h,* end of body from the dorsal side (anus bent upward); *i,* heterogomphe falcate bristle; *j,* jaws; *k,* bladelike swimming bristle; *l,* homogomphe setiferous bristle.

segment. The under half of the peristomium is thick and torous and furrowed by numerous deep, transverse and also lengthwise furrows. There are four pairs of tactile cirri of unequal length: the first ventral pair of cirri reach when laid back ventrally to the 2nd parapodia-bearing segment, the posterior ventral pair to the third. The two pairs of dorsal tactile cirri are longer than the ventral; the anterior pair laid back dorsally reach to the posterior edge of the 4th or to the middle of the 5th parapodia-bearing segment, while the posterior pair, the longest of all, reach respectively to the ninth and to

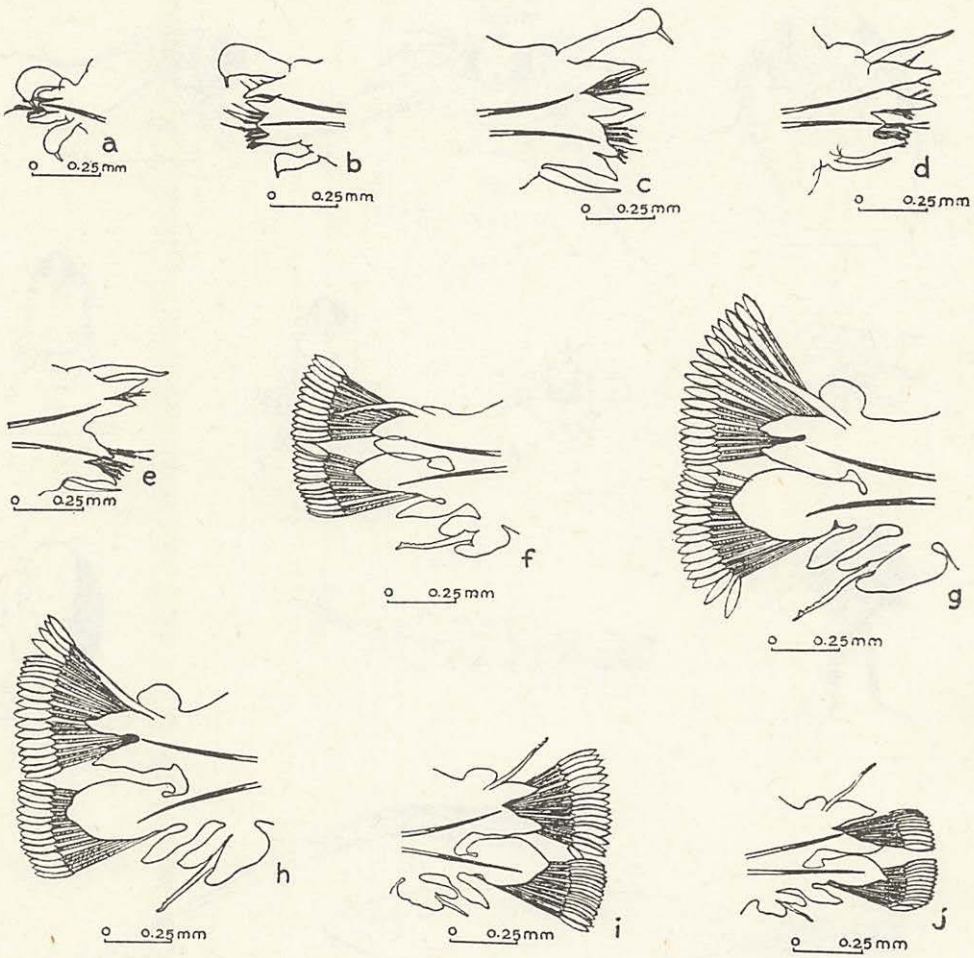

FIGURE 8.—Parapodia of *Nereis (Neonereis) hawaiiensis: a*, single-branched parapodium of the 1st parapodia-bearing segment; *b*, parapodium of the 3d parapodia-bearing segment; *c*, parapodium of the 7th parapodia-bearing segment; *d*, parapodium of the 8th parapodia-bearing segment; *e*, parapodium of the 14th parapodia-bearing segment; *f*, parapodium of the 15th parapodia-bearing segment; *g*, parapodium of the 34th parapodia-bearing segment; *h*, parapodium of the 49th parapodia-bearing segment; *i*, parapodium of the 59th parapodia-bearing segment; *j*, parapodium of the 64th parapodia-bearing segment.

the twelfth segment. The nereid part of the body consists, as above mentioned, of 14 parapodia-bearing segments; the individual segments are upon the dorsal side somewhat strongly convex. Ventrally they are more or less flattened. The parapodia of the first two parapodia-bearing segments of the nereid region are single-branched; all other parapodia are two-branched. The size of the parapodia increases from the first continually up to the seventh, and diminishes gradually from the eighth to the fourteenth. The parapodia are strongly flattened in the long axis of the body and dorsoventrally somewhat high. The first single branched parapodium has a large lobe in which the acicula lies; it is overhung by the two subconical ligulae, especially by the lower one. The notocirrus is strongly developed, of club-shaped form and bent downward; on its distal end it bears a thin conical tip which is directed ventrally and appears attached to it. The neurocirrus is of the same construction only considerably smaller than the notocirrus and arises close at the base of the parapodium. The second pair of parapodia is like the first only somewhat larger. The parapodium of the 3d parapodia-bearing segment, the first two-branched one, is like the previously described parapodia, with two subconical tips, at the base strongly thickened, distally tapering; also the two cirri show the club-shaped form, only one notices here already the tendency of their basal part to stretch in length. As already said, the parapodia reach their strongest development at the seventh segment. Here is noticed especially the extensive development of the notocirrus; its basal part is cylindrical, greatly drawn out in length; its distal part is globular; also here we find the attached thin conical tip. The neurocirrus has its form here altogether changed, is drawn out longish, subconical, with slightly thickened basal part. The next following parapodium shows a notocirrus completely altered in form, which now has taken on the form of the neurocirrus. In all parapodia the two cirri overhang the other parts of the parapodium. The neuropodium is usually more weakly developed than the notopodium. The parapodia of the heteronereid part of the body are as usual characterized by their strong size development, which to be sure reduces steadily toward the caudal end of the body; by their relatively greater thinness in cephalocaudal direction; by their lamellar development; and by their possession of long, bladelike swimming bristles. The tips of the neuropodium are pointed, the ventral one somewhat larger than the dorsal, and its ventral edge appears somewhat flaplike and indented. The dorsal tip of the neuropodium is extensively developed leaf-shaped and on its distal end slightly conically pointed; the ventral tip is in relation to the dorsal little to mention and shows normal size and form. The notocirrus is long, approximately twice as long as the dorsal tip of the notopodium, thin, and bears on the side toward the bristles, on its distal half, clearly visible, elevated projections running transverse of its long direction. Its base becomes surrounded by a roundish elliptical flap. The neurocirrus shows the same form as the notocirrus, only it is considerably shorter and reaches approximately to the distal third of the large, leaf-shaped dorsal tip of the neuropodium; there arises a flap close at the base of the parapodium which is divided by it into a dorsal tongue-shaped and a ventral, wide leaf-shaped part. The after segment bears ventrally two anal cirri, which laid along the body sides reach forward seven to eight body segments. The anal area is circular and surrounded by numerous very short, styliform papillae. In each parapodium, with the exception of the first two pairs, which possess only one acicula, lie two aciculae of dark brown color at the points and slightly bent. The bristle-bundle of the notopodium of a nereid parapodium is made up exclusively of homogomphe setiferous bristles, whose edge on one side bears very short, somewhat thickly placed hairs always becoming shorter toward the distal end of the edge. The two neuropodial bristle-bundles consist partly of homogomphe setiferous bristles and partly of heterogomphe falcate bristles; the latter are set on the edge of the blade with rather widely placed hairs. The color of the above-described bristles is yellowish brown though the bristles themselves are transparent. In the swimming parapodia are found heterogomphe bladelike swimming bristles which are colorless and transparent and on one blade of their knifelike part are equipped with thickly placed serrations. The muscular proboscis bears two strong blackish-brown jaws which possess on their inner side 6 to 7 serrations. The paragnatha are distributed

