Garth, J. S. 1985

ON A SMALL COLLECTION OF BRACHYURAN CRUSTACEA FROM EASTER ISLAND OBTAINED BY THE SCRIPPS INSTITUTION OF OCEANOGRAPHY DOWNWIND EXPEDITION OF 1958

by John S. Garth

OCCASIONAL PAPERS OF THE

ALLAN HANCOCK FOUNDATION

New Series No. 3

PUBLISHED BY THE ALLAN HANCOCK FOUNDATION
University of Southern California
Los Angeles, California 90089

For more information concerning the Allan Hancock Foundation Publications Program, or to order additional copies of this paper, please write to the Allan Hancock Foundation, University of Southern California, University Park, Los Angeles, California 90089.

Cover drawing of the Allan Hancock Foundation building on the University of Southern California campus by Catherine Kimmel.

Published February 1985

On a Small Collection of Brachyuran Crustacea from Easter Island Obtained by the Scripps Institution of Oceanography Downwind Expedition of 1958

by John S. Garth
Allan Hancock Foundation
University of Southern California
Los Angeles, California

ABSTRACT. The first brachyuran crustaceans ever to have been dredged from Easter Island waters are reported. Included are six species of Xanthidae and one of Parthenopidae. All were recovered from a single station in La Pérouse Bay, 40–100 m, by the Scripps Institution of Oceanography (SIO) Downwind Expedition of 1958. Four of the six xanthids are new to science and a fifth, *Liomera monticulosa,* is new to Easter Island, as is the single parthenopid, *Daldorfia horrida.* Genera in which new species are described are *Actaea, Forestia, Liomera,* and *Monodaeus.* With the exception of *Trapezia ferruginea,* a coral inhabitant found in both eastern and western Pacific, relationships of the reported species are entirely Indo-west Pacific.

INTRODUCTION

In September of 1959 the writer received from the late Dr. E. C. Allison, then of the University of California Museum of Paleontology (UCMP), Berkeley, a small collection of recent brachyuran crustaceans obtained by the Scripps Institution of Oceanography (SIO) DOWNWIND Expedition in January of 1958. Included were the first specimens ever to have been dredged from waters surrounding Easter Island, a volcanic island located in the eastern South Pacific at Latitude 27°10′S, Longitude 129°26′W, the *Albatross* Expedition of 1904 (Rathbun 1907) having collected exclusively ashore. All came from a single station in La Pérouse Bay at a depth of 40–100 meters and were collected by means of a rock dredge used in geological exploration. This circumstance, plus the fact that no biologist was present to give them immediate attention, accounts for their fragmented condition.

The paucity or non-existence of comparative material from this or nearby localities made the identification of the Easter Island specimens doubly difficult. When it was possible to compare them with dredged material from similarly remote central Pacific and Indian Ocean localities, sufficient differences were found to justify the establishment of new species, apparently endemic to Easter Island, but perhaps shared with adjacent islands and submerged seamounts. The best clues to their identities were provided by the report on the Brachyura of the *Albatross* Expedition to the Hawaiian Islands (Rathbun 1906) and the report on the Brachyura of the Percy Sladen Trust Expedition to the Indian Ocean (Rathbun 1911), half a world removed. Specimens dredged by the *Albatross* in Hawaii under the direction of David Starr Jordan and Barton Warren Evermann, seen at the U.S. National Museum, Washington, and specimens dredged by the *Sealark* in the Indian Ocean under the leadership of J. Stanley Gardiner, seen at Cambridge University, England (see Garth 1971), although not identical with Easter Island specimens, proved as closely related to them as any existing in museum collections today. Thus the geographical isolation of Easter Island is underscored by the distinctiveness of its brachyuran inhabitants, which are as highly endemic as those of Hawaii, with both faunas clearly derived from the tropical Indo-west Pacific.

RELATED REPORTS

Since first receiving the SIO DOWNWIND collection, the writer has reviewed and reported on the intertidal collections of the Medical Expedition to Easter Island (METEI) and the Expedición Isla de Pascua (EIP) of the Universidad de Concepción, Chile (Garth 1973). Only one species, *Trapezia ferruginea*, proved common to DOWNWIND and earlier reported collections, and that because the living *Pocillopora* in which it occurs extends from the subtidal into the low intertidal zone. The absence of the Oxyrhyncha, noted in connection with METEI and EIP collections, is relieved with the discovery of the widely ranging Indo-west Pacific parthenopid, *Daldorfia horrida*, although recent life-history studies (Yang 1971) cast doubt upon the status of the Parthenopidae as oxyrhynchs. A subsequent report will be made on DOWNWIND collections from Shoal Guyot, a submerged mountain-top in the eastern Pacific. Dredged from a depth of 228 meters, these belong to a different vertical zone and are distinct from the Easter Island specimens.

TAXONOMIC NOTE

The new species described all belong to the Xanthidae, a family undergoing world-wide revision at the hands of Mme. Danièle Guinot of the Paris Museum. Fortunately, the results of her preliminary studies, appearing sequentially, have been consolidated into a single article (Guinot 1971). Entitled *Synthèse et bibliographie*, it lists each species treated to date, gives the genus to which it is presently assigned, and cites the earlier publication in which the new combination may be found, sometimes as an obscure footnote or an addendum to an unrelated article. More recently, Part I of her revision of the Xanthidae, covering the subfamilies Polydectinae, Trichiinae, and Actaeinae (Guinot 1976), has come to hand. Going beyond the earlier Synthesis, it regroups existing species and defines new genera, but unfortunately leaves the generic status of a number of species still in doubt.

The abbreviated terminology of Dana (1852, p. 29, fig. 3), illustrated more accessibly in Rathbun (1930, p. 6, fig. 3), in which the principal parts of the carapace are indicated by letters, their subdivisions by figures, is used in the descriptive portions of this report.

LIST OF SPECIES

Station DW HD-76: La Pérouse Bay, Easter Island, 40–100 meters, 2 February 1958.

