



Errata for Dana's Zoophytes, from ms. note in Dana's handwriting, inserted after the preface, in L. Agassiz's copy at MH-Z:

Plate 27, is referred to as Plate 30 in text - in 1827 1828 / . . .
numbered Plate 30 by 1

P. 262 - Under M. filis
364 - 7th line from
410 - Under G. pelt
457 - For "Plate 34
487 - 7th line from
530 - near bottom,
587 - For "Plate 56
For "Plate 55

The Atlas was not engraved
were made in the number
was completed. -

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Plate 27, is referred to as Plate 30 in text - p.387-412 (it is numbered Plate 30 by the engraver, making two 30's).

- P. 262 - Under M. filagrana, add the reference, Plate 14, fig.9
- 364 - 7th line from top - For "Plate 20", read Plate 26-
- 410 - Under G. peltata, add reference, Plate 30, figs.4,4a,4b
- 457 - For "Plate 34, fig.3" read Plate 34, fig.5
- 487 - 7th line from bottom, for "quadrata", read "securis"
- 530 - near bottom, for "fig.3", read "fig.5"
- 587 - For "Plate 56, f.2 read "Plate 56, fig.4"
For "Plate 55, fig.1" read Plate 56, fig.3"

The Atlas was not engraved when the text was printed, and changes were made in the numbering of the plates, after the manuscript was completed. -

J. D. Dana-
July, 1849 -

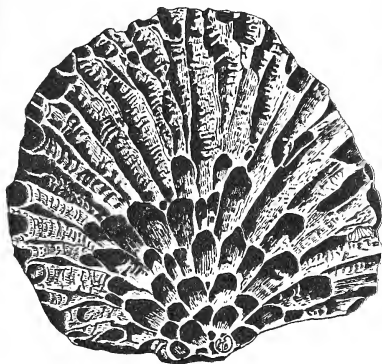
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SYNOPSIS

OF THE

REPORT ON ZOOPHYTES

OF THE

U. S. EXPLORING EXPEDITION

AROUND THE WORLD,

UNDER C. WILKES, U. S. N. COMMANDER, IN THE YEARS
1838—1842.

BY

JAMES D. DANA.

NEW HAVEN:
PUBLISHED BY THE AUTHOR.

[1853]

PRINTED BY E. HAYES,
50 CHAPEL ST., NEW HAVEN, CONN.

SYNOPSIS OF THE REPORT ON ZOOPHYTES, by JAMES D. DANA. 180 pages, 8vo, New Haven, 1859; containing descriptions of all the species in the Author's original 4to Report, which is out of print.

ATLAS OF ZOOPHYTES (the same that was issued by the Government to illustrate the quarto Report), containing 61 colored plates in large folio.

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JAMES D. DANA.

New Haven, Jan. 1859.

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P R E F A C E .

THE Author's Report on Zoophytes was published by the Government in the year 1846. It consists of a volume of text of 750 pages quarto, and a colored Atlas of 61 plates folio. The edition issued amounted to 200 copies, only 100 having been ordered by Congress. The edition on sale having been exhausted, the author here issues a smaller volume containing the brief descriptions of the species in the work, to accompany complete copies of the Atlas. This volume includes also the notices of the localities of the species given in the original work, together with a condensed statement of synonyms and references to other authors. All known species of living zoophytes of the Actinoid and Alcyonoid groups up to the date of publication of the Report are contained in the original work, and only those are included in this Synopsis of the Report. The Hydroids have since then been shown to be related rather to the Acalephs than Polyps. The following statements are cited from its Preface.

"The cruise of the Exploring Expedition afforded unusual opportunities for the study of Coral Zoophytes. Nearly all the groups of islands west of the latitude of the New Hebrides, both north and south of the equa-

tor, were visited by vessels of the squadron; and these Pacific wanderings were followed up by a rapid passage among the reefs of the East Indies. The attention of the author was first directed to this subject in the Feejee Group, the department during a previous summer having been in the hands of Mr. J. P. Couthouy. The field for geological investigation there offered, was limited, as we were shut out from the interior of the islands by the character of the natives: at the same time, coral reefs spread out an inviting field for observation, hundreds of square miles in extent. The three months, therefore, of our stay in that group were principally devoted to exploring the groves of the ocean, where flowers bloomed no less beautiful than those of the forbidden lands, and rocks of coral growth afforded instruction of deep interest. The specimens were obtained by wading over the reefs at low tide, with one or more buckets at hand to receive the gathered clumps: or, where too deep for this, by floating slowly along in a canoe with two or three natives, and, through the clear waters, pointing out any desired coral to one of them, who would glide to the bottom, and soon return with his hands loaded, lay down his treasures, and prepare for another descent. When taken out of its element, the coral often appears as if lifeless; but placing it in a basin of sea-water, the polyps after a while expand, and cover the branches like flowers. Four-fifths of the observations in this department were made at the Feejee Group.

The number of species collected in the course of the cruise, exclusive of the Hydroidea and the Bryozoa, amounts to two hundred and sixty-one, of which two hundred and three are here described as new. The animals of seventy species were figured from the living specimens; yet minute dissections were necessarily few where the time was so short, and the novelties so numerous.

Investigations, with such advantages, were calculated to throw much light upon a department less thoroughly understood than any other in

the Animal Kingdom. The minute Hydroidea, and some Caryophylliæ and Alcyonaria are found in the European seas; and this part of the subject has been wrought out with great beauty and minuteness by different investigators since the time of Trembley and Ellis. But the vast majority of the larger coral zoophytes are in remote regions, and require a patient residence upon the spot to study out their living forms. The voyages of Peron and Lesueur, and Quoy and Gaynard, together with the journey of Ehrenberg to the Red Sea, give nearly all hitherto known with regard to them. It is, therefore, no presumption on the part of the author to say that a large amount of new information was obtained, nor a fact which might not have been anticipated, that such information has detected numerous errors in the received systems or suggested changes of fundamental importance. In making out the Report, it was found impossible, in many genera, to describe the discovered species without giving new and more definite characters to the old; and the genera themselves sometimes required a modification of their limits, and changes in their associations. In every part of the subject, a thorough revision seemed desirable; for only by such a course could the facts obtained be clearly or satisfactorily set forth. The Report, therefore, has necessarily become a Treatise on Zoophytes. Various collections in our country have been consulted in the course of its preparation, among which are Peale's Museum, at Philadelphia; the Cabinet of the Academy of Natural Sciences, in the same city; and that of the Natural History Society of Boston: all were liberally thrown open, and every convenience given to aid in the researches. It will appear, from the results, that the plan adopted was the only one that could have done justice to the department of Zoophytes in the Expedition, and honor to the country which had contributed so largely in her appropriations to the promotion of science. Out of the four hundred and eighty-three species of zoophytes in the tribe Actinaria, (exclusive of the Actiniæ,) which the Report contains, but two hundred and fifty-four, or little more than half,

are to be found in previous works. Much the larger part of these species have been studied from specimens. The names of those thus examined are distinguished by a * in the Index.

The subject of Corals, in this volume, is treated of exclusively in a zoological point of view. The geological questions with regard to the formation and structure of coral-reefs and islands, will come up for discussion in the author's Geological Report."

JAMES D. DANA.

New Haven, January, 1859.

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ZOOPHYTES.

CLASSIFICATION OF ZOOPHYTES.

ANIMALS of the class Radiata: usually attached at base: having a coronet of tentacles above, and an edentate mouth at the centre: within, an alimentary cavity, to which the mouth is the only opening: androgynous; gemmiparous and oviparous: nerves indistinct(?): circulation very imperfect: no special organs of sense.

ORDER I.—ACTINOIDEA.

Visceral cavity enclosing the stomach, and divided into compartments by radiated lamellæ, having reproductive functions; ovules ejected through the mouth.

SUBORDER I.—ACTINARIA.

Tentacles 6, 12, or more, in number, not papillose, (with few exceptions,) and perforate at apex: often coralligenous; coralla calcareous, very rarely corneous, cells radiate with lamellæ.

TRIBE I.—ASTRÆACEA.

Tentacles many, in imperfect series or scattered; when gemmiparous, gemmation superior, the polyps widening above: often coralligenous; coralla calcareous, cells multiradiate, lamellæ prolonged outward beyond the cells, and hence the surface in aggregate coralla is lamello-striate.

FAMILY I. ACTINIDÆ. Not coralligenous, usually attached.

Genera. Actinia, Anthea, Adamsia, Edwardsia, Ilyanthus, Capnea, Actinecta, Epicystis, Actinodendrum, Lucernaria, Metridium, Actinaria, Heterodactyla, Epicladia.

FAMILY II. ASTRÆIDÆ. Calcareo-coralligenous; tentacles arranged along the margin of the disks; disks sometimes confluent in simple series; coralla, with excavate cells, stars circumscribed, sometimes lobed or linear; lamellæ, in aggregate coralla, interrupted usually along the middle of the septa.

Genera. Euphyllia, Ctenophyllia, Mussa, Manicina, Caulastræa, Tridacophyllia, Astræa, Meandrina, Monticularia, Phyllastræa, Merulina. Echinopora.

FAMILY III. FUNGIDÆ. Coralligenous; disks not circumscribed, tentacles scattered, short, and often obsolete: simple or aggregato-gemmate; when aggregate, the disks every way confluent without interstices: coralla, generally with a stellate surface, and without proper cells; lamellæ, in aggregate species, continuous between adjacent polyp-centres.

Genera. Fungia, Cyclolites, Herpetolithus, Halomitra, Polyphyllia, Zoopilus, Pavonia, Agaricia, Psammocora.

TRIBE II.—CARYOPHYLLACEA.

Polyps having numerous tentacles in two or more series: mostly gemmiparous, gemmation inferior, buds lateral; rarely (as in some Cyathophyllidæ) growing upward above the summit of the parent, but summits of polyps (the disks or adjoining margins) not prolate: generally coralligenous; coralla calcareous, cells many-rayed, interstitial surface not lamello-striate.

FAMILY I. CYATHOPHYLLIDÆ. Coralligenous, the corallum of each polyp internally at middle, usually transversely or obliquely cellular.

Genera. Cyathophyllum, Calophyllum, Amplexus, Caninia, Arachnophyllum, Acervularia, Cystiophyllum, Clisiophyllum, Michelinia, Columnaria, Sarcinula.

FAMILY II. CARYOPHYLLIDÆ. Coralligenous; tentacles crowded and long, mouths long exsert; corallum internally not transversely cellular; cells many-

rayed (rays more than twelve), margin of calicles thin, interstices not lamello-striate. (Lamellæ nearly or quite entire.)

Genera. *Ecmesus*, *Cyathina*, *Stephanophyllia*, *Turbinalia*, *Desmophyllum*, *Culicia*, *Caryophyllia*, *Dendrophyllia*, *Oculina*, *Anthophyllum*, *Stylina*, *As-troitis*.

FAMILY III. GEMMIPORIDÆ. Coralligenous, tentacles short, marginal, in 2 to 3 series, disk broad and a little convex: coralla porous; calicles with a stout margin, lamellæ even and not exsert.

Genera. *Gemmipora*, *Astræopora*(?).

FAMILY IV. ZOANTHIDÆ. Not coralligenous, exterior subcoriaceous; tentacles short, marginal, in 2 or 3 series; disk often convex with the margin radially striate and sometimes much reflexed.

Genera. *Isaura*, *Zoantha*, *Palythoa*.

TRIBE III.—MADREPORACEA.

Tentacles in a single series, 12 (rarely more), sometimes obsolete; gemmiparous, gemmation lateral: coralligenous, coralla calcareous, cells quite small, rays 6 to 12 or obsolete; interstitial surface not lamello-striate.

FAMILY I. MADREPORIDÆ. Polyps with 12 tentacles, not secreting lime at middle part of base; and hence the cells deep, extending to the centre of the corallum.

Genera. *Madrepora*, *Manopora*.

FAMILY II. FAVOSITIDÆ. Polyps with 12 tentacles, secreting lime periodically at base, and hence the cells have a calcareous bottom and in the interior of the corallum are transversely septate, rarely solid.

Genera. *Alveopora* (*Alveoporinæ*); *Sideropora*, *Seriatopora*, *Pocillopora*, *Stenopora*, *Constellaria*, *Favosites*, *Catenipora* (*Favositinæ*); *Heliopora*, *Heliolites*, *Millepora* (*Helioporinæ*).

FAMILY III. PORITIDÆ. Polyps with rarely more than 12 tentacles, forming porous calcareous secretions continuously at base; coralla every where equally fine-porous, cells shallow or superficial and scarcely traceable within the corallum, rays indistinct.

Genera. *Porites*, *Goniopora*.

TRIBE IV.—ANTIPATHACEA.

Animals with 6 tentacles, forming at base corneous secretions.

FAMILY I. ANTIPATHIDÆ. Animals fleshy, enveloping a corneous spinulous axis.

SUBORDER II.—ALCYONARIA.

Animals with 8 tentacles; tentacles papillose, papillæ perforate at apex: often coralligenous; coralla calcareous or corneous rarely siliceous, cells never radiate within.

FAMILY I. PENNATULIDÆ. Never attached, but either free or with the base buried in the mud.

Genera. Renilla, Pennatula, Veretillum, Funiculina, Virgularia (*Pennatulina*); Pavonaria, Umbellularia (*Pavonarina*).

FAMILY II. ALCYONIDÆ. Fleshy, usually containing disseminated calcareous granules.

Genera. Rhizoxenia, Anthelia, Xenia (*Xenina*); Ammothea, Sympodium, Nephthya, Alcyonium (*Alcyonina*); Spoggodia (*Spoggodina*).

FAMILY III. CORNULARIDÆ. Forming corneous tubular coralla.

Genus. Cornularia.

FAMILY IV. TUBIPORIDÆ. Forming calcareous tubular coralla.

Genera. Aulopora, Telesto, Tubipora, Syringopora (?).

FAMILY V. GORGONIDÆ. Forming basal epidermic secretions, and often, also, other tissue secretions, the latter separable from the former.

Genera. Corallium (*Coralliina*); Hyalonema, Briareum, Gorgonia, Primnoa, Bebyce (*Gorgonina*); Isis, Mopsea, Melitæa (*Isina*).

ORDER II.—HYDROIDEA.

Animals with the internal cavity tubular and quite simple: ovules growing outward from the sides.

FAMILY I. HYDRIDÆ. Ovules single; buds lateral, young falling off when full grown: not coralligenous.

Genus. Hydra.

FAMILY II. SERTULARIDÆ. Ovules enclosed in ovarian vesicles; buds lateral, persistent: coralla corneous, calicles sessile.

Genera. Antennularia, Plumularia, Sertularia, Thuiaria, Thoa, Pasythea.

FAMILY III. CAMPANULARIDÆ. Ovules enclosed in ovarian vesicles; buds lateral, persistent; coralla corneous, calicles pedicellate.

Genera. Laomedea, Campanularia.

FAMILY IV. TUBULARIDÆ. Caducous gemmules growing from near the base of the tentacles, and naked; often coralligenous, coralla corneous, tubular.

Genera. Pennaria, Tubularia, Syncoryna, Corydendrium, Eudendrium, Coryna, Hydractinia.

DESCRIPTIONS OF SPECIES.

ORDER I.—ACTINOIDEA.

SUB-ORDER I.—ACTINARIA.

TRIBE I.—ASTRÆACEA.

Zoophytes, either wholly fleshy or coralligenous; tentacles numerous, in more than one series, or scattered. Often budding; buds terminal or sub-terminal, the polyps widening above by growth. Coralla calcareous, lamellæ of cells numerous, intersecting the interstices between cells in massive species.

FAMILY I.—ACTINIDÆ.

Non-coralligenous Astræacea, not budding, usually attached at base.

GENUS I.—ACTINIA.

Actinidæ usually attached at base; tentacles simple and naked, retractile.

I. TENTACLES SUBEQUAL.

1. Upper margin uniseriately tuberculate.

a. *Tentacles longer than half the disk.*

1. *ACTINIA FLAGELLIFERA* (*Drayton*).—Exterior smooth; $1\frac{3}{4}$ inches broad at middle, upper and lower extremities much dilated ($2\frac{1}{4}$ inches broad), margin of the summit with a single series of rather large tubercles; tentacles very long (2 to 3 inches), flagelliform, in 3 series; mouth somewhat prominent, elliptical.

Plate 1, fig. 1. Animal, natural size; *a*, the same, with part of the tentacles removed showing the disk; *b*, *c*, *d*, extremities of the inner, middle, and outer tentacles respectively, magnified about three diameters, from drawings by J. P. Couthouy; *e*, tentacles of another variety.—On rocks near Funchal and Camera de Lobos, Madeira.—*Exp. Exp.*

2. *ACTINIA PUSTULATA* (Couthouy).—Exterior pustulate, at middle cylindrical and 2 inches broad, upper and lower extremities very much spread (nearly 3 inches in breadth), base at margin inciso-lobate with the lobes very narrow (1 to $1\frac{1}{2}$ lines), upper margin tuberculate, the tubercles remote and like rudimentary tentacles; tentacles nearly equal, quite long (nearly 2 inches) and stout subulate, in two series; mouth oblong ($\frac{2}{3}$ of an inch), very prominent, with six lobes within: animal, when contracted, of a cylindrico-hemispherical form.

Plate 1, fig. 2, animal, expanded, natural size; *a*, view of the mouth and disk; *b*, animal contracted.—Common on rocks at low tide off Praya Grande fort, Rio de Janeiro.—*Exp. Exp.*

3. *ACTINIA VERATRA* (Drayton).—Exterior papillose, at middle $2\frac{1}{2}$ inches broad, upper and lower extremities very much dilated ($3\frac{1}{4}$ inches in breadth), margin of base undulate, upper margin uniseriately tuberculate; tentacles sub-equal, quite long ($1\frac{3}{4}$ inches), scattered, nearly in 3 series, subulate, none marginal; mouth an inch long, prominent.

Plate 1, fig. 3, animal natural size.—On the rocks of the shores of Wollongong, N. S. Wales.—*Exp. Exp.*

b. *Tentacles shorter than half the disk.*

4. *ACTINIA CLEMATIS* (Drayton).—Depressed, exterior pustulate, at middle $2\frac{1}{2}$ inches broad, upper and lower extremities much dilated, the upper most so and 4 inches broad, with the margin lobed and uniseriately tuberculate, tubercles a line and a half broad; tentacles short and rather stout, numerous (nearly in 5 series), the uncovered portion of the disk less than half the whole diameter; mouth oblong ($\frac{2}{3}$ of an inch), but little prominent.

Plate 1, figs. 4 and 5, different varieties, natural size.—Valparaiso, Chili.—*Exp. Exp.*

5. *ACTINIA FLORIDA* (Drayton).—Exterior crowded papillose, height 2 to $2\frac{1}{2}$ inches, at middle $2\frac{1}{4}$ inches thick; lower and upper extremities sparingly dilated (3 inches in breadth), margin of base undulate, upper margin uniseriately tuberculate, somewhat plicate; tentacles short (about half an inch), nearly equal, subulate, stout, crowded, in 5 imperfect series; mouth prominent.

Plate 2, figs. 6, 7, 8, different varieties, natural size.—Shores of San Lorenzo, off Callao, Peru.—*Exp. Exp.*

6. *ACTINIA TABELLA* (Drayton).—Exterior smooth, animal scarcely an inch thick at middle, with the upper and lower extremities very much dilated (nearly two inches in breadth), margin of base broad lobed, upper margin tuberculate; tentacles short (4 lines), sub-equal, stout, subulate, crowded, in 4

imperfect series; mouth oblong and prominent; form of animal, subglobose when contracted.

Plate 2, fig. 9, animal natural size; *a*, same, contracted.—On the rocks of False Bay, Porto Praya, Cape de Verds.—*Exp. Exp.*

ACTINIA GRAMINEA (*Drayton*).—Exterior smooth, base very much dilated (to 2 inches in breadth), and deeply lobed with the margin finely pustulate in a single line; above, nearly cylindrical and an inch thick, with the disk scarcely broader; upper margin uniseriately tuberculate; tentacles short (3 to 4 lines), subequal, subulate, rather stout, crowdedly in 3 series; mouth a little prominent, circular: form of contracted animal a very low cone.

Plate 2, fig. 10, animal natural size; *a*, disk and tentacles; *b*, the same, contracted.—False Bay, Porto Praya, island of St. Jago, Cape de Verdes, in crevices along the rocky shores.—*Exp. Exp.*

ACTINIA DIADEMA (*Drayton*).—Body covered with scattered verrucæ; base a little dilated ($1\frac{1}{4}$ inches in breadth) and broad lobed; above, cylindrical, an inch thick and the disk not broader; superior margin, with a single series of prominent tubercles; tentacles short (3 to 4 lines), subequal, subulate, rather stout, crowdedly in 4 series; mouth often much elevated: form of animal when contracted a prolonged hemisphere.

Plate 2, fig. 11, animal expanded, natural size; *a*, a view of the disk and prominent mouth; *b*, the animal contracted.—Rocks exposed to the surf, Porto Praya, Cape de Verdes.—*Exp. Exp.*

ACTINIA PRIMULA (*Drayton*).—Small, scarcely an inch high and broad, sparingly dilatate at each extremity, at base not lobed, upper margin tuberculate; tentacles short (2 to 3 lines) and slender, in 3 series; mouth somewhat prominent, a third of an inch long; sides marked vertically with colored lines, which are sometimes interrupted.

Plate 2, figs. 12, 13, 14, 15, different varieties, natural size.—Shores of San Lorenzo, in tide pools.—*Exp. Exp.*

2. Upper margin not tuberculate.

a. *Tentacles long and capitate.*

ACTINIA CLAVIGERA (*Drayton*).—Turgid urceolate, $2\frac{1}{4}$ inches through the middle, vertically and transversely lined; margin of base scarcely lobed; tentacles very stout, an inch long, round capitate, in 3 series, mouth a little prominent.

Plate 2, fig. 17, the animal natural size.—Wilson's Island, Paumotu Group, Pacific Ocean.—*Exp. Exp.*

b. *Tentacles subulate or filiform, longer than half the disk.*

ACTINIA IMPATIENS (Couthouy).—Nearly cylindrical, 1 to 1½ inches in diameter and height, sometimes very much elongated and writhing; sides smooth, but somewhat corrugato-striate, and above, color delicately tessellated; base sparingly dilated; tentacles subequal, an inch long, stout, subulate, in 2 series; mouth prominent, with 8 lobes within.

Plate 3, fig. 18, animal, natural size; *a*, the disk and tentacles; *b*, *c*, *d*, *e*, *f*, forms sometimes assumed by the animal, sketched by J. P. Couthouy.—Among the crevices of rocks, in tide-pools, Orange Harbor, Tierra del Fuego.—*Exp. Exp.*

ACTINIA MONILIFERA (Drayton).—Animal, with the exterior smooth, an inch in diameter, below and above dilated (to 1½ inches), margin of base crenulate, and the surface adjoining appearing beaded; the surface near the upper margin also beaded; tentacles quite slender, nearly an inch long, in 3 series; mouth prominent.

Plate 3, fig. 19, expanded animal, natural size.—Obtained at low tide, at upper extremity of Bay of Islands, New Zealand.

ACTINIA PRETIOSA (Dana).—Cylindrical, oblong, 1½ to 2 lines in diameter; tentacles in 2 series, slender, 2 lines long, subequal; exterior surface smooth, but here and there a minute prominent spot looking like a flower with a simple 5-lobed corolla, besides other scattered dots.

Plate 3, fig. 20, animal enlarged; *a*, natural size.—The Feejee Islands, Pacific Ocean.—*Exp. Exp.*

ACTINIA LINEOLATA (Couthouy).—Animal a low depressed rounded cone, 1¼ inches broad, sides smooth, vertically lined with brown; tentacles 24, in 2 series, 6 to 8 lines long, rather stout; disk small, radiated with whitish lines; mouth small, circular, not prominent.

Plate 3, fig. 22, animal natural size; *a*, view of disk and tentacles.—On small stones just below low water mark, Forge Cove, near Orange Harbor, Tierra del Fuego.—*Exp. Exp.*

ACTINIA CRUENTATA (Couthouy).—Conico-subhemispherical, sparingly dilated at base, sides concentrically wrinkled and tuberculate, tubercles small, suctorial, vertically seriate, obsolete below; tentacles numerous, nearly an inch long, subequal, stout; mouth prominent, four-cleft within; disk radiated with whitish lines.

Plate 3, fig. 23, natural size; *a*, disk with the tentacles.—Saddle Island, entrance of Orange Bay, Tierra del Fuego.—*Exp. Exp.*

ACTINIA DECORATA (Couthouy).—Subcylindrical, at middle 1¼ inches in diameter, base broadly dilated and sinuously lobed; sides naked above, below

tuberculiferous and tubercles perforate; upper margin not tuberculate; tentacles $\frac{3}{8}$ of an inch long, filiform (scarcely $\frac{1}{3}$ of a line thick), in 3 series, crowded, the external a little shorter: when contracted, shape rounded-conical.

Plate 3, fig. 24, three individuals, one of them contracted and the other expanded, natural size.—Lagoon of Honden Island, attached to a dead *Natica*.—*Exp. Exp.*

c. Tentacles shorter than half the disk.

ACTINIA PAUMOTENSIS (*Couthouy*).—Depressed, exterior smooth, 6 inches thick at middle, above very widely dilated (12 inches), upper margin sublobate or plicato-undulate, not tuberculate; tentacles numerous, subequal, nearly $1\frac{1}{2}$ inches long, stout, subulate, covering the larger part of the disk; disk rather strongly marked with radiating lines, and below faintly tuberculate; mouth but little prominent.

Plate 3, fig. 25, animal half the natural size.—From the coral reefs, island of Raraka, Paumotu Archipelago.

ACTINIA MOLLIS (*Couthouy*).—Body 1 inch in diameter at middle, at base sparingly dilated; disk much dilated, and unequally 5-lobed; margin crenulate, tentacles numerous, very short, clavate, arranged in about 20 radiating triangular groups; mouth 4-lobed.

Plate 3, fig. 26, the expanded animal, natural size; 27, the same in one of its positions; *b*, outline of the mouth showing its form.—Lagoon of Clermont Tonnerre.—*Exp. Exp.*

ACTINIA ACHATES (*Drayton*).—Subcylindrical, about an inch through at middle, above dilated and profoundly sinuoso-lobate; lobes 5 or 6; exterior smooth; tentacles in 3 series, quite short (2 lines) and slender ($\frac{1}{3}$ of a line), submarginal; mouth a little prominent, 6-partite.

Plate 3, fig. 28, expanded animal, natural size; *a*, the disk showing its lobed form.—Dredged up in thirty fathoms, off the east coast of Patagonia.

ACTINIA PAPAVER (*Drayton*).—Animal, with the exterior smooth; body depressed, $2\frac{1}{4}$ inches thick at middle, much dilated above and below (3 inches in breadth); margin of base faintly crenulate, upper margin not tuberculate, scarcely undulate; tentacles numerous, nearly $\frac{3}{8}$ of an inch long, stout, subulate, in 3 series; mouth $\frac{3}{8}$ of an inch long, prominent.

Plate 4, fig. 29, animal natural size.—From the rocks exposed to the surf, Wollongong, Illawarra, New South Wales.—*Exp. Exp.*

ACTINIA PLUVIA (*Drayton*).—Minutely tuberculate or papillose, at middle $2\frac{1}{2}$ inches in diameter; upper and lower extremities much dilated ($3\frac{1}{4}$ inches in breadth), margin of base undulate, upper margin not tuberculate; tentacles somewhat crowded, in 3 series, 6 lines long, stout, subulate; disk strongly marked with radiated lines; mouth a little prominent, 6 to 8 lines long.

Plate 4, fig. 30, animal natural size; *a*, part of the surface of one of the varieties.—From rocks, island of San Lorenzo, Callao, Peru.

ACTINIA RETICULATA (*Couthouy*).—Exterior smooth and reticulately corrugate, subcylindrical, one and a half inches high, and two and a half thick, with the disk very much dilated ($3\frac{1}{2}$ inches in breadth), and margin somewhat five-lobed, not tuberculate; tentacles very numerous, quite short (3 lines), not turgid, and covering the larger part of the disk, the inner a little the largest; mouth somewhat prominent, 6 to 8 lines long.