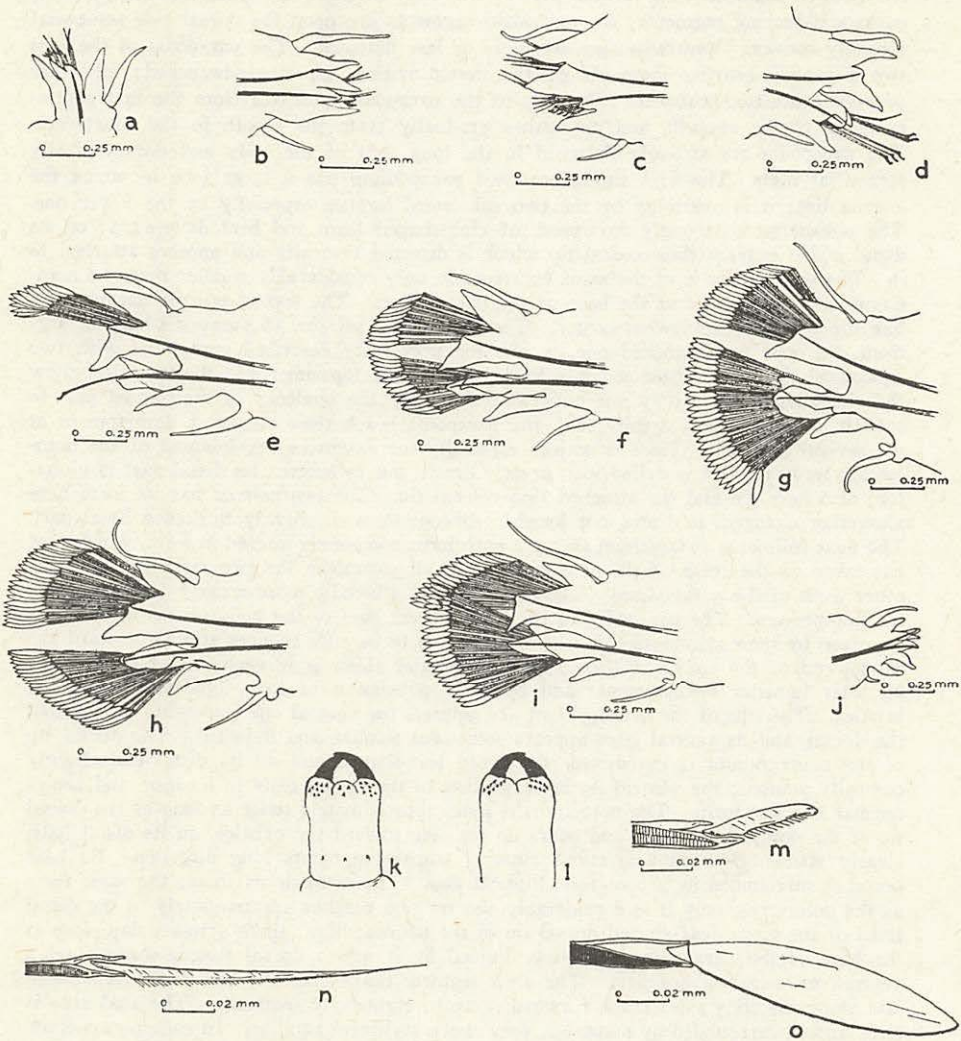

FIGURE 9.—*Nereis (Neonereis) nigroaciculata,* new species: *a,* single-branched parapodium of the 1st parapodia-bearing segment; *b,* parapodium of the 3d parapodia-bearing segment; *c,* parapodium of the 12th parapodia-bearing segment; *d,* parapodium of the 18th parapodia-bearing segment; *e,* parapodium of the 19th parapodia-bearing segment; *f,* parapodium of the 20th parapodia-bearing segment; *g,* parapodium of the 28th parapodia-bearing segment; *h,* parapodium of the 29th parapodia-bearing segment; *i,* parapodium of the 48th parapodia-bearing segment; *j,* parapodium of the 72d parapodia-bearing segment; *k,* proboscis from above; *l,* proboscis from below; *m,* heterogomphe falcate bristle; *n,* homogomphe setiferous bristle; *o,* bladelike swimming bristle.

as follows: area I, without paragnatha; area II, 5 to 8 paragnatha placed in two to three rows; area III, 1 to 3 paragnatha; area IV, 7 to 10 paragnatha in two rows; area V, without paragnatha; area VI, without paragnatha; areas VII and VIII, one row of 3 paragnatha, of which always 1 stands in one field.

The total length of individual specimens ranges between 7.25 and 19.50 mm.

The many specimens are exclusively epitokal and come from Pearl and Hermes Reef, French Frigates Shoal, and Lisiansky Island.

Nereis (Neonereis) nigroaciculata, new species (fig. 9; pl. 1, *F*).

The body color is whitish to yellowish white. The total length of body measures 12.25 to 17.50 mm; the body reaches its greatest width in the nereid region and from the deep indentation which divides the nereid region from the heteronereid gradually becomes smaller to the caudal end. The nereid part of the body consists always of 18 parapodia-bearing segments; the heteronereid part is made up of 53 to 71 segments. The prostomium is nearly square, its anterior part shorter than its posterior part; the two pairs of eyes are of moderate size; they do not stand together, but are separated from each other by an intervening space approximately equal to half an eye diameter; their color is black-violet. Between the palps, which exhibit a moderately long, very thick basal section upon which the little globular terminal section is attached, there rises a longish elliptical, median slightly single-notched protuberance from which the two tentacles take origin; they reach far out almost a palp's length over the palps when these and the former are laid forward. The peristomium measures in length approximately a third to a half of the prostomium and is nearly one and one third times longer than the first parapodia-bearing segment; its ventral side is thick, torous, and round, with numerous lengthwise grooves. There are four pairs of tactile cirri of unequal length; the anterior ventral pair of cirri laid back reach over half of the 2d parapodia-bearing segment, the posterior pair on an average to the end of the same segment; the anterior dorsal pair of cirri laid back reach to the end of the third or to the first third of the fourth swimming segment; the posterior dorsal pair of cirri, the longest, reach laid back to over the thirteenth or fourteenth parapodia-bearing segment. The segments of the nereid region are dorsally moderately convex, ventrally flattened and wider than long; only the last are approximately as wide as long. The first two pairs of parapodia are single-branched; all other pairs are two-branched, of normal construction and normal number of appendages; their size increases rapidly to the twelfth segment, and from there on to the eighteenth, the last of this region, slowly but steadily reduces again; they are cephalocaudally strongly compressed; the first single branched pair of parapodia has tapering ligulae, of which the dorsal is much larger than the ventral, which overhang the lobe in which the acicula lies. The notocirrus is basally somewhat bloated and tapers to a thin pointed end; the neurocirrus is somewhat broader and only a little shorter than the notocirrus. The second pair of parapodia shows the same form as the first, only it is somewhat larger. The other parapodia show always the same form but are unlike in size; the ligulae of the notopodium as also those of the neuropodium are all somewhat broad at their base and distally taper conically. The notocirrus is smooth, thin, and long; it overhangs completely the other appendages of the parapodium for a third of its length. The neurocirrus is considerably shorter, in its under part slightly drawn out flask-shaped, and reaches to half or to the distal third of the ventral ligula of the neuropodium. The parapodia of the heteronereid region are in their formation not specially more strongly developed than those of the nereid region; they are however in cephalocaudal direction more flattened and distally more strongly drawn out in length. In the anterior parapodia the notocirrus is directly attached, only approximately from the middle segment on it supports on the dorsal side of its base a small, roundish, flaplike protuberance; in the others its surface is completely smooth. The considerably shorter neurocirrus of this parapodium is likewise thin and tapers continuously; it is also in the anterior segment of the heteronereid region directly attached to the parapodium, first approximately from the tenth segment

on of this region; it possesses dorsally and ventrally each at its base a small roundish flap. The ligulae reach approximately to half of the shaft of the swimming-bristles. The anal segment is bluntly conical and bears ventrally two anal cirri, which laid ventrally forward reach over 13 to 14 segments. Each parapodium possesses two black aciculae which are slightly bent; the two farthest anterior pairs of parapodia exhibit only one acicula. The notopodial bristles of a parapodium are exclusively homogomphe setiferous bristles; their edge on one border is thickly set with fine hairs. The neuropodial bristles consist of either homogomphe setiferous bristles and heterogomphe falcate bristles, which latter are set on their blades with moderately long hairs, mixed, or the dorsal bristle-bundle of the neuropodium is made of only homogomphe setiferous bristles. The last nereid pair of parapodia can lack bristles altogether. The color of bristles is faintly yellowish brown, transparent. The bristle structure of the heteronereid parapodia consists of bladelike swimming bristles.

