

# Notes on Indo-Pacific Scleractinian Corals. Part 8<sup>1</sup>

## Scleractinian Corals from Easter Island

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THE EARLIEST RECORD of scleractinian corals from Easter Island is by Vaughan (1906) who, in a report on corals collected on the cruise of the *Albatross* in the eastern Pacific in 1904–1905, described as new two hermatypic species “collected on the shore of Easter Island.”

On a *priori* grounds, considering the great distance of this island from the nearest coral reefs and from the rich and varied faunas of the tropical central Pacific, one would expect the coral fauna of Easter Island to be limited to genera that have the widest distribution, that extend to the limits of the generic gradient (such as *Porites*, *Pocillopora*, and *Montipora* [Wells, 1954, table 1]) and that can tolerate the limits imposed by the minimum surface water temperatures at the island, about 18° C., a few degrees above the minimum tolerated by reef-builders.

Collections recently made from Easter Island and vicinity have been made available to the writer: a small collection by I. E. Efford in 1965, a small lot collected on Expedition Downwind (University of California, Scripps Institution of Oceanography, International Geophysical Year [IGY] cruise to the southeast Pacific, 1957), and a specimen collected in 1968 by H. G. Richards. The Downwind material is briefly alluded to in IGY General Report Series no. 2 (Fisher, 1958, p. 13, 54<sup>3</sup>). These collections,

plus the handful reported by Vaughan, show that the reef coral fauna of Easter Island is very limited, as anticipated, this being evidenced by the following list of corals now known from that area (1, Downwind collection; 2, Efford collection; 3, recorded by Vaughan; 4, H. G. Richards):

- Pocillopora damicornis* (Linn.) var. *caespitosa* Dana<sup>1,4</sup>
- Pocillopora danae* Verrill<sup>2</sup>
- Pocillopora diomedea* Vaughan<sup>3</sup>
- Cycloseris vaughani* (Boschma)<sup>1</sup>
- Leptoseris paschalensis* n. sp.<sup>1,2</sup>
- Porites lobata* Dana (*P. paschalensis* Vaughan)<sup>2,3</sup>

All specimens have been deposited in the U.S. National Museum.

CLASS Anthozoa  
SUBCLASS Zoantharia  
ORDER Scleractinia  
FAMILY Pocilloporidae  
GENUS *Pocillopora* Lamarck, 1816

More than 40 “species” of this common Indo-Pacific coral have been named, but so great is intraspecific variation that it is doubtful whether more than 10 or 15 of these can be maintained. On the basis of septal characters there appear to be two groups: (1) *P. damicornis*-group, in which the septa and columella are absent or very weakly developed, as in typical *P. damicornis*, and (2) the *P. ligulata*-group, with septa and columella distinctly developed. Within these groups, “species” are based on growth form and development of verrucae, but, with large suites of specimens from the same locality, these criteria tend to break down even when such minor structures as fine ornamentation are considered. I follow, with misgivings, the generally accepted pattern in the treatment of the genus.

<sup>1</sup> Manuscript received 6 December 1971. Numbers 1–7 of these notes were published in *Pacific Science* as follows: nos. 1 and 2—vol. 13, p. 286–290, 1959; no. 3—vol. 15, p. 189–191, 1961; no. 4—vol. 20, p. 203–205, 1966; nos. 5 and 6—vol. 22, p. 274–276, 1968; no. 7—vol. 25, p. 368–371, 1971.

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<sup>3</sup> While most of the Downwind specimens were recently dead and some slightly worn, a few had been alive when dredged, and the statement in the Downwind report (p. 54) that “Reef corals do not live there [Easter Island] now, but if these hauls are any indication they were extremely abundant at one time,” needs qualification.

*Pocillopora damicornis* (Linnaeus), 1758,  
var. *caespitosa* Dana, 1846

*Pocillopora damicornis* Hoffmeister, 1925, Publ. Carneg. Instn. 343, p. 15, pl. 1, fig. 1 (synonymy and discussion of *P. damicornis*); Wells, 1954, Prof. Pap. U.S. Geol. Surv. 260-I, p. 412, pl. 99, fig. 2 (further synonymy).