Plate 4, fig. 31, the expanded animal, natural size; *a*, the same contracted, of nearly a hemispherical form.—Orange Harbor, Tierra del Fuego.—*Exp. Exp.*

ACTINIA FUEGIENSIS (*Couthouy*).—Subcylindrical, 2 inches in diameter, exterior smooth, upper and lower extremities sparingly dilated, margin of base slightly undulate; tentacles throughout remotely scattered, turgid, 3 lines long; mouth small, circular, 5-cleft: form of animal when contracted very much depressed, convex.

Plate 4, fig. 32, expanded animal, natural size; *a*, upper view of the disk; *b*, animal contracted.—From rocks, on the shores of Orange Harbor, Tierra del Fuego.

ACTINIA NYMPHÆA (*Drayton*).—Small, 8 lines high, exterior smooth; upper and lower extremities dilated (1 inch in breadth); margin of base regularly crenate, crenatures a line and a half broad, sides correspondingly marked with vertical lines; tentacles short ($2-2\frac{1}{2}$ lines in length), in 3 series, slender; mouth a little prominent, and one-sixth of an inch long: the form of the contracted animal a very low depressed truncated cone.

Plate 4, fig. 33, expanded animal, natural size; *a*, the same contracted.—Valparaiso, Chili.—*Exp. Exp.*

ACTINIA RUBUS (*Drayton*).—Small, $\frac{1}{4}$ of an inch high, exterior smooth; upper and lower extremities dilated (nearly an inch broad), base crenated, and crenatures a line broad, sides marked with vertical interrupted lines; tentacles short ($2\frac{1}{2}$ lines in length), in 2 series; mouth a little prominent, nearly a sixth of an inch long.

Plate 4, fig. 34, animal natural size; *a*, same, contracted.—Valparaiso, Chili.—*Exp. Exp.*

ACTINIA GEMMA (*Drayton*).—Small, nearly cylindrical, $\frac{1}{2}$ an inch thick, exterior with contiguous tubercles; disk scarcely at all dilated; tentacles short ($2\frac{1}{2}$ lines long), in 2 series, rather slender; animal, when contracted, pyriform.

Plate 4, fig. 35, the expanded animal, natural size; *a*, the same contracted.—False Bay, Porto Praya, Cape de Verdes.—*Exp. Exp.*

ACTINIA CURTA (*Drayton*).—Small, very much depressed, 6 to 8 lines broad, and scarcely $1\frac{1}{2}$ lines high, dilated at base and lobed, but disk scarcely at all spreading; tentacles subequal, 3 lines long, in 2 series, rather stout.

Plate 4, fig. 36, animal natural size; *a*, upper view of the same.—False Bay, Porto Praya, Cape de Verdes.—*Exp. Exp.*

II. OUTER TENTACLES MUCH THE SMALLEST.

ACTINIA RHODORA (*Couthouy*).—Subhemispherical, $1\frac{1}{2}$ inches thick, exterior smooth, base dilated and sparingly lobed; tentacles subulate, rather stout, in 3 series, the internal 1 inch long, the external a third of an inch; mouth very turgidly prominent, 6-cleft within.

Plate 4, fig. 37, expanded animal, natural size; *a*, upper view of the disk and tentacles.—Hospital Island, Rio de Janeiro.—*Exp. Exp.*

III. INNER TENTACLES MUCH THE SMALLEST.

ACTINIA ARTEMISIA (*Pickering*).—Suburceolate, at middle very turgid and $2\frac{1}{4}$ inches through, disk somewhat dilated; sides studded with vertical series of prominent tubercles, which become obsolete below; tentacles in 3 series, stout, subulate, the inner half an inch, the exterior an inch, in length; disk faintly radiate; mouth small, lobate.

Plate 4, fig. 38, animal natural size; *a*, a view of the disk and tentacles.—Abundant in Discovery Harbor, Puget's Sound, Northwest Coast of America.

GENUS II.—METRIDIDIUM.—OKEN.

Actinidæ attached at base, having some simple naked tentacles and other frondescent tentacles or appendages, either marginal or scattered over the disk.

METRIDIUM PRÆTEXTUM (*Couthouy*).—Very large cylindrical, $2\frac{1}{2}$ inches in diameter, and often 6 inches long, exterior smooth, base scarcely dilated and neatly crenate at margin, with the crenatures a sixth of an inch broad; inner tentacles long ($1\frac{1}{2}$ inches) and flagelliform, rather stout; external a little shorter, 3 lines wide, frondescently lacinate or delicately lobed, coalescing by their sides with only the apex free; a few tubulate pores over the surface.

Plate 5, fig. 39, animal natural size; *a*, under surface of exterior tentacular appendages; *b*, upper view of disk.—Harbor of Rio de Janeiro.—*Exp. Exp.*

METRIDIUM CONCINNATUM (*Drayton*).—Depressed, 2 inches in diameter at middle; upper and lower extremities dilated; disk 3 inches broad, strongly radiate, margin plicato-lobate; sides tuberculous, tubercles suctorial; inner tentacles half an inch long, stout, subulate, scattered, channelled and almost triangular; fringe-tentacles external, nearly $\frac{1}{2}$ an inch long, and 1 to $1\frac{1}{2}$ lines broad, frondescently lacinate.

Plate 5, fig. 40, animal natural size; *a*, one of the tentacles; *b*, a transverse section of the same. 41. The animal as it occurs half-concealed in the sand.—San Lorenzo, Callao, Peru.—*Exp. Exp.*

METRIDIUM MUSCOSUM (*Drayton*).—Much depressed, an inch high, and $2\frac{1}{2}$ inches in diameter; sides furnished with suctorial vesicles; disk faintly radiated, scarcely plicate at the margin; tentacles subulate, in three series, nearly $\frac{3}{4}$ of an inch long, stout, and scattered among them are numerous frondescent appendages, not over three lines in length.

Plate 5, fig. 42, the expanded animal of natural size; 43, the same, as it lies embedded in the sand.—From sandy pools among the rocks, left by the tide, Wollongong, Illawarra, New South Wales.—*Exp. Exp.*

FAMILY II.—ASTRÆIDÆ.

Animals with numerous tentacles arranged along the margin of the disks, and covered by the same on contraction. The disks either simple, or budding in lines and long-confluent. Corolla calcareous, with concave radiate cells; lamellæ, in aggregate species, not continuous from one centre to another, but generally interrupted half-way; the stars, therefore, circumscribed.

The genera of Astræidæ may be arranged and characterized from the corolla as follows:

I. *Lamellæ of the cells large, and entire or nearly so; corolla calicularly branched, or stipitate (explanato-glomerate).*

GENUS I. *EUPHYLLIA*. Corolla calicularly branched, calicles subturbinate, lamellæ thin, bottom of the cell very narrow and often concealed by the large lamellæ.

GENUS II. *CTENOPHYLLIA*. Corolla explanato-glomerate, meandrine; lamellæ very stout and remote.

II. *Lamellæ of the cells dentate or denticulate, rarely entire and then minute; corolla calicularly branched or glomerate, the septa rarely foliaceous.*

GENUS III. *MUSSA*. Calicularly branched or explanato-glomerate; calicles subturbinate, cells large and concave, sometimes meandrine; lamellæ coarse and dentate, very unequal and unequally exsert (6 or 7 in a breadth of a fourth of an inch, and half of these smaller).

GENUS IV. MANICINA. Calicularly branched or explanato-glomerate; cells large, meandrine; lamellæ very even and numerous, and neatly denticulate, rounded above.

GENUS V. CAULASTRÆA. Calicularly branched; cells small (hardly exceeding half an inch), concave, lamellæ unequally exsert, nearly entire; branches nearly cylindrical, calicles not turbinate.

GENUS VI. TRIDACOPHYLLIA. Cells large, septa thin foliaceous, prominent, cristate.

GENUS VII. ASTRÆA. Glomerate; cell nearly or quite circular, rarely lobed.

GENUS VIII. MEANDRINA. Glomerate, not stipitate; cell a narrow meandering trench (trench not exceeding the fourth of an inch in breadth).

GENUS IX. MONTICULARIA. Glomerate; no distinct cells; surface of coralla covered with small lamello-radiate cones; internal texture very cellular.

III. *Coralla explanate or foliaceous.*

GENUS X. PHYLLASTRÆA. Erect, calicles large and distinct, affixed laterally to the foliaceous corallum.

GENUS XI. MERULINA. Spreading-foliaceous or ramose; surface covered with oblique lamellar ridges or lamello-radiate prominences, with shallow trenches or cells between; internal texture very compact.

GENUS XII. ECHINOPORA. Foliaceous or ramose; surface finely echinulato-striate, calicles small, nearly hemispherical and echinulate.

GENUS I.—EUPHYLLIA.*—DANA.

Quite simple or segregato-gemmate, rarely free; zoophytes hemispherical. Tentacles oblong, subequal. Coralla having the calicles subturbinate, either circular or much compressed, sometimes meandering; lamellæ nearly or quite entire; cell very narrow at bottom.

I. Quite simple Euphyllia.

1. EUPHYLLIA PAVONINA (*Lesson*), *Dana*.—Solitary, free, cuneiform, semi-circular above in outline; tentacles numerous, stout, three-quarters of an inch long, subequal. Corallum below acutely carinate, edge either straight or forming an obtuse angle at centre, at middle a small pedicel; exterior smooth, scarcely plicate, radiately substriate; cell two inches long, and one broad at the aperture, very deep, lamellæ not exsert, subdenticulate.

* From *ευ*, *well* or *handsome*, and *φυλλον*, *leaf*, alluding to the neat entire lamellæ of the cells.

Plate 6, fig. 5, corallum, natural size; 5 *a*, the animal expanded; fig. 6, the corallum of another variety; 6 *a*, profile of the same.—Sandwich Islands, according to Lesson, who states that a large number of specimens were brought to England by the Blonde. The Expedition did not meet with it.

2. *EUPHYLLIA ANTHOPHYLLUM* (*Ehrenberg*,) *Dana*.—Erect compressed, attached, $4\frac{1}{2}$ lines high and broad. Corallum with the margin entire; aperture oblong; lamellæ included, denticulate, with the lateral surface granulous: exterior obsoletely striate.

3. *EUPHYLLIA SPHENISCUS* (*Dana*).—Not budding, free, cuneiform, in outline inverted deltoid, with the summit arcuate, and truncate at base; flesh-colored and greenish-yellow; mouth very long, disk transversely banded with red, tentacles numerous, attenuate, diaphanous, with flesh-colored tips. Corallum smooth without, very faintly concentrically plicate; cell deep, oblong-elliptic, with the aperture regularly rounded at each end; lamellæ entire and regular, unequal, truncate, not exsert.

Plate 6, fig. 1 *a*, animal unexpanded, showing the partly-opened oblong mouth, with the vertically-plaited inner surface of the lips;—1 *b*, animal expanded;—1 *c*, one of the tentacles;—1 *d*, profile section of corallum;—1 *e*, a small specimen, with side processes.—Coral reefs, Singapore, East Indies, in two to three fathoms water.—*Exp. Exp.*

4. *EUPHYLLIA RUBRA* (*Q. & G.*) *Dana*.—Not budding, attached, subcuneiform, below somewhat distorted, above a little arcuate, 1 inch in greatest breadth, base $\frac{1}{2}$ inch broad and often dilated; disk yellowish, with 4 transverse red bands, oblong-elliptic, mouth very long and rose-colored; tentacles long, whitish, diaphanous. Corallum having the exterior faintly striate; lamellæ not exsert, regular, unequal.

Cook's Straits, New Zealand, in twenty-four fathoms.—*Quoy & Gaynard*.

• 5. *EUPHYLLIA SPINULOSA* (*Dana*).—Not budding, attached, compressed sub-turbinate, a little distorted, scarcely convex at summit where it is 10 lines by 5 in breadth, below attenuate, and one-sixth of an inch thick at base. Corallum having a subelliptical aperture, sides fine lamello-striate vertically and spinuloso-denticulate; lamellæ rounded above, a line exsert, sub-entire.

Plate 6, fig. 2, corallum, natural size; *a*, profile of transverse section.—Cape Frio, entrance to the harbor of Rio de Janeiro.—*Exp. Exp.*

2. *Euphyllia* segregato-gemmate, not meandering.

6. *EUPHYLLIA GLABRESCENS* (*Chamisso & Eysenhardt*).—Segregato-gemmate, furcately ramose, 2 inches in height; color yellow; tentacles many, an inch long, clavate. Corallum with the branches $\frac{1}{2}$ an inch thick, exterior nearly smooth; calicles angular, an inch wide, very deep at centre, margin entire or obsoletely denticulate.

The Radack Archipelago, Pacific Ocean.—*Chamisso*.

7. *EUPHYLLIA GRACILIS* (Dana).—Convex, furcato-ramose; disk mostly simple. Corallum having the calicles subturbinate, scarcely 2 lines distant, the exterior minutely striate; cell usually $\frac{1}{2}$ an inch broad, sometimes 1 inch long; lamellæ very broad, extremely thin, a very little exsert.

Caribbean Sea, *Esper*.—West Indies, *Bost. Soc. Nat. Hist.*

8. *EUPHYLLIA ASPERA* (Dana).—Furcato-ramose, hemispherical; disks usually simple and nearly circular. Corallum with the branches subdivaricate, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch thick, calicles subturbinate; coarsely ribbed-striate and spinulous, below nearly smooth; lamellæ unequal, very broad, exsert, obliquely truncate, the larger one-tenth of an inch apart, and with about 3 smaller intermediate.

Plate 9, fig. 7, part of corallum, natural size; 7*a*, profile section showing the form of the lamellæ.—West Indies?

9. *EUPHYLLIA APERTA* (Dana).—Furcato-ramose, hemispherical, with the disks mostly simple. Corallum having the branches $\frac{3}{4}$ of an inch thick, subdivaricate, short, calicles subturbinate, $\frac{3}{4}$ of an inch long and broad, remotely costate, with the ridges somewhat denticulate and below becoming obsolescent; lamellæ few, thin, about 1 line exsert, the larger quite broad and obliquely truncate at top, $\frac{1}{3}$ of an inch apart, and usually with one quite small intermediate lamellæ.

West Indies?

10. *EUPHYLLIA RUGOSA* (Dana).—Furcato-ramose, hemispherical; polyps pale grayish red, disks usually simple; tentacles numerous, stout, $\frac{3}{8}$ of an inch long, with yellow tips. Corallum with the calicles $\frac{3}{4}$ to 1 inch broad, sometimes lobed, 3 to 4 lines apart; exterior often transversely wrinkled and finely carinato-striate; lamellæ broad, entire, scarcely at all exsert.

Plate 6, fig. 3, a clump of the natural size, with most of the polyps fully expanded, a few partly so or closed; 3*a*, a tentacle enlarged; 3*b*, a separate calicle; 3*c*, part of a transverse section of a branch; 3*d*, one of the lamellæ; 3*e*, corallum of a young individual, found growing from the side of one of the calicles.—The Feejee Islands, in shallow water about the reefs.—*Exp. Exp.*

11. *EUPHYLLIA TURGIDA* (Dana).—Hemispherical, furcato-ramose, disks sometimes sparingly compound. Corallum with the calicles mostly $1\frac{1}{4}$ to 2 inches broad, at times 3 inches long, and lobed; exterior undulate and rather remotely faint carinato-striate: lamellæ very broad and numerous, entire, thin, a little exsert.

Plate 9, figs. 9*a*, 9*b*, outline of lamellæ.—Malacca, East Indies.

3. Meandrine Euphyllia.

12. *EUPHYLLIA MEANDRINA* (Dana).—Very large, hemispherical, disks mostly compound, linear, and meandering. Corallum, with the branches

rarely cylindrical, and $\frac{3}{4}$ of an inch thick, generally laminato-compressed, sometimes 6 inches broad and 5 to 9 lines thick; exterior smooth or in some parts finely striate and sometimes surface a little undulate, margin fragile; lamellæ crowded, very broad, entire, not exsert.

Plate 6, fig. 4, part of a corallum, natural size; 4 *a*, vertical section, showing the narrow bottom; 4 *b*, transverse section, showing the cellular texture of the interior.—East Indies.—*Exp. Exp.*

13. *EUPHYLLIA SINUOSA* (*Dana*).—Very large, hemispherical; disks compound, linear, and long meandering. Corallum similar to that of the *meandrina*, but the sinuous cells longer, $\frac{1}{2}$ an inch broad, and the lamellæ few and mostly $\frac{1}{2}$ of an inch distant, entire, not exsert.

14. *EUPHYLLIA CULTRIFERA* (*Dana*).—Large, convex, disks compound, linear, meandering. Corallum, with the cell $\frac{3}{8}$ of an inch broad, sometimes 5 inches long; exterior nearly smooth or sparingly plicate, and faintly striate; lamellæ long exsert (sometimes $\frac{3}{4}$ of an inch), and often $\frac{1}{2}$ an inch broad.

Plate 9, fig. 8 *a*, 8 *b*, showing the form of the lamellæ.—East Indies.—*Dr. A. A. Gould*.

GENUS II.—CTENOPHYLLIA.—DANA.

Animals explanato-glomerate; disks seriatly budding, and hence linear and sinuous. Coralla substipitate, convex; cells trenchlike and meandering; lamellæ very stout, few, subequal, entire or nearly so.

1. *CTENOPHYLLIA PECTINATA* (*Lamarck*,) *Dana*.—Corallum with the ridges sulcate, 5 to 6 lines wide; gyri sinuous, 6 to 7 lines broad, lamellæ rounded, fossæ 3 to 4 lines deep; inferior surface smooth, except within $\frac{1}{4}$ of an inch of the margin, where it is rugose and remotely striate.

Plate 14, fig. 13, outline of the lamellæ and trench.—West Indies.

2. *CTENOPHYLLIA QUADRATA* (*Dana*).—Corallum usually with sulcate subquadrate ridges, 3 to 4 lines broad; gyri 4 to 5 lines broad, fossæ 3 lines deep, septum often 1 line thick; lower surface for $\frac{1}{4}$ inch crimped and striate.

Plate 14, fig. 14, outline of the lamellæ and trenches.—West Indies.

3. *CTENOPHYLLIA PACHYPHYLLA* (*Ehrenberg*,) *Dana*.—Corallum with the ridges entire, Gothic, rarely obsoletely sulcate, 5 to 6 lines wide; gyri 5 to 8 lines broad; lamellæ stout; septum thin.

Plate 14, fig. 15, outline of lamellæ and trench.—West Indies.

4. *CTENOPHYLLIA PROFUNDA* (*Dana*).—Corallum with the ridges entire, Gothic, (4 lines wide), gyri 5 to 6 lines broad, fossæ very deep (nearly $\frac{1}{2}$ an inch), lamellæ rather thin.

Plate 14, fig. 16, outline of lamellæ and trench.

GENUS III.—MUSSA.—OKEN.

Large Astræidæ, segregate, also explanato-glomerate; tentacles numerous, unequal, the inner tumid. Coralla calicularly branched or explanato-glomerate; calicles very stout, subturbinate, with orbiculate or lobed cells, sometimes very broadly compressed with the cells long meandering; exterior stoutly lamello-striate and echinatodentate; lamellæ coarsely dentate or gash-toothed, unequally exsert.

I. Caliculato-ramose; cells simple or but little lobed.

1. *MUSSA FASTIGIATA* (*Ellis*), *Dana*.—Fastigiate; disks usually nearly circular. Corallum with the branches stout; calicles remotely ribbed-angular, not dentato-echinate, $\frac{2}{3}$ to 1 inch broad (rarely $\frac{1}{2}$ an inch), lamellæ scarcely toothed; subacute at apex.

West Indies. *Ellis*.

2. *MUSSA CARDUUS* (*Pallas*), *Dana*.—Very large; disks nearly circular. Corallum having the calicles very stout ($2\frac{1}{2}$ to $3\frac{1}{2}$ inches broad), very long turbinate, nearly circular; exterior every where (above and below) strongly lamello-striate and sharp serrate; cell concave, margin rounded, lamellæ coarsely serrato-dentate.

Plate 8, fig. 8, section of cell showing the outline of lamellæ. West Indies.

3. *MUSSA ANGULOSA* (*Pallas*), *Oken*.—Large; disks usually nearly circular, sometimes lobed. Corallum large, branches short; calicles suborbicular, from 1 to $1\frac{1}{2}$ inches broad, often lobed (sometimes with 4 to 5 lobes), exterior every where lamello-striate, and dentato-echinate; cell with a rounded margin; lamellæ thin, regularly serrato-dentate.

Plate 8, figure 4, section of cell showing the outline of lamellæ.—West Indies.

4. *MUSSA CORYMBOSA* (*Forskal*), *Dana*.—Fastigiate; pale fuscous, disk usually nearly circular, gold-yellow, centre smooth, margin tumid papillose, papillæ bursiform, scarcely a line high, tentacles small. Corallum erect, fastigiate; calicles unequal, 1 to $1\frac{1}{2}$ inches broad, subturbinate, often compressed

and angular; lamellæ strongly dentate; margin of calicle not revolute, subacute.

Red Sea. *Forskal, Ehrenberg.*

5. *MUSSA CACTUS* (*Dana*).—Regularly hemispherical; disk usually suborbiculate, green; *inner* tentacles bursiform, pearl white and brown at tip, *outer* a little elongate and brown. Corallum having the branches crowded, calicles sometimes 2 to 3-lobed, 1 to $1\frac{1}{2}$ inches thick, subturbinate, exterior irregularly lamello-striate and serrate; lamellæ unequal, strongly dentate, rounded at apex, with 3 to 5 subtriangular teeth.

Plate 7, fig. 1, hemispherical clump natural size, with part of the polyps expanded; 1 *a*, tentacle enlarged; 1 *b*, vertical section of a calicle; 1 *c*, transverse section.—Feejee Islands.—*Exp. Exp.*

6. *MUSSA COSTATA* (*Dina*).—Hemispherical; disks usually suborbiculate. Corallum having the branches crowded; calicles $\frac{3}{8}$ to $1\frac{1}{4}$ inches broad, scarcely turbinate, elongate, exterior ribbed angular, with rarely a tooth; lamellæ very unequal, dentate, the larger broad, truncate at apex, and often 2-3-gash-toothed.

Plate 7, fig. 2, a calicle natural size; 2 *a*, 2 *b*, lamellæ.—Tahiti, Society Islands.—*Exp. Exp.*

II. Calculato-ramose; cells often elongate and sinuous.

7. *MUSSA SINUOSA* (*Lamarck*).—Hemispherical; disks usually elongate and meandering. Corallum with the branches $\frac{3}{8}$ to $1\frac{1}{2}$ inches thick, usually much compressed, exterior striate and for an inch or more serrato-dentate; cells sometimes simple, but often sinuous and 2 to 5 inches long; lamellæ stout, broad dentate and inciso-dentate, $\frac{1}{2}$ to $\frac{1}{2}$ an inch exsert; intervals between the calicles, nearly half an inch broad.

Plate 8, fig. 1 *a*, 1 *b*, 1 *c*, outline of cell and lamellæ.—East Indies, *Esper, Gmelin.*—Red Sea, *Ehrenberg.*

8. *MUSSA CYTHEREA* (*Dana*).—Regularly hemispherical; disks mostly linear and meandering. Corallum having the branches usually much compressed, $\frac{1}{2}$ an inch thick, and $\frac{3}{8}$ to 5 inches broad, closely crowded; exterior striate above, and sparingly echinate; cell often 5 inches long and sinuous; larger lamellæ much exsert with 3 to 5 smaller intermediate, subtruncate at apex and 2-3-gash-toothed.

Plate 7, fig. 3 *a*, 3 *b*, 3 *c*, section of cells showing the outline of the lamellæ.—Tahiti, Society Islands.—*Exp. Exp.*

9. *MUSSA MULTILOBATA* (*Dana*).—Animal chestnut-brown; disks long, sinuous, and multilobate, bright green. Corallum meandrine, calicles $\frac{3}{8}$ of an inch wide, cell very much gyrose, at bottom 3 or 4 longitudinal lamellæ; lamellæ

with a convex apex coarsely toothed, teeth subtriangular, large and small lamellæ alternate.

Plate 8, fig. 2, the animal not fully expanded; 2 a, 2 b, profile of lamellæ.—Feejee Islands.—*Exp. Exp.*

10. *MUSSA CEREBRIFORMIS* (*Dana*).—Very large, hemispherical; disks very long, linear, and sinuous. Corallum meandering; cells $\frac{3}{4}$ of an inch broad and very long, the lobes often straight and a foot long; at bottom of cell one or two longitudinal lamellæ; lamellæ rather thin, scarcely rounded above, dentate.

Plate 8, figure 3, transverse section; 3 a, 3 b, profile of lamellæ and cell.—Feejee Islands.—*Exp. Exp.*

11. *MUSSA REGALIS* (*Dana*).—Subhemispherical, polyps large, often laterally coalescing, disks forming long sinuous lines. Corallum meandrine, calicles 1 to $1\frac{1}{2}$ inches broad, sometimes $\frac{1}{8}$ of an inch apart, but often coalescing; exterior striate, not echinate; cells very deep (often 1 inch), sometimes 6 inches long; lamellæ unequal, dentate, nearly $\frac{1}{2}$ an inch exsert.

Plate 8, fig. 5, section of cell, showing outline of lamellæ and cells.—East Indies.

III. Aggregate, meandrine.

12. *MUSSA CRISPA* (*Lamarck*,) *Dana*.—Stipitate, explanato-glomerate, spreading, convex; disks linear and sinuous. Corallum with the margin thin, crispate, sublobate; below, striate, plicate, and sparingly spinulose; above, with sinuous gyri near $\frac{3}{4}$ of an inch broad (rarely 1 inch), dilating at the border of the corallum; ridges $\frac{1}{2}$ to $\frac{3}{8}$ of an inch broad; lamellæ stout, unequal, strongly serrate.

Plate 8, fig. 6, view of the lamellæ.—Indian Ocean, *Lamarck*.—Singapore, *Exp. Exp.*

13. *MUSSA DIPSACEA* (*Dana*).—Very short, turbinate, convex, disks short, linear, and almost simple. Corallum very firm; cells $\frac{1}{2}$ to $\frac{3}{8}$ of an inch broad and $\frac{3}{8}$ to 2 inches long, often lobed; lamellæ quite stout, slenderly and neatly dentate, 1 line exsert, alternately smaller; ridges sometimes obsolete sulcate, septa very thin ($\frac{1}{2}$ to 1 line), solid.

Plate 8, fig. 9, section of cell, showing outline of lamellæ.

14. *MUSSA FRAGILIS* (*Dana*).—Glomerate, scarcely stipitate or partly incrusting, convex. Corallum fragile; below, strongly and acutely lamello-striate; above, gyri $\frac{1}{2}$ to $\frac{3}{8}$ of an inch broad, dilating at the margin of the corallum; ridges 4 to 5 lines broad, rounded and somewhat sulcate; septum $\frac{1}{8}$ of an inch thick, and at top two longitudinal calcareous lines one-tenth of an inch apart; lamellæ fragile, dentate, with the teeth slender, at apex denticulate.

Plate 8, fig. 7, outline of lamellæ and transverse profile of trench.—West Indies, Bermudas.

15. *MUSSA GYROSA* (*Ellis*,) *Dana*.—Convex, glomerate, disks long and sinuous. Corallum with the gyri $\frac{1}{2}$ to $\frac{3}{8}$ of an inch broad, septa stout, at the centre nearly solid.—East Indies (?).—*Esper*.

16. *MUSSA RECTA* (*Dana*).—Glomerate, very large, disks very long, and often straight. Corallum with the gyri 1 inch broad; septa stout, solid, scarcely cellular; lamellæ unequal.

Plate 8, fig. 11, worn fragment of the corallum; 4 a, vertical section of the same.—Wake's Island, Pacific Ocean.—*Exp. Esp.*

17. *MUSSA NOBILIS* (*Dana*).—Glomerate, subhemispherical or nearly plane; disks long sinuous, green; mouth white; tentacles very short. Corallum, with the gyri 1–1½ inches broad; lamellæ unequal, spinoso-dentate, small and large alternating; ridges entire.