A variation was found in one specimen: this had in the notopodium of the first heteronereid pair of parapodia exclusively swimming bristles which in the neuropodium were lacking completely; in their place was found one single heterogomphe falcate bristle. The parapodia of the farther segments had completely and well developed swimming bristles in both branches; there were found, however, in numerous parapodia of this region next to the swimming bristles in the neuropodium the single heterogomphe falcate bristle. In a few parapodia in the close vicinity of the caudal end of the animal, or in the last parapodium only, the bristles were lacking altogether, and only the aciculae were found.

The small flaplike appendages of the notocirrus and neurocirrus on the caudal parapodia again disappear and the cirri are attached directly upon the parapodium. The proboscis is thick, muscular and bears two strong jaws whose inner side is set with nine teeth. The paragnatha are distributed as follows: area I, without paragnatha; area II, 4 to 9 paragnatha in two rows; area III, 3 paragnatha in one direction, point turned away from the proboscis end; area IV, a group of 9 to 11 paragnatha; area V, without paragnatha; area VI, without paragnatha; area VII and VIII, 3 to 4 paragnatha in one row.

Twenty-nine exclusively epitokal specimens from Pearl and Hermes Reef.

Subgenus HERFRIEDIA, new subgenus

The body is made up of numerous segments. Its dorsal side is more strongly convex than its ventral side, which bears a sunken median furrow. At the end of the body arise two very short anal cirri.

The prostomium is clearly set off from the body; its posterior part is broader than its anterior, which reduces toward the front. At the anterior border of the prostomium arise two single tentacles and behind them on the side border two palps which are composed of a broad basal section and a small knob-shaped terminal section. The posterior part of the prostomium bears two pairs of large eyes.

The peristomium is approximately as broad as the first parapodia-bearing segment; between the peristomium and the prostomium stand four pairs of tactile cirri.

The proboscis is strongly developed, thick, muscular, and of cylindrical form. It is provided with strong teeth and bears paragnatha which are found only upon areas IV, VII, and VIII; upon areas I, II, III, V, and VI they are lacking.

The parapodia are two-branched with always one lobe and two ligulae; a dorsal and a ventral cirrus is present. One single homogomphe setiferous bristle arises from the notopodium, from the neuropodium bundles of homo- and heterogomphe setiferous bristles as well as heterogomphe falcate bristles.

The type of the new subgenus is *Nereis* (*Herfriedia*) *waikikiensis,* new species.

The subgenus *Herfriedia* new subgenus of the genus *Nereis* is related to the subgenus *Nereis* sensu stricto Kinberg of the same genus but differs from it in the arming of the proboscis, bristle structure, and in the parapodia.

Nereis (Herfriedia) waikikiensis, new species (fig. 10; pl. 1, *G*).

Complete specimens measure in body length 3 to 6.20 mm. The color is whitish to brownish. The body reaches its greatest width in the nereid region (these specimens are all epitokal); the nereid region is separated from the heteronereid by a deep incision. Caudad the body reduces steadily. The nereid region is composed of 13 parapodia-bearing segments; the heteronereid region consists of 27 to 30 parapodia-bearing segments, of which in these specimens the 16 to 17 anterior ones possess swimming parapodia and the 11 to 13 posterior ones again exhibit nereid parapodia. The prostomium is roundish, its anterior part somewhat shorter than its posterior part, which latter bears two pairs of large, black-violet eyes, of which each two or one side stand close together; the palps have a thick, moderately long basal segment to which is attached distally a small, more or less roundish terminal segment; between the palps there arises a short protuberance, which exhibits a faintly visible median furrow; from this protuberance arise the tentacles, which reach out for approximately a quarter of their length beyond the palps. In length the peristomium is dorsally somewhat shorter than the prostomium and longer by a third than the 1st parapodia-bearing segment; its ventral side is thick, torous, and furrowed with incisions in the long axis of the body. There are four pairs of tactile cirri which are slightly ringed: the anterior ventral pair of cirri reach laid back somewhat over the peristomium; the posterior pair reach approximately over half of the first parapodia-bearing segment; the anterior dorsal pair of cirri laid back reach over half of the 2d parapodia-bearing segment, the posterior pair to the end of the third or over the anterior third of the 4th parapodia-bearing segment. The segments of the nereid region are dorsally convex, ventrally flattened. The first two pairs of parapodia are single-branched, all others two-branched; their size increases from the first up to the seventh, and from there on to the thirteenth, the last of the nereid region, again reduces; the swimming parapodia reach their greatest size approximately in the middle of the heteronereid region. The aciculae, which in their distal two thirds are colored brownish transparent, lie in relatively large lobes; the dorsal ligulae of the notopodium and neuropodium are very small and roundish conical. The ventral ligulae are of usual size, cylindrical, and distally rounded; in the anterior pair of parapodia the ventral cirri are thickened at the base, strongly club-shaped; in the posterior pair they stretch in length but are at the base always somewhat inflated flask-shaped; distally all ventral cirri are drawn out pointed; the dorsal cirri show in individual pairs of parapodia three forms: the anterior six are distally widened and thickened, dorsally are furnished with horn-shaped papillae which in the most anterior parapodia are short and few; toward the back they become more numerous and longer and reach their greatest development in the sixth parapodium. The dorsal cirrus of the seventh pair of parapodia has a completely different form; it is the longest of all cirri, is slightly bent outward and runs to a conical point, and it lacks all papillae; the dorsal cirri of the remaining parapodia of the nereid region show the same form as the ventral cirri already described. The swimming parapodia are larger than the nereid and cephalocaudally strongly compressed; the dorsal ligula of the notopodium is also here very small; the dorsal ligula of the