PARTHENOPIDAE: *Daldorfia horrida* (Linnaeus), 1 female

XANTHIDAE: *Forestia pascua*, new species, 1 female
Actaea allisoni, new species, 1 male
Liomera monticulosa A. Milne Edwards, 1 female
Liomera laperousei, new species, 1 male
Monodaeus pettersoni, new species, 1 male, 2 females
Trapezia ferruginea Latreille, 1 male

Section BRACHYURA
Subsection BRACHYGNATHA
Superfamily OXYRHYNCHA
Family PARTHENOPIDAE

Daldorfia horrida (Linnaeus)

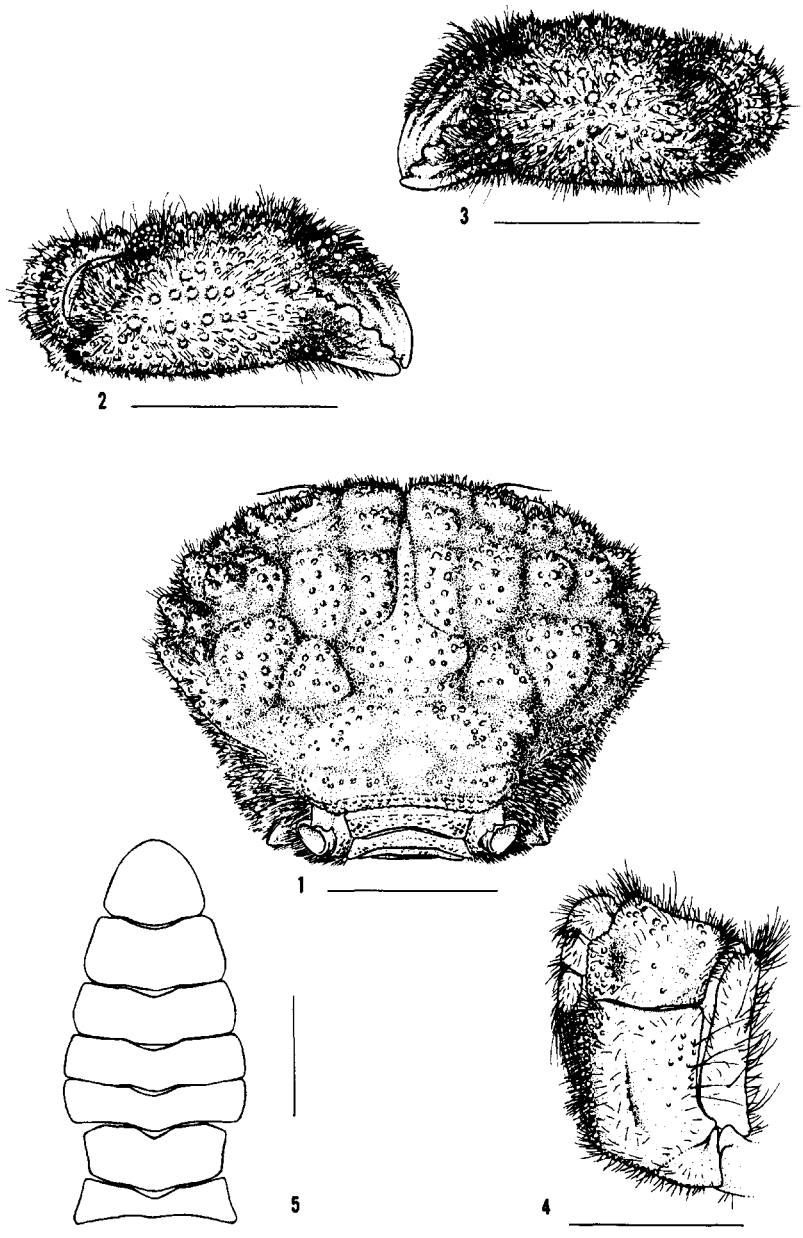
Cancer horridus Linnaeus, 1767, p. 1047.
Parthenope horrida, Randall, 1839, p. 111 (Sandwich Islands). Flipse, 1930, p. 58 (literature). Sakai, 1938, p. 340, pl. 39, fig. 3 (Japan).
Daldorfia horrida, Rathbun, 1904, p. 171; 1906, p. 886, pl. 14, fig. 5; text-fig. 39.

Range. From the Red Sea to Japan and the Hawaiian Islands.

Material. La Pérouse Bay, Easter Island, 40–100 meters, DW HD-76, 2 February 1958, 1 young female.

Measurements. Immature female, length 10.2 mm, width 14.0 mm.

Remarks. A large and striking species, *Daldorfia horrida* ranges widely throughout the Indo-west Pacific. Its eastern Pacific counterpart, *D. garthi* Glassell, occurs in the Galapagos Islands and along the American mainland from Mexico to Colombia. The Easter Island specimen was seen by Dr. T. Sakai, who reported the species from Japan (above).



Figs. 1–5. 1. *Forestia pascua* Garth, new species, female holotype (AHF No. 5817), dorsal view of carapace. 2. Same, outer view of right cheliped. 3. Same, outer view of left cheliped. 4. Same, external maxilliped. 5. Same, abdomen. Scale for Figs. 1, 2 and 3 = 4 mm, for Figs. 4 and 5 = 2 mm.

Superfamily BRACHYRHYNCHA
Family XANTHIDAE

Forestia pascua, new species
Figs. 1–5

Type. Female holotype, AHF No. 5817, from La Pérouse Bay, Easter Island, 40–100 meters, 2 February 1958, SIO Downwind Expedition Station HD-76 (UCMP B-5667).

Measurements. Female holotype: length of carapace 8.0 mm, width of carapace 11.8 mm, of front 3.0 mm, of fronto-orbit 7.2 mm, length of chela 6.4 mm, of dactyl 3.2 mm, height of palm 3.2 mm.

Diagnosis. Carpace half again as broad as long, anterolateral border shorter than posterolateral, third to fifth lobes dentate. Areole 2M (of Dana) completely divided.

Description. Carapace two-thirds as long as broad, flattened, especially posteriorly, areoles

separated by shallow grooves, indistinct posteriorly, hirsute and granulate, the granules on the edge of the front, orbit, principal areoles, and anterolateral margins conical. Front slightly deflexed, the slightly arcuate lobes separated by a median U-shaped notch. Of the five anterolateral lobes including the exorbital, the second represented by a cluster of granules, the third, fourth, and fifth dentate, acuminate, the margins granulate. 1M (of Dana) slightly separated from inner lobe of 2M; this lobe narrower than the outer lobe, and completely separated from it. Posterolateral margin straight, longer than anterolateral margin. Merus of outer maxilliped rectangular, dimpled internally, slightly produced anteroexternally.

Chelipeds equal, carpus with one longitudinal and two transverse grooves, carpus and manus covered with short pile and some longer setae, and with conical granules tending to form lines on the manus. Fingers short, deflexed, grooved, ridges granulate, margins irregularly dentate, tips crossing. Fingers of female brown, tips white.

Walking legs moderately setose, with conical granules on upper and lower margins of meri and on outer surface of carpi, propodi, and dactyli.

The male of the species is unknown, hence description of the characters associated with that sex cannot be given.