Plate 8, fig. 10, worn fragment of the corallum.—Port Carteret, New Ireland, *Quoy & Gaymard*.—Wake's Island, Pacific, *Exp. Esp.*

GENUS IV.—MANICINA.—EHRENBERG.

Animals aggregate or segregate, and explanato-glomerate; disks rarely simple, very commonly seriatly budding, and becoming long and sinuous. Coralla substipitate, convex; cells fossiform, meandering, with the margin rounded; lamellæ even, thin, neatly and distinctly denticulate.

1. *MANICINA AMARANTUM* (*Dana*).—Segregato-gemmate, large, convex; disks sinuous. Corallum having the calicles meandrine; fossa 1 to 1¼ inches deep, usually perpendicular and $\frac{1}{4}$ of an inch broad, but often dilating to 1 inch towards the margin, at bottom very narrow and not porous; ridges rounded, near 2 lines thick.

Plate 9, fig. 1, part of a corallum, natural size.—East Indies.—*Exp. Esp.*

2. *MANICINA FISSA* (*Ehrenberg*).—Stipitate, convex, mostly aggregate in structure; disks sinuous. Corallum having the margin thin, lobate, broadly plicate; ridges nearly $\frac{1}{2}$ an inch broad, subtruncate and sulcate; septa openly cellular, $\frac{1}{2}$ of an inch thick, trenches very deep (often 1 inch), irregular, dilating at the margin; lamellæ lax, foliaceous.

West Indies(?)

3. *MANICINA AREOLATA* (*Ellis*,) *Ehrenberg*.—Short turbinate, sinuoso-plicate at margin, gyri $\frac{1}{2}$ to $\frac{3}{8}$ of an inch broad, sparingly sinuous, folds for the

most part coalescing. Corallum with the ridges generally duplicate, broad and strongly concave; fossæ $\frac{1}{3}$ of an inch deep, lamellæ a little dilated at base.

Plate 9, fig. 3, profile vertical section, natural size.—West Indies.

4. *MANICINA MEANDRITES* (*Esper.*) *Ehrenberg*.—Short turbinate, convex, aggregate; gyri sinuous, and of nearly uniform width, $\frac{3}{4}$ of an inch broad. Corallum with the fossæ and ridges triangular, the latter nearly subacute, and usually sulcate.

West Indies.

5. *MANICINA HISPIDA* (*Ehrenberg*).—Very short, turbinate, and semiglobose; gyri sinuous $\frac{2}{3}$ to $\frac{1}{2}$ of an inch broad. Corallum with the ridges $\frac{1}{4}$ to $\frac{1}{2}$ of an inch wide, every where truncate and concave; lamellæ abruptly inclined, dilatate at base, laterally hispid; septa perpendicular.

West Indies.

6. *MANICINA PRÆRUPTA* (*Ehrenberg*).—Turbinate-globose; gyri about $\frac{3}{4}$ of an inch broad. Corallum sparingly dilated at base; ridges nearly perpendicular, and mostly entire; lamellæ subtruncate at apex, lateral surfaces arenose; fossæ 4 to 5 lines deep, 2 to 4 lines broad.

West Indies.—*Ehrenberg*.

GENUS V.—TRIDACOPHYLLIA.—BLAINVILLE.

Aggregate Astræidæ; animals quite broad, with the sides expanded explanate, and assurgent; tentacles minute. Coralla substipitate; septa thin foliaceous, lamello-striate, enclosing broad cells, and often having on the lateral surface a few oririmes similar to those of the *Pavonia*.

1. *TRIDACOPHYLLIA LACTUCA* (*Pallas,*) *Blainville*.—Subhemispherical. Corallum, with very thin foliaceous septa, often 3 to 4 inches high, very deeply lacinate, and fragile; cells large and deep, with a few lateral oririmes; lamellæ very narrow, sub-denticulate, granulous, becoming obsolete near the upper margin of the folia; under surface remotely striate.

Plate 9, fig. 10.—East Indies.—*Exp. Exp.* West Indies (?)—*Pallas, Ellis*.

2. *TRIDACOPHYLLIA PÆONIA* (*Dana*).—Convex; disk brown, $\frac{1}{2}$ to 1 inch broad, rugate, exterior to the tentacles grayish-green; tentacles minute. Corallum with the foliaceous septa less thin and large than in the *lactuca*, about 2 inches high; cells usually 1 inch broad, very rarely with lateral oririmes; lamellæ numerous, and not becoming obsolete at the margin above, somewhat granulous; under surface with more crowded striæ than in the *lactuca*.

Plate 9, fig. 11, natural size; 11 a, section of corallum, with outline of lamellæ.—The Feejee Islands.—*Exp. Exp.*

GENUS VI.—CAULASTRÆA.—DANA.

Segregato-gemmate, cespitose, with the stems and calicles subcylindrical. Coralla fragile, exterior striate, sometimes denticulate; cell nearly orbicular, broadly excavate; lamellæ unequally exsert, subentire, very numerous.

1. *CAULASTRÆA FURCATA* (*Dana*).—Stems straight, furcating, scarcely undulate, 3 to 5 lines thick; disk of the polyps bright green. Corallum every where obtusely striate, smooth; branchlets 1 to 2 inches long, alive for 4 to 6 lines; calicles often a little tumid, elliptical or orbicular; lamellæ numerous, 1 line exsert, subentire, subequal, usually narrowing upward.

Plate 9, fig. 4, animal unexpanded; 4 *a*, one of the calicles; 4 *b*, transverse section of the same; 4 *c*, an enlarged lamella.—The Feejee Islands, in shallow water on the coral-reefs.—*l xp. Exp.*

2. *CAULASTRÆA DISTORTA* (*Dana*).—Stems contorted, 3 to 5 lines in diameter. Corallum every where striate; branchlets shorter than in the preceding, alive for 3 to 6 lines; calicles often tumid and distorted with the exterior lamello-striæ finely spinulous; lamellæ numerous, subequal, 1 line exsert, their lateral surfaces finely plicate.

Plate 9, fig. 5, corallum, natural size.—Feejee Islands.—*Exp. Exp.*

3. *CAULASTRÆA UNDULATA* (*Dana*).—Hemispherical clumps, stems straight, crowded ($\frac{1}{3}$ of an inch distant), subcylindrical, undulate. Corallum thick, throughout rugately striate and denticulate, calicles $\frac{1}{2}$ an inch broad, sometimes dilated and compressed; lamellæ numerous, triangular, subacute at apex and a little exsert, subdenticulate; cell conical, bottom narrow, and of very open texture.

Plate 9, fig. 6, profile section of calicle.

GENUS VII.—ASTRÆA.—LAMARCK.

Aggregate Astræidæ; disks simple, rarely two or three mouthed; tentacles short. Coralla convex, usually neat hemispherical, rarely erect-gibbous, or glomerato-incrusting; cells excavate, many-rayed, nearly circular, sometimes angular or somewhat lobed; lamellæ extending over the surface between the cells, and usually interrupted at the middle of the septum.

Arrangement of the Species.

SUBGENUS 1. ORBICELLA. Cells nearly circular, more or less prominent, not subdividing by growth, or rarely so; stars with distinct limits formed by the coalescence laterally of the lamellæ, and therefore cells appearing tubular and separated by interstices.

I. *Calicles prominent, cells more than 2 lines broad, lamellæ in adult cell, 36 or 48.*

- | | |
|------------------------|-----------------------|
| 1. A. Orb. radiata. | *5. A. Orb. curta. |
| *2. A. Orb. argus. | 6. A. Orb. rotulosa. |
| *3. A. Orb. glaucopis. | *7. A. Orb. coronata. |
| *4. A. Orb. patula. | |

II. *Calicles more or less prominent, cells less than 2 lines broad, lamellæ in adult cell, 18 or 24.*

- | | |
|--------------------------|-----------------------------|
| *8. A. Orb. hyades. | *13. A. Orb. stelligera. |
| *9. A. Orb. excelsa. | 14. A. Orb. crispata. |
| *10. A. Orb. pleiades. | *15. A. Orb. microphthalma. |
| *11. A. Orb. annularis. | *16. A. Orb. ocellina. |
| *12. A. Orb. stellulata. | |

SUBGENUS 2. SIDERINA. Cells not subdividing by growth, interstices flat, stars with limits along the middle of the interstices, and cells not appearing tubular; lamellæ minute and crowded.

- *17. A. Sid. galaxea.

SUBGENUS 3. FISSICELLA. Cells subdividing by growth and budding.

A. CONVEX OR ROUNDED.

a. Cellules of the stars in a transverse section decompound, lamellæ even.

I. *Calicles prominent.*

- | | |
|-------------------|--------------------|
| *18. A. speciosa. | *21. A. pandanus. |
| 19. A. uva. | *22. A. puteolina. |
| 20. A. ananas. | *23. A. pallida. |

II. *Calicles immersed, ridges somewhat sulcate or entire.*

- | | |
|------------------------|---|
| *24. A. dipsacea. | *30. A. fragilis (cellules sparingly decompound.) |
| *25. A. porcata. | *31. A. tenella. |
| *26. A. flexuosa. | *32. A. magnifica. |
| *27. A. fusco-viridis. | *33. A. filicosa. |
| *28. A. virens. | |
| *29. A. echinata. | |

b. Cellules of the stars in a transverse section scarcely decomposed or not at all so.

I. *Ridges sulcate or entire, lamellæ unequally exert.*

- | | |
|-----------------------------|--------------------------|
| *34. <i>A. versipora.</i> | *37. <i>A. deformis.</i> |
| *35. <i>A. denticulata.</i> | *38. <i>A. varia.</i> |
| *36. <i>A. pectinata.</i> | |

II. *Ridges narrow, entire, nearly naked at summit, lamellæ unequal, but hardly at all exert, cellules of stars sometimes sparingly decomposed.*

- *39. *A. rigida.*

III. *Ridges entire or sulcate, lamellæ even; cells not coronate within, cellules of stars not decomposed or scarcely so.*

- | | |
|----------------------------|--------------------------|
| 40. <i>A. reticularis.</i> | *42. <i>A. purpurea.</i> |
| *41. <i>A. petrosa.</i> | *43. <i>A. pulchra.</i> |

IV. *Ridges entire, lamellæ even, cells coronate within; cellules of stars simple (cells often very regularly polygonal).*

- | | |
|----------------------------|--|
| 44. <i>A. pentagona.</i> | *49. <i>A. parvistella.</i> |
| *45. <i>A. favistella.</i> | *50. <i>A. favulus.</i> |
| *46. <i>A. eximia.</i> | *51. <i>A. cerium.</i> |
| *47. <i>A. sinuosa.</i> | *52. <i>A. intersepta</i> (hardly coronate). |
| 48. <i>A. melicerum.</i> | |

B. ERECT LOBED.

- | | |
|-----------------------------|-------------------------|
| *53. <i>A. abdita.</i> | *55. <i>A. robusta.</i> |
| *54. <i>A. tesserifera.</i> | |

C. UNARRANGED SPECIES.

- | | |
|---------------------------|---------------------------|
| 56. <i>A. complanata.</i> | 59. <i>A. halicora.</i> |
| 57. <i>A. heliopora.</i> | *60. <i>A. cyclostra.</i> |
| 58. <i>A. Hemprichii.</i> | 61. <i>A. favosa.</i> |

SUBGENUS I.—ORBICELLA.

1. *A. ORBICELLA RADIATA* (*Ellis*).—Convex. Corallum with the calicles 1 to 1½ lines distant, cylindrical, 5 to 6 lines broad, rounded at the margin; interstices concave, radiately striate; cells deep; lamellæ narrow.

West Indies.—*Ellis and Solander. Lamarck.*

2. *A. ORBICELLA ARGUS* (*Lamarck*).—Subhemispherical, polyps mostly 5 lines broad, a little prominent, with 48 internal lamellæ. Corallum nearly solid; calicles very short, conical, polygonal, 1 line high, exterior crowdedly and very evenly striate and denticulate; cells circular, 3 lines broad, rather

shallow, broad at bottom; lamellæ thin, denticulate; in a transverse section, stars multiradiate, with the cellules simple; septa nearly solid, with a few linear or $>$ -form cellules.

Plate 10, fig. 1 *a*, transverse section; 1 *b*, vertical section.—West Indies.

3. *A. ORBICELLA GLAUCOPIS* (*Dana*).—Very large, hemispherical; polyps a little prominent, with 48 lamellæ. Corallum subcellular: stars in a transverse section, suborbiculate, 4 to 5 lines broad, finely 24 to 26-rayed, with the cellules simple; septa subcellular; the cellules linear and $>$ -shape, numerous.

Plate 10, fig. 2 *a*, a vertical section; 2 *b*, transverse section; both natural size.—The Feejee Islands.—*Exp. Exp.*

4. *A. ORBICELLA PATULA* (*Dana*).—Very large, hemispherical, dark-umber colored; polyps 6 to 8 lines broad, with the disks radiated with pale gray. Corallum cellular; calicles polygonal, flat conical, or nearly flat, evenly and crowdedly striate without, and denticulate; cells very shallow, not coronate; lamellæ incrassate, spinoso-denticulate: in a transverse section, stars many-rayed, rays thick and nearly contiguous; septa with a few narrow cellules.

Plate 10, fig. 14, part of a corallum with the animals unexpanded; *a*, section showing outline of cells and ridges, and the dentation of the lamellæ; *b*, an enlarged view of the same; *c*, *d*, vertical sections, natural size; *e*, transverse section.—The Feejee Islands.—*Exp. Exp.*

5. *A. ORBICELLA CURTA* (*Dana*).—Convex; polyps a little prominent, 3 to 4 lines broad, with 48 internal lamellæ. Corallum very minutely cellular; calicles short, round, conical, crowdedly and evenly striate and finely denticulate without; cells orbicular, $2\frac{1}{2}$ lines broad, rather deep, subcoronate within; lamellæ almost equally exsert, denticulate: in a transverse section, stars with many rays, and cellules sparingly subdivided; septa usually minutely cellular, with the cellules linear or $>$ -shape.

Plate 10, fig. 3, *a*, enlarged profile view of cell and lamellæ; *b*, enlarged transverse section; *c*, vertical section, natural size.—The Feejee Islands.—*Exp. Exp.*

6. *A. ORBICELLA ROTULOSA* (*Ellis*).—Subglobose, polyps a little prominent, with 36 (?) internal lamellæ. Corallum with the calicles very short cylindrical; lamellæ unequal and very unequally exsert; cells 2 to $2\frac{1}{2}$ lines broad, with a corona of 6 to 8 teeth.

West Indies —*Ellis, Lamarck.*

7. *A. ORBICELLA CORONATA* (*Dana*).—Convex, subglobose; polyps a little prominent, $2\frac{1}{2}$ to 3 lines broad, with 36 internal lamellæ. Corallum subcellular; calicles very short cylindrical with the lamellæ unequal and unequally exsert, numerous; cells 2 lines broad, circular, rather shallow, coronate within

with 10 to 12 minute points: in a transverse section, septa nearly solid, often with delicate cellules, which are sometimes numerous; stars many-rayed, cellules simple.

Plate 10, fig. 4 *a*, part of corallum, natural size; *b*, calicles enlarged; *c*, outline of cell and lamellæ; *d*, vertical section natural size; *e*, transverse section, enlarged; *f*, the same, showing natural size.—Tahiti, and also the Feejee Islands, and Wake's Island, Pacific Ocean.—*Exp. Exp.*

8. *A. ORBICELLA HYADES* (*Dana*).—Convex, erect glomerate and gibbous; polyps scarcely 2 lines broad, with 24 internal lamellæ. Corallum light cellular; cells circular, $1\frac{1}{2}$ lines broad, with the margin annulate as in the *pleiades*; lamellæ very thin; interstices narrow, mostly concave: in a transverse section, stars with 24 rays, septa spongy cellular.

Plate 10, fig. 15, transverse view, natural size.—West Indies.—*Bost. Soc. Nat. Hist.*

9. *A. ORBICELLA EXCELSA* (*Dana*).—Erect glomerate and gibbous, 5 inches high and 2 broad; polyps small (scarcely 2 lines broad), with 24 internal lamellæ. Corallum firm; cells circular, scarcely $1\frac{1}{2}$ lines broad; margin a little prominent, with 24 subequal denticulate lamellæ; interstices usually $\frac{1}{2}$ a line broad: in a transverse section, stars about 24-rayed; septa sparingly cellular, cellules sometimes uniseriate.

Plate 10, fig. 16, transverse view, natural size.—West Indies.—*Bost. Soc. Nat. Hist.*

10. *A. ORBICELLA PLEIADES* (*Ellis*).—Convex; polyps $1\frac{1}{2}$ lines broad, with 24 internal lamellæ. Corallum very light and delicately cellular; cells orbiculate, nearly $1\frac{1}{2}$ lines broad, margin annular and very thin; interstices concave, loose cellular, narrow (about $\frac{1}{3}$ of a line): in a transverse section, lamellæ 12, very thin, the intermediate obsolete.

Plate 10, fig. 5 *a*, transverse section, natural size; 5 *b*, same enlarged; 5 *c*, vertical section, natural size.—East Indies, *Ellis, Lamarck*.—Wake's Island, Pacific Ocean, *Exp. Exp.*

11. *A. ORBICELLA ANNULARIS* (*Lamarck*).—Polyps small ($1\frac{1}{2}$ lines broad), with 24 internal lamellæ. Corallum cellular; cells orbiculate, scarcely over a line broad, 10 to 12 slender rays, and others intermediate obsolete; interstices plano-concave: in a transverse section, septa cellular, with the cellules minute, usually in a single medial series, rarely in two series.

Plate 10, fig. 6, transverse section of corallum, natural size.—West Indies.—*Ellis, Lamarck.*

12. *A. ORBICELLA STELLULATA* (*Ellis*).—Convex and often undulate; polyps $1\frac{1}{2}$ lines broad, disks sometimes budding and dichastic; 24 internal lamellæ. Corallum subcellular; cells orbiculate, 1 line broad, rarely oblong; lamellæ

thin, a little prominent above the septum, and evenly so; interstices usually concave, yet often entire: in a transverse section, septa solid or nearly so, sometimes with cellules interruptedly uniseriate, and occasionally biseriate; stars 10 to 12-rayed, other intermediate rays obsolete.

Plate 10, fig. 7 *a*, transverse section, natural size; *b*, vertical section, do.—West Indies.

13. *A. ORBICELLA STELLIGERA* (*Dana*).—Convex and subgibbous; polyps $1\frac{1}{2}$ lines broad, disks rarely budding and dichastic; 18 internal lamellæ. Corallum subcellular; cells quite small ($\frac{2}{3}$ of a line broad), neatly orbiculate, sometimes oblong and dichastic, rather shallow, within minutely coronate; interstices concave; lamellæ slightly prominent, neatly radiating upon the septum around the cell, abrupt within: in a transverse section, the septa nearly solid, stars few-rayed (6 to 8 larger).

Plate 10, fig. 9, surface of corallum, natural size; 9 *a*, profile of cell and lamellæ; *b*, lamella enlarged; *c*, vertical section, natural size; *d*, transverse do.; 9 *e*, transverse section enlarged.—Feejee Islands.—*Exp. Exp.*

14. *A. ORBICELLA* (?) *CRISPATA* (*Lamarck*).—Corallum incrusting; cells nearly circular, infundibuliform, separated along the ridge, multilamellate; lamellæ denticulate.

Indian Ocean.—*Peron* and *Lesueur*.

15. *A. ORBICELLA MICROPHTHALMA* (*Lamarck*).—Glomerate; greenish fuscous; tentacles whitish, minute; polyps a little prominent, 1 to $1\frac{1}{2}$ lines broad; lamellæ 24. Corallum subcellular, having short globoso-cylindrical calicles, granulato-striate without, often contiguous; cells $\frac{2}{3}$ of a line broad, rather deep; lamellæ minute, usually about 12 somewhat exsert, and 6 a little the most so; interstices very finely granulous: in a transverse section, the septa with few cellules, stars irregularly few-rayed.

Plate 10, fig. 11, surface of corallum, natural size; 11 *a*, animal enlarged; 11 *b*, calicle enlarged; 11 *c*, vertical section enlarged; 11 *c'*, same, natural size; 11 *d*, transverse section, natural size; 11 *e*, same, enlarged.—New Holland Seas, *Peron* and *Lesueur*.—Feejee Islands, *Exp. Exp.*

16. *A. ORBICELLA OCELLINA* (*Dana*).—Glomerate and lobed, often incrusting; polyps scarcely exceeding a line in breadth, lamellæ 24. Corallum with the calicles globoso-cylindrical, as in the *microphtalma*, but smaller, with 12 minute lamellæ equally exsert; interstices nearly naked; cell deep: in a transverse section, septa nearly solid, and stars few-rayed.

Plate 10, fig. 10.—Sandwich Islands.

SUBGENUS II.—SIDERINA.

17. *A. SIDERINA GALAXEA* (*Ellis*).—Incrustating and glomerate, sometimes subglobose. Corallum subcellular; cells immersed, rather deep, mostly $1\frac{1}{2}$ lines broad, lamellæ very narrow, and very minutely denticulate, 6 to 10 a little more prominent than the others; septa plane, scarcely a line broad, very closely and finely lamello-striate: in a transverse section, stars polygonal, mostly 2 lines broad, crowdedly multiradiate, with the centre solid.

Plate 10, fig. 12, surface of corallum natural size; 12 *a*, same, another variety; 12 *b*, transverse section of the variety fig. 12, natural size; 12 *c*, same enlarged; 12 *d*, transverse section of the variety fig. 12 *a*.—West Indies, Martinique. *Lamouroux*.—East Indies, *Lamarck*, *Acad. Nat. Sci. Philad.*

SUBGENUS III.—FISSICELLA.

18. *ASTRÆA SPECIOSA* (*Dana*).—Hemispherical; polyps a little prominent, 4 to 6 lines broad. Corallum light cellular; calicles usually subcylindrical, and 1 to $1\frac{1}{2}$ lines prominent, often somewhat remote, margin neatly rounded; cells deep, abrupt within, and scarcely at all coronate; lamellæ neatly even and denticulate: in a transverse section, stars many-rayed; rays very thin and cellules decompound; septa very cellular.

Plate 11, fig. 1, part of the corallum, natural size; 1 *a*, vertical section of cell, and profile of lamellæ; 1 *b*, lamellæ enlarged; 1 *c*, transverse section of corallum, natural size; 1 *d*, vertical section, natural size.—East Indies.—*Exp. Exp.*

19. *ASTRÆA UVA* (*Esper*).—Polyps prominent and often 9 lines broad. Corallum with the calicles $1\frac{1}{2}$ to 2 lines prominent, subangular and rounded conical, contiguous (and hence the intermediate sulcus subacute); exterior crowdedly lamello-striate and denticulate; cells 4 to 5 lines broad, and often elongated.

China Sea.—*Esper*, from M. Chemnitz.—Red Sea, *Ehrenberg*.

20. *ASTRÆA ANANAS* (*Ellis*).—Subhemispherical; polyps 3 to 5 lines broad. Corallum with rounded or convex calicles, subangular, often oblong, unequal, contiguous; interstices concave; cells 2 to 3 lines broad; lamellæ denticulate.

West Indies.—*Ellis*, *Lamarck*.

21. *ASTRÆA PANDANUS* (*Dana*).—Subglobose, color dark brown; polyps $\frac{1}{2}$ an inch broad. Corallum quite cellular, with rounded calicles (as in the *ananas*), subangular, contiguous, subequal; cells nearly circular, often oblong, 3 to 4 lines broad, rather shallow, obsolete coronate within; lamellæ even, finely denticulate within and without: in a transverse section, septa biserially cellular; stars many-rayed, with the cellules much decompound.

Plate 11, fig. 2, the polyps unexpanded; 2 *a*, a few cells, natural size; 2 *b*, vertical section of cell, with profile of the lamellæ, enlarged; 2 *c*, vertical section of corallum, natural size; 2 *d*, transverse section.—Feejee Islands.—*Exp. Exp.*

22. *ASTRÆA PUTEOLINA* (*Dana*).—Hemispherical; polyps $\frac{1}{2}$ an inch broad. Corallum light cellular; calicles subpolygonal, a little prominent; ridges 2 $\frac{1}{2}$ lines thick, rounded and sulcate; cells deeper than broad, nearly perpendicular, scarcely coronate within; lamellæ even, finely denticulate.

Plate 11, fig. 3, cells of corallum, natural size; 3 *a*, section of cells, showing profile of lamellæ; 3 *b*, vertical section, natural size.—East Indies.—*Exp. Exp.*

23. *ASTRÆA PALLIDA* (*Dana*).—Hemispherical; polyps 6 to 8 lines broad, disk pale bluish-gray, tentacles whitish, the interior bursiform. Corallum open cellular; calicles conico-cylindrical, 1-1 $\frac{1}{2}$ lines high, contiguous, exterior remotely lamello-striate and finely denticulate; cells 5 to 6 lines broad, rather shallow, within coronate; lamellæ thin, narrow above and somewhat unequally exsert, sparingly dentate: in a transverse section, septa with large cellules in 1 or 2 series; stars scarcely multiradiate with the cellules sparingly decompound.

Plate 10, fig. 13, natural size; 13 *a*, tentacles enlarged of the two series; 13 *b*, cells in outline; 13 *c*, vertical section of cell, with profile of lamellæ and ridges; 13 *c'*, same, natural size; 13 *d*, transverse section of corallum; 13 *e*, vertical section of same.—Feejee Islands.—*Exp. Exp.*

24. *ASTRÆA DIPSACEA* (*Lamarck*).—Convex, subhemispherical; polyps often 8 lines broad. Corallum light cellular; cells 4 to 6 lines broad, subangular and often lobed, rather deep, not coronate within; ridges subtruncate and sometimes slightly sulcate; lamellæ thin, lacerato-dentate, not crowded, nearly even: in a transverse section, stars many-rayed with the cellules decompound; septa a line thick, cellular, cellules large and in one or two series.

Plate 11, fig. 4 *a*, vertical section of cell and ridges, showing profile of the lamellæ and internal cellules, natural size; 4 *b*, the same through the longer diameter of an oblong cell; 4 *c*, vertical section of corallum, natural size; 4 *d*, transverse section, natural size.—West Indies.

25. *ASTRÆA PORCATA* (*Esper*).—Convex, subglobose; dark chestnut-brown. Corallum cellular, rather firm; cells 3 to 4 lines broad, rather shallow, short coronate within; ridges nearly flat, obsoletely sulcate, 1 to 2 lines thick; lamellæ even, incrassate, denticulate and very finely so at apex: in a transverse section, stars many-rayed, with the cellules decompound; septa subcellular, cellules minute and scattered.

Plate 11, fig. 5, polyps unexpanded, natural size; 5 *a*, profile of the lamellæ and ridges, natural size; 5 *b*, same, enlarged; 5 *c*, vertical section of corallum, natural size; 5 *d*, transverse section, natural size.—East Indies, *Esper.*—Tongatabu, *Exp. Exp.*

26. *ASTRÆA FLEXUOSA* (*Dana*).—Flexuoso-convex; polyps 6 to 8 lines broad; disks brownish-red, tentacles pale, with the tips yellow. Corallum firm and subcellular; calicles often contorted; cells 4 to 7 lines broad, deep, not coronate within; ridges $1\frac{1}{2}$ to 2 lines thick, undulate, rounded, obsoletely truncate; lamellæ even, crowded, rather stout, denticulate: in a transverse section, stars multiradiate, with the cellules decompose; septa often exceeding $1\frac{1}{2}$ lines, solid, with few cellules.

Plate 11, fig. 6, polyps partly expanded, natural size; 6 *a*, tentacle, enlarged; 6 *b*, another in outline; 6 *c*, view of opening of mouth, enlarged; 6 *d*, profile of cell, ridges and lamellæ; 6 *e*, vertical section of corallum, natural size.—Feejee Islands.—*Exp. Exp.*

27. *ASTRÆA FUSCO-VIRIDIS* (*Quoy & Gaymard*).—Convex; polyps 5 to 7 lines broad, disks bright green, sometimes partly brown. Corallum firm and subcellular; calicles usually oblong; cells 4 to 6 lines broad, rather deep, obsoletely or not at all coronate within; ridges rounded, entire; lamellæ even, crowded, denticulate: in a transverse section, stars many-rayed, with the cellules decompose; septa nearly solid.