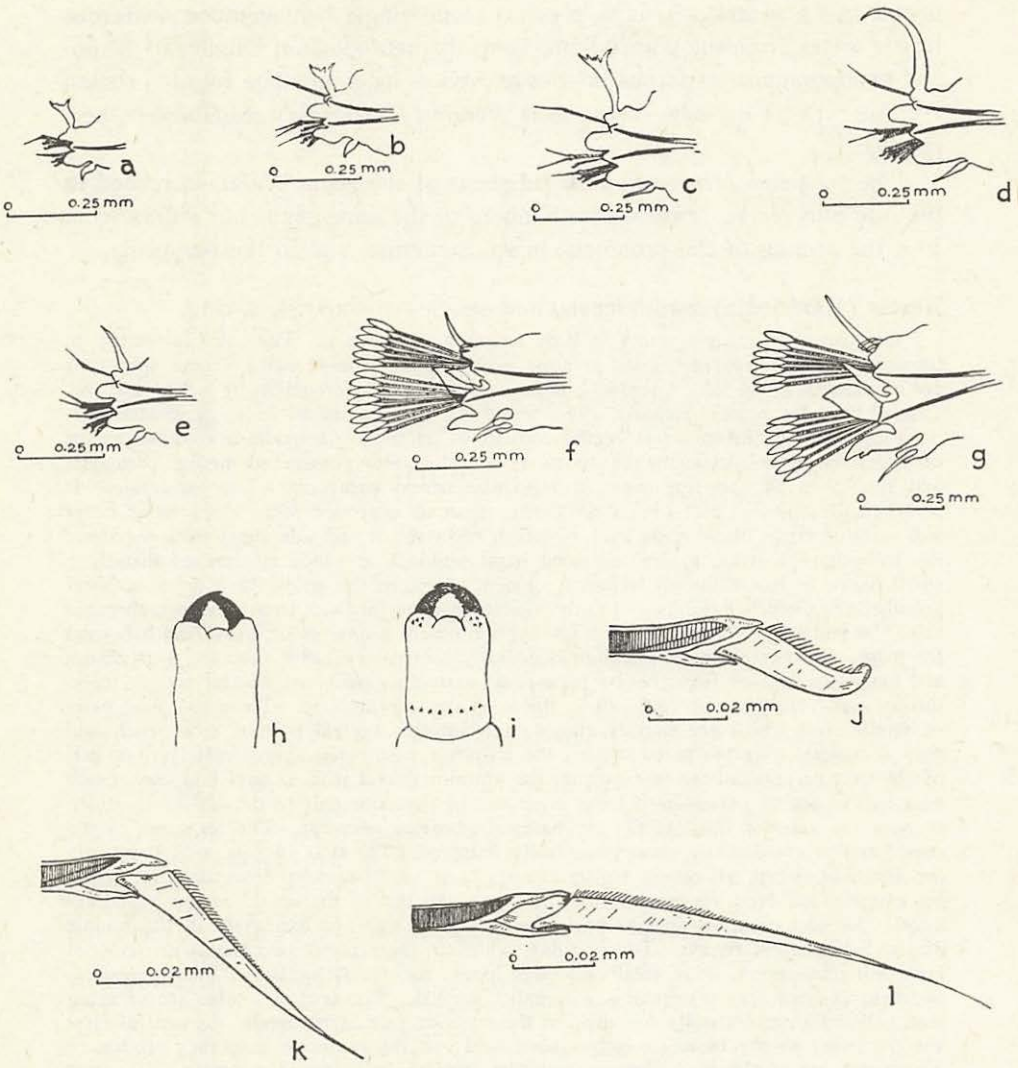

FIGURE 10.—*Nereis (Herfriedia) waikikiensis*, new subgenus, new species: *a*, single-branched parapodium of the 1st parapodia-bearing segment; *b*, parapodium of the 3d parapodia-bearing segment; *c*, parapodium of the 6th parapodia-bearing segment; *d*, parapodium of the 7th parapodia-bearing segment; *e*, parapodium of the 13th parapodia-bearing segment; *f*, parapodium of the 14th parapodia-bearing segment; *g*, parapodium of the 27th parapodia-bearing segment; *h*, proboscis from above; *i*, proboscis from below; *j*, heterogomphe falcate bristle; *k*, heterogomphe setiferous bristle; *l*, homogomphe setiferous bristle.

neuropodium is enlarged, broad lancet-shaped and pointed; the dorsal cirri are thin, running to a point and smooth; at their base are found one to two papillae which arise from the parapodium; the ventral ligulae of the neuropodium are tongue-shaped, in the anterior heteronereid parapodia on the ventral edge smooth, in the largest parapodia, approximately in the middle of the heteronereid region, the ventral edge exhibits a longish papilla; the ventral cirrus of the swimming parapodia arises from an elliptical flap which it divides into two tongue-shaped flaplets; also the ventral cirrus is absolutely smooth. In the swimming parapodia are found exclusively bladelike bristles, whose bladelike part exhibits serrations on one edge. In the nereid parapodia are found three kinds of bristles; in the notopodium one single homogomphe setiferous bristle, in the neuropodium homogomphe and hererogomphe setiferous bristles and heterogomphe falcate bristles. The edge of a complete setiferous bristle is provided on one side with thickly placed hairs; likewise the blade of the falcate bristle bears hairs on its edge, which however in comparison to those of the setiferous bristles are somewhat wider placed and also become somewhat longer. The proboscis is thick, muscular, and bears a pair of strong, distally brown transparent colored jaws. The paragnatha are distributed as follows: area I, without paragnatha; area, II, without paragnatha; area III, without paragnatha; area IV, 3 to 4 paragnatha; area V, without paragnatha; area VI, without paragnatha; areas VII and VIII, 7 to 9 paragnatha in one row.

One specimen from Waikiki, Oahu; two from Pearl and Hermes Reef; and two from French Frigates Shoal.

Subgenus CERATONEREIS Kinberg, 1865

Nereis (Ceratonereis) pietschmanni, new species (fig. 11; pl. 1, *H*).

The color is yellowish to light brownish white. The total length of body ranges between 5.75 and 12 mm; the body reaches its greatest width in the nereid region, then reduces in the heteronereid region gradually to the caudal end; the nereid region stretches over 16 parapodia-bearing segments; the rest of the body consists of 43 to 57 parapodia-bearing segments, of which the anterior 19 to 26 possess swimming parapodia, which are very large in comparison to the other parapodia. The prostomium is almost quadrangular, its anterior part a good deal shorter than its posterior part, which bears the two pairs of large, dark violet-colored eyes; the two eyes of one side stand closely against each other; from the anterior border of the prostomium arise the palps and the tentacles; the former have a thick, longish basal segment to which a short globular segment is attached; the tentacles overreach the terminal segments of the palps by approximately a quarter of their length. The peristomium is dorsally somewhat shorter than the first parapodia-bearing segment; ventrally it is thick, torous, and furrowed by an incision in the long axis of the body. There are four pairs of tactile cirri: the anterior ventral pair of cirri laid back ventrally reach to the 6th or 7th parapodia-bearing segment; the posterior pair reach over 8 parapodia-bearing segments; the anterior dorsal pair of cirri reach back over the nereid region, over approximately 2 to 4 swimming parapodia-bearing segments; the posterior dorsal pair of cirri is very long and laid back reach over the first third of the heteronereid region. The parapodia of the nereid region are dorsally somewhat convex, ventrally flattened; the first two pairs of parapodia are single-branched, but with two aciculae; all other parapodia are two-branched; all appendages, such as cirri and ligulae, are very long; I could observe for certain in any nereid parapodia no dorsal ligula in the neuropodium—at any rate, it must be very small; all parapodia of this region have appendages of like shape and are in form wholly alike, differing only in size; the anterior are smaller than the middle and these are again larger than the posterior, although the increase and reduction are continual and moderate. The heteronereid parapodia are typical swimming parapodia which reach their greatest development in the middle of the heteronereid region; the cirri also are here long and thin, but in compari-