Several fragmentary specimens, most of them dead, have the straggly growth form of Vaughan's *P. caespitosa* var. *laysanensis* (1907, p. 88, pl. 13, fig. 1-3), a subvariety from deeper water (36 to 55 m).

#### Occurrence

Easter Island: off La Pérouse Bay, 40 to 100 m (Downwind *Horizon* dredge haul no. 76); Anakena Beach (H. G. Richards).

Elsewhere: Indian Ocean eastward to Hawaii and eastern Pacific.

*Pocillopora danae* Verrill, 1864

Fig. 1—1

*Pocillopora danae* Verrill, Vaughan, 1918, Publ. Carneg. Instn. 213, p. 77, pl. 22, fig. 1, 1a, 2 (with synonymy); Wells, 1954, Prof. Paper U.S. Geol. Surv. 260-I, p. 412 (further synonymy).

One nearly complete colony, with no further data than "Easter Island" but probably from very shallow water, is about 13 cm in diameter and 9 cm high. There is no observable difference between this specimen and Verrill's types as figured by Vaughan (1918, pl. 22, fig. 2). *P. danae* lies between the *caespitosa* form of *P. damicornis* and *P. verrucosa* (Ellis & Solander).

#### Occurrence

Easter Island (Efford).

Elsewhere: Indonesia eastward to Tahiti.

*Pocillopora diomedea* Vaughan, 1906

*Pocillopora diomedea* Vaughan, 1906, Bull. Mus. Comp. Zoöl. Harv., vol. 50, p. 65, pl. 2, fig. 2, 2a; pl. 6, fig. 1.  
? ——— *informis* Dana, Vaughan, 1907, Bull. U.S. Nat. Mus. 59, p. 100, pl. 24, fig. 1, 1a.

This species was based on several fragmentary pieces collected on the shore of Easter Island. It groups with the *ligulata*-group of species with more or less well-developed septa and columella. Vaughan compared it with *P. elongata* Dana, but the feebly developed or almost obsolete verrucae, thick blunt branches, and columellar character suggest that it may be the same as Dana's *P. informis* from Hawaii.

It has not yet been re-collected.

#### Occurrence

Easter Island, "shore" (*Albatross*).

### FAMILY Fungiidae

GENUS *Cycloseris* Milne Edwards & Haime, 1849

*Cycloseris vaughani* (Boschma), 1923

Fig. 1—2, 3

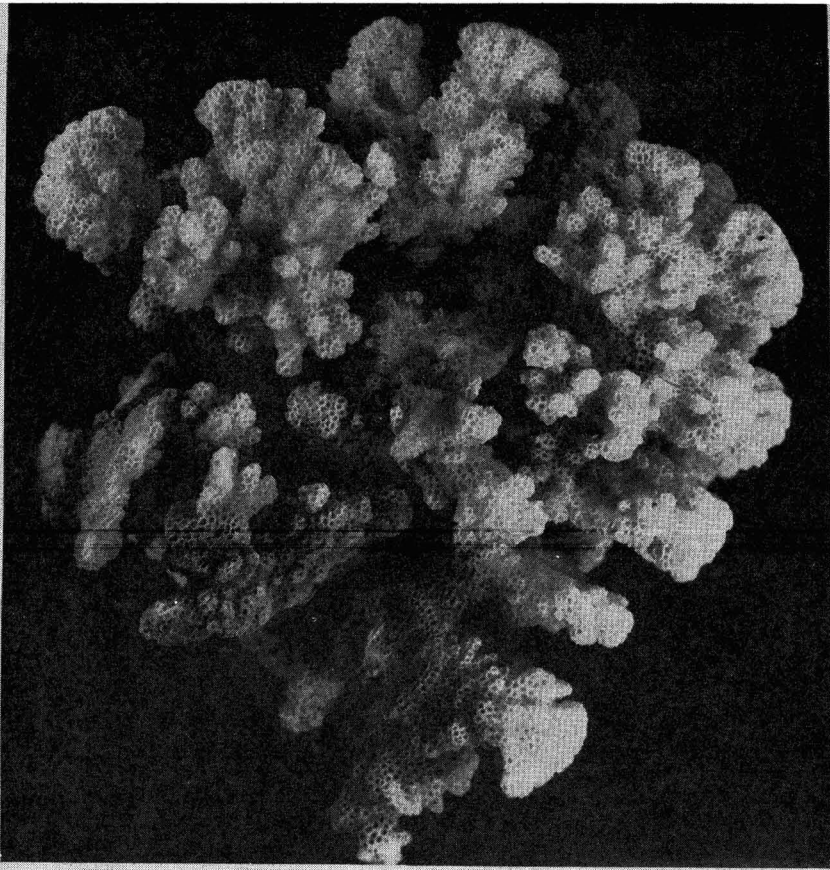
*Fungia patella* Vaughan, 1907 (*non Madrepora patella* Ellis & Solander, 1786), Bull. U.S. Nat. Mus. 59, p. 28, pl. 27, fig. 2, 3; pl. 28, fig. 2.