Plate 11, fig. 7, animal unexpanded; 7 *a*, another variety enlarged; 7 *b*, vertical section, natural size; 7 *c*, profile of cell, and lamellæ enlarged.—Tongatabu, *Quoy & Gaymard*.—Feejee Islands, *Exp. Exp.*

28. *ASTRÆA VIRENS* (*Dana*).—Convex; whole surface bright green, polyps $\frac{1}{2}$ an inch broad. Corallum cellular, not very firm; cells rather shallow, angular, and often oblong (4 to 6 lines), scarcely coronate within; ridges rounded, entire; lamellæ even, crowded, denticulate, at apex spinoso-denticulate: in a transverse section, stars many-rayed, with the cellules much decompose; septa $\frac{1}{2}$ a line thick, cellules minute and scattered.

Plate 11, fig. 8, polyps unexpanded; 8 *a*, portion of corallum, natural size; 8 *b*, profile of cell and lamellæ, enlarged; 8 *c*, vertical section of corallum, natural size; 8 *d*, transverse section of same.—Feejee Islands.—*Exp. Exp.*

29. *ASTRÆA ECHINATA* (*Dana*).—Convex; brownish-black, surface papillose; polyps 6 to 8 lines broad, disks nearly black. Corallum cellular, surface strongly echinate; cells rather shallow, nearly circular or oblong; 5 lines broad, not distinctly coronate; ridges rounded, not sulcate; lamellæ even, with 3 or 4 small teeth within the cell, and 3 or 4 spines 1 to $1\frac{1}{2}$ lines long over the septum: in a transverse section, stars many-rayed, with the cellules decompose; septa somewhat cellular, cellules oblong and often interruptedly uniseriate.

Plate 12, fig. 1, natural size; 1 *a*, vertical section of corallum and cells, with profile of lamellæ, natural size; 1 *b*, transverse section.—Feejee Islands.—*Exp. Exp.*

30. *ASTRÆA FRAGILIS* (*Dana*).—Subglobose, polyps 4 to 5 lines broad. Corallum light cellular; cells circular or oblong, deep, short coronate within; ridges rounded, slightly sulcate, a line wide; lamellæ even, finely and neatly denticulate, very thin: in a transverse section, stars many-rayed, with the cellules sparingly decompound; septa $\frac{3}{4}$ of a line thick, fragile cellular, cellules usually uniseriate.

Plate 12, fig. 2 *a*, profile of cell, ridges and lamellæ, natural size; 2 *b*, same enlarged; 2 *c*, vertical section of corallum, natural size; 2 *d*, transverse section of the same.—East Indies.—*Exp. Exp.*

31. *ASTRÆA TENELLA* (*Dana*).—Hemispherical; polyps 3 to 5 lines broad. Corallum very light cellular; calicles polygonal often oblong; in a transverse section, stars very slenderly 14 to 16 rayed, with large radiate cellules around the porous centre, and at the margin other small cellules in one or two series; septa delicately filiform.

Plate 13, fig. 1, transverse section of corallum, slightly enlarged (about a sixth); 1 *b*, vertical section of same, natural size.—Wake's Island, Pacific Ocean.—*Exp. Exp.*

32. *ASTRÆA MAGNIFICA* (*Blainville*).—Convex, subhemispherical. Corallum light, cellular; cells often elongated and a little flexuous, 2 to 3 lines broad and sometimes 8 long; angular, deep, short coronate within; ridges narrow, scarcely a line thick, entire, obtuse, perpendicular; lamellæ neatly even, finely and elegantly pectinato-denticulate: in a transverse section, stars many-rayed, with the cellules much decompound; septa $\frac{1}{2}$ a line thick, with large cellules in a single series.

Plate 12, fig. 3 *a*, outline view of cells; 3 *b*, transverse section of corallum, natural size; 3 *c*, vertical section of same.—East Indies.—*Exp. Exp.*

33. *ASTRÆA FILICOSA* (*Dana*).—Corallum quite cellular, yet firm; cells very deep, 5 to 8 lines broad, suborbiculate, perpendicular; ridges and lamellæ narrow: in a transverse section, stars multiradiate, lamellæ stout, cellules decompound; septa somewhat cellular, cellules oblong, mostly in a single interrupted series.

Plate 12, fig. 4, cells of a worn corallum, natural size; 4 *a*, transverse section of corallum, natural size; 4 *b*, vertical section of same.—Wake's Island, Pacific Ocean.—*Exp. Exp.*

34. *ASTRÆA VERSIPORA* (*Lamarck*).—Subglobose. Corallum cellular, firm, surface rough; cells deeper than broad, subangular, and often oblong (4 to 6 lines), subcoronate within; ridges sulcate; lamellæ unequal and unequally exsert, roughly denticulate, narrow, vertical.

Plate 12, fig. 5 *a*, profile of cells, ridges and lamellæ, natural size; 5 *b*, transverse section of corallum, natural size.—East Indies, *Lamarck*.—Red Sea, *Ehrenberg*.

35. *ASTRÆA DENTICULATA* (*Ellis*).—Subglobose. Corallum cellular; cells somewhat circular, half an inch wide, rather shallow, coronate within; ridges slightly sulcate; lamellæ unequal and unequally exsert, vertical, subtruncate at apex.

Plate 12, fig. 6, outline view of a cell, natural size; 6 *a*, profile of cell and lamellæ; 6 *b*, transverse section of corallum, natural size; 6 *c*, vertical section of the same.—East Indies.—Pacific Ocean.—*Exp. Exp.*

36. *ASTRÆA PECTINATA* (*H. & Ehrenberg*).—Subglobose; brown. Corallum with the cells 3 to 6 lines long, often oblong and flexuous, deep, coronate within; ridges scarcely sulcate; lamellæ with the inner margin vertical, truncate at apex, rough.

Red Sea.—*Ehrenberg*.

37. *ASTRÆA DEFORMIS* (*Lamarck*).—Subglobose. Corallum with the cells 4 to 6 lines long, angular, sometimes oblong and irregular; ridges narrow, entire; lamellæ alternate, asperate, truncate, exsert.

Indian Ocean? *Lamarck*.—Red Sea, *Ehrenberg*.

38. *ASTRÆA VARIA* (*Dana*).—Hemispherical, polyps mostly 3 lines broad, disks sometimes 2 or 3 mouthed. Corallum light cellular; cells angular, deep or rather so, ridges and lamellæ triangular and nearly acute above; lamellæ thin, unequal and unequally exsert, fine denticulate; septa scarcely half a line thick.

Plate 12, figs. 13 *a*, 13 *b*, sections of cells of different varieties, giving profile of lamellæ.—West Indies.

39. *ASTRÆA RIGIDA* (*Dana*).—Subglobose; polyps 6 to 10 lines broad. Corallum firm; cells angular, 5 lines broad, and sometimes 8 to 10 long, often lobed, not coronate within; ridges thin, entire, and naked at summit; lamellæ dentate, very unequal, not crowded: in a transverse section, septa solid or with rarely a cellule, a line broad; stars hardly many-rayed, cellules large, and sparingly decompound.

Plate 12, fig. 8 *a*, section of cell and ridges, showing profile of lamellæ, natural size; 8 *b*, a cell bisected; 8 *c*, size and form of cells on surface of corallum; 8 *d*, transverse section, natural size.—West Indies.

40. *ASTRÆA RETICULARIS* (*Lamarck*).—Subglobose. Corallum with the cells angular, often oblong and subflexuous, deep, radiate from the centre; ridges nearly naked, smooth at apex.

Plate 12, fig. 9 *a*, section of cells and ridges, with the lamellæ, natural size; 9 *b*, size and form of cells; 9 *c*, transverse section of corallum.—West Indies?

41. *ASTRÆA PETROSA* (*Dana*).—Convex. Corallum subcellular, firm: in a transverse section, the stars orbiculate, commonly oblong, $1\frac{1}{2}$ to 3 lines broad, and $1\frac{1}{2}$ to 5 lines long, many-rayed, rays very thin, with the cellules simple; septa a line thick and quite solid.

Plate 12, fig. 12 *a*, transverse section of corallum, natural size; 12 *b*, vertical section of same.

42. *ASTRÆA PURPUREA* (*Dana*).—Hemispherical; polyps half an inch broad, disks bright-green, tentacles numerous, purple. Corallum subcellular, firm; cells angular, rather shallow; 4 to 5 lines broad, not coronate within; ridges triangular, very delicately sulcate; lamellæ crowded, even, very finely denticulate, nearly entire, and but slightly prominent at apex: in a transverse section, stars nearly circular, many-rayed, cellules simple, very narrow; septa solid, cellules rare and very minute.

Plate 12, fig. 10, natural size; 10 *a*, cells, do.; 10 *b*, profile of cell and lamellæ, enlarged; 10 *b'*, same, natural size; 10 *c*, vertical section, enlarged; 10 *d*, same, natural size; 10 *e*, transverse section, enlarged four diameters, from a part of the corallum where the cells were small.—Feejee Islands.—*Exp. Exp.*

43. *ASTRÆA PULCHRA* (*Dana*).—Convex; umber-colored, top of ridges pale, tentacles brown. Corallum subsolid, firm; cells angular, unequal, mostly 3 to 4 lines broad, rather shallow, not coronate within; ridges triangular, entire, lamellæ even, crowded, thin, nearly entire, but little prominent over the septum: in a transverse section, stars many-rayed, with the cellules simple: septa quite solid: in a vertical section cellules under the star very minute.

Plate 12, fig. 11, polyps partly expanded, natural size; 11 *a*, polyp enlarged; 11 *b*, section of cells, showing outline of lamellæ, enlarged two diameters; 11 *c*, same, natural size; 11 *d*, vertical section of corallum, enlarged; 11 *e*, same, natural size; 11 *f*, transverse section of corallum, enlarged three diameters.—Feejee Islands.—*Exp. Exp.*

44. *ASTRÆA PENTAGONA* (*Esper*,) *Ehrenberg*.—Semiglobose. Corallum with the cells angular, usually pentagonal, $4\frac{1}{2}$ to 5 lines broad, unequal, sometimes oblong, neatly coronate within, a columnar appendage at centre; ridges narrow, obtuse, or subacute.—East Indies.—*Esper*.

45. *ASTRÆA FAVISTELLA* (*Dana*).—Subhemispherical. Corallum cellular, rather light; cells neatly angular, rather shallow, mostly 3 to 4 lines broad, coronate within; ridges about a line thick, entire, Gothic, subacute; lamellæ subentire and very even, abrupt within: in a transverse section, stars scarcely many-rayed, with the cellules simple; septa not half a line thick, with very minute cellules, uniseriate, sometimes obsolete.

Plate 13, fig. 2, cells of corallum, natural size; 2*a*, 2*b*, sections of cells; 2*c*, transverse section of corallum, natural size; 2*d*, vertical section of same, natural size.—Feejee Islands.—*Exp. Exp.*

46. *ASTRÆA EXIMIA* (*Dana*).—Convex. Corallum cellular, firm; cells very neatly polygonal, mostly about 2 lines broad, rather deep, coronate within; ridges about half a line wide, abrupt, acute, lamellæ very narrow, subentire, not at all exsert: in a transverse section, septa scarcely $\frac{1}{2}$ a line thick, solid, stars many-rayed, with simple, deep, cellules.

Plate 13, fig. 4*a*, section of cells and ridges, showing profile of lamellæ; 4*b*, size and form of cells; 4*c*, transverse section of corallum, natural size; 4*d*, vertical section, natural size.—Pacific Ocean.—*Exp. Exp.*

47. *ASTRÆA SINUOSA* (*Dana*).—Convex. Corallum subcellular; cells subangular, hardly 2 lines broad, sometimes lobed and flexuous and 6 lines long, rather deep, crowdedly coronate within, ridges rounded, 1 to $1\frac{1}{2}$ lines thick, abrupt, entire; lamellæ even, subentire: in a transverse section, stars scarcely many-rayed, with the cellules simple; septa $\frac{1}{2}$ a line thick and nearly solid.

Plate 13, fig. 5, cells of corallum, natural size; 5*a*, section of cells and ridges, showing profile of lamellæ, natural size; 5*b*, transverse section of corallum; 5*c*, vertical section of same.—Feejee Islands.—*Exp. Exp.*

48. *ASTRÆA MELICERUM* (*Ehrenberg*).—Effuse, 3 lines high, allied to the *pentagona*. Corallum with the cells $2\frac{1}{2}$ lines broad, columella none, interstices a little broader, subtruncate.

49. *ASTRÆA PARVISTELLA* (*Dana*).—Convex. Corallum cellular; cells angular, a line broad, rarely oblong, shallow, distinctly coronate within; ridges scarcely $\frac{1}{2}$ a line thick, rounded; lamellæ minute, even: in a transverse section, stars scarcely many-rayed, with the cellules simple; septa nearly solid, scarcely $\frac{1}{2}$ of a line thick: texture below the cells coarsely cellular.

Plate 13, fig. 6, cells of corallum, natural size; 6*a*, transverse section of corallum, enlarged; 6*b*, same, natural size; 6*c*, vertical section, natural size.—Feejee Islands.—*Exp. Exp.*

50. *ASTRÆA FAVULUS* (*Dana*).—Convex. Corallum somewhat cellular, cells 1 line broad, angular, occasionally 3 lines long, rather deep, obsoletely coronate within; ridges scarcely a line thick, Gothic, or rounded, abrupt, entire; lamellæ nearly equal, subentire: in a transverse section, stars scarcely many-rayed, with the cellules simple; septa scarcely $\frac{1}{2}$ a line thick, nearly solid, with occasional minute cellules: texture below the cells very minutely cellular.

Plate 13, fig. 7, cells of corallum, natural size; 7*a*, section of cells and ridges, showing also profile of lamellæ; 7*b*, transverse section of corallum, natural size; 7*c*, vertical section of the same.—Feejee Islands.—*Exp. Exp.*

51. *ASTRÆA CERIUM* (*Dana*).—Corallum subcellular, firm; cells angular, $1\frac{1}{2}$ lines broad; ridges quite narrow: in a transverse section, stars scarcely multiradiate (about 12 larger rays) with simple open cellules; septa solid, nearly $\frac{1}{2}$ a line thick: in a vertical section, cellules nearly equal, $\frac{1}{2}$ a line broad, and septa linear and solid.

Plate 13, fig. 8.—Wake's Island, Pacific Ocean.—*Exp. Exp.*

52. *ASTRÆA INTERSEPTA* (*Eesper*).—Convex; disks often budding and dichastic. Corallum cellular, firm; cells minute, nearly circular, less than a line broad, rather shallow, scarcely cornate within; ridges flat, sometimes duplicate, lamello-scabrous; lamellæ a little exsert and radiate around the cells upon the septum, truncate at apex, fragile, abrupt within: in a transverse section, stars few-rayed, with the cellules simple; septa $\frac{1}{2}$ to $\frac{1}{3}$ of a line thick, subcellular, cellules interruptedly in a single series.

Plate 13, fig. 12, surface of corallum, natural size; 12*a*, cells enlarged; 12*b*, lamellæ and section of cell, natural size; 12*c*, lamellæ enlarged; 12*d*, transverse section enlarged; 12*e*, vertical section, natural size.—East Indies.—*Exp. Exp.*

53. *ASTRÆA ABDITA* (*Ellis*).—Glomerate, gibbous or lobato-ramose and angular. Corallum with angular cells, 4 to 6 lines wide, shallow, patulous; ridges acute and often thin; lamellæ crenulato-dentate.
East Indies.

54. *ASTRÆA TESSERIFERA* (*H. & Ehrenberg*).—Glomerate, erect, lobed and polygonal; fuscous. Corallum cellular, rather light; cells angular, 5–6 lines broad, shallow, patulous, not coronate within; ridges rather stout and triangular, apical thin and often pellucid; lamellæ strongly denticulate: in a transverse section, stars multiradiate, septa nearly solid.

Plate 13, fig. 9*a, b, c*, sections of cells, natural size; showing profile of lamellæ; 9*d*, transverse section of corallum, natural size.—Red Sea.—*Ehrenberg*.

55. *ASTRÆA ROBUSTA* (*Dana*).—Lobed glomerate, lobes ascending and polygonal, as in the *tesserifera*. Corallum firm and little cellular; cells 4 to 6 lines broad, angular, shallow, patulous, short coronate within; ridges triangular; lamellæ narrow, spinoso-denticulate: in a transverse section, stars multiradiate, and rays closely crowded, with minute cellules; septa nearly solid.

Plate 13, fig. 10, part of corallum, natural size; 10*a*, section of cells, showing profile of lamellæ; 10*b*, the same enlarged; 10*c*, transverse section of corallum, natural size; 10*d*, vertical section of same.—Féejee Islands.—*Exp. Exp.*

56. *ASTRÆA COMPLANATA* (*H. & Ehrenberg*).—Effuse; brown. Corallum pulvinate, spinulous; cells large, $4\frac{1}{2}$ to 5 lines broad, nearly circular, plane; interstices narrow, depressed, every where obsolescent.

The Red Sea.—*Ehrenberg*.

57. *ASTRÆA HELIOPORA* (*Lamarck*).—Planulate. Corallum with the cells circular, rather large, many-rayed, the lamellæ separated along the ridges between the cells, incrassate above and without; centre papillose.

The "Austral Seas."—*Lamarck*.

58. *ASTRÆA HEMPRICHII* (*Ehrenberg*).—Corallum with the cells unequal, 5 to 5½ lines broad, pentagonal or hexagonal, rather shallow; interstices acutely cristate; lamellæ strongly denticulate.

The Red Sea.—*Ehrenberg*.

59. *ASTRÆA HALICORA* (*Ehrenberg*).—Globose. Corallum, with cells 3½ lines broad, often pentagonal, somewhat shallow, lamellæ of contiguous stars somewhat continuous, sometimes alternate, interstices none.

The Red Sea.

60. *ASTRÆA CYCLASTRA* (*Dana*).—Flexuoso-convex, polyps 3 to 5 lines broad. Corallum cellular, cells circular, margin a little prominent and ridges usually sulcate: in a transverse section, stars many-rayed (24-30), rays thin, with the cellules sparingly decompound; septa ½ to 1 line thick, cellular along the middle, cellules in 1 or 2 series.

61. *ASTRÆA FAVOSA* (*Lamarck*).—Subglobose. Corallum with the cells rather large, unequal, angular, margin subacute, sides lamellose, lamellæ dentate.

East Indies.

GENUS VIII.—MEANDRINA.—LAMARCK.

Aggregate Astræidæ; disks seriatly budding and remotely or not dichastic, and hence linear, sinuous; tentacles forming a series along either margin of the linear disk. Coralla, with trench-like, gyrose, cells; lamellæ thin, prolonged out of the cell to the middle of the septum or beyond. (Gyri not exceeding half an inch in breadth.)

A. CONVEX, HEMISPHERICAL, NOT GIBBOUS OR LOBATO-RAMOSE.

a. Septa at apex subacute or acute.

I. *Gyri short*.

1. *MEANDRINA DEDALEA* (*Ellis*).—Hemispherical; with the submeandering disks short, seldom over an inch long; gyri 3 lines broad. Corallum with the fossæ 3 lines deep, ridges acute-triangular; lamellæ much unequal and unequally exsert, eroso-denticulate; septa scarcely ½ a line thick at base.

Plate 14, figs. 12 *a*, 12 *b*, sections of cells, of a specimen from the Feejees, showing profile of lamellæ, natural size; 12 *c*, vertical section of the corallum, natural size.—East Indies. Feejee Islands.—*Exp. Exp.*

2. *MEANDRINA SPONGIOSA* (*Dana*).—Globose or hemispherical; disks sometimes quite simple, but usually linear and subgyrose; gyri 3 to 4 lines broad, and rarely 2 inches long. Corallum very light cellular; ridges triangular; fossæ deep; septa thin, but also often inflated; lamellæ rather distant, subacute at apex, subequal, very thin, delicately eroso-denticulate.

Plate 14, fig. 17 *a*, section of fossæ and profile of lamellæ.—West Indies?—*Bost. Soc. Nat. Hist.*

II. *Gyri very long.*

3. *MEANDRINA LABYRINTHICA* (*Ellis*).—Hemispherical; linear disks very long and gyrose; gyri 3 to 4 lines broad. Corallum subcellular, firm; ridges triangular, subacute, nearly naked at top; septa very slightly turgid; lamellæ nearly even, denticulate, somewhat dilatate at base: in a transverse section, septa solid, with rarely a cellule, scarcely 1 line thick.

Plate 14, fig. 1, section of fossæ and profile of lamellæ.—The West Indies and Bermudas. The Red Sea, *Ehrenberg*.

4. *MEANDRINA STRIGOSA* (*Dana*).—Hemispherical; linear disks very long, gyrose; gyri evenly $2\frac{1}{2}$ lines broad. Corallum cellular and rather light; bottom of trench convoluto-porous: in a transverse section, septa filiform, hardly $\frac{1}{3}$ of a line thick; lamellæ equal, very thin, numerous.

Plate 14, fig. 4 *a*, transverse section of corallum, natural size; 4 *b*, vertical section of same.—West Indies?

5. *MEANDRINA INTERRUPTA* (*Dana*).—Surface convex and undulate; linear disks rather long (some very short and others long), often lobed and subgyrose, gyri $2-2\frac{3}{4}$ lines broad, somewhat unequal. Corallum firm; fossæ porous at bottom: in a transverse section, septa irregular, nearly a line thick, solid; lamellæ quite thin, alternately large and small, crowded, the smaller obsolescent.

Plate 14, fig. 18, transverse section of corallum.—West Indies.

6. *MEANDRINA RUSTICA* (*Dana*).—Hemispherical; linear disks not long, gyrose; gyri $2\frac{1}{2}$ to 3 lines broad. Corallum cellular, firm; fossæ at bottom subcellular: in a transverse section, septa $\frac{3}{4}$ of a line thick, lamellæ rather stout, equal.

Plate 14, fig. 5 *a*, transverse section of corallum, natural size; 5 *b*, vertical section of same.—Wake's Island, Pacific Ocean.—*Exp. Exp.*

7. *MEANDRINA VALIDA* (*Dana*).—Subhemispherical; gyri tortuous and tortuously lobed, 3 to 4 lines broad. Corallum cellular, firm; septa somewhat

cellular at middle, subacute, nearly triangular, $\frac{1}{4}$ of an inch high, and $\frac{1}{8}$ thick at base; lamellæ quite thin.

Plate 14, fig. 11 *a*, worn surface, natural size; 11 *b*, outline of fossæ, do.

8. *MEANDRINA PHRYGIA* (Ellis,) *Lamarck*.—Subhemispherical; linear disks long, straight or flexuous in different parts; gyri 2 to $2\frac{1}{2}$ lines broad. Corallum cellular, firm; ridges nearly triangular; lamellæ subacute, eroso-denticulate, remote, very unequal, the intermediate smaller lamellæ obsolescent; fossæ triangular, lamello-linear at bottom, and not porous, with the longitudinal lamella interrupted and somewhat crispate: in a transverse section, septa $\frac{1}{8}$ of a line thick.

Plate 14, fig. 8, surface of corallum, natural size; 8 *a*, section of same, showing profile of lamellæ; 8 *b*, vertical section.—East Indies. Ceylon.—*Rev. G. A. Aphthorp*.

9. *MEANDRINA GRACILIS* (Dana).—Convex; linear disks long, straight or tortuous (as in the *phrygia*); gyri nearly 2 lines broad. Corallum cellular, rather firm; ridges Gothic, abrupt, a line high; lamellæ finely eroso-denticulate, equal or nearly so, numerous, but little exsert; fossæ very narrow, lamello-linear at bottom and not porous: in a transverse section, septa $\frac{3}{4}$ to 1 line broad, subcellular.

Plate 14, fig. 6, surface of corallum, natural size; 6 *a*, section of same, showing profile of lamellæ; 6 *b*, transverse section of same, natural size.—Feejee Islands.—*Exp. Exp.*

10. *MEANDRINA TENUIS* (Dana).—Subhemispherical; linear disks tortuous, of a green color; tentacles small, brownish; gyri $1\frac{1}{2}$ lines broad. Corallum very cellular, rather light; ridges Gothic, abrupt, a line high; fossæ very narrow, lamello-lineate at bottom instead of porous; lamellæ numerous, even, finely denticulate: in a transverse section, septa hardly $\frac{1}{8}$ of a line thick, serriately cellular.

Plate 12, fig. 7, enlarged view of part of the zoophyte; 7 *a*, one of the tentacles enlarged; 7 *b*, section of cells showing profile of lamellæ, natural size; 7 *c*, lamellæ of same, enlarged; 7 *d*, transverse section of corallum, natural size.—Feejee Islands, *Exp. Exp.*—Tongatabu, *Quoy & Gaynard*.

11. *MEANDRINA FILOGRANA* (Esper,) *Dana*.—Convex or nearly flat; linear disks subtortuous; gyri $1\frac{1}{2}$ lines broad. Corallum with the ridges rounded, triangular, nearly a line high; lamellæ very finely denticulate, and very much crowded; fossæ repand, at bottom convolute-porous.

Plate 14, fig. 9.—West Indies.

b. Septa stout, and truncate at apex.

12. *MEANDRINA CEREBRIFORMIS* (*Lamarck*).—Hemispherical; linear disks very long and tortuous; gyri 5 lines broad. Corallum cellular, firm; ridges 3

lines broad, perpendicular, somewhat rounded and obtusely sulcate above; septa $\frac{1}{2}$ of an inch thick at apex; lamellæ numerous, denticulate, thin: in a transverse section, septa subcellular.

Plate 14, fig. 2, section of trenches and ridges, showing also profile of lamellæ.—Bermudas and West Indies.

13. *MEANDRINA TRUNCATA* (*Dana*).—Hemispherical; linear disks long and tortuous; gyri 4 to 5 lines broad. Corallum subcellular, firm; septa at apex truncate and full $\frac{1}{2}$ of an inch thick, solid; fossæ a little broader, narrow-linear at bottom.

Plate 14, fig. 3, section of cells and ridges of worn specimen, natural size; 3a, worn surface.

B. GIBBOUS OR CYLINDRICAL.

14. *MEANDRINA MAMMOSA* (*Dana*).—Gibbous and coarsely mammillary, effuse; linear disks tortuous; gyri $\frac{1}{2}$ of an inch broad. Corallum with the ridges triangular, subacute and nearly naked at apex; septa stout and solid; lamellæ thin, subentire; fossæ 2 to 3 lines deep.

Plate 14, fig. 10, section of trench and ridges; 10a, outline sketch of surface of corallum.

15. *MEANDRINA CYLINDRUS* (*Dendrogyra cylindrus*, *Ehrenberg*).—Cylindrical, erect. Corallum with the ridges convex, obtuse, often narrower than a line, 2 to 3 lines distant, lamellæ stout, unequal, somewhat inflated, the alternate larger.

16. *MEANDRINA CAUDEX* (*D. caudex*, *Ehrenberg*).—Erect stout, cylindrical. Corallum with the ridges dilatate, flat, lamellæ stout, few, a little prominent, the alternate larger, fossæ a line broad.

GENUS IX.—MONTICULARIA.—LAMARCK.

Aggregate Astræidæ; disks seriatly and reticulately budding, and not dichastic, with no interstices between the polyps, but small cones, around which the tentacles are arranged. Coralla cellular; cells none, surface covered with small lamello-radiate cones.

1. *MONTICULARIA MICROCONA* (*Lamarck*).—Convex, subhemispherical; disks ash-colored, tentacles numerous, pale brown. Corallum cellular; conelets small, nearly equal, usually obsoletely compressed; lamellæ finely serrulate.

Plate 13, fig. 13a, enlarged view of the surface of the corallum; 13b, enlarged view of the live zoophyte; 13c, transverse section of corallum, enlarged;

13*d*, vertical section, enlarged; 13*e*, polyps injured, and part of the white cords and lamellæ extruded; 13*f*, the same extruded from the mouth.—East Indies and Pacific Ocean. Feejee Islands.—*Exp. Exp.*

2. *MONTICULARIA LOBATA* (*Lamarck*).—Incrusting and prominently gibbous or gibboso-lobate, with the lobes erect, $\frac{3}{4}$ to 2 inches thick, and nearly flat at top. Corallum light cellular; conelets crowded, unequal, compressed, especially so over the apex, where they are nearly 2 lines high; lamellæ subserrulate.