Remarks. The new species from Easter Island relates to a group of Indo-west Pacific species formerly in the genus *Actaea* (*sensu lato*), of which two are now assigned to the newly erected genus *Forestia* Guinot, 1976, while the generic status of the third remains in doubt. These are *Forestia depressa* (White) (South Africa, Madagascar, Ceylon, Andaman Islands, Mergui Archipelago, Philippine Islands, Bonin Islands, and Japan), *F. scabra* (Odhner) (Viet Nam, Malaysia, Sunda Islands, and Queensland, Australia), and *Actaea mortensoni* Odhner (Key Islands). In general shape it most clearly resembles *F. depressa*; however, in that species the carapace is narrower, being three-fourths as long as broad. With respect to the short anterolateral border it resembles *F. depressa* and *F. scabra*, while the three lateral teeth resemble those of [*A.*] *mortensoni*. In all of them lobe 2M is incompletely divided, whereas in the Easter Island specimen it is completely divided, as indeed it is in *F. abrolhensis* (Montgomery) (SW Australia), formerly considered a subspecies of *F. depressa* but recently elevated to specific rank. Since Guinot (1976, p. 204) now considers [*Actaea*] *mortensoni* "en dehors d'*Actaea*, et parfois hors des Actaeinae," it is apparent that the resemblance of the new species to it is a superficial one, while the resemblance to *F. scabra* and *F. depressa* rests on surer ground. Its generic placement in *Forestia* is supported by the truncate basal antennal article, which barely touches the front. Comparison of the male first pleopods should confirm this, when the male of the species is known. [The above comparisons, with the exception of *F. abrolhensis*, were suggested to the writer by Mme. D. Guinot of the Muséum National d'Histoire naturelle, Paris, on the occasion of his 1966 visit to the Laboratoire de Zoologie (Arthropodes), 10 years before her revision placed two of the three species with which comparison was suggested in the genus *Forestia*, with *F. depressa* as type.]

The new species honors the Spanish name of Easter Island, *Isla de Pascua*.

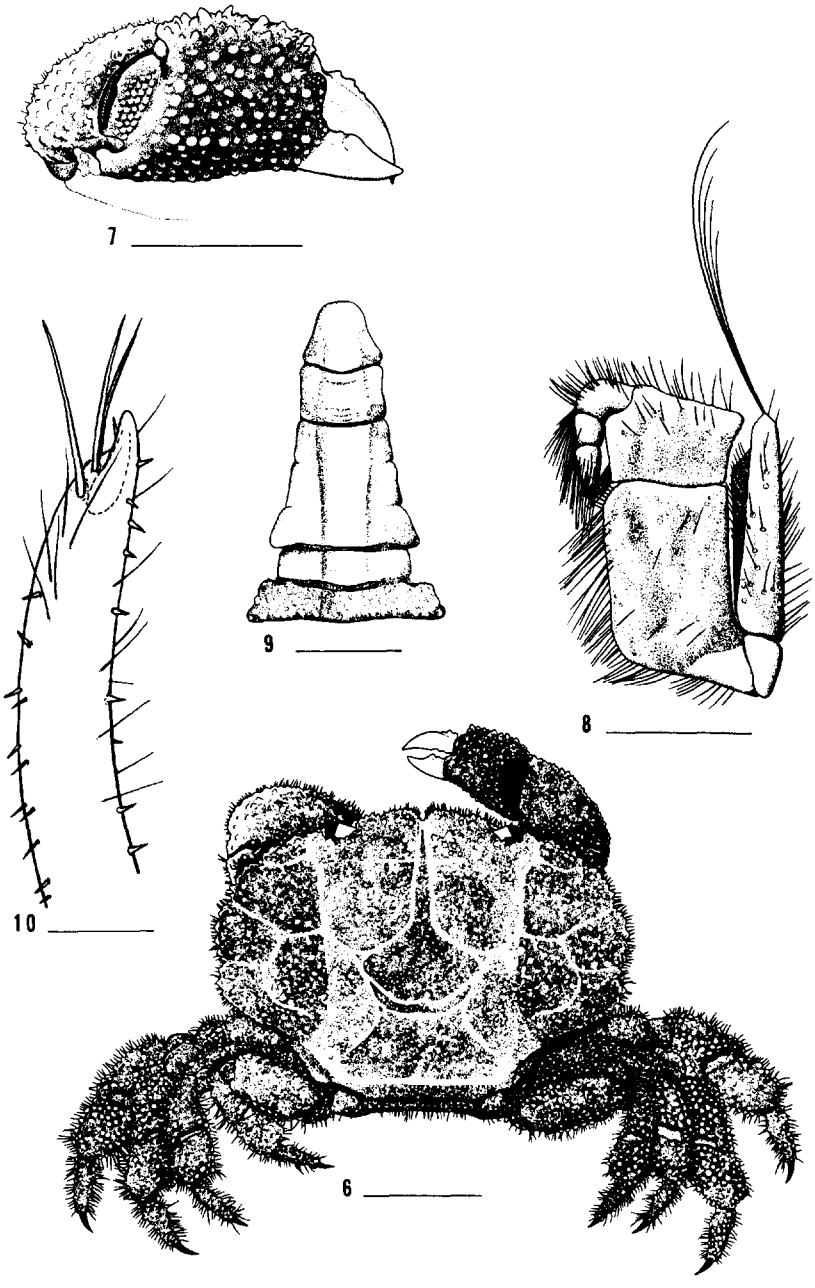
Actaea allisoni, new species
Figs. 6–10

Type. Male holotype, AHF No. 5818, from La Pérouse Bay, Easter Island, 40–100 meters, 2 February 1958, SIO Downwind Expedition Station HD-76 (UCMP B-5667).

Measurements. Male holotype: length of carapace 12.2 mm, width of carapace 18.0 mm, of front 3.6 mm, of fronto-orbit 8.8 mm, length of chela 9.0 mm, of dactyl 4.6 mm, height of palm 4.2 mm.

Diagnosis. Anterolateral lobes projecting slightly, fifth lobe small, dentate. Areoles slightly protuberant, intervening grooves shallow; gastric shield not noticeably elevated. Merus of maxilliped not deeply indented nor depressed. No spot of color, but a light median band, with traces of color laterally and anteriorly.

Description. Carapace broadly oval, thickened anterolaterally, areolated anteriorly, flattened posteriorly, densely granulate and hairy. Areoles slightly protuberant, separated by shallow furrows. Surface more granulate than hairy, largest granules on branchial regions, interspersed with granules of medium to small size. Front advanced medially, deflexed, lobes rounded, separated by a wide U-shaped sinus from each other and by a lesser sinus from preorbital lobes. Orbits with two closed fissures above and one open fissure externally. Anterolateral margins faintly divided into five shallow lobes, in-



Figs. 6–10. 6. *Actaea allisoni* Garth, new species, male holotype (AHF No. 5818), dorsal view of entire crab. 7. Same, outer view of right cheliped. 8. Same, external maxilliped. 9. Same, abdomen. 10. Same, tip of first pleopod. Scale for Figs. 6 and 7 = 5 mm, for Figs. 8 and 9 = 2 mm, for Fig. 10 = 0.2 mm. Figs. 6–9 by Carl Petterson.

cluding the exorbital lobe; of these the second (first of A. Milne Edwards) scarcely distinguishable from the first or exorbital, the third and fourth more rounded, separated from each other and from the fifth by shallow furrows extending onto carapace; fifth narrower than third and fourth and slightly dentate. Sternum, pterygostomian region, and maxillipeds densely and finely granulate. Merus of third maxilliped broader than long, slightly produced at anteroexternal angle, anterior margin sinuous, notched to receive the palpus.