——— *vaughani* Boschma, 1923, *Siboga*-Exped., Mon. 16d, p. 17, pl. 10, fig. 27, 27b; 1925, Dansk. Naturh. Fören. Vid. Meded. 79, p. 205, pl. 5, fig. 20.

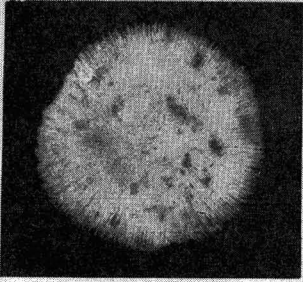
*Cycloseris vaughani* Wells, 1954, Prof. Pap. U.S. Geol. Surv. 260-I, p. 447, pl. 157, fig. 4, 6.

Eight dead and worn specimens, four of them with traces of the commensal gastropod *Leptoconchus*, were obtained from a single dredge haul in depths 132 to 174 meters. They range

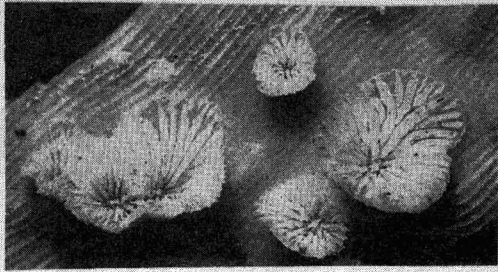
FIG. 1. 1, *Pocillopora danae* Verrill,  $\times 1$ , "Easter I." (Efford). 2, 3, *Cycloseris vaughani* (Boschma): 2, basal aspect,  $\times 1$ , off Poike Peninsula, Easter Island, 132 to 174 m (Downwind *Horizon* dredge haul no. 75); 3, calicular aspect of another specimen from same haul,  $\times 1$  (note cavity occupied by *Leptoconchus*). 4, *Leptoseris paschalensis* n. sp., undersurface of holotype, with juvenile offsets,  $\times 4$ . 5, *Leptoseris paschalensis* n. sp., early stages,  $\times 4$ , off La Pérouse Bay, Easter Island, 40 to 100 m (Downwind *Horizon* dredge haul no. 76).



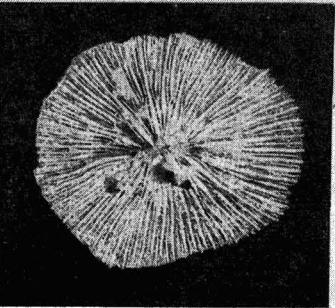
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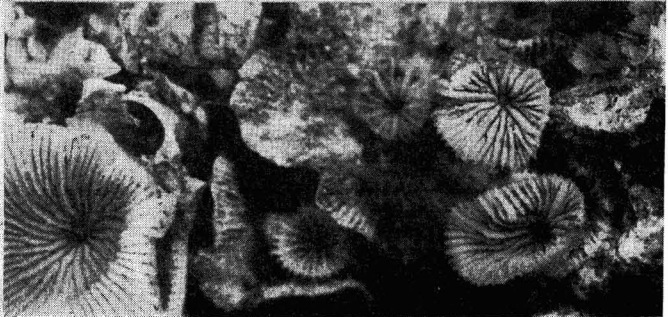
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4