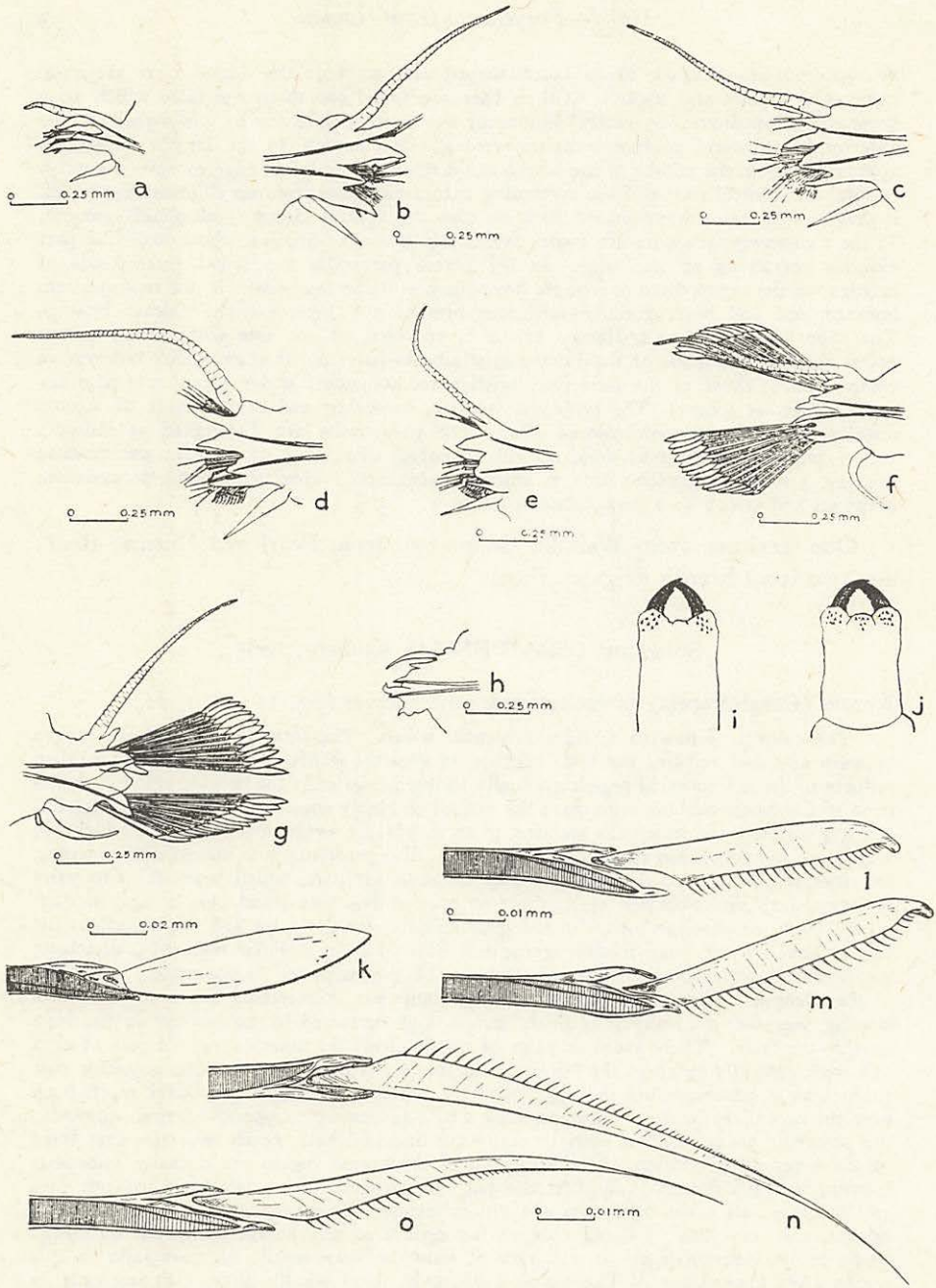

FIGURE 11.—*Nereis (Ceratonereis) pietschmanni*, new species: *a*, parapodium of the 1st parapodia-bearing segment; *b*, parapodium of the 3d parapodia-bearing segment; *c*, parapodium of the 4th parapodia-bearing segment; *d*, parapodium of the 5th parapodia-bearing segment; *e*, parapodium of the 15th parapodia-bearing segment; *f*, parapodium of the 16th parapodia-bearing segment; *g*, parapodium of the 26th parapodia-bearing segment; *h*, bristleless parapodium of the very posterior part of the body; *i*, proboscis from above; *j*, proboscis from below; *k*, bladelike swimming bristle; *l*, heterogomphe falcate bristle of the anterior parapodia of the nereid region; *m*, heterogomphe falcate bristle of the middle parapodia of the nereid region; *n*, heterogomphe setiferous bristle; *o*, homogomphe setiferous bristle.

son to the other parts of the parapodium smaller than those of the nereid region. In the anterior swimming parapodia the neurocirrus arises directly, while in the middle ones it brings to development ventrally a small vesicular flap. The aciculae are slightly bent and brownish in their anterior two thirds. The notopodial bristle-bundles of the nereid parapodia are made of homogomphe setiferous bristles; the bristle-bundles of the neuropodium consist of homogomphe and heterogomphe setiferous bristles and heterogomphe falcate bristles; the setiferous edges are thickly set with fine hairs; the edge of the blade of the falcate bristles has the same border, only here the hairs are coarser and somewhat wider set. The posteriormost parapodia lack bristle structure entirely; only the two aciculae are present; these parapodia are also considerably smaller than the former, which possess swimming bristles, as in general the caudal part of the body is sharply set off in its size from the other. The anal area is circular, the anal opening surrounded by five large, conical papillae. The proboscis is thick, muscular, and bears a pair of strong, dark-brown jaws which are provided on the inner side with 7 to 8 serrations. The strong, conical, dark-brown paragnatha are found only on the maxillary proboscis ring; they are distributed as follows: area I, without paragnatha; area II, 6 to 9 paragnatha in two to three slanting rows; area III, one nearly three-cornered group of 5 to 8 paragnatha; area IV, one nearly circular group of 10 to 12 paragnatha; areas V, VI, VII, and VIII, without paragnatha.

Numerous epitokal specimens from Pearl and Hermes Reef and Lisiansky Island.

Genus PERINEREIS Kinberg, 1865

Perinereis helleri Grube, 1878.

One specimen from Pearl and Hermes Reef, and 4 specimens from Oahu —2 from Waikiki and 2 from Kaneohe Bay. All specimens are atokal.

Perinereis curvata, new species (fig. 12; pl. 1, *I*).

The color is whitish, yellowish to brownish white; the head between the eyes, and to greater extent the dorsal side of the anterior body segments and the proboscis, are more or less dark-brownish pigmented. The size of specimens ranges between 9 and 14 mm. The body reaches its greatest width in the middle of the nereid region and reduces continually to the caudal end. The nereid region is clearly separated from the heteronereid and consists of 15 parapodia-bearing segments; the heteronereid region is composed of 43 to 56 parapodia-bearing segments. The anal area is circular and bears ventrally a pair of anal cirri which are ringed and, laid forward, reach over approximately 5 to 6 segments; the anal opening is surrounded by numerous small styliform papillae. The prostomium is roundish; its anterior part is shorter than its posterior part, which bears the two pairs of large, black-violet eyes; the eyes of each side stand close together. The palps are short, with thick basal segments and a small ball-shaped terminal segment; between the palps are found the tentacles, which extend beyond the terminal segments of the palps approximately a quarter of their length. The peristomium is as wide as the head flaps and only very little shorter than the first swimming segment (dorsal); ventrally the peristomium is thick and torous and marked with grooves parallel to the long axis of the body. There are four pairs of slightly curled tactile cirri: the anterior ventral pair of cirri laid back ventrally do not reach over the peristomium; the posterior pair reach back scarcely over the first quarter of the first swimming segment; the anterior dorsal pair of cirri reach laid back dorsally to the posterior border of the second or over half of the third parapodia-bearing segment; the posterior dorsal pair of cirri, the longest of all, reaches, laid back, over 4 to 5 parapodia-bearing segments. The segments of the nereid region are dorsally somewhat convex, ventrally flattened. The first two pairs of parapodia are single-branched, with one acicula; all other parapodia are two-

branched, with two aciculae. The first pair of parapodia has thick, club-shaped cirri, to which a thin tip is attached distally; these cirri lengthen until they reach their greatest development in the seventh pair of parapodia; they lengthen continually and become pointed and lose their clublike form; all cirri are bent ventrally; from the eighth to the fifteenth, the last pair of parapodia of the nereid region, the cirri become suddenly smaller, pointed, and inflated flask-shaped at the base. The lobes in which the aciculae lie are bluntly conical and small, the ligulae longish and also distally bluntly conical; their size is the size of corresponding normal parapodia. The parapodia of the heteronereid region

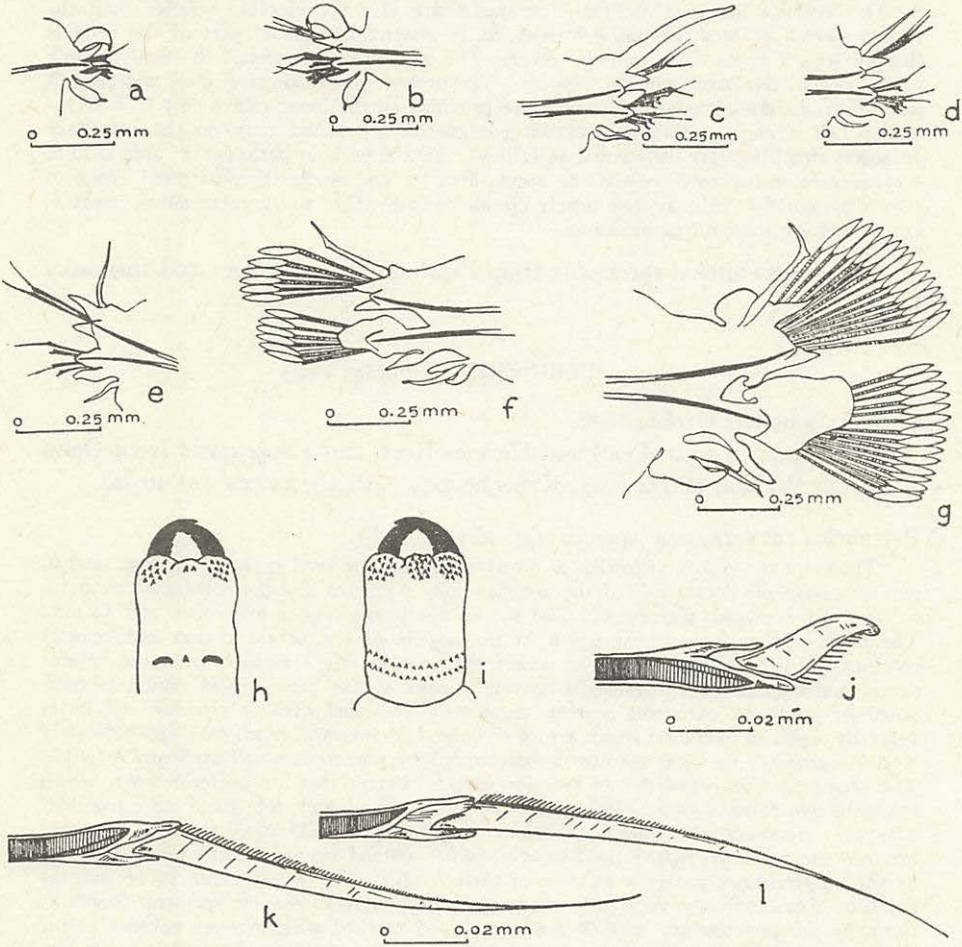

FIGURE 12.—*Perinereis curvata*, new species; *a*, single-branched parapodium of the 1st parapodia-bearing segment; *b*, parapodium of the 3d parapodia-bearing segment; *c*, parapodium of the 7th parapodia-bearing segment; *d*, parapodium of the 8th parapodia-bearing segment; *e*, parapodium of the 14th parapodia-bearing segment; *f*, parapodium of the 15th parapodia-bearing segment; *g*, parapodium of the 39th parapodia-bearing segment; *h*, proboscis from above; *i*, proboscis from below; *j*, heterogomphe falcate bristle; *k*, heterogomphe setiferous bristle; *l*, homogomphe setiferous bristle.