Chelipeds of male subequal, granulate and hairy, merus deeply notched on superior margin; carpus inflated, rounded externally, superior groove obsolescent; manus rounded supe-

riorly, granules on outer surface arranged in rows leading to dactyls; fingers white, compressed, channeled, bladelike, tips pointed and crossing; movable finger with a basal row of granules, immovable finger with a triangular median tooth.

Walking legs granulate and hairy, sharpness of granules increasing toward dactyls, nails amber.

Male abdomen with somites 3–5 fused, somite six rectangular, somite seven triangular, tip broadly rounded.

Male first pleopod long, slender, cylindrical, flattened, and tapering distally, with numerous short setae in rows along margins and three longer setae at tip.

Remarks. The Easter Island specimen was compared with the female holotype of *Actaea obesa* A. Milne Edwards, a dry specimen from Zanzibar, M. L. Rousseau, 1905 (28-9-5) in the collections of the Paris Museum, from which it differs in having the anterolateral lobes less projecting, the dorsal areoles less elevated, and the grooves of the carapace, particularly those separating the gastric from the branchial and the branchial from the hepatic regions, less depressed. Also, the fifth anterolateral tooth is smaller than that of *obesa*, the merus of the maxilliped less depressed in the center and less deeply indented along the anterior margin. Other specimens of *A. obesa* seen include a 12.9 × 19.5 mm female from Macclesfield Bank, 32–35 fathoms, Basset Smith (93.11.3.57) in the collections of the British Museum (Natural History), compared by T. Odhner with a photograph of the type, and an ovigerous female from Male Atoll, Maldive Islands, L. A. Borradaile, in the collections of Cambridge University, identified by Borradaile as *?A. pulchella* A. Milne Edwards but brought to *A. obesa* by T. Odhner. Additional points of difference noted from these comparisons are that the Easter Island specimen has a more advanced front and longer fingers than does *A. obesa*.

The Easter Island specimen was also compared with the male holotype of *Actaea alcocki* Laurie from Ceylon, Herdmann coll. (1907.5.22.225) at the British Museum (Natural History), from which it differs in being less convex and less areolate, in particular lacking the greater elevation of the gastric shield, and with an ovigerous female from Viet Nam, N. Zarenkov, in the collections of the Paris Museum, from which it differs also in lacking the characteristic small red spot on the mid-gastric line.

The new species from Easter Island belongs to a group of species that includes not only *A. obesa* A. Milne Edwards and *A. alcocki* Laurie, but also *A. inskipensis* Rathbun and *Xantho bowenensis* Rathbun, which should be transferred to *Actaea* (cf. Guinot 1969, p. 232). Each has a characteristic color pattern, although that of the last two mentioned species is undescribed. The red gastric spot of *A. alcocki* has been referred to above; the pattern of *A. obesa*, said by de Man (1902, p. 613) to resemble a Grecian cross and described by Odhner (1925, fig. 5) as brown with white fields behind the eyes and either side of the cardiac region, the lobes of the anterolateral margins whitish, is not duplicated by the Easter Island specimen which, although faded, shows a light median band with traces of color laterally and anteriorly along the mid-gastric line. All are Indo-west Pacific species, the first two from the Indian Ocean and South China Sea (Macclesfield Bank), the last two from the Coral Sea off Queensland, Australia.

The new species is named in memory of the late Edwin C. Allison, professor of geology at San Diego State University, whose untimely death on 1 January 1971, eclipsed a rising star on the horizon of marine invertebrate paleontology.

Liomera monticulosa (A. Milne Edwards)

Carpilodes monticulosus A. Milne Edwards, 1873, p. 181, pl. 5, fig. 4 (New Caledonia). Odhner, 1925, p. 21, pl. 1, fig. 18 (Durban, Natal; Tahiti, Tuamotu).

?Carpilodes cariosus Alcock, 1898, p. 86 (Ceylon; Andaman Islands).

Liomera monticulosus, Barnard, 1950, p. 240, text-figs. 44c, d (Delgoa Bay, Mozambique).

Range. From Natal and Mozambique to Tahiti and Tuamotu. Many of the Indian Ocean records were reported as *Carpilodes cariosus* Alcock.

Material. La Pérouse Bay, Easter Island, 40–100 meters, DW HD-76. 2 February 1958, 1 female.

Measurements. Female specimen: length 5.5 mm, width 9.5 mm.

Remarks. The Easter Island female was compared with the types (3) from New Caledonia in the collection of the Paris Museum. These all have the ridge that includes the posterior gastric

area continuous from side to side, whereas this ridge is several times interrupted in the Easter Island specimen. The latter agrees more closely with a male specimen of *L. monticulosa* from Upolu, Samoa (1940-vii-16–7), Buxton and Hopkins, in the collection of the British Museum (Natural History), and with a female specimen from Eniwetok (ESR-8), Ernst S. Reese, in the collection of the Allan Hancock Foundation. It was concluded that the Easter Island specimen, although not typical *monticulosa,* should not be given another name until the status of Alcock's *cariosa,* a questionable synonym, could be determined.

Odhner (1925, p. 21) calls attention to the discrepancy between the color of A. Milne Edwards's figure, which is uniform deep violet, and the description in the text: "Carapace golden with red flecks, legs red," as additional grounds for considering *L. cariosa* a synonym of *L. monticulosa.*

Liomera laperousei, new species
Figs. 11–16

Type. Male holotype, AHF No. 5819, from La Pérouse Bay, Easter Island, 40–100 meters, 2 February 1958, SIO Downwind Expedition Station HD-76 (UCMP B-5667).

Measurements. Male holotype: length of carapace 7.6 mm, width of carapace 12.0 mm, of front 4.3 mm, of fronto-orbit 7.6 mm, length of chela 7.8 mm, of dactyl 3.6 mm, height of palm 3.8 mm.

Diagnosis. Front bi-arcuate, anterolateral teeth acuminate, groove between fourth and fifth teeth short, furrow inside fifth tooth lacking. Chelipeds granulate, color of pollex continued slightly on palm. Tip of male abdomen narrow.