3



5

in diameter from 24.5 to 42.5 mm. Two are slightly concave, the rest slightly elevated centrally. Details of the septa and costae are as described by Vaughan: septa solid with fine dentations and laterally minutely granulated or finely striated normal to the margin, peripherally every fourth septum larger and equally prominent; costae distinct to central basal scar where they are equal, peripherally every fourth costa larger. Columella papillose. All are smaller than Vaughan's or Boschma's Hawaiian examples which average 50 mm.

*C. elegans* Verrill, which is restricted to the eastern Pacific off the coasts of Mexico and Central America, differs from *C. vaughani* mainly in the nature of the costae which are equal or faintly alternating with acute margins in the former and unequal in the latter. In *C. vaughani* the columella is papillose and spongy; in *C. elegans*, it is trabecular.

#### Occurrence

Easter Island, off Poike Peninsula, 132 to 174 m (Downwind *Horizon* dredge haul no. 75).

Elsewhere: Hawaii (Vaughan), 16.5 to 463 m; Bikini Atoll (Wells), 60 to 243 m.

#### FAMILY Agariciidae

GENUS *Leptoseris* Milne Edwards & Haime, 1849

#### *Leptoseris paschalensis* n. sp.

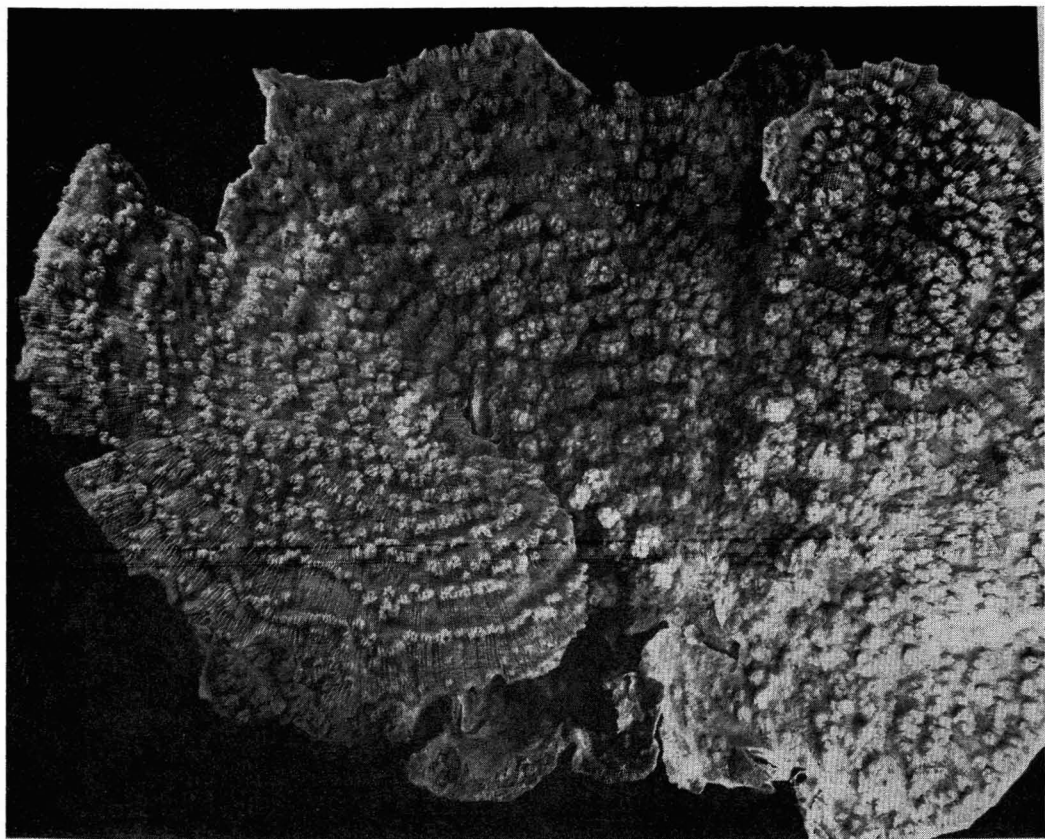
Fig. 1—4, 5; 2—1, 2, 3; 3—1, 2, 3

Corallum is a thin, centrally attached folium. The holotype measures 25 × 33 cm. Calices are unifacial, irregularly scattered over the central part of the corallum, 2 to 6 mm apart radially, 2 to 5 mm distant laterally, but are arranged near the margins in irregular concentric rows about 10 mm apart. Calices are strongly inclined toward margins, their proximal sides swollen with contorted, thickened septocostae, in places carried up 5 mm or more from the common surface. In the central part of the holotype, clusters of 2 to 4 centers are elevated as much as 10 mm. Both septa and septocostae strongly alternate in height and thickness. The larger septa are thick, tapering to a thin edge, faintly striated laterally normal to the margin; the