are typical swimming parapodia; they are cephalocaudally strongly compressed; their size increases gradually up to the middle of the heteronereid region, and again reduces to the caudal end of the body. The cirri of these parapodia are proportionately thin and are surrounded at the base by a flap; this flap is much smaller on the notocirrus than on the neurocirrus; the former is divided by the notocirrus into two unequally large roundish flaps; the latter is divided by the neurocirrus into a dorsal tongue-shaped flap and a ventral broad one, distally conical and posteriorly widened out leaf-shaped. The dorsal ligula of the notopodium is tapered to a point, of usual size; the ventral ligula is enlarged and tongue-shaped. The dorsal ligula of the neuropodium is extensively developed leaf-shaped and distally tapers bluntly conically; the ventral ligula is again tongue-shaped and very insignificant. The aciculae are colored deep black in their distal two thirds and slightly bent. The bristle structure of the nereid parapodia is formed of bristles of three types placed together: homogomphe and heterogomphe setiferous bristles the edge of which is thickly set with fine hairs and heterogomphe falcate bristles, the edge of whose blade is set with coarser, more widely spaced hairs. The swimming parapodia have exclusively knifelike bristles whose knifelike part is provided with small serrations on the edge. The nereid bristles are faintly brownish and transparent; the swimming bristles are colorless and likewise transparent. The thick, muscular proboscis bears two strong dark-brown to blackish jaws which are provided with 7 to 8 serrations on the inner side. All proboscis areas show strong dark-brown paragnatha which are distributed upon the different areas as follows: area I, 2 to 3 conical paragnatha; area II, 8 to 12 conical paragnatha; area III, 16 to 20 paragnatha (conical); area IV, 14 to 20 paragnatha (conical); area V, 1 conical paragnath; area VI, 1 large oblique paragnath; areas VII and VIII, 34 to 36 conical paragnatha in two rows.

Numerous epitokal specimens from Pearl and Hermes Reef, French Frigates Shoal, and Lisiansky Island.

Genus PLATYNEREIS Kinberg, 1865

Platynereis pestai, new species (figs. 13-15; pl. 1, *J, K*).

The color of the animals is always brownish yellow, although the females appear considerably darker because of the numerous eggs with which their bodies are filled.

Males (figs. 13, 14; pl. 1, *J*).

The body length of the largest specimen measures 18.75 mm; its greatest width, without measuring the parapodia, is 2.08 mm. The nereid region is composed of 14 parapodia-bearing segments and is clearly distinguished from the heteronereid region, which consists of 64 to 78 parapodia-bearing segments. The prostomium is long, considerably longer than broad; the posterior part bears the very large deep black violet-colored eyes in two pairs; the eyes of each side stand close together; the anterior pair of eyes is much larger than the dorsally placed posterior pair and lies almost completely ventral. The anterior part of the prostomium is rounded on the anterior border and transparent; ventrally there arise from it the tentacles, the form of which appears broadly three-cornered with points drawn out distally. Likewise on the ventral side of the prostomium are found the two palps, which consist of a somewhat longish, ellipsoid basal segment and a small, nearly egg-shaped terminal segment. The peristomium lies dorsally in the form of a three-cornered flap over the posteriormost part of the prostomium; the point of the lobe reaches between the posterior pair of eyes; ventrally the peristomium is thick and torous and cross-furrowed. There are four pairs of ringed tactile cirri: the anterior ventral pair of cirri reaches laid back ventrally approximately over half or to the posterior border of the 2d parapodia-bearing segment; the posterior pair reaches over half of the sixth parapodia-bearing segment; the anterior dorsal pair of cirri reaches laid back dorsally over seven, the posterior pair over about 10 parapodia-

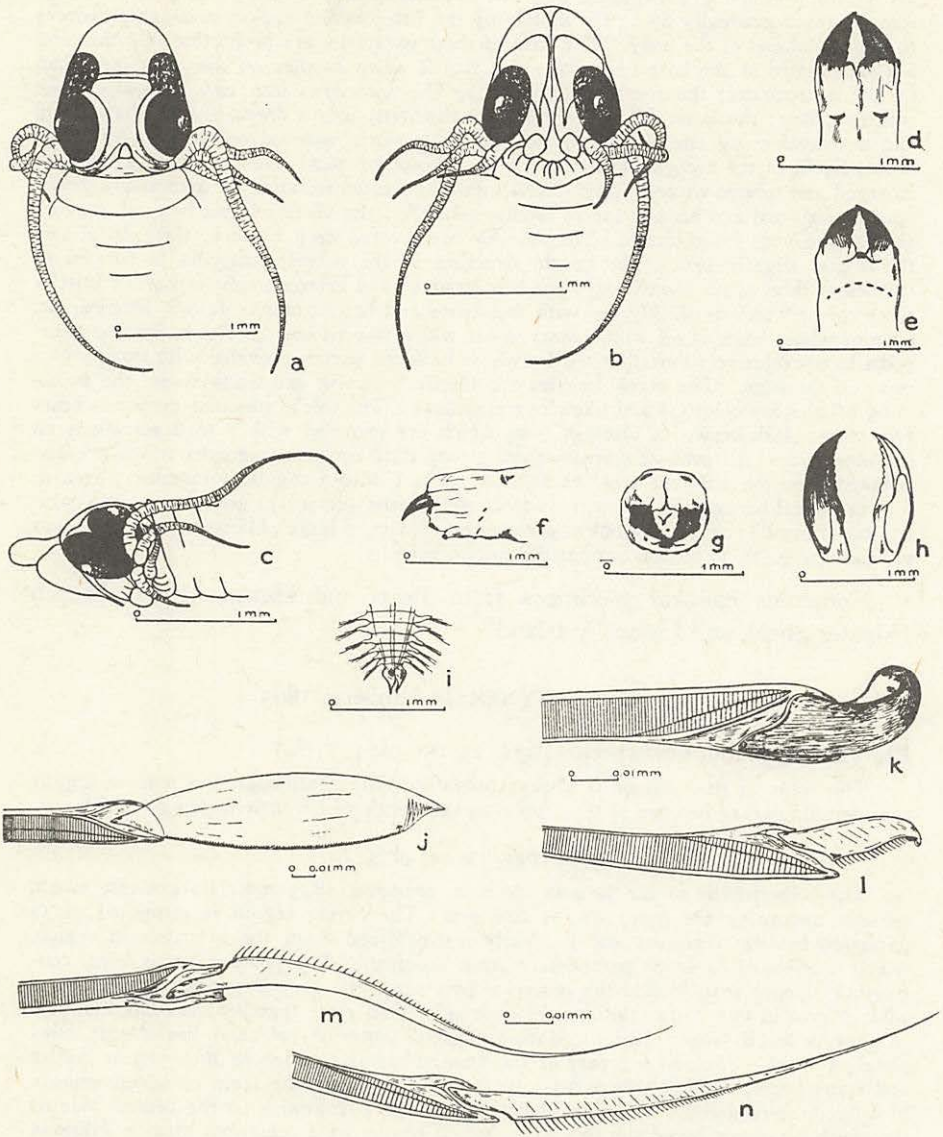

FIGURE 13.—*Platynereis pestai*, new species, male: *a*, head from above; *b*, head from below; *c*, head from the side; *d*, proboscis from above; *e*, proboscis from below; *f*, proboscis from the side; *g*, proboscis from the front; *h*, jaws; *i*, end of body; *j*, bladelike swimming bristle; *k*, hooklike bristle; *l*, heterogomphe falcate bristle; *m*, homogomphe setiferous bristle; *n*, heterogomphe setiferous bristle.