East Indies.

3. *MONTICULARIA POLYGONATA* (*Lamarck*).—Glomerato-lobate, subramose. Corallum with the conelets crowded, compressed, unequal; lamellæ serrulate. Japan.

GENUS X.—PHYLLASTRÆA.—DANA.

Explanate Astræidæ, foliaceous; polyps prominent and opening upward. Coralla striated, scarcely echinulate; calicles large and laterally attached to the folia.

PHYLLASTRÆA TUBIFEX (*Dana*).—Foliaceous, erect, unifacial, often laterally revolute and united by the vertical margins, thus forming large tubes; fuscous, disks bright-green, tentacles numerous. Corallum thin, margin fragile; surface vertically striate, striæ coarse, unequal, and scabrous; calicles very prominent, $\frac{1}{2}$ of an inch broad, opening upward; lamellæ few and stout, often distorted.

Plate 16, fig. 4, the zoophyte, natural size, with the polyps unexpanded; 4*a*, enlarged view of polyp, partly expanded; 4*b*, cells and surface of corallum, natural size.—Feejee Islands.—*Exp. Exp.*

GENUS XI.—MERULINA.—EHRENBERG.

Thin explanate or cumulato-ramose; polyps very small, disks usually budding seriatly (as in the *Meandrina*), the disks and ridges therefore linear, venosely furcate, or reticulate. Coralla nearly solid; lamellæ quite small, oblique.

I. *Explanate Merulina*.

1. *MERULINA AMPLIATA* (*Lamarck*), *Ehrenberg*.—Broad explanate, variously undulate and with the margin lobed, unifacial. Corallum with the ridges rounded, scarcely a line high, often reticulately coalescent and enclosing oblique cells; lamellæ even, serrulate.

Plate 15, fig. 2, cells and ridges, enlarged; 2 *a*, lamellæ of surface, enlarged.—East Indies.—*Exp. Exp.*

2. *MERULINA REGALIS* (*Dana*).—Broad explanate, unifacial, variously lobed and plicate, and forming a broad open hemispherical clump; folia 3 to 6 inches broad; umber-colored, disks greenish, tentacles minute, forming a series along the margin of the disk. Corallum with the ridges narrow, nearly 1 line high; lamellæ lax.

Plate 15, fig. 1, outline sketch of part of the corallum, natural size; 1 *a*, part of the live zoophyte; 1 *b*, enlarged view, showing the tentacles; 1 *c*, view of the cells and the ridges enlarged; 1 *d*, 1 *e*, lamellæ enlarged.—Feejee Islands.—*Exp. Exp.*

3. *MERULINA SPECIOSA* (*Dana*).—Very thin explanate, unifacial; folia aggregated, and crowdedly implicate, 1-3 inches broad, very much crispate, often crenato-lobate. Corallum with the ridges $\frac{1}{2}$ a line high, sometimes obsolete, lamellæ minute and crowded.

Plate 16, fig. 1, part of corallum, natural size.—Feejee Islands.—*Exp. Exp.*

4. *MERULINA CRISPA* (*Dana*).—Very thin explanate; folia crispate and every where coalescing, small, sublaciniate, the inner bifacial. Corallum with the ridges and lamellæ lax, uneven, and very rough.

Sooloo Sea, East Indies.—*Exp. Exp.*

5. *MERULINA FOLIUM* (*Lamarck*,) *Dana*.—Thin explanate, somewhat concave, with broad rounded lobes. Corallum below, faint radiato-striate; above, the surface covered with unequal cones, diminishing and obsolescent at the margin.

East Indies.—*Lamarck*.

II. *Ramose Merulina*.

6. *MERULINA SCABRICULA* (*Dana*).—Ramosa, branches subdivaricate, often coalescing, $\frac{1}{3}$ of an inch thick; color yellowish-umber, greenish; tentacles minute. Corallum with the branches subangular, and obsoletely compressed, truncate at apex, lamellæ crowded, and not becoming more lax at apex, transverse, even, scabrosely serrulate; ridges short, oblique, obtuse.

Plate 16, fig. 2, view of corallum; 2 *a*, view of the animals, enlarged; 2 *b*, transverse section of branch, enlarged.—Feejee Islands.—*Exp. Exp.*

7. *MERULINA LAXA* (*Dana*).—Ramosa, branches divaricate, often coalescent, with the branches angular, often alate and compressed, $1\frac{1}{2}$ to 3 lines thick, sometimes $\frac{1}{2}$ an inch broad and subpalmate; ridges small, acute, sometimes elongato-conical; lamellæ lax, very oblique and ascending, much more lax at apex.

Plate 16, fig. 3, corallum, natural size.—Sooloo Sea, East Indies.—*Exp. Exp.*

8. *MERULINA RIGIDA* (Dana).—Very much ramose, branches proliferous and sometimes coalescent, 3 to 6 lines thick, covered with small contiguous cones; branchlets attenuate, often curved; animals like those of the *Monticularia*. Corallum with small lamello-radiate cones, which are unequal and scarcely compressed at apex of branchlets, lax and attenuated; lamellæ granulous.

Plate 17, fig. 1, corallum, natural size; 1 a, one of the conelets, enlarged; 1 b, animals, enlarged; 1 c, part of a transverse section of stem, enlarged.—Feejee Islands.—*Exp. Exp.*

GENUS XII.—ECHINOPORA.—LAMARCK.

Explanate or cumulato-ramose; polyps a little prominent, placed perpendicularly with the surface of the zoophyte; the margin and not the disks widening by growth in budding (as in the *Orbicellæ*). Coralla striate and echinulaté, nearly solid; calicles convex, echinulate.

1. *ECHINOPORA UNDULATA* (Dana).—Foliaceous, erect, bifacial, undulate. Corallum very thin, on each surface fine striate and spinuloso-asperate, with scattered cells scarcely tumid, 6 to 8 rayed.

Plate 17, fig. 3, corallum, natural size; 3 a, cell of the same.—Sooloo Sea, East Indies.—*Exp. Exp.*

2. *ECHINOPORA ROSULARIA* (Lamarck).—Explanato-foliaceous, suborbiculate, unifacial. Corallum above striato-asperate, calicles echinate, below striate.

New Holland Seas.—*Peron* and *Lesueur*.

3. *ECHINOPORA RINGENS* (Lamarck,) *Blainville*.—Subturbinata, lobed. Corallum with irregular cells, subconfluent, sinuous, contiguous; margin thick, convex.

West Indies?—*Lamarck*.

4. *ECHINOPORA REFLEXA* (Dana).—Foliaceous, unifacial; folia suberect, sides reflexed and often coalescing by the margin (thus forming tubes); color, umber; mouth quite small; tentacles none, except the minute tubercles over the spines. Corallum above finely spinuloso-striate; calicles spinulous, tumid, rather more than $\frac{1}{2}$ of an inch broad; large lamellæ 10 to 15, denticulate; outer surface, near the margin only, obsoletely fine striate.

Plate 17, fig. 2, corallum, natural size; 2 a, animal enlarged; 2 b, transverse section of a folium, enlarged.—Feejee Islands.—*Exp. Exp.*

5. *ECHINOPORA ASPERA* (Ellis,) *Dana*.—Explanate, partly incrusting, margin thin and undulate; sometimes gibbous above and cumulato-subramose;

polyps large, $\frac{1}{4}$ to $\frac{1}{2}$ an inch broad. Corallum above coarsely lamello-striate and strongly spinoso-dentate; calicles 3 to 6 lines broad, somewhat prominent, occasionally hemispherical, often wholly immersed.

East Indies.

6. *ECHINOPORA HORRIDA* (*Dana*).—Ramosé, branches crowded, tortuous, sometimes coalescing; umber-colored, without tentacles, but with small scattered elongate tubercles. Corallum with the branches $\frac{2}{3}$ — $\frac{1}{2}$ of an inch thick, branchlets rudely attenuate and apex often lacinate and alate; calicles tumid, 2 lines broad, echinate; cells 15 to 18 rayed; interstices between cells scarcely striate, but mostly with scattered spines.

Plate 17, fig. 4, corallum, natural size; 4 *a*, animal enlarged; 4 *b*, transverse section, enlarged; 4 *c*, enlarged cell.—Feejee Islands.—*Exp. Exp.*

FAMILY III.—FUNGIDÆ.

Astræacea having depressed animals, either quite simple, or aggregato-gemmate; disks without circumscribed limits, and in aggregate species, all every way confluent, without interstices; tentacles short, scattered, sometimes obsolete, and when contracted, not covered. Coralla without true cells; surface lamello-striate, and usually stellately so, stars not circumscribed; in aggregate coralla, the lamellæ extending uninterruptedly from centre to centre.

The generic divisions of this group, depend on the mode of growth and budding, and may be distinguished as follows:

Arrangement of the genera of Fungidæ.

I. *Free—not budding; a central oririme above.*

1. *FUNGIA*. Corallum lamello-radiate above, tuberculato-radiate below.
2. *CYCLOLITES*. Corallum lamello-radiate above, concentric lines of growth below.

II. *Free—explanato-gemmate.*

3. *HERPETOLITHUS*. A continuous medial line of large polyps, with others smaller, scattered either side; a distinct circle of tentacles to each polyp-mouth. Corallum with a long medial trench (compound oririme); surface consisting of short denticulate lamellæ scarcely at all radiate, half an inch to an inch long, none extending from the centre to the circumference.

4. HALOMITRA. Polyps all scattered; a distinct circle of tentacles to each polyp-mouth(?). Corallum without a medial trench; lamellæ nearly as in the preceding, but more radiate and coarsely toothed.

5. POLYPHYLLIA. Polyps all scattered, or an imperfect medial series; a single tentacle to each lamella, and not a separate circle to each polyp-mouth. Corallum without a proper medial trench; surface consisting of short denticulate lamellæ less than half an inch long, imperfectly or not at all radiate.

6. ZOOPILUS. Polyps all scattered. Corallum without a medial trench, surface consisting of long lamellæ, with thinner lamellæ intermediate; only the latter interrupted by oririmes and short, the polyp-mouths being situated in the intervals between the large lamellæ.

III. Budding; attached.

7. PAVONIA. Foliaceous, unifacial or bifacial, sometimes glomerate or subramose; polyps not in distinct series, or imperfectly so. Coralla compact, surface plane or without parallel ridges; no excavate cells, lamellæ distinct, and nearly or quite entire.

8. AGARICIA. Foliaceous, unifacial or bifacial; polyps in more or less perfectly transverse series. Coralla with transverse ridges and fossæ, sometimes consisting of coalescent excavate cells, and irregular; lamellæ alternately smaller, nearly or quite entire.

9. PSAMMOCORA. Bifacial and foliaceous, or glomerate and columnar. Coralla with or without large excavate cells; lamellæ equal, and very minutely ragged-denticulate and granulous, indistinct.

I. Free Fungidæ, not gemmate.

GENUS I.—FUNGIA.—LAMARCK.

Free Fungidæ, not budding, hence quite simple; orbicular or elliptic, sometimes conical. Mouth oblong. Tentacles scattered. Coralla with the upper surface and to some extent the under surface lamello-radiate, the latter tuberculate.

a. Orbicular, but little elliptic.

1. FUNGIA CYCLOLITES, (*Lamarck*).—Small, orbicular or subelliptical, mouth oblong; convex above and concave below. Corallum below very finely radiate; above, with the lamellæ unequal, crenulate, lateral surface rough.

Austral Seas.—*Peron* and *Lesueur*. *Lamarck*.

2. FUNGIA TENUIS (*Dana*).—Small, orbicular, nearly flat, and undulate, 1½ to 2 lines thick. Corallum thin and fragile, margin subacute, lamellæ very

thin, very finely denticulate, unequal: below very minutely radiato-striate, and a little scabrous.

Plate 18, fig. 1, outline of a vertical section, natural size.—Pacific Ocean, and probably the Paumotu Archipelago.—*Exp. Exp.*

3. *FUNGIA GLANS* (*Dana*).—Small, orbicular, high conoido-rotundate, $1\frac{1}{2}$ inches broad and as much in height, below neatly concave; very stout at middle. Corallum with crowded lamellæ, very finely denticulate: under surface very delicately striate and minutely scabrous.

Plate 18, fig. 2, outline of a vertical section, natural size.

4. *FUNGIA DISCUS* (*Dana*).—Orbicular, a little undulate, on both sides nearly flat. Corallum with thin lamellæ, unequal, denticulate, the intermediate crenulate, then entire, and bearing a single obtuse tooth, and afterwards becoming one of the larger lamellæ, and again crenulate or denticulate; below radiately lamello-striate and spinous, but about the middle, the striæ obsolete, and the spines acute and very minute.

Plate 18, fig. 3, outline of lamellæ, with the tentacular tooth.—Tahiti, Society Islands.—*Exp. Exp.*

5. *FUNGIA AGARICIFORMIS* (*Lamarck*).—Large, orbicular, either nearly flat or much convex, often a little undulate; tentacles $\frac{1}{3}$ of an inch long. Corallum with the lamellæ finely denticulate, thin, unequal, tentacular tooth obsolete; below, lamello-striate, striæ spinose, subequal, and about the centre, spines not in series, papilliform, minute, and sometimes obsolescent.

Plate 18, fig. 5, outline of a lamella, above and below.—The East Indies. Singapore and Sooloo Sea, *Exp. Exp.*—Red Sea, *Forsk.*

Var. *tenuifolia*, from Tahiti.—Pl. 18, fig. 6.

6. *FUNGIA DENTATA* (*Dana*).—Large, often hemispherical, and deeply concave below. Corallum with unequal lamellæ, unevenly dentate; teeth small and subacute, with usually acute intervals; below, coarsely and every where equally crowded echinate, the spines, in adult specimens, often acervate, and nearly 2 lines long, over the middle scarcely smaller, and not radiate.

Plate 18, fig. 7, outline of a lamella, above and below, showing a profile of a section of the corallum.—East Indies.—*Exp. Exp.*

7. *FUNGIA ECHINATA* (*Esper*,) *Dana*.—Large, orbiculate, often undulate, and sometimes convex; umber-colored, tentacles bursiform, whitish, scarcely 3 lines long. Corallum with unequal lamellæ, inciso-dentate; teeth oblong, irregular, often compound; below, remotely lamello-radiate and coarsely echinate, with other smaller spines intermediate, partly seriate.

Plate 18, fig. 9, the animal expanded; 9a, a tentacle enlarged, with the animal integument broken through, as often happens, over the points or teeth of the lamellæ; 9b, profile section of the corallum, showing outline of lamella; fig. 8, the same of another variety.—E. Indies, and the Feejees.—*Exp. Exp.*

8. *FUNGIA REPANDA* (*Dana*).—Large, suborbiculate, convex, and sometimes nearly flat; umber-colored, tentacles whitish, minute. Corallum with stout lamellæ, dentate, teeth short and not oblong nor crowded, often repand-dentate; below crowdedly radiate and coarsely papillose, papillæ stout and rounded, and about the middle not seriate, crowded and smaller.

Plate 19, fig. 1, animal expanded; 1*a*, profile of section, showing outline of lamellæ; 2, outline of a specimen from the Sooloo Sea; 3, a large specimen from the Feejees.—Feejee Islands and the East Indies.—*Exp. Exp.*

9. *FUNGIA INTEGRATA* (*Dana*).—Large, orbicular. Corallum with unequal lamellæ, obsolete denticulate; below, remotely and unequally radiate, coarsely echinate, spines often clustered, minute over a small space at the centre.

Plate 19, fig. 4.

10. *FUNGIA CONFERTIFOLIA* (*Dana*).—Large, suborbicular, convex, below a little concave. Corallum with the lamellæ crowded, subequal, undulate, dentate, or subrepando-dentate; teeth short and subacute, tentacular teeth obsolete: below somewhat lamello-radiate, rays crowded and coarsely echinate, about the middle less crowded.

Plate 19, fig. 5.—Feejee Islands.—*Exp. Exp.*

11. *FUNGIA HORRIDA* (*Dana*).—Orbiculate, nearly flat. Corallum with the lamellæ very unequal, remote, very coarsely eroso-dentate: below, remotely lamello-radiate, and strongly echinate.

Plate 19, fig. 7.—Feejee Islands.—*Exp. Exp.*

12. *FUNGIA ACTINIFORMIS* (*Quoy & Gaymard*).—Orbiculate, convex, below nearly flat; tentacles long, cylindrical, fuscous, with yellowish tips. Corallum with subequal lobato-dentate lamellæ; below lamello-striate, with the striæ finely denticulate.

Island of Cocos.—*Quoy & Gaymard*.

13. *FUNGIA CRASSITENTACULATA* (*Quoy & Gaymard*).—Orbiculate, flat; tentacles conical, stout, greenish-yellow at tip. Corallum with unequal lamellæ, strongly lobato-dentate, the larger alternate; below, regularly striate.

Island of Vanicoro, Pacific Ocean.—*Quoy & Gaymard*.

14. *FUNGIA PAUMOTENSIS* (*Stutchbury*).—Small, neatly elliptic (2 inches by 1½), somewhat convex; below flat or undulate. Corallum with equal even lamellæ, much crowded, nearly entire or very finely denticulate; below finely striate and very minutely spinulous, nearly smooth at middle.

Plate 19, fig. 8, animal, drawn by J. P. Couthouy; 8*a*, outline of corallum; 9, supposed to be corallum of a young individual.

The Paumotu Islands, Pacific Ocean.—*Exp. Exp.*

15. *FUNGIA DENTIGERA* (*Leuckart*).—Elliptical or oblong-ovate, convex above, concave below. Corallum with the lamellæ unequal, gently flexuous, very delicately serrulate, tentacular tooth large and prominent: below radiately echinulate, with the teeth crowded, slender, and obtuse.

Plate 18, fig. 4, a lamella with the tentacular teeth of other lamellæ projecting above it.—Red Sea. *Rüppell*.—Sandwich Islands.

16. *FUNGIA SCUTARIA* (*Lamarck*).—Oblong-elliptic ($7\frac{1}{2}$ inches by 4), nearly flat on both sides. Corallum with the lamellæ subequal, a little undulate, subentire, or obsoletely crenulate; oririme nearly half as long as the corallum; tentacular teeth obsolete: below, crowdedly and evenly papillose; papillæ small rounded, scarcely $\frac{1}{2}$ a line long.

Plate 19, fig. 10, outline of a section; 10 *a*, form of the disk.—East Indies.—*Exp. Exp.*

17. *FUNGIA PECTINATA* (*Ehrenberg*).—Oblong-elliptic, flat on both sides. Corallum with the lamellæ rudely dentate, oririme continued quite to each extremity.

Indian Ocean (?).—*Ehrenberg*.

18. *FUNGIA EHRENBERGII* (*Leuckart*), *Dana*.—Large, oblong-elliptic, sometimes narrower at the middle, below concave. Corallum with the lamellæ coarsely dentate, teeth rounded at apex, and intervals usually subacute, granulous; oririme extending nearly to each extremity: below, crowdedly echinate.

Plate 19, fig. 11.—East Indies.—*Exp. Exp.*

19. *FUNGIA ASPERATA* (*Dana*).—Large, oblong-elliptical, length three times the breadth; below, concave or nearly plane. Corallum with the medial oririme a little more than half its length; lamellæ rudely and spinosely incisedentate.

Red Sea.—*Ehrenberg*.

20. *FUNGIA RÜPPELLII* (*Leuckart*), *Dana*.—Large, much elongate, twice as long as broad, convex, below concave. Corallum with unequal lamellæ, rough on both surfaces; denticulate, denticles unequal, usually lacerate, sometimes subtruncate; oririme continued nearly to each margin, undivided: below, echinate.

Indian Ocean.—*Leuckart*.

21. *FUNGIA CRASSA* (*Dana*).—Large, much elongate, full twice as long as broad, strongly convex and laterally compressed; below deeply concave. Corallum very stout, lamellæ coarsely dentate, not granulous, teeth rounded, often $1\frac{1}{2}$ to 2 lines broad, oririme 4 to 5 parted; below very crowdedly echinate.

Plate 19, fig. 13.—Feejee Islands.—*Exp. Exp.*

GENUS II.—CYCLOLITES.—LAMARCK.

Free Fungidæ, not budding, and therefore quite simple; mouth central. Coralla above, with a depression (oririme) at centre, and surface radiated with lamellæ; below, concentrically striate, naked.

II. *Free explanato-gemmate Fungidæ.*

GENUS III.—HERPETOLITHUS.—ESCHSCHOLTZ.

Free Fungidæ, budding and explanate; a single medial series of large polyps, and others scattered, each with a separate circle of tentacles, which are quite short or obsolete. Coralla elongate, with a deep medial compound oririme, and others simple scattered; lamellæ interrupted at the scattered oririmes, and hence short (not less than half an inch), scarcely at all radiate, denticulate; under surface echinate.

1. HERPETOLITHUS LIMACINUS (*Lamarck*,) *Eschscholtz*.—Narrow oblong, nearly flat or convex. Corallum with the lamellæ lax, rarely an inch long, not radiating.

Plate 20, fig. 2, profile of vertical section; 2a, form of corallum; 2, b, c, d, outline of lamellæ.—East Indies.—*Exp. Exp.*

2. HERPETOLITHUS INTERRUPTUS (*Ehrenberg*,) *Leuckart*.—Oblong, convex, and below concave. Corallum with unequal lamellæ, fasciculately interrupted, the medial oririme not in the middle.

3. HERPETOLITHUS FOLIOSUS (*Ehrenberg*,) *Leuckart*.—Oblong, convex, below concave. Corallum with a medial compound oririme, and a lateral series on either side.

4. HERPETOLITHUS STELLARIS (*Ehrenberg*,) *Leuckart*.—Oblong. Corallum radiate, stellate; medial oririme very narrow, lamellæ interrupted, not distinctly fasciculate.

5. HERPETOLITHUS STRICTUS (*Dana*).—Narrow oblong, thick, attenuate at either extremity, convex; below concave or nearly flat. Corallum with thin fragile lamellæ, closely crowded, not radiate, very minutely denticulate; the medial oririme continued quite to each extremity.

Plate 21, fig. 1, profile of vertical cross section.—Tahiti, Society Islands. *Exp. Exp.*

6. *HERPETOLITHUS CRASSUS* (*Dana*).—Narrow oblong, very stout, (at margin and at middle $1\frac{1}{4}$ to $1\frac{1}{2}$ inches thick,) broadly rounded at each extremity, much convex, and below concave; color umber, tentacles very short, bright green. Corallum with the lamellæ much crowded, not radiate; spines below stout.

Plate 20, fig. 5, zoophyte expanded, natural size; 5*a*, profile of section of corallum; 5*c*, outline of a lamella; 5*b*, a marginal lamella.—Feejee Islands.—*Exp. Exp.*

GENUS IV.—HALOMITRA.—DANA.

Free Fungidæ, budding and explanate; polyps throughout scattered (each with a separate circle of large tentacles?). Coralla convex, oririmes large, every where scattered; lamellæ short and stout (not less than half an inch), coarsely dentate, radiate; under surface echinate.

HALOMITRA PILEUS (*Lamarck*), *Dana*.—Very large, hemispherico-conical. Corallum $\frac{3}{8}$ to $1\frac{1}{4}$ inches thick, lamellæ stout, strongly inciso-dentate, usually $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long (nearly $1\frac{1}{4}$ at the margin); under surface stoutly and very crowdedly radiately echinate.

Plate 21, fig. 2, cross section; 2*a*, outline of lamellæ; 2*b*, another variety.—East Indies and Pacific. The Feejees.—*Exp. Exp.*

GENUS V.—POLYPHYLLIA.—QUOY & GAYMARD.

Free Fungidæ, budding and explanate; polyps equal and throughout scattered, rarely remotely seriate along the medial line, crowded, with mouth and tentacles every where interspersed. Coralla with very short lamellæ (less than half an inch long), denticulate, scattered or imperfectly radiate; oririmes scattered, sometimes indistinct.

I. *A medial interrupted series of oririmes.*

1. *POLYPHYLLIA TALPA* (*Blainville*).—Narrow oblong, convex, below concave. Corallum $\frac{3}{4}$ of an inch thick, oririmes quite distinct, often obliquely substellate, the medial seriate; lamellæ short, mostly about $\frac{1}{2}$ of an inch, but the marginal $\frac{3}{8}$ of an inch, long.

Plate 21, fig. 5*a*, lamellæ as they radiate from one side of an oririme; 5*b*, *c*, outline of lamellæ; 5*d*, marginal lamella.—East Indies.—*Lamarck*.

2. *POLYPHYLLIA LEPTOPHYLLA* (*Ehrenberg*).—Narrow oblong, above convex, and below concave, extremities rounded. Corallum $\frac{3}{4}$ of an inch thick, oririmes very distinct and deep, often substellate, the medial seriate; lamellæ quite short ($1\frac{1}{2}$ to 2 lines), much prominent, very slenderly denticulate and fragile, the marginal, 2 to 3 lines long.

Plate 20, fig. 6a, form of the corallum; 6b, c, outline of lamellæ.

3. *POLYPHYLLIA SIGMOIDES* (*Ehrenberg*).—Narrow oblong, curving slightly like the letter S, attenuate towards both extremities. Corallum with the lamellæ subsolitary, thinner and shorter than in the *talpa*; medial oririmes seriate.

4. *POLYPHYLLIA PELVIS* (*Quoy & Gaymard*).—Somewhat oblong, convex, below concave; tentacles brownish-red, white at tip. Corallum thin, fragile; lamellæ unequal, denticulate, granulous; in large specimens the medial oririmes subseriate.

Port Carteret, New Holland, and also Vanikoro.—*Quoy & Gaymard*.

II. *Oririmes very conspicuous, no medial series.*

5. *POLYPHYLLIA FUNGIA* (*Dana*).—Circular, convex, and below concave; polyps throughout scattered. Corallum rather stout (4 to 6 lines thick); oririmes deep, 1 to $1\frac{1}{2}$ lines broad; lamellæ not radiate, very prominent and thin, inciso-denticulate, 3 to 5 lines long, and those of the margin 6 to 12 lines; below crowdedly and throughout radiately echinulate.

III. *Oririmes indistinct, no medial series.*

6. *POLYPHYLLIA PILEIFORMIS* (*Dana*).—Very large, nearly hemispherical or cap-shape, at top very broadly rounded; young specimens broad dish-shape. Corallum thin ($\frac{1}{3}$ of an inch), fragile; lamellæ every where solitary, 2 to 3 lines long; no distinct oririmes in any part.

Plate 21, fig. 4, lamellæ, natural size.—Feejee Islands.—*Exp. Exp.*

7. *POLYPHYLLIA GALERIFORMIS* (*Dana*).—P. conico-hemispherical, cap-shape, with the top narrow; young specimens inverted neat cup-shape, hemispherical. Corallum quite thin ($\frac{1}{4}$ of an inch), and fragile; lamellæ every where solitary; $1\frac{1}{2}$ to 2 lines long; no distinct oririmes in any part.

Plate 21, fig. 3, zoophyte expanded; 3a, lamellæ, natural size; 3b, same, enlarged.—Feejee Islands.—*Exp. Exp.*

GENUS VI.—ZOOPIILUS.—DANA.

Free Fungidæ, budding and explanate; polyps every where scattered, mouths radiately seriate. Coralla with the larger la-

mellæ radiately prolonged quite to the margin, the intermediate much smaller, and these alone interrupted by the oririmes.

ZOOPILUS ECHINATUS (*Dana*).—Cap-shape or inverted dish-shape. Corallum thin ($\frac{1}{2}$ inch), fragile, larger lamellæ $\frac{1}{3}$ of an inch distant, strongly dentate, teeth narrow, unequal, and granulous at apex, the intermediate lamellæ very thin, much crowded, denticulate; oririmes not very distinct, about $\frac{1}{2}$ an inch apart.

Plate 21, fig. 6, corallum, natural size; 6 a, outline of part of a section.—Feejee Islands.—*Exp. Exp.*

III. *Attached Fungidæ, gemmate.*

GENUS VII.—PAVONIA.—LAMARCK.