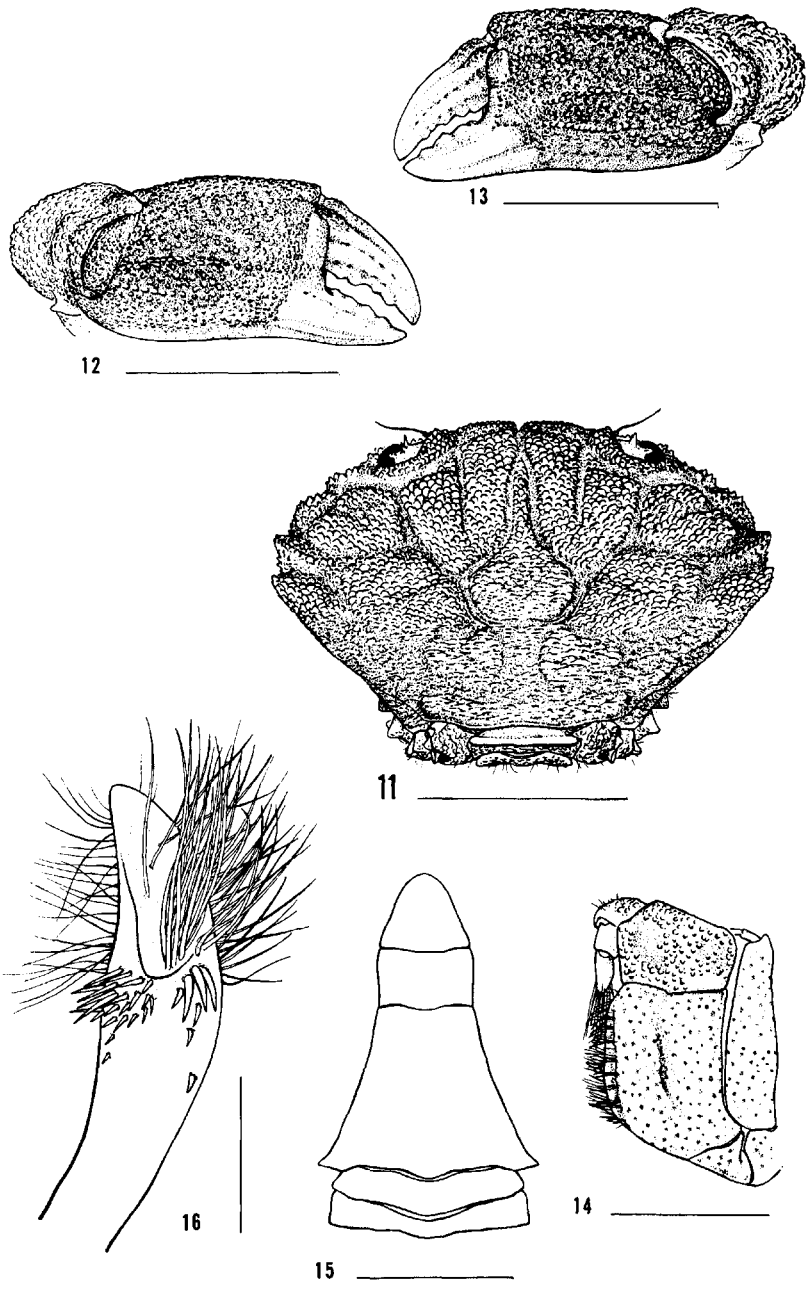
Description. Carapace broadly oval, posterolateral margins straight, exceeding anterolateral, granulate and areolate anteriorly, smooth and flattened posteriorly, regions, especially gastric and hepatic, well defined. Front bi-arcuate, median lobes separated by a broad U-shaped sinus and by a shallower sinus from a small lateral lobe continuous with the orbit. Orbital margins thickened, lacking fissures above, and granulate like front. Anterolateral marginal teeth five, including exorbital tooth; first or exorbital little more than a granule, second a cluster of granules of which one is largest, third to fifth triangularly dentate, separated by U-shaped sinuses, third broadest, obtuse, fourth and fifth acute, fourth with a convex outer margin, margins of all teeth granulate or denticulate, carapace widest opposite fifth tooth. Areoles separated by wide, smooth grooves of which the cervical groove is deepest, a continuous groove separating front and orbits from gastric and hepatic areoles; 1M (of Dana) confluent with 2M, which is partially divided medially; 2L and 3L continuous, separated from 4L by a shallow sulcus; a light groove separating 4L from 1R, which is flattened, rather than dimpled (as in *L. rugata*). Granules of posterior portion of carapace flattened and fused into rugose lines. Suborbital region granulate. Sternum and external maxillipeds punctate. Merus of external maxilliped granulate, rectangular, broader than long, anterointernal angle clipped but not notched to receive palpus.

Chelipeds subequal and of good size, carpus and manus granulate and sparsely hairy, carpus with a faint groove anteriorly and externally, toothed and angled internally; manus with two faint superior grooves, granules of outer surface irregularly placed except for two lines of fused granules on lower portion; fingers thickened, grooved, tips spoon-shaped, lower margin of manus sinuous, color of pollex continued slightly on palm, dactyl basally granulate, a bicuspid tooth near base and a smaller tooth near tip; pollex with three low teeth externally, setose internally; fingers gaping on closure. Walking legs lacking on the unique holotype specimen.

Male abdomen with segments one and two granulate, three little wider than one, three to five fused, six quadrate, seven longer than broad, sides concave, tip rounded.

Male first pleopod stout, curved, constricted at mid-point; tip lanceolate and excavate, with numerous longer setae arising marginally and internally and a few shorter, curled setae externally at their bases.

Remarks. The new species from Easter Island corresponds most closely with *Liomera pallida* (Borradaile) from the Gilbert Islands (cf. Odhner 1925, pl. 1, fig. 17), from which it differs in the following particulars: the groove extending inward from between the fourth and fifth anterolateral teeth is much shorter and the furrow inside the fifth tooth is completely obliterated; the front is biarcuate, while that of *L. pallida* is only slightly advanced medially; the granulations are sharper, the anterolateral teeth slightly more acuminate; the chelipeds are more gran-



Figs. 11–16. 11. *Liomera laperousei* Garth, new species, male holotype (AHF No. 5819), dorsal view of carapace. 12. Same, outer view of right cheliped. 13. Same, outer view of left cheliped. 14. Same, external maxilliped. 15. Same, abdomen. 16. Same, tip of first pleopod. Scale for Figs. 11, 12 and 13 = 5 mm, for Figs. 14 and 15 = 2 mm, for Fig. 16 = 0.5 mm.

ulate, the color of the immovable finger not continued so far on the palm; the tip of the abdomen is narrower and more pointed. A general observation might be that while *L. pallida* is clearly derived from *L. rugata* (Milne Edwards), the Easter Island species is less clearly so. Also, *L. pallida* is a small species, the specimen examined from Kapingamarangi (USNM No. 106546), collected by C. Hand on 11 August 1954, and identified by L. B. Holthuis, measuring but 3.5 × 5.8 mm.

The new species honors the memory of Jean-François de Galaup, Comte de La Pérouse, commander of the vessels "La Boussole" and "L'As-

trolabe," which on 9 April 1786 anchored in the bay that now bears his name, and from which were subsequently dredged the specimens that are the subject of this paper.

Monodaeus pettersoni, new species
Figs. 17–22

Type. Male holotype, AHF No. 5820, and two female paratypes, from La Pérouse Bay, Easter Island, 40–100 meters, 2 February 1958, SIO Downwind Expedition Station HD-76 (UCMP B-5667).