thinner septa are triridged on the upper margin with a sharp, slightly higher, central ridge flanked on each side by an outwardly directed ridge. Below these are one or two similar lateral ridges or rows of granules. The larger septa are similar in early stages of development, later thickening and tending to obscure the ridges. The number of septa per center varies from 12 in small calices to 26 or more in large ones. They are very thick and wedge-shaped on the elevated proximal side of the calices where they number from six to eight, much thinner and more numerous on the marginal side, their inner ends free, except those of the first cycle that are attached to the columella by a few trabecular processes. Septocostae number 10 to 15 per 5 mm. Columella are well developed, deep, consisting of one or two thick, twisted laths or a laminar plate formed by fusion of the laths. Costae on the undersurface of the corallum are generally equal, acute, and very finely granulated near the margins, rounded on older parts.

The freshness of the costae on the undersurface of the holotype indicates that the edge zone evidently extended a considerable distance, up to 10 cm, from the margin, and in several places clusters of small monocentric to dicentric offsets are derived by budding from the edge zone (costal continuity of offset and parent indicates that the offsets are not of planular origin [Fig. 1—4]), indistinguishable from the early monocentric stages of other species of *Leptoseris*.

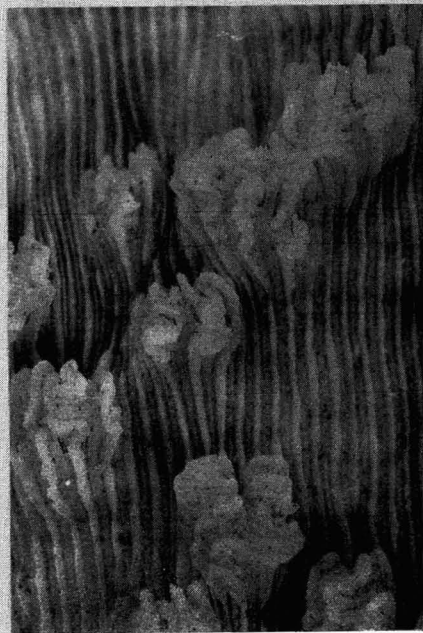
Besides the holotype, there are a number of fragments dredged off La Pérouse Bay, many of them long dead, corroded, and overgrown. They are pieces of colonies with calices ranging from the nearly flush calices of the *L. hawaiiensis* type to the irregularly protuberant ones of the holotype. Several of the latter (Fig. 3—1, 2, 3) were from living colonies and one (Fig. 1—5) shows what appears to be a number of mostly monocentric juveniles, but which are from a cluster of small coralla that have undergone several rejuvenations without attaining any size. These could be a different species, possibly a stunted *L. tubulifera*, although in every way they resemble the early stages found on the holotype of *L. paschalensis*.