Attached Fungidæ, budding; explanate, glomerate or subramose; polyps obsolescently tentaculate, scattered, rarely transversely subseriate. Coralla having the surface plane and stellate, and not plicate; oririmes distinct, but cells none; lamellæ nearly or quite entire, the alternate somewhat smaller.

I. *Unifacial, hypocrateriform.*

1. *PAVONIA EXPLANULATA* (*Lamarck*), *Dana*.—Hypocrateriform, often distorted and lobed when large, attached below at centre. Corallum $\frac{1}{2}$ to $\frac{1}{3}$ an inch thick, lamellæ crowded, subequal, the larger alternate, laciniato-denticulate; oririmes remotely scattered, often 2 lines long; under surface echinulostriate and porous.

East Indies.—*Exp. Exp.*

II. *Unifacial, foliaceous.*

2. *PAVONIA CRISPA* (*Ehrenberg*), *Dana*.—Small ($1\frac{1}{2}$ inches), foliaceous, hemispherical, fronds 4 lines broad, distorted, rounded at apex. Corallum with crowded oririmes on the under surface, scarcely a line broad.

3. *PAVONIA PAPYRACEA* (*Dana*).—Small, foliaceous, fronds solitary, erect, strongly crispate, very thin (scarcely $\frac{1}{3}$ of a line thick), multilobate. Corallum papyraceous, lamellæ very delicate, a little prominent near the oririmes; oririmes few and remote, $1\frac{1}{2}$ lines broad; under surface obsolete striate, very slightly scabrous.

Plate 22, fig. 3, corallum, natural size.—The Sooloo Sea.—*Exp. Exp.*

4. *PAVONIA ELEPHANTOTUS* (*Pallas*), *Dana*.—P. foliaceous, cespitose; folia thin, broadly crispate, sometimes lacerate and proliferously extended. Coral-

lum with the oririmes remote, large; lamellæ thin and delicate, not crowded, denticulate; under surface striate.

East Indies.—*Esper*.

III. *Bifacial, folia crispate.*

5. *PAVONIA CACTUS* (*Ehrenberg*).—Erect and lobed, lobes foliaceous, crispate, with the margin rounded, crenulate, often excised; polyps green, tentacles obsolete. Corallum with the oririmes half a line broad, series united by a slight trench, subconcentric, separated by ridges not quite obsolete; lamellæ minute, arenoso-asperate, obsoletely denticulate.

Red Sea.—*Ehrenberg*.

6. *PAVONIA PRÆTORTA* (*Dana*).—Cespitoso-hemispherical; folia bifacial, delicate, and lobato-subdivided, every where strongly crispate and contorted. Corallum with the folia quite thin, (below, 1 to 1½ lines,) at the margin, nearly like paper in thickness; oririmes minute (scarcely ¼ a line), mostly in imperfect transverse series, with the interstices scarcely at all convex; lamellæ very delicate and crowded, the alternate but little smaller.

Plate 22, fig. 5, part of a clump, natural size; 5a, a separate folium.—Tahiti, Society Islands.—*Exp. Exp.*

7. *PAVONIA FORMOSA* (*Dana*).—Cespitoso-hemispherical; folia thin, bifacial, lobato-subdivided, curved and broadly subcrispate. Corallum with the folia thin, (below, 1½ to 2 lines thick,) at the margin usually acute; oririmes ¼ a line long, often transversely seriate, with the interstices a little convex, and 1 to 1½ lines broad; lamellæ very delicate, much crowded, the alternate scarcely smaller.

Plate 24, fig. 2, part of a hemispherical clump, natural size.—Tahiti, Society Islands.—*Exp. Exp.*

8. *PAVONIA VENUSTA* (*Dana*).—Cespitoso-hemispherical; folia thin, bifacial, lobato-subdivided, curved and strongly crispate. Coralla with the folia thinner than in the *formosa*; oririmes quite small, often exceeding a little half a line; interstices throughout flat, often 2½ lines in breadth; lamellæ very delicate, the alternate much smaller.

9. *PAVONIA DIVARICATA* (*Lamarck*).—Cespitose, plano-hemispherical; folia bifacial, very much subdivided, lobes carinato-angular, and flexuoso-divaricate, crowded and stout, ¼ to ½ an inch broad. Corallum with the lamellæ rather crowded, oririmes often a line long.

Plate 22, fig. 6, natural size.—Indian Ocean, *Lamarck*.—Feejee Islands, *Exp. Exp.*

10. *PAVONIA BOLETIFORMIS* (*Lamarck*).—Subhemispherical; folia bifacial, thin, undulate or somewhat crispate, lobed, lobes rarely exceeding an inch in

breadth, with the margin acute and usually sinuous. Corallum with the surface even and not carinate; lamellæ lax; oririmes often $1\frac{1}{2}$ lines long.

Plate 22, fig. 7, a single leaf of the corallum, natural size.—East Indies. Sooloo Sea.—*Exp. Exp.*

IV. *Bifacial, folia planulate.*

11. PAVONIA FRONDIFERA (*Lamarck*).—Subhemispherical; folia bifacial, lobed; lobes 1 to 3 inches broad (usually $1\frac{1}{2}$ inches), and $1\frac{1}{2}$ lines thick, flat and not crispate; rounded at apex, often vertically coalescent and intersecting one another; margin acute, thin. Corallum with the surface vertically carinate; lamellæ crowded, oririmes scarcely a line long, rarely seriate.

The "Austral Seas," *Peron & Lesueur*.—The Feejees and Singapore, *Exp. Exp.*

12. PAVONIA DECUSSATA (*Dana*).—Subhemispherical, folia bifacial, rather thin, broadly lobed ($\frac{1}{2}$ to 4 inches), planulate and erect, often transversely coalescent or intersecting one another (decussately aggregated): color umber, polyps with the tentacles obsolete, bright green. Corallum rather fragile, with the surface obsoletely carinate; lamellæ lax; oririmes $1\frac{1}{2}$ lines long, subseriate.

Plate 22, fig. 4, corallum, natural size; 4 a, animals, enlarged; 4 b, section of a plate.—Feejee Islands.—*Exp. Exp.*

13. PAVONIA LATA (*Dana*).—Very large, folia a foot broad, planulate or slightly undulate; margin thin and sparingly lobed, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch thick at base. Corallum with the margin fragile and surface not at all carinate; lamellæ lax; oririmes a line and a half long, and rarely in transverse series.

Plate 23, fig. 1, outline view of corallum; 1 a, part of the surface, natural size.—Feejee Islands.—*Exp. Exp.*

14. PAVONIA CRASSA (*Dana*).—Very large, folia 6 to 9 inches broad, very stout, nearly flat or somewhat undulate or curved, few-lobed, erect and decussately aggregated, margin usually acute. Corallum firm, margin not fragile, surface not carinate; lamellæ crowded; oririmes scarcely oblong, sometimes subseriate.

Plate 23, fig. 2, corallum, natural size; 2 a, surface of same, magnified; also, plate 24, 1, 1 a, another variety.—Feejee Islands and Singapore.—*Exp. Exp.*

III. *Glomerate.*

15. PAVONIA SIDEREA (*Ellis & Solander*), *Dana*.—Subglobose. Corallum with the oririmes 3 to 4 lines distant, interstices scarcely elevated; lamellæ denticulate.

West Indies?

16. PAVONIA LATISTELLA (*Dana*).—Incrusting, nearly flat. Corallum with the oririmes nearly $\frac{1}{2}$ an inch distant, interstices flat; lamellæ entire, undulate.

Port Carteret, New Ireland.—*Quoy & Gaymard*.

17. *PAVONIA CLAVUS* (*Dana*).—Erect cylindrical, 1 to 3 inches in diameter, sometimes a little compressed, rounded at apex, occasionally lobato-furcate; tentacles obsolete, bright green. Corallum with the oririmes 1 to $1\frac{1}{2}$ lines distant, and smaller at apex; lamellæ entire.

Plate 24, fig. 4, corallum, natural size; 4 *a*, animal, enlarged; 4 *b*, star of corallum, magnified.—Feejee Islands.—*Exp. Exp.*

GENUS VIII.—AGARICIA.—LAMARCK.

Attached Fungidæ, oblique or erect explanate, unifacial or bifacial; polyps transversely seriate with the outer side prominent; sometimes subseriate with the parts around each mouth elevated; hence the mouths are arranged either at the bottom of transverse fossæ or of cells. Coralla transversely or reticulately colliculate; lamellæ minute, subentire, crowded, alternately smaller.

SUBGENUS I.—UNDARIA.

Transversely colliculate; no excavate cells in any part; oririmes minute and arranged along the bottom of the fossæ.

1. *AGARICIA UNDATA* (*Ellis*), *Lamarck*.—Very broad explanate, and often plano-subcucullate, scarcely lobed, margin thin and not revolute; ridges long and rather even, mostly $\frac{1}{2}$ of an inch broad, rotundato-triangular, becoming obsolete at the margin.

Plate 21, fig. 8, surface of corallum, natural size.—West Indies.

2. *AGARICIA RUGOSA* (*Lamarck*).—Broad explanate, stout, sparingly incisoblate, and sometimes wide subpalmate, margin strongly reflexed; ridges large, often interrupted and very unequal, 2 to 3 lines thick at base, with the summits often much prolonged; polyps reddish-brown, tentacles obsolete.

Plate 22, fig. 1, part of corallum, natural size; 1 *a*, the animals enlarged; 1 *b*, longitudinal cross-section, enlarged; 1 *c*, transverse, do.—“Austral Seas,” *Peron & Lesueur*.—Feejee Islands, *Exp. Exp.*

3. *AGARICIA SPECIOSA* (*Dana*).—Cucullato-explanate; subreniform, thin, margin not reflexed; ridges prominent, narrow (1 to $1\frac{1}{2}$ lines), subtriangular, nearly even. Corallum with the margin fragile, and under surface very finely striate.

Plate 21, fig. 7, corallum, natural size.—East Indies.—*Exp. Exp.*

4. *AGARICIA LEVICOLLIS* (*Dana*).—Broad explanate, a little undulate, thin ($1\frac{1}{2}$ to 3 lines); ridges elongate, nearly obsolete, narrow (1 to $1\frac{1}{2}$ lines). Corallum with the oririmes seriate, indistinct; under surface finely striate.

Plate 22, fig. 2, part of corallum, natural size.—East Indies.—*Exp. Exp.*

5. *AGARICIA PLANULATA* (*Dana*).—Broad explanate, attached by a point on the under surface; thin ($1\frac{1}{2}$ lines); polyps either seriate or scattered. Corallum with obsolete interstitial ridges, or with polygonal cells nearly superficial, and 1 to 2 lines broad; under surface concentrically and radiately faint plicate, striæ very fine and a little divergent.

SUBGENUS II.—MYCEDIA.

Surface with transverse or reticulate ridges; fossæ sometimes long and even, but usually consisting of separate excavate cells, clustered or seriate (cells sometimes distinct only along the fossæ near the margin). Coralla very compact.

I. *Unifacial*.

6. *A. MYCEDIA CUCULLATA* (*Ellis*), *Oken*.—Unifacial, stipitate, subturbin ate; fronds often convoluted and coalescing at base; above concave, with transverse ridges subflexuous and irregular, and frequent deep cells interspersed. Corallum very firm and compact, below very finely striate.

West Indies.

7. *A. MYCEDIA PURPUREA* (*Lesueur*).—Foliaceous, unifacial, for the most part incrusting, concave above and undulate, with deep cells arranged either in series or irregularly grouped, and the surface therefore irregularly or reticulately colliculate; polyps with the tentacles obsolete; lip yellowish, and disks with yellow rays. Corallum with the margin acute; below finely striate and concentrically undulate.

St. Thomas, West Indies.—*Lesueur*.

8. *A. MYCEDIA FRAGILIS* (*Dana*).—Unifacial, stipitate, broadly explanate, and somewhat hypocateriform, very thin; polyps small, mostly in series, which are separated by even ridges $1\frac{1}{2}$ lines broad. Corallum with the margin subpapyraceous, and, for a considerable breadth, translucent and quite fragile; fossæ scarcely $\frac{3}{4}$ of a line deep, and often near the margin composed of seriate calicles; cells (oririmes) $\frac{3}{4}$ of a line broad; under surface very finely striate and concentrically undulate.

West Indies.—*Bost. Soc. Nat. Hist.*

II. *Glomerate, but explanate at base*.

9. *A. MYCEDIA GIBBOSA* (*Dana*).—Coarse gibboso-glomerate and angular, below broad planulate, sparingly undulate, and stipitate at centre; polyps often

reticulately subseriate, but generally scattered; surface reticulate with ridges which are triangular and nearly acute; fossæ short, 1 to 3 lines broad, and the larger often reticulate at bottom. Corallum below very finely striate.

Barbadoes, West Indies.

III. *Foliaceous, bifacial.*

10. A. MYCEDIA AGARICITES.—Bifacial and erect, fronds often aggregated, stout, semicircular in outline; polyps transversely seriate; ridges transverse, subacute, often flexuous, fossæ $1\frac{1}{2}$ lines broad and 1 deep. Corallum firm and compact.

West Indies.

11. A. MYCEDIA CRISTATA (*Lamarck*).—Bifacial and erect; fronds long and deeply lobed, lobes rounded, cristate; polyps subseriate and often scattered; ridges sometimes transverse, but generally sinuous and reticulate, subacute or obtuse, and including cells 2 to $2\frac{1}{2}$ lines broad.

West Indies.

GENUS IX.—PSAMMOCORA.—DANA.

Attached Fungidæ, glomerate or ramose; tentacles of polyps obsolete, polyps not seriate; interstices sometimes flat, usually throughout turgidly elevated, the surface, then, consisting of excavate cells. Coralla porous; oririmes minute; lamellæ very minute, often indistinct, and very minutely arenoso-denticulate, often irregular, not alternately smaller.

I. *Cespitose.*

1. PSAMMOCORA OBTUSANGULA (*Lamarck*), *Dana*.—In subhemispherical tufts, very closely branched; branches flexuoso-plicate, many-lobed, lobes short and obtuse. Corallum with the oririmes distinct, circular, $\frac{1}{3}$ of a line broad, stars sometimes a little depressed, no where seriate.

Indian Ocean?—*Lamarck*.

2. PSAMMOCORA PPLICATA (*Dana*).—Cespitose, plano-convex, crowdedly ramose, branches $\frac{1}{4}$ to $\frac{3}{4}$ of an inch broad, flexuous and flexuoso-plicate, often coalescing below, obtuse; polyps umber-colored, tentacles obsolete, greenish-white. Corallum with very minute oririmes, scarcely visible, often arranged in longitudinal series; stars hardly distinguishable, not at all depressed.

Plate 25, fig. 2, corallum, natural size; 2a, animals enlarged; 2b, surface enlarged.—Feejee Islands.—*Exp. Exp.*

II. *Glomerate.*

3. *PSAMMOCORA FOSSATA* (*Dana*).—Subcylindrical, 5 inches thick, surface nearly even, plano-rotund at top; surface with cells often an inch long and meandering, and containing 6 polyp-mouths, others simple, $1\frac{1}{2}$ lines deep, and $1\frac{1}{2}$ to 2 lines broad; ridges rounded.

Plate 26, fig. 2, outline view of corallum; 2*a*, surface of the same, natural size.—Feejee Islands.—*Exp. Exp.*

4. *PSAMMOCORA COLUMNA* (*Dana*).—Erect, very stout, subdivided above, lobes erect and crowded, compressed-cylindrical, truncate at apex, 1 to 3 inches broad, surface even, with deep cells, subangular, sometimes lobed, a line broad, sometimes 3 lines long (and then containing 3 polyps); ridges round.

Plate 25, fig. 1, corallum, natural size; 1*a*, cell; 1*b*, sectional view.—Feejee Islands.—*Exp. Exp.*

5. *PSAMMOCORA EXESA* (*Dana*).—Erect, very stout, subdividing above, lobes erect and crowded, subcylindrical, 1 to 3 inches thick, surface uneven and often gibbous, apex rounded or subtruncate; cells $1\frac{1}{2}$ lines broad, irregular, nearly superficial, often imperfectly diffluent, ridges obsolescent; color purplish-brown, tentacles none.

Plate 26, fig. 1, corallum, natural size; 1*a*, animals enlarged; 1*b*, a cell magnified; 1*c*, sectional view of interior.—Feejee Islands.—*Exp. Exp.*

TRIBE II.—CARYOPHYLLACEA.

Actinaria with numerous tentacles, in two or more series. Mostly gemmiparous; gemmation inferior, the polyps not widening at summit. Generally coralligenous; coralla calcareous, cells many-rayed, surface between the cells in aggregate coralla, rarely obsolete lamello-striate, or not at all so.

FAMILY I.—CYATHOPHYLLIDÆ.

Caryophyllacea forming calcareous coralla. Gemmate, with the buds inferior, either lateral or growing upward from the summits. Corallum of a polyp usually transversely or obliquely

septate at middle, the coral secretions forming at base seriatly or interruptedly.

I. THE TRANSVERSE SEPTA STRAIGHT OR A LITTLE OBLIQUE, SOMETIMES OBSOLETE.

GENUS I.—CYATHOPHYLLUM.

Quite simple, ramose or glomerate. Corallum within transversely septate; cells concave, regularly stellate; numerous intermediate dissepiments uniting the lamellæ, and the outer portions of the corallum of a polyp consequently angularly cellular.

GENUS II.—CALOPHYLLUM.—DANA.

Quite simple, caliculato-ramose or aggregate. Corallum within transversely septate, cells simply concave, regularly stellate; no intermediate dissepiments between the lamellæ, and the sides of the corallum, therefore, not cellular.

GENUS III.—AMPLEXUS.—SOWERBY.

Cyathophyllidæ with the stems subcylindrical, slightly uneven. Corallum within transversely septate, septa very broad and nearly straight, extending quite to the sides; cells many-rayed.

GENUS IV.—CANINIA.—MICHELIN.

Quite simple or aggregato-gemmate. Corallum within transversely septate; cells concave; one or more rays of the star, on one side, obsolete, and the transverse septa beneath this part having a funnel-shaped depression; general texture like that of the *Calophylla*.

GENUS V.—ACERVULARIA.—SCHWEIGGER.

Ramose or aggregate. Corallum imperfectly transverse-septate, or not at all so; cells at summit acervately proliferous.

GENUS VI.—ARACHNOPHYLLUM.—DANA.

Aggregate Cyathophyllidæ, having the cells faintly radiate (the rays often obsolete towards the margin); texture of the corallum for the most part cellular; of the radiating lamellæ, very minutely cellular.—Plate 26, fig. 5.

GENUS VII.—CYSTIOPHYLLUM.—LONSDALE.

Quite simple or ramose Cyathophyllidæ. Corallum not radiate, or rarely with distinct rays about the central area; texture of the sides and usually of the whole corallum spumoso-cellular.

II. THE TRANSVERSE SEPTA OBLIQUE UPWARD AND RUNNING TOGETHER INTO THE AXIS.

GENUS VIII.—CLISIOPHYLLUM.—DANA.

Quite simple, ramose or aggregato-glomerate. Corallum having the cells radiate, the middle within consisting of septa and cellules converging upward, but without a distinct axis; texture exterior to this middle portion cellular.—Plate 26, fig. 6, 7.

GENUS IX.—MICHELINIA.—KONINCK.

Aggregate Cyathophyllidæ. Corallum with excavate cells; the whole interior with oblique irregular septa, converging towards an axial line; axis none.

GENUS X.—COLUMNARIA.—GOLDFUSS.

Glomerate; polyps laterally in contact, and consequently prismatic. Corallum having the cells radiate, the middle within consisting of oblique septa and cellules converging upward into an axis; texture exterior to this middle portion, cellular.—Plate 26, figs. 9, 10.

GENUS XI.—SARCINULA.—LAMARCK.

Cespitose or fasciculate Cyathophyllidæ; stems cylindrical. Corallum having the cells multiradiate; internal septa simple, oblique upward, conical, and extending quite from the sides; axis distinct.—Plate 26, fig. 11.

FAMILY II.—CARYOPHYLLIDÆ.

Coralligenous Caryophyllacea; polyp-mouths long exsert, tentacles oblong. Coralla within not transversely septate, surface not lamello-striate; cells with the margin acute and thin; lamellæ nearly or quite entire.

The genera of this family may be characterized as follows:

A. POLYPS NOT EXSERT; CALICLES PROMINENT: SOMETIMES SOLITARY.

a. Cells with a corona of points within, at the base of the lamellæ.

1. ECMESUS. Free; disk-shape.
2. CYATHINA. Attached; turbinate.

b. Cells not coronate within.

I. *Zoophytes free when adult.*

3. STEPHANOPHYLLIA. Free; disk-shape; flat below, with prominent lamellæ.
4. TURBINALIA. Free; turbinate, sometimes compressed.

II. *Zoophytes attached; simple or ramose.*

5. DESMOPHYLLUM. Simple; lamellæ arranged in groups or fascicles.
6. CULICIA. Simple; calicle smooth without, fragile; lamellæ inciso-denticulate.

7. CARYOPHYLLIA. Simple, or calicularly ramose, with only the tips of the branches alive; lamellæ nearly or quite entire.

8. DENDROPHYLLIA. Ramose, arborescent (each branch with an apical parent-polyp and an axial star); cells with the lamellæ nearly entire.

9. OCLINA. Cumulato-ramose, arborescent, branches without an axial star.

III. *Zoophytes attached; glomerate.*

10. ANTHOPHYLLUM. Calicular tubes united by a separable spongy base; the exterior smooth or faintly striate; cell with a depressed centre.

11. **STYLINA.** Calicular tubes united by a cellular base or by plates at intervals; the exterior striate; centre of cell becoming prominent and exsert.

B. **POLYPS LONG EXSERT; CALICLES NEARLY OR QUITE OBSOLETE.**

12. **ASTROITIS.** Corallum glomerate; cells concave.

A. **POLYPS NOT EXSERT; CALICLES OF GEMMATE ZOOPHYTES PROMINENT.**

a. Cells within coronate.

GENUS I.—ECMESUS.—PHILIPPI.

Non-budding Caryophyllidæ, free; disk-shape, and nearly flat below. Coralla above radiate with lamellæ, and coronate with papillæ about the centre.

GENUS II.—CYATHINA.—EHRENBERG.

Simple, attached, turbinate; polyps like those of the Caryophylliæ. Coralla with the lamellæ nearly or quite entire, cells coronate within.

1. **CYATHINA CYATHUS** (*Lamarck*), *Ehrenberg*.—Clavato-turbinate, two inches high. Corallum nearly smooth without; lamellæ entire or nearly so, stout, a little exsert, rounded above; cells deep, papillose at bottom.

Mediterranean Sea, where, according to E. Forbes, it ranges in depth from five to ninety fathoms.

2. **CYATHINA PEZITA** (*Ehrenberg*).—Three lines high, and 1 thick, sub-flexuous. Corallum having the lamellæ truncate within; six medial points, flexuous, single, not placed opposite the larger lamellæ.

3. **CYATHINA SMITHII** (*Broderip*), *Dana*.—Rather small, nearly cylindrical. Corallum decidedly striate without; lamellæ unequal, mostly with 3 smaller intermediate, sparingly plicate and lightly crenulate; bottom obsoletely tuberculate, and consisting of stony pieces.

Coast of Devonshire, *T. Smith, Esq.*—Cornwall, *Mr. Couch*.

4. **CYATHINA TURBINATA** (*Dana*).—Small, turbinate, below much attenuated. Corallum finely striate, papillæ about 12, small, very thin and fragile, lamellæ scarcely exsert, with 3 to 5 intermediate smaller.

b. Cells not coronate within.

I. *Zoophytes free when adult.*

GENUS III.—STEPHANOPHYLLIA.—MICHELIN.

Non-budding Cyathophyllidæ, free and disciform; below, nearly flat. Coralla above, radiated with prominent lamellæ.

GENUS IV.—TURBINALIA.—LAMARCK.

Non-budding Caryophyllidæ; free, turbinate, often compressed; cell of the corallum usually broad, excavate.

II. *Attached; quite simple or ramose.*

GENUS V.—DESMOPHYLLUM.—EHRENBERG.

Not budding, quite simple, attached. Coralla infundibuliform; lamellæ nearly entire, and arranged in a series of groups or fascicles.

DESMOPHYLLUM DIANTHUS (*Esper*,) *Ehrenberg*.—Two inches in height, with the disk an inch broad, and at base flexuous. Corallum with the lamellæ in 12 groups of threes, the middle of each larger, all truncate within.

East Indies.

DESMOPHYLLUM STELLARIA (*Ehrenberg*).—An inch in height, disk half an inch broad. Corallum with the lamellæ in 12 groups of threes, the middle one larger, all subequal.

GENUS VI.—CULICIA.—DANA.

Non-gemmate Caryophyllidæ, attached, quite small and sub-cylindrical; polyps like those of the Caryophylliæ. Coralla fragile and delicate, exterior not striate; lamellæ inciso-denticulate; cell shallow and sometimes scarcely at all excavate.

CULICIA STELLATA (*Dana*).—Quite simple, cylindrical, nearly 3 lines high, and $1\frac{1}{2}$ broad; pale-ochreous in color, tentacles numerous and subequal. Corallum with the margin thin and entire; cell rather deep; lamellæ 24 in num-

ber, 6 broader than the others, and above entire, having the arrangement and appearance of a star, with 3 smaller intermediate delicately incised.

Plate 28, fig. 5, calicles scattered over dead coral, natural size; 5 *a*, animal enlarged; 5 *b*, tentacle enlarged; 5 *c*, calicle enlarged; 5 *d*, two of the lamellæ enlarged.—Singapore.—*Exp. Exp.*

CULICIA TENELLA (*Dana*).—Quite simple, cylindrical, 2 lines high and $1\frac{1}{2}$ broad. Corallum with a very thin and acute margin; cells rather deep; lamellæ 24, subequal, the larger for the most part entire, but incised at apex and at base, the smaller intermediate incised.

Plate 28, fig. 6, calicle enlarged; 6 *a*, natural size; 6 *b*, three of the lamellæ enlarged.—Port Jackson, New Holland, attached to the base of a *Melitæa*.—*Exp. Exp.*

CULICIA TRUNCATA (*Dana*).—Quite simple, nearly cylindrical or subturbinate, $1\frac{1}{4}$ lines high and as many in breadth. Corallum plane at top, cell not excavate, but filled with the minutely laciniate lamellæ, which are twenty-four in number, large and small alternate.

Plate 28, fig. 7, calicle enlarged; 7 *a*, same, natural size.—The Feejee Islands, attached to the dead part of an *Echinopora*.—*Exp. Exp.*

GENUS VII.—CARYOPHYLLIA.—LAMARCK.

Attached Caryophyllidæ with segregate growth and gemmation; polyps usually cylindrical, mouth long exsert, tentacles numerous. Coralla calculato-ramose; alive only at the tips of the branches, and in this part usually striate, with the striæ equalling the lamellæ in number; but below, where dead, the striæ becoming obsolete.

1. *CARYOPHYLLIA CESPITOSA* (*Lamarck*).—Elongate cylindrical stems, nearly erect and crowdedly fasciculate, scarcely 2 lines in diameter; polyps bright orange. Corallum with the branches striate, slightly scabrous, sometimes coalescing; cells concave; lamellæ subequal.

The Mediterranean Sea; Ægean Sea, where, according to E. Forbes, it occurs in water not exceeding six or eight feet in depth.

2. *CARYOPHYLLIA CONFERTA* (*Dana*).—Short cespitose, somewhat convex, with the branches flexuous and much crowded, nearly 2 lines in diameter, alive for 2 lines. Corallum with the calicles very finely striate, about 36 subequal lamellæ, alternately larger, a very little exsert.

Plate 27, fig. 6, part of corallum, natural size.

3. *CARYOPHYLLIA FLEXUOSA* (*Lamarck*).—Cespitose, branches cylindrical, 3 to 4 lines thick, flexuous and crowded, often coalescent. Corallum with the calicles striate, lamellæ unequal, 8 to 12 larger, 3-5 intermediate smaller.

Plate 27, fig. 5, part of corallum, natural size.—West Indies (?).