Measurements. Male holotype: length of carapace 7.3 mm, width of carapace 11.4 mm, of front 3.8 mm, of fronto-orbit 7.1 mm, length of chela 7.8 mm, of dactyl 4.1 mm, height of palm 3.3 mm. Female paratypes: 7.5 × 12.0 mm, and 8.5 × 13.5 mm in length and width, respectively.

Diagnosis. Granules of carapace forming transverse ridges, of which gastric, cardiac, and intestinal are prominent. Anterolateral teeth narrow with denticulate tips. Color of immovable finger continued on palm. Carpus of walking legs non cristate. Merus of outer maxilliped not produced at anteroexternal angle. Male first pleopod with a flange at tip.

Description. Carapace transversely hexagonal, five-eighths as long as broad, deeply areolated, rough with sharp granules tending to form transverse ridges, of which the posterior gastric, cardiac, and intestinal are most prominent. Five anterolateral teeth including exorbital tooth, with narrow, denticulate tips; first tooth smallest, fourth tooth most prominent, a subhepatic tubercle between second tooth and exorbital (actually between second tooth and infraorbital, following downward trend of anterolateral teeth), posterolateral margins slightly convex. Front straight or slightly arcuate, a broad tooth at outer angle, a narrow median notch, edge crenulate. Orbit with inner angle dentiform, two shallow notches above, two equal, well spaced teeth below, the outer separated from the supraorbital by a large, V-shaped notch. A double tubercle at base of eyestalk. Flagellum of antenna one and one-half times as long as width of orbit.

Pterygostomian region granulate. Merus of external maxilliped sparsely granulate, with two oblique depressions, anteroexternal angle rounded, not produced.

Chelipeds unequal in both sexes, very rough with granules forming irregular clusters on carpus and longitudinal lines on manus. Merus spinulous externally, carpus with a distal groove and a recurved tooth at inner angle with two or three denticles at its base. Manus with two superior grooves separated by granulate ridges. Dactyls basally granulate, deeply grooved, edges irregularly dentate, meeting without gape; color of immovable finger continued well back on palm; immovable finger of major manus of male with three prominent teeth proximally, of which the middle one is largest.

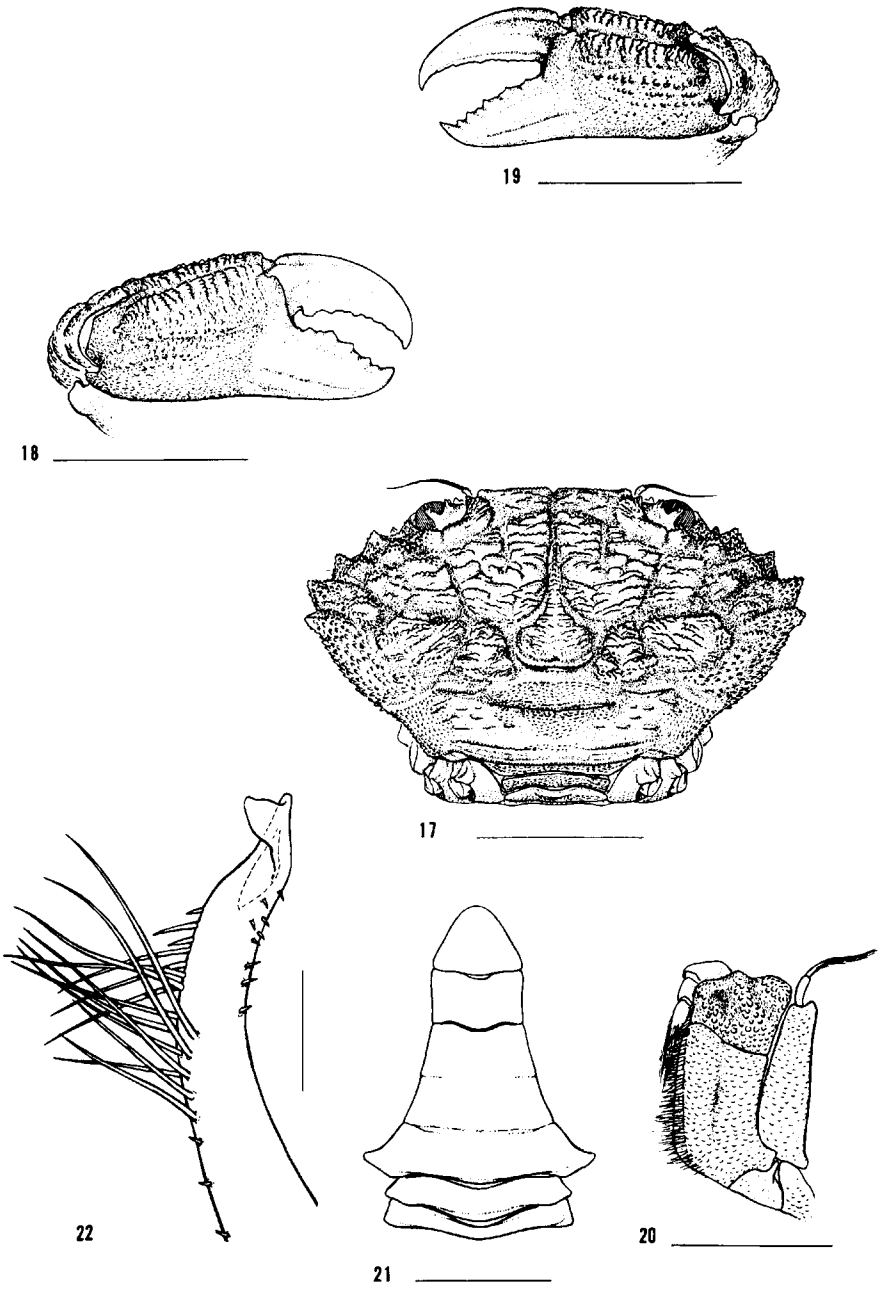
Legs granulate, upper margins spinulous, all segments hairy, spinules of the merus alternately large and small, a strong distal tooth, carpus non cristate and without a truncate, proximal tooth.

Male abdomen with first two segments granulate, remaining segments smooth; sixth segment short (broader than long), sides parallel, seventh segment longer.

Male first pleopod slender, flattened, tapering, and incurving, convex curvature with a row of 5 or 6 longer setae on sternal margin and a row of about 12 such setae on abdominal margin, tip narrow, pointed, slightly recurved, and with an upturned, triangular flange.