bearing segments. The individual parapodia-bearing segments of the nereid region are dorsally strongly, ventrally more slightly convex; the first two pairs of parapodia are single-branched with one acicula, all other parapodia two-branched with two aciculae; the parapodia are only very little longer than high; the tips are all conical and of normal size; the lobes are moderately small and bluntly angular-pointed. The notopodial cirrus of the first pair of parapodia is almost globular and has distally a ventrally directed, pointed tip; the neurocirrus has also the same form, only it is smaller and has a somewhat stretched-out basal segment; both cirri differ gradually in form in the following parapodia; the neurocirrus becomes smaller and thin, with inflated flask-shaped basal segment and pointed distal part; the notocirrus enlarges considerably up to the seventh parapodium; its distal part becomes cylindrical and extends in length; distally it becomes broad and develops on two opposite sides conically pointed appendages of unequal size; its looks like a pickaxe and overhangs all other parts of the parapodium considerably. From the eighth pair of parapodia on the notocirrus changes its form suddenly and has now the same form as the neurocirrus but is always larger than the latter although it is considerably smaller than the notocirrus of the seventh pair of parapodia. The parapodia of the heteronereid region are typical swimming parapodia, very large,

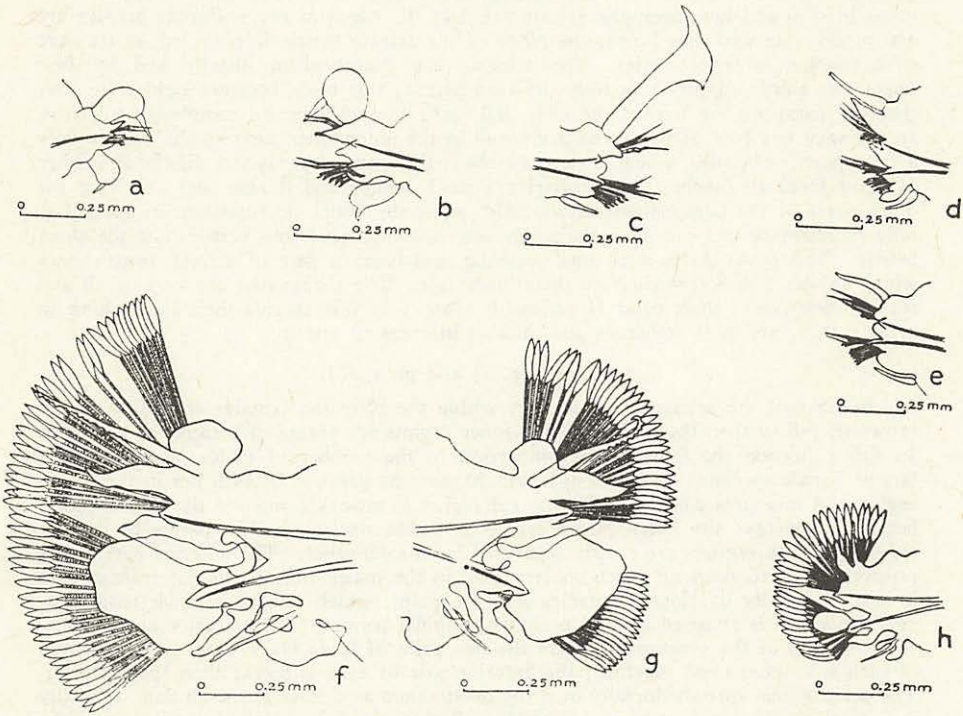

FIGURE 14.—*Platynereis pestai*, new species, male: *a*, single-branched parapodium of the 1st parapodia-bearing segment; *b*, parapodium of the 4th parapodia-bearing segment; *c*, parapodium of the 7th parapodia-bearing segment; *d*, parapodium of the 8th parapodia-bearing segment; *e*, parapodium of the 14th parapodia-bearing segment; *f*, parapodium of the 34th parapodia-bearing segment; *g*, parapodium of the 54th parapodia-bearing segment; *h*, parapodium of the 74th parapodia-bearing segment.

lamellar, with strongly enlarged appendages. The notocirrus is long and thin on one side set with numerous conical papillae; at its base is attached dorsally a large roundish flap. The lobes in which the aciculae lie are somewhat large and bluntly angularly pointed; the dorsal tip of the notopodium is long and conically pointed; the ventral tip is broad, tongue-shaped, pointed; it is somewhat bent ventrally and proximally roundish and flaccidly broadened. The dorsal ligula of the neuropodium is extensively broadened leaf-shaped with irregular scalloped border; the ventral ligula of the neuropodium is much smaller than the dorsal, tongue-shaped, distally conically pointed, and has on the dorsal border a more or less well developed conical and rounded flap. The neurocirrus is considerably smaller than the notocirrus but of the same form and bears likewise on one side a few very small papillae; at its base is developed a large flap, which is divided by it into a dorsal tongue-shaped, smaller, and a ventral, leaf-shaped, larger part. The caudal end of the body is trapezoid with two short broadly conical papillae. The swimming bristles are homogomphe, and of the normal bladelike form which is particular to the corresponding genus. In the parapodia of the nereid region one can find the following bristles placed together: in the notopodium homogomphe setiferous bristles and one or two brownish transparent hook bristles, the hook of which has distally a globular termination. In the neuropodium are found homo- and heterogomphe setiferous bristles and heterogomphe falcate bristles; the edges of the setiferous bristles are set on one side with fine hairs; the blade of the falcate bristle is provided on its edge with coarser, wider-set hairs. The aciculae are slightly bent distally and in their upper two thirds slightly brownish and transparent; this color becomes lighter the farther the parapodia lie toward the body end, until the aciculae are completely colorless. In the very last pair of parapodia are found in the notopodium next to the acicula only a few spearlike bristles, which are cross-ribbed; this pair of parapodia differs altogether in form from all others; the notocirri are much longer and thicker and overhang the other parts of the parapodium considerably, while the entire neuropodium in general is only rudimentary and can have one single heterogomphe setiferous bristle near the short bristle. The proboscis is thick and muscular and bears a pair of strong, brown jaws which exhibit 7 to 8 serrations on their inner side. The paragnatha are very small and set in thick rows; their color is yellowish brown; in this species they are lacking in areas I, II, V; are most numerous and thickest in areas III and IV.

Females (fig. 15 and pl. 1, *K*).

Because of the accumulation of eggs within the body the females are much darker brownish yellow than the males; all the inner organs are shrunken because of the eggs. In this collection the females, in comparison to the number of males, are few. The largest female specimen measures in length 20 mm; its greatest breadth lies in the nereid region and measures 2.60 mm. The nereid region is always composed of 19 parapodia-bearing segments; the heteronereid region stretches over 44 to 61 parapodia-bearing segments. Both regions are clearly separated from each other. The anterior part of the prostomium is rounded off much shorter than in the males and also is not transparent; it bears normally developed tentacles and the palps, which exhibit a thick basal segment, to which is attached a small roundish terminal segment; the posterior nearly four-cornered part of the prostomium bears the two pairs of large black-violet eyes; the eyes of each side stand close together; the anterior pair of eyes is larger than the posterior. The peristomium spreads dorsally over the prostomium as a three-cornered flap; ventrally it is thick, torous, and grooved lengthwise. There are four pairs of tactile cirri: the anterior ventral pair of cirri laid back ventrally reach to the posterior border of the 2d parapodia-bearing segment; the posterior pair reach to the posterior border of the 3d parapodia-bearing segment; the anterior dorsal pair of cirri laid back dorsally reach to the posterior border of the seventh or over a quarter of the 8th parapodia-bearing segment; the posterior pair reach over 10 to 10½ parapodia-bearing segments. The nereid parapodia are small in relation to the whole segment, which both dorsally and ventrally is strongly convex; always the body appears greatly inflated by the very large