1



2



3

FIG. 2. 1, *Leptoseris paschalensis* n. sp., calicular aspect of holotype,  $\times 0.5$ , off Easter Island, approximately 150 m (Efford). 2, 3, *Leptoseris paschalensis* n. sp.: 2, calicular surface of piece of holotype,  $\times 1$ ; 3, calices,  $\times 4$ , off Easter Island, approximately 150 m (Efford).

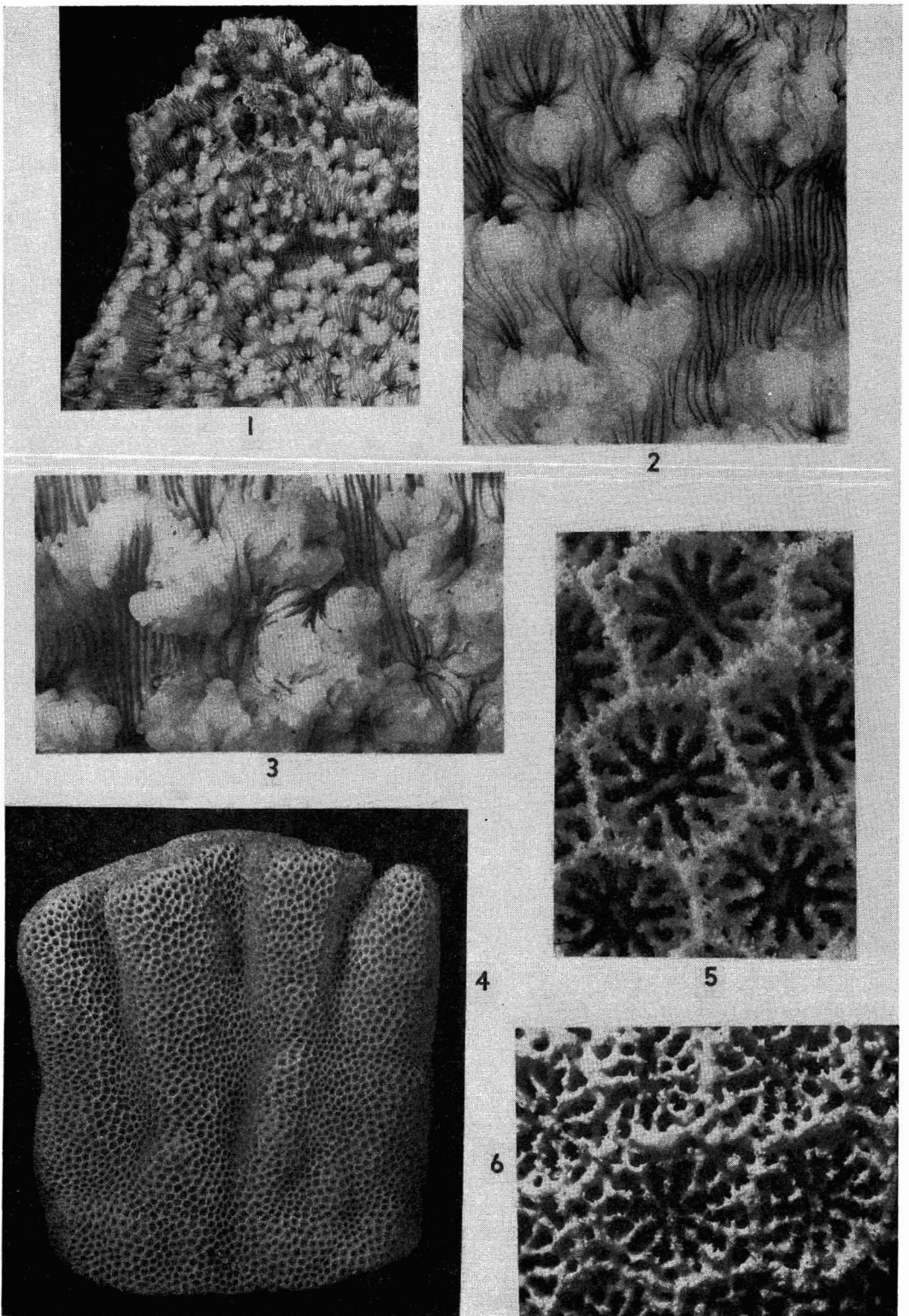


FIG. 3. 1, 2, 3, *Leptoseris paschalensis* n. sp.: 1, paratype,  $\times 1$ ; 2, 3, calices,  $\times 4$ , off La Pérouse Bay, Easter Island, 40 to 100 m (Downwind *Horizon* dredge haul no. 76). 4, 5, 6, *Porites lobata* Dana: 4, part of a colony,  $\times 1$ ; 5, calices of same,  $\times 16$ ; 6, calices of another specimen,  $\times 16$ , tide pools, Hanga-piko, Easter Island (Efford).

Of the 12 or so species of *Leptoseris* now known from the Indo-Pacific, this species is closest to *L. solida* (Quelch) (including Quelch's *L. porosa* and *L. regularis*), *L. columna* Yabe & Sugiyama, and *L. explanata* Y. & S. (Wells, 1954, p. 444), but has a freer growth form; coarser septa; and smaller, more discrete, and much more salient calices.

#### Occurrence

Easter Island: holotype, from "Father Ricardo who said it was snagged while fishing in 150 meters" (Efford); paratypes, 15 fragments dredged by Downwind *Horizon* dredge haul no. 76, 40 to 100 m off La Pérouse Bay.

#### FAMILY Poritidae

##### GENUS *Porites* Link, 1807

##### *Porites lobata* Dana, 1846

Fig. 3—4, 5, 6

*Porites paschalensis* Vaughan, 1906, Bull. Mus. Comp. Zool. Harv., p. 50, p. 71, pl. 9, 10.  