Remarks. The new species from Easter Island has been compared with the male holotype of *Xanthias tuberculidens* Rathbun (USNM No. 41248), from Saya de Malha, Indian Ocean, with which it was at first thought to be identical. However, it differs from that species in having the granules of the carapace tending to form transverse ridges, of which the prominent cardiac ridge is not present in *tuberculidens.* The tubercles of the chelipeds are more clearly aligned in rows, the furrows deeper, the minor chela cristate above, the color, especially on the major manus of the male, continued appreciably on the palm. The male sixth abdominal segment is short, the sides parallel, rather than long and constricted, the seventh segment longer. The merus of the outer maxilliped does not flare widely, as in *tuberculidens,* nor is the carpus of the walking legs cristate, as in that species. The male first pleopods are similar, but that of the Easter Island species bears a flange on its tip.

Of the three Indo-Pacific species of *Micropanope* mentioned by Sakai (1965, p. 139) as most closely related to his *M. obtusidens* Sakai 1965, namely, *M. cumatodes* (MacGilchrist 1905), *M. alcocki* (Rathbun 1902), and *M. tuberculidens*



Figs. 17–22. 17. *Monodaeus pettersoni* Garth, new species, male holotype (AHF No. 5820), dorsal view of carapace. 18. Same, outer view of left cheliped. 19. Same, outer view of right cheliped. 20. Same, external maxilliped. 21. Same, abdomen. 22. Same, tip of first pleopod. Scale for Figs. 17, 18 and 19 = 5 mm, for Figs. 20 and 21 = 2 mm, for Fig. 22 = 0.2 mm.

(Rathbun 1911), none remains in this genus following the revision of Guinot (1967). Of these, *M. obtusidens* and *M. cumatodes* were placed in the newly erected genus *Paraxanthodes* Guinot, with the former as type-species; *M. alcocki* was placed in the newly erected genus *Nanocassiope* Guinot, of which *N. melanodactylus* (A. Milne Edwards) is type-species; while *M. tuberculidens* was placed in the newly erected genus *Monodaeus* Guinot, of which *M. couchi* (Bell) is type-species. Thus, although Rathbun (1911) considered her *Micropanope tuberculidens* to be most closely related to *M. cumatodes* (both then in *Xanthias* Rathbun 1897), the writer feels that the new species from Easter Island is so closely related to *tuberculidens* that it may safely be placed with

it in *Monodaeus,* rather than with *cumatodes* in *Paraxanthodes.* Certainly, it cannot be placed in *Micropanope* Stimpson 1871, which was restricted by Guinot (1967, 1968) to *M. sculptipes* Stimpson, the type species, and one other. The male first pleopods tend to support this view.

The new species is named in memory of the late Carl Petterson, scientific artist, whose meticulous illustrations have enhanced a number of the writer's papers, including the present one.

Trapezia ferruginea Latreille

Trapezia ferruginea Latreille, 1825, p. 695 (Red Sea). Ortmann, 1897, p. 205, synonymy. Garth, 1973, p. 322.

Trapezia cymodoce ferruginea, Rathbun, 1907, p. 58 (Easter Island); 1930, p. 557, pl. 228, figs. 1, 2 (Clarion Island). Hertlein & Emerson, 1957, p. 5 (Clipperton Island).

Trapezia miniata Jacquinot & Lucas, 1853, p. 43, pl. 4, fig. 10 (Marquesas).

Range. From Red Sea and Zanzibar to Hawaii and Marquesas in the western Pacific; Clarion, Clipperton, Galapagos, and Easter Island in the eastern Pacific; Gulf of California to Colombia along the American mainland.

Material. La Pérouse Bay, Easter Island, 40–100 meters, SIO Downwind Station HD-76, 2 February 1958, 1 male, lacking right cheliped and all legs but one.

Measurements. Male specimen: length 8.7 mm, width 10.6 mm.

Remarks. Previously reported from Easter Island by the *Albatross* Expedition (Rathbun 1907) and by the METEI (Garth 1973), *Trapezia ferruginea* is found among the branches of *Pocillopora* coral, of which three species, *P. danae, P. damicornis,* and *P. diomedae* occur at Easter Island, according to Dr. John W. Wells of Cornell University.

ACKNOWLEDGMENTS

The writer is grateful to the late Dr. E. C. Allison for the privilege of studying this small but rich collection, and to the late Mr. Henry B. Roberts for the loan of the comparative material from the collections of the Museum of Natural History, Smithsonian Institution, Washington, D.C. Museum curators who provided access to collections abroad were Drs. I. Gordon and A. J. Rice of the British Museum (Natural History), London; C. B. Goodhart of the University Museum of Zoology, Cambridge; and Mr. J. Forest and Mme. D. Guinot of the Muséum National d'Histoire Naturelle, Paris. Travel to European museums was made possible through grants by the National Science Foundation (NSF GB-3849) and the National Defense Education Act (NDEA). Illustrations, begun by the late Mr. Carl Petterson, were completed by Mr. Jerry Battagliotti.

LITERATURE CITED

ALCOCK, A. 1898. Materials for a carcinological fauna of India. No. 3. The Brachyura Cyclometopa. Part I. The family Xanthidae. Jour. Asiatic Soc. Bengal, vol. 67, pp. 67–233.

BARNARD, K. H. 1950. Descriptive catalogue of South African decapod Crustacea. Ann. So. African Mus., vol. 38, pp. 1–837.

DANA, J. D. 1852. Crustacea. *In* United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842, under the command of Charles Wilkes, U.S.N. Vol. 13, pp. (viii) 1–685. Philadelphia.

FLIPSE, H. J. 1930. Die Decapoda Brachyura der Siboga-Expedition. VI. Oxyrhyncha: Parthenopidae. Siboga-Exped., monogr. 39c², livr. 112, pp. 1–96.

GARTH, J. S. 1971. Borradaile's Maldivian collections revisited. Jour. Mar. Biol. Assoc. India, vol. 11, pp. 182–190.

———. 1973. The brachyuran crabs of Easter Island. Proc. California Acad. Sci., ser. 4, vol. 39, pp. 311–336.

GUINOT, DANIÈLE. 1967. Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyoures. II. Les anciens genres *Micropanope* Stimpson et *Medaeus* Dana. Bull. Mus. nat. Hist. nat., sér. 2, vol. 39, pp. 345–374.

———. 1968. [Same title.] VI. Les Carpiliinae. Bull. Mus. nat. Hist. nat., sér. 2, vol. 40, pp. 320–334.

———. 1969. Sur divers Xanthidae, notamment sur *Actaea* De Haan et *Paractaea* gen. nov. (Crustacea Decapoda Brachyura). Cahiers du Pacifique, no. 13, pp. 222–267.

———. 1971. Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyoures. VIII. Synthèse et bibliographie. Bull. Mus. nat. Hist. nat., sér. 2, vol. 42 (for 1970), pp. 1063–1090.

———. 1976. Constitution de quelques groupes naturels chez les Crustacés Décapodes Brachyoures. I. La superfamille des Bellioidea et trous sous-familles de Xanthidae (Polydectinae Dana,

Trichiinae de Haan, Actaeinae Alcock). Mem. Mus. nat. Hist. nat., n.s., sér. A, Zoologie, vol. 97, pp. 1–308.