4. *CARYOPHYLLIA ARBUSCULA* (*Lesueur*).—Small, loosely ramose and sub-arborescent; branches divaricate and often flexuous, cylindrical, $1\frac{1}{2}$ to 2 lines thick; polyps with 30 to 32 tentacles, tentacles conical, in two series, rufous and greenish, with a white spot at apex. Corallum faint striate; calicles denticulate at the margin, larger lamellæ alternate.

Plate 27, fig. 7, corallum, natural size; also fig. 24, p. 62.—St. Thomas, West Indies.—*Lesueur*.

5. *CARYOPHYLLIA CORNIGERA* (*Lamarck*).—Very large, loosely ramose and arborescent; branches often $\frac{1}{2}$ of an inch thick, branchlets subcylindrical, 4 to 8 lines thick, and 1 to 3 inches long; polyps straw-yellow. Corallum striate and often undulate, margin of the calicles uneven.

Mediterranean Sea, near Marseilles, from a depth of 150 fathoms—*Marsilli*.

6. *CARYOPHYLLIA ANTHOPHYLLUM*.—Cumulato-fasciculate, polyps long turbinate; branchlets often 3 inches long, $\frac{1}{2}$ an inch wide at top, and very much attenuated below. Corallum with the surface obsoletely striate, and somewhat undulate.

East Indies.—*Lamarck*.

APPENDIX.—The following species have been observed only in the simple state, and may or may not be budding species.

C. SOLITARIA (*Lesueur*).—Cylindrical, three to four lines high, and scarcely three lines broad; tentacles twenty-two in number, in two series, diaphanous, dotted with white. Calicle circular, margin entire or nearly so, above slightly striate without; fifteen to sixteen larger lamellæ alternating with smaller. Guadaloupe, West Indies (*Lesueur*, Jour. Acad. Nat. Sci. Philad., i, 179, pl. 8, fig. 10; *Mém. du Mus.*, vi, 273, pl. 15, fig. 1; *Lamk.*, 2d ed., ii, 350, No. 6 a.).

C. POCILLUM (*Dana*).—Turbinato-cylindrical, four and a half lines broad at top, and three high; exterior striate half way to the base and granuloso-scabrous, lamello-striæ nearly equal; twelve lamellæ larger, very broad and exsert, rounded above, granulous; three intermediate smaller, and one-half narrower. West Indies. Plate 27, fig. 8, natural size.

C. DILATATA (*Dana*).—Turbinato-cylindrical, three lines high, and the same in breadth at summit; twelve lamellæ larger, quite broad, subacute at apex, a little exsert, and very prominent on the exterior half way to the base; the intermediate three, much narrower, nearly equal, and scarcely at all prom-

inent on the exterior; the lateral surface of the calicle hence smooth, except the twelve large carinating lamellæ. Barbadoes, West Indies. Plate 27, fig. 9, calicle, natural size; 9a, transverse section, showing profile of larger and smaller lamellæ.

GENUS VIII.—DENDROPHYLLIA.—BLAINVILLE.

Aggregato-gemmate, patrio-ramose, arborescent; polyp-mouths long exsert. Coralla subcellular; calicles cylindrical; lamellæ included, unequal; cell deep, broad at bottom; exterior smooth or fine striate.

1. *DENDROPHYLLIA RAMEA* (Linn.) Blainville.—Large arborescent, sometimes 5 feet in height; branches long and terete, branchlets 4 to 5 lines thick at summit. Corallum throughout, finely undulato-striate; calicles 3 to 5 lines broad, and 4 to 8 long, rather shallow.

Mediterranean; Cape Negro, coast of Africa. Madeira.—*Exp. Exp.*

2. *DENDROPHYLLIA MICRANTHA* (Ehrenberg,) Dana.—Resembling the *ramea* in habit. Corallum with the calicles more crowded, branches smaller (2½ to 3 lines), cells deeper, interstices more porous.

3. *DENDROPHYLLIA NIGRESCENS* (Dana).—Arborescent, and 3 feet high, branches long, and nearly in a single plane; almost black, with the mouths of the polyps long exsert, green and radiately striate at summit, with a brown margin; tentacles pale-brownish. Corallum with scattered pores over the surface, and not striate, calicles cylindrical or subturbinate, nearly 3 lines broad, and 3 to 4 lines long, rather fragile, cells deep.

Plate 27, fig. 1, branch, natural size; 1a, animal enlarged; 1b, tentacle; 1c, part of branch near extremity, showing the surface and a calicle; 1d, vertical section of a calicle; 1e, transverse section, near base of zoophyte; 1f, ditto, near apex.—Feejee Islands.—*Exp. Exp.*

4. *DENDROPHYLLIA AURANTIACA* (Quoy & Gaymard,) Dana.—Low, subramose; orange. Corallum finely striate, striæ denticulate, calicles ½ an inch broad, cylindrical or a little elliptic, lamellæ alternately large and small, somewhat denticulate.

New Holland, at Port Royal George, and Port Jackson.—*Quoy & Gaymard.*

5. *DENDROPHYLLIA COCCINEA* (H. & Ehrenberg,) Dana.—Low subramose (1½ inches high), yellowish-orange, polyps large, with 18 to 20 tentacles. Corallum finely striate, calicles cylindrical, unequal, aperture angular, nearly ½ inch broad.

Plate 27, fig. 4, corallum of specimen from the Feejees, natural size.—The Red Sea, *Ehrenberg*.—Singapore and Feejee Islands, *Exp. Exp.*

6. *DENDROPHYLLIA DIAPHANA* (*Dana*).—Low, subramose, fuscous, polyps 3 to 4 lines broad. Corallum a cluster of cylindrical or slightly elliptical calicles, very finely striate without, and somewhat scabrous, sides thin and diaphanous, margin entire; cell quite deep (nearly $\frac{1}{2}$ an inch); 6 to 10 larger lamellæ, and 2 to 3 intermediate much smaller.

Plate 27, fig. 3, corallum, natural size.—Singapore, East Indies.—*Exp. Exp.*

7. *DENDROPHYLLIA RUBEOLA* (*Quoy & Gaymard*).—Cespitose, scarcely ramose; polyps about 2 lines broad, reddish; tentacles slender. Corallum with cylindrical calicles, 2 to 3 lines long, somewhat striate, truncate at summit, margin entire; cell conical; the larger lamellæ alternate with smaller.

New Zealand.—*Quoy & Gaymard*.

D. scabrosa, *Dana*.—Singapore. Plate 27, fig. 2.

GENUS IX.—OCULINA.—LAMARCK.

Aggregato-gemmate, one bud proceeding from each polyp, the succession forming elongating stems, divaricately ramose. Coralla solid with the exterior smooth; calicles subcylindrical; lamellæ entire, more or less exsert.

I. *Lamellæ very exsert and unequal.*

1. *OCULINA HIRTELLA* (*Linn.*) *Lamarck*.—Ramosé, stout, branches below sometimes coalescing and often an inch thick, above at apex a fourth of an inch. Corallum with the calicles nearly 2 lines thick, lamellæ very much exsert and unequal, truncate at apex.

East Indies.—*Lamarck*.

2. *OCULINA HORRESCENS* (*Dana*).—Cespitose, much branched, branches much coalescing, branchlets short, 2 to 3 lines thick. Corallum with prominent calicles, nearly $1\frac{1}{2}$ lines broad, lamellæ unequal, 10 to 12 larger, much exsert.

Plate 28, fig. 1, corallum, natural size; 1 *a*, section of stem and calicle, enlarged; 1 *b*, calicle enlarged.—Feejee Islands.—*Exp. Exp.*

II. *Lamellæ but little exsert and equal.*

3. *OCULINA PROLIFERA* (*Pallas*,) *Lamarck*.—Ramosé and subdichotomous, reticulato-coalescent; polyps very large, axillary or terminal, and their sides often proliferous. Corallum with the calicles turbinate, often 6 lines thick; lamellæ a little exsert, subequal and somewhat revolute.

Norwegian Sea.—*Pallas*.

4. *OCULINA AXILLARIS* (*Ellis*,) *Lamarck*.—Ramosé, dichotomous; branches short, divaricate; polyps distant, large, terminal and axillary. Corallum with turbinate calicles, 3 to 4 lines in diameter, lamellæ a little exsert, even.

East Indies.—*Lamarck*.

5. *OCULINA VARICOSA* (*Lesueur*).—Arborescent, a foot high, loosely ramosé; branchlets long and often divaricate. Corallum with the calicles every where, quite to the apex, at right angles with the axis of the branch, short, $1\frac{1}{2}$ lines broad at top, the base much inflated or hemispherical; lamellæ about 24 in number, subequal and even; a little exsert.

Figure 28, page 67 of Introduction to Report.—West Indies, St. Thomas.—*Lesueur*.

6. *OCULINA OCLATA*.—Very ramosé, branches tortuous, implicate and much coalescing. Corallum with scattered calicles, mostly obsolescent, but towards the extremities of the branchlets prominent and cylindrical, 1 to $1\frac{1}{4}$ lines broad, lamellæ slightly exsert, or not all so.

West Indies.

7. *OCULINA PALLENS* (*Ehrenberg*).—Arborescent, ($1\frac{1}{2}$ feet high,) loosely ramosé, sometimes coalescing; stem 6 to 8 inches thick, branches and branchlets slender, attenuate, often 2 to 4 inches long, and above $\frac{1}{2}$ of an inch thick. Corallum with prominent calicles, about $1\frac{1}{4}$ lines broad; towards the summits oblique, with an elliptical aperture, and but little prominent; below erect and circular, and surrounded at base with a tumid elevation, which is faintly radiate-striate.

Figure 29, page 57 of Introduction to Report.—West Indies, St. Thomas.—*Ehrenberg*.

8. *OCULINA VIRGINEA* (*Linnaeus*,) *Blainville*.—Ramosé, branches slender (1 to 3 lines in diameter), divaricate and tortuous. Corallum with the calicles 1 to $1\frac{1}{4}$ lines broad, often alternately arranged, every where even to the summits of the branches, prominent and erect; lamellæ nearly equal, a little exsert.

The Mediterranean Sea, *Esper*.—Off Marseilles, at a depth of 150 fathoms, *Marsilli*.

9. *OCULINA DIFFUSA* (*Lamarck*).—Small, much branched, branches divaricate, and often coalescing, upper branchlets $\frac{1}{2}$ to 1 inch long, one-tenth of an inch thick. Corallum with the calicles a little prominent, 1 line broad, rather numerous, below, erect, with the base around radiately striate, above, very oblique, smaller and elliptical; lamellæ a little exsert, even.

West Indies.—*Mauger*, *Lesueur*.

III. *Glomerate, cells tubulate, loosely aggregate.*

GENUS X.—ANTHOPHYLLUM.—SCHWEIGGER.

Aggregato-gemmate, glomerate. Coralla consisting of calicular tubes, and a separable spongy calcareous base; calicles prominent, with very solid sides, often faintly striate; lamellæ entire, generally exsert.

1. ANTHOPHYLLUM MUSICALE (*Linnaeus*), *Schweigger*.—Corallum consisting of long turbinate and often curved tubes, striate without, and hardly 2 lines in diameter, connected by a spongy mass or a series of spongy plates.

Indian Ocean.

2. ANTHOPHYLLUM FASCICULATUM (*Linnaeus*), *Dana*.—Corallum consisting of clavato-turbinate and often curved tubes, rising from a spongy base; calicles half an inch high, a very little compressed, mostly a fourth of an inch broad; lamellæ 1 to 1½ lines exsert, cultriform.

East Indies. Vanikoro, *Quoy & Gaymard*.—Sooloo Sea, *Exp. Exp.*

3. ANTHOPHYLLUM ASTREATUM (*Lamarck*).—Glomerato-globose. Corallum with very short calicles, truncate, rising from a spumous base; lamellæ elevated above the margin of the cell.

4. ANTHOPHYLLUM CESPITOSUM (*Esper*), *Dana*.—Glomerate, often erect and lobed. Corallum with the calicles about ¼ of an inch in diameter, a little compressed, very faintly striate above, projecting ½ an inch from a spumous base; lamellæ very thin, papyraceous, rather remote, 6 to 9 much broader than the others; ½ a line exsert, obliquely truncate.

Plate 28, fig. 4, natural size.—East Indies.—*Exp. Exp.*

5. ANTHOPHYLLUM HYSTRIX (*Dana*).—Glomerate; a series of bursiform tentacles of a bright green color, and others with pale green tips, which are coralligenous and therefore erect, and enclose a calcareous lamella. Corallum with the calicles 6 to 8 lines high, and often 4 to 5 broad, somewhat compressed, exterior remotely carinate, rising from a spongy base; lamellæ cultriform, often 3 lines exsert, apex subacute.

Plate 28, fig. 2, corallum, natural size; 2a, animal enlarged; 2b, tentacle, enlarged; 2c, calicle, natural size; 2d, section of calicle; 2e, texture of spongy part.—Feejee Islands.—*Exp. Exp.*

6. ANTHOPHYLLUM CUSPIDATUM (*Esper*), *Dana*.—Glomerate; tentacles clavate, color approaching purple, white at tips; disks bright green. Corallum with the tubes much compressed, angular; calicles turbinate, ½ to 1 inch broad, often very irregular, lamellæ long exsert.

Red Sea, *Ehrenberg*.—The China Seas, *Esper*, who received it from M. Chemnitz.

7. *ANTHOPHYLLUM CLAVUS* (*Dana*).—Claviform and subdivided above, erect, a foot and a half or more high. Corallum with small cylindrical calicles, 2 to 3 lines long, and $1\frac{1}{2}$ broad, rising from a spongy base; lamellæ a little exsert, truncate.

Plate 28, fig. 3, corallum, natural size; 3 *a*, calicle, enlarged; 3 *a'*, natural size; 3 *b*, section of part of stem.—Feejee Islands.—*Exp. Exp.*

GENUS XI.—STYLINA.—LAMARCK.

Fasciculato-glomerate; tubes of the coralla cylindrical and striate, connected by transverse septa and often also by a cellular base; the centre of the cells often exsertent.

STYLINA ECHINULATA (*Lamarck*).—Massive fasciculate, sessile. Corallum above echinate with truncate styliiform prominences.

The "Austral Ocean."—*Peron & Lesueur*.

B. GLOMERATE; CALICLES VERY SHORT, POLYPS REMOTELY EXSERT.

GENUS XII.—ASTROITIS.—BOCCONE.

Aggregate Caryophyllidæ, forming coral secretions only at base; and polyps, hence, appearing to be long salient. Coralla with the calicles scarcely at all prominent; cells nearly contiguous, concave; lamellæ included and even.

ASTROITIS CALICULARIS (*Boccone*).—Glomerate, incrusting, animals purple or orange. Corallum with the tubes $2\frac{1}{2}$ lines broad, contiguous, and sometimes with cellular interstices; cells excavate, circular or angular, bottom of cell broad, and somewhat prominent.

Mediterranean; Bay of Algesiras, off Algiers, and elsewhere.

ASTROITIS VIRIDIS (*Quoy & Gaymard*,) *Dana*.—Subglobose, polyps much exsert, grayish, tentacles green. Corallum porous, with immersed cells, 2 lines broad, polygonal, compressed, conical; lamellæ even, denticulate; margin rugose.

Island of Vanikoro.—*Quoy & Gaymard*.

FAMILY III.—GEMMIPORIDÆ.

Caryophyllacea with broad, often convex, disks to the polyps, having the tentacles marginal and short. Coralla internally porous, surface granulous and not striate, margin and sides of the cells stout; lamellæ included, narrow and neatly even.

This family includes but two genera:

Gemmipora. Calicles prominent, cylindrical or conico-cylindrical.

Astreopora. Calicles obsolete or nearly so.

GENUS I.—GEMMIPORA.—BLAINVILLE.

Foliaceous or glomerate. Coralla porous, with a granulous surface and cylindrical or conico-cylindrical calicles.

I. *Glomerate*.

1. GEMMIPORA PALIFERA (*Lamarck*.) *Blainville*.—Glomerate, often subglobose and lobed; polyps yellowish, tentacles very short. Corallum with the calicles much crowded, cylindrical, 1 to 3 lines high, and $1\frac{1}{2}$ lines in diameter, and a little smaller at summit; margin thick and stout.

Plate 29, fig. 2, corallum; 2a, transverse section, enlarged; 2b, animal, enlarged.—The Austral Seas, *Lamarck*.—Feejee Islands, *Exp. Exp.*

II. *Explanate, stipitate at centre*.

2. GEMMIPORA PELTATA (*Esper*.) *Blainville*.—Explanate; frond stipitate, often peltate, usually concave above, often variously plicato-contorted when of large size; margin 2 to 3 lines thick. Corallum with the calicles cylindrical, sometimes obsolete, mostly 3 lines broad, with a stout margin and about 32 lamellæ to the cell.

East Indies. The Feejee Islands.—*Exp. Exp.*

3. GEMMIPORA PATULA (*Dana*).—Explanate; frond stipitate, infundibuliform, and often variously plicato-contorted; 1 to $1\frac{1}{2}$ lines thick at the margin. Corallum with the calicles short, cylindrical, 2 lines in diameter; margin subacute; many very short or obsolete.

4. GEMMIPORA CRATER (*Pallas*.) *Blainville*.—Explanate; frond stipitate, infundibuliform, margin a line thick. Corallum with the calicles short, nearly $1\frac{1}{2}$ lines in diameter.

East Indies.

5. *GEMMIPORA CINERASCENS* (Ellis,) Dana.—Explanate; frond stipitate, broad, hypocateriform, often plicato-contorted, thin (margin but $\frac{1}{2}$ a line thick). Corallum wrinkled without; within calicles short, a line in diameter, conical or globoso-conical, cells $\frac{2}{3}$ of a line broad and deep.

Plate 27, fig. 11, surface of corallum magnified.—East Indies, Singapore.—*Exp. Exp.*

III. *Foliaceous, fronds aggregate.*

6. *GEMMIPORA FRONDENS* (Dana).—Explanate; fronds clustered, suberect, sinuate, margin $\frac{2}{3}$ of a line thick, sometimes lobed; polyps yellow. Corallum not wrinkled without; within, calicles crowded, short, subcylindrical or globoso-conical, cells deep, aperture $\frac{1}{2}$ to $\frac{2}{3}$ of a line wide.

Plate 27, fig. 10, corallum, showing its form, and a single lobe with the calicles, natural size; 10 *a*, appearance of an animal partly expanded; 10 *b*, section of folium enlarged; 10 *c*, surface magnified.—Feejee Islands.—*Exp. Exp.*

7. *GEMMIPORA BRASSICA* (Dana).—Explanate; fronds cucullately infolded with one another at base, thin, very large. Corallum with the exterior every where wrinkled; within, calicles rather remotely scattered, conico-cylindrical, cells shallow, $\frac{1}{2}$ a line broad at the aperture.

Plate 29, fig. 1, corallum; 1 *b*, transverse section of calicle, seen from above, enlarged; 1 *c*, calicle enlarged.—Feejee Islands.—*Exp. Exp.*

GENUS II.—ASTRÆOPORA.—BLAINVILLE.

Gemmiporidae with glomerate mode of growth; polyps scattered; calicles of corallum obsolete, cells quite deep, cylindrical; interstices porous.

1. *ASTRÆOPORA PULVINARIA* (Lamarck,) Blainville.—Glomerate, often globose, incrusting; tentacles 24 or more, brownish. Corallum very porous, surface pulvinate-echinulate; calicles nearly hemispherical, and contiguous at base, sometimes nearly obsolete and distant; cells very deep, $\frac{3}{4}$ of a line broad.

Plate 29, fig. 3, corallum, natural size; 3 *a*, animal, partly expanded, enlarged; 3 *b*, cell, enlarged; 3 *c*, animal, less expanded; 3 *d*, vertical section of corallum, enlarged.—The "Austral Seas, *Peron & Lesueur*.—Feejee Islands, *Exp. Exp.*

2. *ASTRÆOPORA PUNCTIFERA* (Lamarck,) Blainville.—Globose. Corallum with the cells nearly circular, unequal, small; interstices smooth, prosopunctate.

East Indies.—*Lamarck.*

3. *ASTRÆOPORA FUNGIFORMIS* (*Blainville*).—Stipitate, subfungiform. Corallum porous, cells immersed, elliptical, nearly 2 lines broad, with a convex and porous bottom.

4. *ASTRÆOPORA STELLULATA* (*Lamarck*), *Blainville*.—Glomerate, with an undulate surface. Corallum very minutely porous; cells circular, 1 to 2 lines distant, nearly a line broad, very deep; margin elevated; lamellæ minute and vertical; interstices nearly flat, very finely arenose.

Seas of America (?), *Lamarck*.—Feejee Islands, *Exp. Exp.*

FAMILY IV.—ZOANTHIDÆ.

Caryophyllacea either budding or simple; exterior subcoriaceous; polyps with broad convex disks having the margin radiately striate and sometimes much reflexed; no coral secretions, but coral sand often included in their texture by the growing zoophytes.

This family includes three genera, distinguished by their mode of budding and growth.

1. *ISAURA*. Simple and not budding.
2. *ZOANTHA*. Budding and forming lines of polyps.
3. *PALYTHOA*. Budding, and forming incrusting plates or convex masses.

GENUS *ISAURA*.—SAVIGNY.

Non-budding, simple Zoanthidæ.

1. *ISAURA HEMPRICHII* (*Ehrenberg*), *Dana*.—Half an inch high, nearly black; rays of the disk 20 to 24.

Red Sea, near Tor.—*Ehrenberg*.

2. *ISAURA SAVIGNII* (*Audouin*), *Dana*.—Four lines high, clavate, more slender than the *Hemprichii*, and paler in color.

Red Sea.—*Ehrenberg*.

3. *ISAURA ASTER* (*Dana*).—An inch high, and 2 to 3 lines thick, with the exterior ash-colored, disk half an inch in diameter, brown, with numerous pale greenish-yellow rays; tentacles in two series, olive green.

Plate 30, fig. 2, zoophytes, natural size; 2 *a*, same, enlarged.—Feejee Islands.—*Exp. Exp.*

4. *ISAURA SPECIOSA* (*Dana*).—Stout, $\frac{3}{4}$ of an inch high, and 2 to 4 lines thick, pale; disk 8 lines broad, deep-green, but becoming brown near the margin; tentacles short, in three series, the outer yellow, the intermediate umber, with a tinge of green, and the inner deep and rich green.

Plate 30, fig. 1 zoophytes, natural size; 1 *a*, same magnified.—The Balabac Passage, north of Borneo.—*Exp. Exp.*

GENUS ZOANTHA.

Zoanthidæ budding from creeping shoots.

1. *ZOANTHA ELLISII* (*Bosc*).—Polyps often 2 inches long, clavate, tentacles filiform.

West Indies.—*Ellis*.

2. *ZOANTHA SOCIATA* (*Lesueur*).—Polyps 2 inches high, and subviolaceous, disks half an inch in diameter, greenish; tentacles slender and short, yellowish. Guadeloupe, West Indies.—*Lesueur*.

3. *ZOANTHA SOLANDRI* (*Lesueur*).—Polyps stouter than in the *sociata*, 2 inches high, disks reddish-brown, tentacles short.

West Indies, St. Thomas.—*Lesueur*.

4. *ZOANTHA DUBIA* (*Lesueur*).—Smaller than the *sociata*, cylindrical; disk green at centre, tentacles and mouth yellow; tentacles in two series, very numerous.

Guadeloupe, West Indies.—*Lesueur*.

5. *ZOANTHA BERTHOLETTI* (*Audouin*,) *Ehrenberg*.—Reticulate; polyps 4 lines in height, and $1\frac{1}{2}$ to 2 lines broad, subcylindrical, with the tentacles clavate; when contracted mammilliform.

Red Sea.—*Savigny*.

GENUS PALYTHOA.—LAMOUROUX.

Zoanthidæ with explanate gemmation; polyps united to one another laterally.

I. *United only at base.*

1. *PALYTHOA DENUDATA* (*Cavolini*,) *Dana*.—Purple; the polyps united only at base, very prominent, cylindrical, and clavate, 1 to 2 lines thick, and 6 to 9 high; tentacles in three series, the outer smallest.

Near Naples, Mediterranean Sea.—*Cavolini*.

2. *PALYTHOA AURICULA* (*Lesueur*,) *Dana*.—Reddish; polyps united only at base, prominent, turbinate, 3 lines broad, and 3 to 6 high; disks 4 lines broad, greenish; tentacles 26-30, reddish.

St. Vincent and Dominica, West Indies, covering the rocks at the entrance of the port.—*Lesueur*.

3. *PALYTHOA NYMPHÆA* (*Lesueur*,) *Dana*.—Resembling the *auricula*, yellowish-red; disks yellow, with a green circle at the base of the tentacles; tentacles about 50 in number, in two series, and of a light brown color; mouth prominent.

St. Christopher, West Indies.—*Lesueur*.

4. *PALYTHOA FULIGINOSA* (*H. & Ehrenberg*,) *Dana*.—Brownish-yellow, polyps united only at base, when contracted only $2\frac{1}{2}$ lines broad, and quite prominent; when expanded an inch high, clavate; disks with 32 teeth to the margin; tentacles clavate, obtuse, banded with brown and white, about 64 in 2 series, the inner larger.

The Red Sea.—*Ehrenberg*.

II. *Short mammillary—polyps laterally united, but with free summits.*

5. *PALYTHOA MAMMILLOSA* (*Ellis*,) *Lamouroux*.—Polyps laterally united, but with quite prominent summits when contracted, $\frac{1}{2}$ to 1 inch high and nearly 3 lines broad.

Coasts of Jamaica.

6. *PALYTHA OCELLATA* (*Ellis*,) *Lamouroux*.—Similar to the *mammillosa*, rust-colored; polyps united by their sides, but prominent above, 3 lines broad, sides wrinkled.

St. Domingo, West Indies.—*Ellis*.

III. *Scarcely at all mammillose, polyps united quite to their summits.*

7. *PALYTHOA GLAREOLA* (*Lesueur*,) *Dana*.—Polyps short, and united by their sides quite to the summit, disks deep violet, whitish at centre; tentacles 20, four of which are grayish-red.

Guadaloupe, on the volcanic rocks of Point Noire.—*Lesueur*.

8. *PALYTHOA FLAVO-VIRIDIS* (*H. & Ehrenberg*,) —Polyps united to their summits, bright greenish-yellow; disks margined with 16 crenatures, and as many tentacles; tentacles hyaline, and in a single series; internal lamellæ 32 in number.

Red Sea.—*Ehrenberg*.

9. *PALYTHOA ARGUS* (*H. & Ehrenberg*,) —Brownish-yellow, often subglobose; polyps, when contracted, 6 to 10 lines broad; disks with 20 crenatures

to the margin; tentacles 40, pale brown, in two series, the internal larger, obtuse, clavate; visceral lamellæ 32 in number.

Red Sea.—*Ehrenberg*

10. *PALYTHOA CÆSIA* (*Dana*).—Convex; color umber; polyyps, when contracted, 4 to 6 lines broad; disks umber-colored, except the centre, which is pale grayish-violet; outer margin of the disks crenulate; tentacles very numerous, in two series, umber-colored.

Plate 30, fig. 3, and 3*a* to 3*h*.—Feejee Islands.—*Exp. Exp.*

TRIBE III.—MADREPORACEA.

Actinaria with the tentacles 12 in number (rarely more), in a single series, the alternate sometimes smaller: gemmiparous; gemmation inferior: coralligenous; coralla calcareous, with the rays of the cells 6 to 12 in number or obsolete, interstitial surface not striated with the prolonged lamellæ of the cells.

The characteristics of the coralla in the several genera, are as follows:

FAMILY I.—MADREPORIDÆ.

Cells deep and without cross septa.

GENUS 1. *MADREPORA*. Branches with an apical calicle, and distinct lateral calicles upon the branchlets. Cells deep, 6-12 radiating points within, which are sometimes obsolete.

GENUS 2. *MANOPORA*. No apical calicle; calicles all obsolete, or irregular; coralla quite porous; cells as in the *Madreporæ*.

FAMILY II.—FAVOSITIDÆ.

Cells with cross septa within the coralla; rarely, solid below.

SUBFAMILY 1. *ALVEOPORINÆ*. Coralla very light porous; cells deep, and with radiating points within, as in the *Madreporæ*.