 ——— *lobata* Dana, Vaughan, 1907, Bull. U.S. Nat. Mus. 59, p. 196, pl. 81, fig. 1–1*b*; pl. 82, 83; pl. 84, fig. 1, 2; pl. 85, fig. 1 (further synonymy); Vaughan, 1918, Publ. Carneg. Instn. 213, p. 192, pl. 85, fig. 2, 3; Hoffmeister, 1925, Publ. Carneg. Instn. 343, pl. 21, fig. 1*a*, 1*b*; Crossland, 1952, Sci. Rep. Gr. Barrier Reef Exped., vol. 6, p. 242 (this species?); Wells, 1954, Prof. Pap. U.S. Geol. Surv. 260-I, p. 452, pl. 166, fig. 1, 2.

Several specimens of small, subencrusting, nodular-to-columniform colonies, all smaller than the two described by Vaughan as *P. paschalensis*, are characteristic of *P. lobata*, with deep, flat-floored calices with high, trimurate, corallite walls and deep, compressed columellas. According to Vaughan the paler formula is complete (i.e., eight pali) in *P. lobata*, whereas in *P. paschalensis* only the four before the four lateral septal pairs and the two directive pali are present. If it were consistent, this might be a valid distinction, but Vaughan's many figures of the calices of his various *formae* of *P. lobata* from Hawaii show that, in many cases, the pali before the three septa of the triplet and the opposing directive are very weak or suppressed.

A large suite of *P. lobata* from Midway Island collected by H. S. Ladd also shows the same paler variation. The largest specimen from Easter Island (Fig. 3—4, 5) has rather heavy septa, equal in thickness to the interspaces; in others (Fig. 3—6) the septa are strongly spinose and about half as thick as the interspaces. This range is also found in typical *P. lobata*.

#### Occurrence

Easter Island: Hanga-piko, in tide pools.

Elsewhere: Hawaii (Vaughan); Midway Island; Samoa (Hoffmeister); Fiji (Dana); Marshall Islands (Wells); Fanning Island (Vaughan).

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