HERTLEIN, L. G., AND W. K. EMERSON. 1957. Additional notes on the invertebrate fauna of Clipperton Island. Amer. Mus. Novitates. no. 1859, pp. 1–9.

JACQUINOT, H., AND H. LUCAS. 1853. *In* Hombron et Jacquinot, Voyage au Pôle Sud et dans l'Océanie sur les corvettes "L'Astrolabe" et "La Zélée" pendant les anées 1837–1838–1839–1840 sous le commandement de M. Dumont d'Urville. 3. Crustacés, pp. 1–107.

LATREILLE, P. A. 1825. Trapézie. Encyclopédie méthodique: Entomologie, ou Histoire naturelle des Crustacée, des Arachnides et des Insectes, vol. 10, pp. 695–696.

LINNAEUS, C. 1767. Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Ed. 12, tomus I, pars II, pp. 533–1325.

MAN, J. G. DE. 1902. Die von Herrn Prof. Kükenthal im Indischen Archipel gesammelten Dekapoden und Stomatopoden. *In* W. Kükenthal, Ergebnisse einer zoologischen Forschungsreise in den Molukken und Borneo. Abh. Senckenb. naturf. Gesellsch., vol. 25, pp. 465–929.

MILNE EDWARDS, A. 1873. Recherches sur la faune carcinologique de la Nouvelle-Calédonie. II. Cyclometopes. Nouv. Arch. Mus. Hist. nat., Paris, vol. 9, pp. 155–332.

ODHNER, T. 1925. Monographierte Gattungen der Krabbenfamilie Xanthidae. I Göteborgs Kungl. Vet. och Vitterh. Sämh. Handl., Fjärde följd., vol. 29, no. 1, pp. 1–92.

ORTMANN, A. E. 1897. Die geographische Verbreitung der Decapoden-Familie Trapeziidae. Zool. Jahrb., Abth. Syst., vol. 10, pp. 201–216.

RANDALL, J. W. 1839. Catalogue of the Crustacea brought by Thomas Nuttall and J. K. Townsend from the west coast of North America and the Sandwich Islands. Jour. Acad. Nat. Sci. Philadelphia, vol. 8, pp. 106–147.

RATHBUN, MARY J. 1904. Some changes in crustacean nomenclature. Proc. Biol. Soc. Washington, vol. 17, pp. 169–172.

———. 1906. The Brachyura and Macrura of the Hawaiian Islands. Bull. U.S. Fish Comm., vol. 23 (for 1903), pp. 827–930.

———. 1907. Reports on the scientific results of the expeditions to the tropical Pacific . . . by the United States Fish Commission Steamer "Albatross" . . . IX, X. The Brachyura. Mem. Mus. Compar. Zool., Harvard, vol. 35, pp. 23–74.

———. 1911. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner. XI. Marine Brachyura. Trans. Linn. Soc. London, ser. 2, Zool., vol. 14, pp. 191–261.

———. 1930. The cancroid crabs of America of the families Euryalidae, Portunidae, Atelecyclidae, Cancridae, and Xanthidae. Bull. U.S. Nat. Mus., no. 152, pp. (xvi) 1–609.

SAKAI, T. 1938. Studies on the crabs of Japan. III. Brachygnatha Oxyrhyncha. Pp. 193–364. Tokyo.

———. 1965. The crabs of Sagami Bay. Pp. (xvi) 1–206. Maruzen Co., Tokyo.

YANG, W. T. 1971. The larval and postlarval development of *Parthenope serrata* reared in the laboratory and the systematic position of the Parthenopidae. Biol. Bull., vol. 140, pp. 166–169.

Accepted for publication January 1984.

Published February 1985.

Allan Hancock Foundation
Occasional Papers (New Series)

The Allan Hancock Foundation Occasional Papers (New Series) will consist of scientific papers not in excess of fifty printed pages in the fields of ecologic and systematic biology, paleontology, and paleoecology. Contributions based substantially upon the collections of the Allan Hancock Foundation or reports dealing with the eastern Pacific region in particular will be considered for publication. The new series begins with Number 1. The old series began in 1945 and was completed in 1965, with Number 29.

The Occasional Papers follow the *Style Manual for Biological Journals* (American Institute of Biological Sciences), except for the following:

1. Footnotes are discouraged. If necessary, however, they are to be typed at the bottom of the page to which they belong.
2. When co-authors represent different institutions the name of the author should be followed by the name of his/her institution.
3. Citations in text should give author(s) and date as follows: . . . Jones and Muse (1969) found that . . . , or: . . . Published results (Jones and Muse 1969) indicate . . .
4. Generic and specific names, if used in text, are set in italics (or underlined in the manuscript).
5. Format for citing literature:

JONES, J. W., and W. G. FRY. 1969. A new species of parasitic isopod, *Lavenella cortezi* (Crustacea: Isopoda: Cymothoidae), from the Caribbean Sea. J. Parasit. 54(4): 37–45.

MILLER, E. N. 1976. Crustacea. *In* The zoology of Captain Beechey's voyage. London: Henry G. Bohn, pp. 77–92, pls. 24–28.

(Subsequent citations by the same author(s) need not repeat the author's name(s), but should begin with the date, suitably indented).

Journal abbreviations should follow the recommended abbreviations in the *World List of Scientific Periodicals.*

An abstract is required, both in the language of the manuscript and in an appropriate second language. Papers must be submitted in English. Publication of new species (and other nomenclatural matters) must meet the recommendations and guidelines established by the international commission involved (e.g., the International Code of Zoological Nomenclature). Line drawings should be in waterproof black ink on white board or heavy paper, or suitable glossy photographs should be submitted. Illustrations should be in correct proportion to the page size of the Occasional Papers.

Manuscripts, including illustrations, should be submitted in duplicate to the Chairman of the Allan Hancock Foundation Publications Committee. All manuscripts will be reviewed by at least two specialists and published on approval of the Publications Committee and the Director of the Foundation. Authors may purchase an unlimited number of copies, at cost, if the order is received with return of the page proofs. Authors with grant or other funding covering publication costs are requested to contribute to a portion of the printing costs.

The ALLAN HANCOCK FOUNDATION was established at the University of Southern California in 1939 by Captain G. Allan Hancock, business and educational leader, master mariner and organizer of scientific expeditions. The building housing the Foundation, which was especially designed for marine science programs and collections obtained on the Captain's expeditions, together with his ship the VELERO III, were presented to the University in 1939. The Hancock Library, built around the holdings of the Boston Society of Natural History, which were acquired by the Captain in 1944, now contains more than 90,000 volumes and 100,000 reprints and separates. The building also contains one of the most extensive collections of marine algae and invertebrates from the Eastern Pacific region.

The Foundation's principal research activities are oriented toward ecological and systematic marine biology, biological oceanography, marine geology, and paleoecology.

Dr. Richard C. Dugdale is Director of the Foundation.