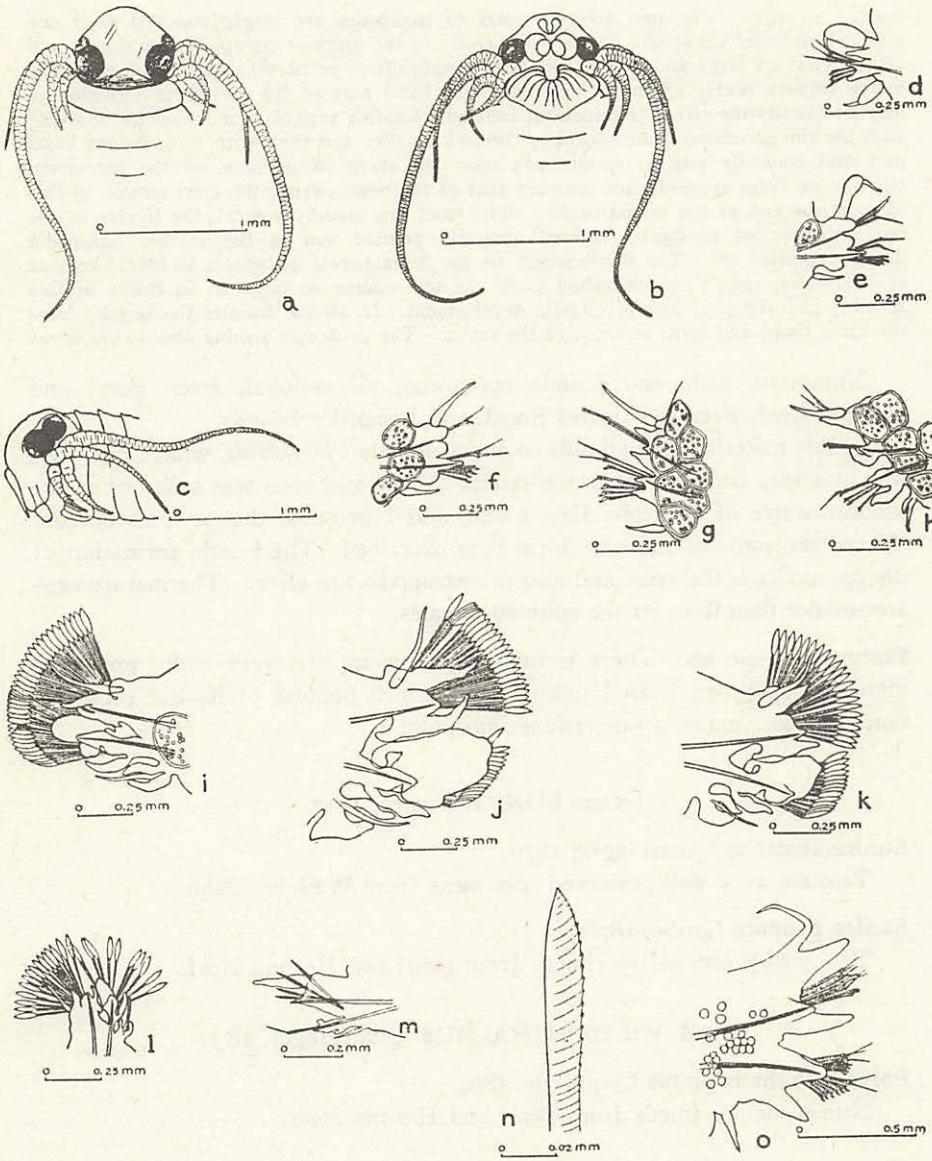

FIGURE 15.—*Platynereis pestai*, new species, female: *a*, head from above; *b*, head from below; *c*, head from the side; *d*, single-branched parapodium of the 1st parapodia-bearing segment; *e*, parapodium of the 5th parapodia-bearing segment; *f*, parapodium of the 6th parapodia-bearing segment; *g*, parapodium of the 13th parapodia-bearing segment; *h*, parapodium of the 19th parapodia-bearing segment; *i*, parapodium of the 20th parapodia-bearing segment; *j*, parapodium of the 33rd parapodia-bearing segment; *k*, parapodium of the 42d parapodia-bearing segment; *l*, parapodium of the 49th parapodia-bearing segment; *m*, parapodium of the last parapodia-bearing segment; *n*, ribbed spear-like bristles of the last pair of parapodia; *o*, atokal female, parapodium.

number of eggs. The two anterior pairs of parapodia are single-branched with one acicula; all other parapodia are two-branched; in the anterior parapodia the dorsal and ventral cirri are large and egg-shaped, with a ventrally directed, thin, conical tip attached; in the further course of the nereid region the basal part of the notocirrus stretches in length; distally the cirrus is somewhat inflated, roundish vesicular, and likewise provided with the tips mentioned; the neurocirri become smaller and thin, with flask-shaped basal part and conically pointed distal end; from the sixth parapodium on the notocirrus changes its form suddenly and assumes that of the neurocirrus; the cirri remain in this form to the end of the nereid region. The lobes are broadly conical, the ligulae in the two anteriormost parapodia tapered conically pointed and in the further parapodia distally rounded off. The development of the heteronereid parapodia is here like that of the males, only their individual parts do not become so large as in males of this species; also the cirri lack all papilla development. In all the females the bristles have the same shape and form as those of the males. The proboscis arming also is the same.

Numerous male and female specimens, all epitokal, from Pearl and Hermes Reef, French Frigates Shoal, and Lisiansky Islands.

In this material I found also an atokal female *Platynereis,* which, however, was in a very bad state of preservation. A like specimen was collected in the shallow water of Kaneohe Bay, Oahu, and I presume that it is to be considered the same as the new form here described. The bristle formation of the parapodia is the same and also the parapodia are alike. The mature eggs are smaller than those of the epitokal females.

Platynereis, species. There is one single incomplete, very badly preserved immature specimen from Laysan Island, which because of its bad preservation I do not venture to determine indisputably.

Genus EUNICE Cuvier, 1817

Eunice australis Quatrefages, 1870.

Two not very well preserved specimens from Waikiki, Oahu.

Eunice paupera Grube, 1878.

Two well-preserved specimens from Pearl and Hermes Reef.

Genus POLYOPHTHALMUS Quatrefages, 1850

Polyophthalmus pictus Claparède, 1864.

Numerous specimens from Pearl and Hermes Reef.

I have the caudal end of a terebellid from Pearl and Hermes Reef that is indeterminable.

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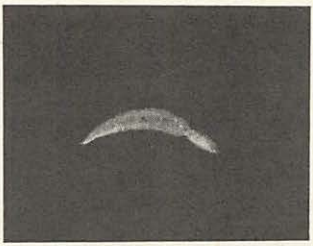

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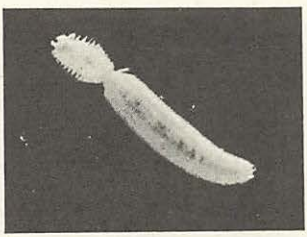

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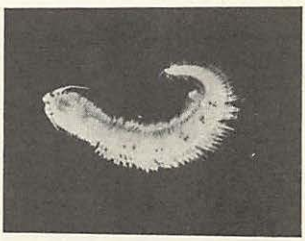

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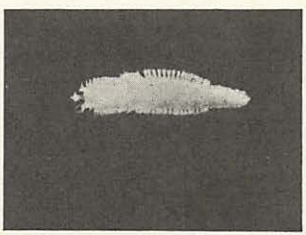

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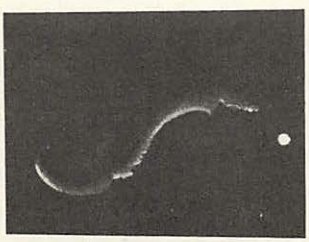

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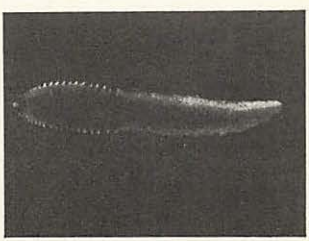

K

HAWAIIAN POLYCHAETES: *A*, NEREIS (NEREIS) UNICA; *B*, NEREIS (NEREIS) ABBREVIATA; *C*, NEREIS (NEREIS) MARIAE; *D*, NEREIS (NEREIS) MYERSI; *E*, NEREIS (NEONEREIS) HAWAIIENSIS; *F*, NEREIS (NEONEREIS) NIGROACICULATA; *G*, NEREIS (HERFRIEDIA) WAIKIKIENSIS; *H*, NEREIS (CERATONEREIS) PIETSCHMANNI; *I*, PERINEREIS CURVATA; *J*, PLATYNEREIS PESTAI, MALE; *K*, PLATYNEREIS PESTAI, FEMALE.—(PHOTOGRAPH BY DR. ADENSAMER, WIEN.)