GENUS 1. *ALVEOPORA*. Cells contiguous, with very thin cribrate parietes.

SUBFAMILY 2. *FAVOSITINÆ*. Cells with radiating *entire* lamellæ, often becoming obsolete; contiguous, at least at the summits of the coralla.

GENUS 2. SIDEROPORA. Coralla with obtuse branches; cells containing a distinct star of six rays, meeting in a short columella at centre—not seriate, distinctly traceable within the corallum.

GENUS 3. SERIATOPORA. Coralla with very slender terete branches, often pointed; cells seriate; texture very solid, and cells, therefore, not traceable within the coralla.

GENUS 4. POCILLOPORA. Coralla with the branches never terete; surface usually verrucose, and cells traceable within, except when quite slender; texture mostly very compact; lamellæ nearly obsolete.

GENUS 5. FAVOSITES. Coralla consisting of agglomerated prismatic cells.

GENUS 6. CATENIPORA. Coralla consisting of single lines of cells, forming meandering vertical plates, which plates often intersect one another.

SUBFAMILY 3. HELIOPORINÆ. Cells circular, not contiguous.

GENUS 7. HELIOPORA. Cells with narrow radiating lamellæ; texture of the interstices minute tubular.

GENUS 8. HELIOLITES. Cells with narrow lamellæ; interstices irregularly cellular.

GENUS 9. MILLEPORA. Cells very minute; rays obsolete; texture of the interstices quite compact or sparingly porous.

FAMILY III.—PORITIDÆ.

Cells shallow, hardly traceable within the coralla, which are throughout fine-porous.

GENUS 1. PORITES. Coralla glomerate or furcato-ramose; cells not over a line in diameter; (polyps with twelve short tentacles.)

GENUS 2. GONIOPORA. Coralla glomerate or columnar; cells over a line in diameter; (polyps with sixteen to twenty-four tentacles.)

FAMILY I.—MADREPORIDÆ.

Polyps not coralligenous at middle of base; cells of the corallum therefore, very deep, and not crossed by septa within.

GENUS I.—MADREPORA.—LINN.

Patrio-ramose; arborescent, cespitose, or through coalescence, reticulate or foliaceous. Coralla with the branches terete (very rarely compressed); calicles regular.

Forms of calicles (see plate 31):

1. *Tubiform*, cylindrical, figs. 2 a, 3 a; apex transverse, 3 a; apex oblique, 3 b, 11 c, 12 b, c, d; sometimes close appressed to the branch, 3 a, 9 a, 8 a.

2. *Narifform* (from the Latin for nose), triangular in profile, with the upper side which contains the aperture, nearly at right angles with the stem, 4 a; tubo-narifform, 5 a, 4 b.

3. *Cochleariform*, a short, stout, erect cylindrical calicle, with a broad apex and upper partly wanting, 10 a, 10 b.

4. *Dimidiate*, a tubular calicle bisected longitudinally nearly to its base, 7 a.

5. *Labellate* or long-lipped, or in shape like a blade of a shovel, 6 a, b, c.—It passes into the dimidiate form.

Arrangement of the Species.

A. Horizontal or oblique foliate, without proper branchlets above.

I. *Calicles tubiform.*

1. *M. palmata.*

3. *M. flabellum.*

2. *M. alces.*

4. *M. cyclopea.*

II. *Calicles labellate.* (*Surface of corallum covered with incipient conical branchlets.*)

5. *M. conigera.*

B. Horizontal or oblique, with erect or ascending branchlets above, which form a clump with an evenly concave or convex top—vasiform or cespitose.

I. *Calicles thin labellate.*

6. *M. efflorescens.*

11. *M. millepora.*

7. *M. cytherea.*

12. *M. prostrata.*

8. *M. spicifera.*

13. *M. subulata.*

9. *M. hyacinthus.*

14. *M. convexa.*

10. *M. surculosa.*

II. *Calicles quite thin; round nariform, or appressed-tubiform.*

15. *M. aculeus.*

17. *M. tubicinaria* (suffruticose).

16. *M. tenuis.*

III. *Calicles stout, nariform or tubiform.*

18. *M. paxilligera.*

20. *M. digitifera.*

19. *M. nasuta.*

21. *M. globiceps.*

- | | |
|----------------------------|-------------------------|
| 22. <i>M. effusa.</i> | 27. <i>M. cerealis.</i> |
| 23. <i>M. corymbosa.</i> | 28. <i>M. acervata.</i> |
| 24. <i>M. appressa.</i> | 29. <i>M. valida.</i> |
| 25. <i>M. echidnæa.</i> | 30. <i>M. retusa.</i> |
| 26. <i>M. plantaginea.</i> | |

C. Fastigiate, calicles short, and round nariform; branches much and closely subdivided, erect.

31. *M. ramiculosa.*

D. Arborescent, branches evenly covered with proliferous branchlets or clusters.

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|-------------------------|------------------------|
| 32. <i>M. echinata.</i> | 34. <i>M. rosaria.</i> |
| 33. <i>M. carduus.</i> | 35. <i>M. florida.</i> |

E. Arborescent or fruticose, branches either not proliferous, or unevenly so.

I. *Calicles thin and fragile, labellate, round nariform, or tubiform.*

- | | |
|-----------------------------------|---------------------------|
| 36. <i>M. implicata.</i> | 41. <i>M. cribripora.</i> |
| 37. <i>M. tortuosa.</i> | 42. <i>M. gravida.</i> |
| 38. <i>M. aspera.</i> | 43. <i>M. virgata.</i> |
| 39. <i>M. hebes (cespitose?).</i> | 44. <i>M. horrida.</i> |
| 40. <i>M. exigua.</i> | |

II. *Calicles stout, tubiform, dimidiate, or nariform.*

- | | | | | | |
|---|---|------------------------------------|---|--|--|
| 45. <i>M. formosa.</i> | } | 53. <i>M. cervicornis.</i> | } | | |
| 46. <i>M. brachiata.</i> | | 54. <i>M. prolifera.</i> | | | |
| 47. <i>M. arbuscula.</i> | | 55. <i>M. nobilis.</i> | | | |
| 48. <i>M. robusta.</i> | | 56. <i>M. secunda.</i> | | | |
| 49. <i>M. hystrix.</i> | | 57. <i>M. gracilis.</i> | | | |
| 50. <i>M. divaricata.</i> | | 58. <i>M. humilis.</i> | | | |
| 51. <i>M. abrotanoides.</i> | | 59. <i>M. pocillifera.</i> | | | |
| 52. <i>M. austera.</i> | | | | | |
| Calicles mostly tubiform
or tubo-nariform. | | Calicles nariform or
dimidiate. | | | |

F. A few long stems, simple, or rarely branched, from a common base.

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|-------------------------|--------------------------|
| 60. <i>M. deformis.</i> | 61. <i>M. cuspidata.</i> |
|-------------------------|--------------------------|

G. Erect plates in place of proper branches, and no distinct apical polyp.

- | | |
|------------------------|------------------------|
| 62. <i>M. labrosa.</i> | 64. <i>M. cuneata.</i> |
| 63. <i>M. securis.</i> | |

1. *MADREPORA PALMATA (Lamarck).*—Ponderous, very broad foliate; fronds spreading obliquely, subconvolute at base, deeply lobed; lobes often 2 to 3 feet long, and $1\frac{1}{2}$ broad, with a thickness of 1 to 2 inches; outer margin a

little lacinate, $\frac{1}{2}$ an inch thick. Corallum below, short caliculate, calicles nariform; above, calicles cylindrical, with an oblique apex, very unequal, many 2 lines long and $1\frac{1}{2}$ broad, others round nariform, and others obsolete; star distinct.

Plate 31, fig. 11 *a*, view of cell, enlarged; 11 *b*, *c*, *d*, *e*, different calicles, natural size.—West Indies, where it is a very common species.

2. *MADREPORA ALCES* (*Dana*).—Stout foliate, fronds deeply digitate lobed; lobes narrow, oblong, or ligulate, often 2 feet long, 2 to 4 inches wide, and $\frac{1}{2}$ to $1\frac{1}{2}$ inches thick. Corallum below, with short crowded calicles; above, calicles tubiform, unequal, 2 to $2\frac{1}{2}$ lines long, and $\frac{2}{3}$ of a line broad, erect, never nariform, many obsolete; star distinct, two lamellæ nearly uniting below.

Plate 31, fig. 12 *a*, view of cell, enlarged; 12 *b*, *c*, *d*, *e*, *f*, different calicles, natural size.—East Indies.—*Exp. Exp.*

3. *MADREPORA FLABELLUM* (*Lamarck*).—Spreading foliate, fronds rather stout, convoluted at base, the margin consisting of incipient branchlets scarcely $\frac{1}{4}$ of an inch thick. Corallum below, with short crowded calicles; above, calicles slender tubiform, often $1\frac{1}{2}$ lines long and $\frac{1}{2}$ to $\frac{2}{3}$ of a line broad, never nariform, sometimes acervate in lines, many immersed cells; star scarcely distinguishable.

Plate 31, fig. 13 *a*, view of cell, enlarged; 13 *b*, *c*, *d*, *e*, different calicles, natural size.—West Indies.

4. *MADREPORA CYCLOPEA* (*Dana*).—Very broad foliate, and ponderous, fronds spreading, lobed, 3 to 6 inches thick, and 6 feet or more broad, with large, rounded, remotely scattered knobs (2 to 3 inches thick). Corallum above, having the calicles crowded.

Wake's Island, Pacific Ocean.—*Exp. Exp.*

5. *MADREPORA CONIGERA* (*Dana*).—Broad foliate, fronds stout, lobed at margin, and sometimes deeply subdigitate; above, covered with short and stout subacute cones; below, surface plane. Corallum below having very short calicles; above, calicles much crowded, labellate, lip elongate, nearly erect, and almost flat; star obsolete, two of the lamellæ scarcely broader.

Plate 32, fig. 1, part of corallum in outline, natural size; 1 *a*, one of the incipient branchlets, ditto.—Singapore.—*Exp. Exp.*

6. *MADREPORA EFFLORESCENS* (*Dana*).—Vasiform (?), branches coalescing into a solid plate $\frac{1}{2}$ to $\frac{3}{4}$ of an inch thick, which is reticulate only near the margin, and ribbed with the coalescing branches; below flat; above, having very short crowded branchlets, the marginal $\frac{1}{2}$ an inch long and $\frac{1}{2}$ of an inch in diameter, but those of the middle of the frond not terete, a fourth of an inch long, acervate and proliferous. Corallum below with short calicles; above, the calicles of the branchlets labellate, lip long und erect, the apical calicle cylindrical, a line long and $\frac{1}{2}$ a line broad.

Plate 33, fig. 6, fragment of corallum, natural size.—Ceylon, East Indies.—*Rev. G. A. Aphthorp.*

7. *MADREPORA CYTHEREA* (Dana).—Vasiform, pedicellate; frond very broad, 1 to 2 inches thick; branches reticulately coalescent; below complanate, without branchlets; above branchlets crowded, $\frac{1}{2}$ to 1 inch long, often very short and acervato-proliferous. Corallum having the calicles labellate; lip long and scarcely at all flattened; the apical calicle long cylindrical; 2 to $2\frac{1}{2}$ lines long and $\frac{1}{4}$ of a line broad.

Plate 32, figs. 3a, 3b, fragments of corallum, natural size; 3a, weathered specimen.—Tahiti, Society Islands.—*Exp. Exp.*

8. *MADREPORA SPICIFERA* (Dana).—Vase-shaped, fronds very broad, $\frac{1}{2}$ to $1\frac{1}{4}$ inches thick; below closely reticulate and complanate; above with nearly simple branchlets, $\frac{1}{2}$ to 1 inch long, 2 lines in thickness, subacute. Corallum having the calicles of the branchlets imbricate, labellate; lip somewhat flattened, truncate; star indistinct.

Plate 33, fig. 4, specimen from the Feejees, natural size; 4a, fragment of same; 4b, and 5, fragments of specimens from Singapore: plate 31, figs. 6a, b, c, calicle of Feejee variety, enlarged.—Singapore and the Feejee Islands.—*Exp. Exp.*

9. *MADREPORA HYACINTHUS* (Dana).—Vasiform, pedicellate, frond 1 to $1\frac{1}{4}$ inches thick, branches sparingly coalescent; below, branchlets crowded and spreading, $\frac{1}{2}$ to $\frac{1}{2}$ inch long, often proliferous; above, branchlets slender ($\frac{1}{8}$ of an inch thick), nearly simple, sometimes proliferous, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long. Corallum having the calicles tubo-labellate, not fragile, 1 to $1\frac{1}{2}$ lines long, lip not at all flattened; cells open, with an indistinct star, apical calicle cylindrical, prominent.

Plate 32, fig. 2, fragment of corallum, natural size, showing the character of the upper and under surface.—Feejee Islands.—*Exp. Exp.*

10. *MADREPORA SURCULOSA* (Dana).—Short and stout pedicellate, broad, and slightly concave, flat or a little convex; frond $1\frac{1}{2}$ to 2 inches thick, branches coalescing; below, flattened, and with no spreading branchlets; above, branchlets crowded, erect, spike-shape, tapering, and nearly acute, 1 to 2 inches long, often a little angular, proliferous at apex. Branchlets of the corallum with crowded calicles, 1 to $1\frac{1}{2}$ lines long, scarcely labellate, elongated lip not flattened, the subapical calicles becoming very small, the apical cylindrical, and $\frac{3}{4}$ of a line broad; star indistinct.

Plate 32, fig. 4, corallum (small specimen), natural size; 4a, branchlet, ditto; fig. 5, probably the same, from Tahiti.—Society and Feejee Islands, and East Indies.—*Exp. Exp.*

11. *MADREPORA MILLEPORA* (*Ehrenberg*,) *Dana*.—Short pedicellate cespitose, broad, a little convex, branches openly reticulato-coalescent; below, a few naked branchlets appressed into the plane of the frond; above, branchlets very evenly terete, 2 inches long and scarcely $\frac{1}{4}$ of an inch thick, nearly simple. Corallum with the branchlets obtuse, calicles short labellate, crowded imbricate, $\frac{1}{2}$ a line broad, star indistinct, two of the lamellæ very prominent; apical calicle nearly a line broad and $\frac{1}{2}$ a line exsert; calicles of the marginal branchlets very much spreading.

Plate 33, fig. 2, part of corallum, natural size; 2*a*, branchlet, ditto.—East Indies, where it is common.—*Exp. Exp.*

12. *MADREPORA PROSTRATA* (*Dana*).—Cespitose, prostrate, with a flat top, branches remotely coalescing; below, not flattened, branchlets few, and cells all immersed; above, branchlets neatly cylindrical, nearly simple, $\frac{1}{2}$ of an inch thick: polyps green, and having one of the tentacles much longer than the others. Corallum having the branchlets obtuse, the apical calicle short, four-fifths of a line broad; other calicles crowded, labellate, broad and spreading, with the lip much flattened; cells stellate, two of the lamellæ a little the broadest.

Plate 33, fig. 1, part of corallum, natural size; 1*a*, one of the polyps, enlarged; 1*b*, same, partly expanded, an upper view; 1*c*, branchlet, natural size; 1*d*, calicles, enlarged; 1*e*, same in profile; 1*f*, transverse section of branch, enlarged.—Feejee Islands, and Sooloo Sea.—*Exp. Exp.*

13. *MADREPORA SUBULATA* (*Dana*).—Prostrate, plane above; branches loosely intricate, and remotely coalescing, ramose, $\frac{1}{2}$ an inch thick; below, branchlets few, nearly naked, and appressed into the plane of the frond; above, branchlets every where terete, subulate, a little undulate and subacute, $2\frac{1}{2}$ inches long and 2 to 3 lines thick, nearly simple. Corallum having the calicles labellate, but quite small and very short or scarcely prominent, those of the marginal branchlets more spreading and somewhat larger; star obsolete, two lamellæ quite broad; apical calicle very exsert (1 line), nearly or quite $\frac{3}{4}$ of a line broad.

Plate 33, fig. 3, part of corallum, natural size; 3*a*, branchlet, natural size.—The East Indies.—*Exp. Exp.*

14. *MADREPORA CONVEXA* (*Dana*).—Broad cespitose and short pedicellate, convex above, branches nearly horizontal, reticulato-coalescent; below flattened with a few naked subangular branchlets; above branchlets of the central portions terete, rarely angular, nearly simple, sometimes proliferous, 2 to $2\frac{1}{2}$ inches long, and $\frac{1}{4}$ of an inch thick; the marginal branchlets rudely acervato-proliferous. Corallum with the apical calicle short, cylindrical, four-

fifths of a line broad; other calicles labellate, fragile, lip broad and elongated, much flattened; star distinct, 6-rayed, two lamellæ broader than the others.

Singapore, East Indies.—*Exp. Exp*

15. *MADREPORA ACULEUS* (*Dana*).—Prostrate, branches stout (1–3 inches thick), and very uneven, very much and very closely subdivided; below, branchlets short, angular, horizontal, and covered with long tubular calicles; above, branchlets erect, and rising with a curve, very crowded, angular, and attenuated, 2 lines thick, and often 2 inches long, subacute. Corallum with the apical calicle prominent (often a line); the lateral not crowded, small, round-nariform, with the edge thin; cell round, opening upward, star mostly distinct, two of the lamellæ a little the broadest,

Plate 32, fig. 6, part of corallum, natural size; 6*a*, branchlet, ditto; 6*b*, profile of calicles.—Feejee Islands.—*Exp. Exp*.

16. *MADREPORA TENUIS* (*Dana*).—Cespitose, rounded, sparingly spreading; branchlets very slender, scarcely 2 lines thick, 3 inches long, subterete and proliferous. Corallum with the apical calicle small ($\frac{3}{8}$ of a line broad), a little prominent; the lateral appressed tubiform, irregular, elongate ($1\frac{1}{2}$ lines) and slender; margin fragile, exterior neatly striate and finely scabrous; aperture circular, star indistinct, two lamellæ a little prominent.

17. *MADREPORA TUBICINARIA* (*Dana*).—Cespitose, rounded, branches but little spreading, closely ramose, branchlets very nearly terete, 3 to 4 lines stout, scarcely at all tapering, apex obtuse. Corallum quite porous; apical calicles very stout (1 to $1\frac{1}{2}$ lines broad), a little prominent; the lateral, appressed tubiform, and regular, four-fifths of a line broad and $1\frac{1}{2}$ to 2 lines long, thin and fragile at the margin, exterior neatly striate, aperture broad and circular, opening upward; star short six-rayed.

Plate 32, fig. 7, corallum, natural size; 7*a*, extremity of branch, natural size.—Feejee Islands.—*Exp. Exp*.

18. *MADREPORA PAXILLIGERA* (*Dana*).—Very broad, pedicellate cespitose, plane above; base of the frond solid, disk-form, stout; below, scarcely convex, naked, pedicellate at middle; above, branchlets digitiform, $2\frac{1}{2}$ to 3 inches long, and $\frac{1}{2}$ to $\frac{3}{8}$ of an inch thick, erect and subterete, rarely furcate, subacute; margin of the corallum squarrose, the branchlets being very short and incipient. Corallum having the apical calicle short and small (hardly a line broad): the lateral a little unequal, very crowded, a little prominent, compressed nariform, or sometimes dimidiate, striate, aperture oblong, star scarcely distinct.

Plate 34, fig. 1, part of corallum, natural size; 2*a*, part of branchlet, ditto; 1*b*, profile of calicles, ditto.—Tahiti, Society Islands.—*Exp. Exp*.

19. *MADREPORA NASUTA* (*Dana*).—Broad cespitose, short pedicellate, a little convex, with a solid plano-obconical base; below, complanate and nearly

naked, stout pedicellate; above, branchlets crowded, digitiform, nearly simple, rarely proliferous, subterete, 2 to 2½ inches long and 4 to 5 lines thick, subacute, branchlets of the margin horizontal and elongate. Corallum with the lateral calicles very prominent, compressed nariform, very finely striate; star often distinct, two of the lamellæ a little the broadest.

Plate 34, fig. 2, corallum, natural size; 2a, branchlet, ditto; 2b, profile of calicles.—Tahiti, Society Islands.—*Exp. Exp.*

20. *MADREPORA DIGITIFERA* (*Dana*).—Broad, nearly flat above, base of the frond solid and disk-form; above, branchlets crowded, digitiform, scarcely terete, and subacute, 2½ to 3 inches long and 4 to 5 lines thick, often short proliferous. Corallum with the apical calicle a little prominent, scarcely a line broad; the lateral crowded, divaricate, dimidiate, erect, and not at all compressed, ¾ of a line long, lip rather thick, with some scattered immersed cells; star short 6-rayed, exterior lamella quite prominent.

21. *MADREPORA GLOBICEPS* (*Dana*).—Broad cespitose, convex above, with a solid disk-form base; above, branchlets erect digitiform, crowded, subangular, 2½ inches long and ½ to ⅔ of an inch thick, rounded at apex. Corallum having the apical calicle scarcely at all prominent, a line broad; the lateral crowded, short, tubiform or tubo-nariform, obsoletely striate, oblique at apex, aperture elliptical, star distinct.

Plate 34, fig. 3, branchlet, natural size.—Tahiti, Society Islands.—*Exp. Exp.*

22. *MADREPORA EFFUSA* (*Dana*).—Broad cespitose, convex above, base nearly solid and disk-form; above, branchlets crowded, digitiform, 1½ inches long, and 4 to 5 lines thick; at the margin, the branchlets scarcely free. Corallum having the apical calicle stout, cylindrical, rather more than a line broad, the lateral much crowded and unequal, compressed-nariform 1½ lines long, sometimes tubo-nariform and proliferous: under surface crowdedly covered with short calicles.

Ceylon, Indian Ocean.—*Rev. G. A. Aphorp.*

23. *MADREPORA CORYMBOSA* (*Lamarck*).—Broad cespitose, convex above; branchlets digitiform, subsimple, 3 to 4 lines broad and 2½ to 3 inches long, subterete. Corallum with the apical calicle large (1 to 1¼ lines broad); the lateral 1½ to 1¾ lines long, tubiform, with the summit oblique and margin echinulate; exterior striate and scabrous; a few minute calicles interspersed; star very short or indistinct; two of the lamellæ a little the most prominent.

East Indies, and Indian Ocean.

24. *MADREPORA APPRESSA* (*Ehrenberg*).—Prostrate, the horizontal branches coalescing into a plate which is nearly entire, flattened and naked below; above, branchlets erect, crowded, spiciform, nearly terete, 2½ to 3 inches long and 3 lines thick. Corallum with the apical calicles a little prominent; the

lateral crowded and equal, $1\frac{1}{2}$ lines long, appressed and subimbricate, rostrato-narifform, very minutely striated; star very distinct, two of the lamellæ a little the most prominent, and meeting below.

Plate 34, fig. 3, branchlets of corallum, natural size; 3 a, calicle, natural size; plate 31, figs. 8 a, 8 b, different views of calicle, enlarged.—East Indies, Singapore.—*Exp. Exp.*

25. *MADREPORA ECHIDNÆA* (*Lamarck*), *Dana*.—Broad cespitose (?), branchlets proliferous and irregular, about 3 or 4 lines thick; near the *triticum* in habit, but more slender. Corallum with the apical calicle much elongate; the lateral close appressed, unequal, tubular, obtusely rostrate, often 3 to 4 lines long, exterior smooth; aperture minute, nearly circular; star very distinct, two of the lamellæ nearly meeting below.

Plate 35, fig. 3, branch, natural size; 3 a, calicle, natural size; plate 31, figs. 9 a, 9 b, different views of calicle, enlarged.—The East Indies. Sooloo Sea.—*Exp. Exp.*

26. *MADREPORA PLANTAGINEA* (*Lamarck*).—Very broad cespitose, slightly convex; branches horizontal, and coalescing into a flattened lamina nearly entire, naked below, and interrupted by an occasional break; above, branchlets spiciform, 4 to 6 lines thick, and 2 to $2\frac{1}{2}$ inches long, and often proliferous and irregular. Corallum having the apical calicles a little prominent, and broad (1 to $1\frac{1}{2}$ lines); the lateral, tubiform, appressed, very unequal, often 2 lines long, and $\frac{3}{4}$ of a line broad; stout, with an obtuse lip, exterior very finely striate, smooth; aperture scarcely elliptical; star quite distinct, two of the lamellæ most prominent, and nearly meeting below.

The East Indies, and Singapore, *Exp. Exp.*—Ceylon, *Rev. G. A. Aphorop.*

27. *MADREPORA CEREALIS* (*Lamarck*).—Broad cespitose, somewhat convex; above, branchlets numerous, erect, spiciform, 3 to 4 lines thick, and 2 inches long, proliferous, and not terete. Corallum having the apical calicles a little prominent, small (scarcely four-fifths of a line); the lateral, appressed subtubiform, unequal, 1 to $1\frac{1}{2}$ lines long, subrostrate, exterior smooth, aperture elliptical, star very short or imperfectly distinct; two of the lamellæ a little prominent.

Plate 35, fig. 2, part of corallum, natural size; 2 a, branchlets, ditto.—The Sooloo Sea, East Indies.—*Exp. Exp.*

28. *MADREPORA ACERVATA* (*Dana*).—Broad cespitose, a little convex, exterior branches nearly prostrate, and somewhat flattened below; above, branchlets 2 inches high, 5 to 8 lines thick, very proliferous, often acervate at apex, and subretuse. Corallum with the apical calicles very broad ($1\frac{1}{2}$ to 2 lines), scarcely exsert; the lateral crowded, appressed-tubiform, 1- $1\frac{1}{2}$ lines long, exterior rather smooth; oblique at apex; lip thick, aperture elliptical; star very distinct, two of the lamellæ nearly meeting below.

Plate 34, fig. 43, branchlet, natural size.—Singapore, East Indies.—*Exp. Exp.*

29. *MADREPORA VALIDA* (*Dana*).—Cespitose, branchlets subdigitiform, very uneven, $2\frac{1}{2}$ inches long and 6 to 8 lines thick, rudely proliferous, polyps quite large. Corallum having the lateral calicles unequal, appressed-tubiform, very stout, and large, 2 to 4 lines long, and 1 line broad, exterior smooth; star rather distinct, two of the lamellæ meeting below.

Plate 35, fig. 1, corallum, natural size.—Feejee Islands.—*Exp. Exp.*

30. *MADREPORA RETUSA* (*Dana*).—Cespitose, small, convex, branchlets digitiform, $\frac{1}{2}$ an inch thick, $2\frac{1}{4}$ inches long, not terete, truncate at summit. Corallum having the lateral calicles crowded and acervate at the summit of the branchlets, very unequal, some 3 lines long and others obsolete interspersed, appressed-tubiform and slender, lip elongate, exterior smooth; aperture often oblong, star scarcely distinct.

Feejee Islands.—*Exp. Exp.*

31. *MADREPORA RAMICULOSA* (*Dana*).—Subfastigiate, close ramose, and very minutely subdivided into branchlets; ramicles much crowded, subterete, $1\frac{1}{2}$ to 2 lines thick. Corallum slightly porous, smooth; apical calicle nearly 2 lines prominent, and often over a line in breadth; the lateral, remote, short, round-nariform, rather stout; cells of the branches immersed, and having a very distinct star.

Plate 35, fig. 4, part of a branch of corallum, natural size; 4 a, extremity of a branchlet, natural size.—Feejee Islands.—*Exp. Exp.*

32. *MADREPORA ECHINATA* (*Dana*).—Arborescent, spreading, and remotely ramose, branches $\frac{1}{2}$ to $\frac{3}{4}$ of an inch thick, and covered evenly and crowdedly with capillary polyp-bearing ramicles. Corallum with the surface scarcely porous; ramicles nearly $\frac{3}{4}$ of an inch long, and consisting of a few thin and smooth tubiform calicles; single calicles $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long, and $\frac{3}{4}$ of a line broad, star six-rayed, and very distinct.

Plate 36, fig. 1, corallum, natural size; 1 a, one of the ramiculi.—Feejee Islands, and Sooloo Sea.—*Exp. Exp.*

33. *MADREPORA CARDUUS* (*Dana*).—Arborescent, near the *echinata* in habit, branches above, very closely subdivided, lateral polypiferous ramicles longer (1 inch), and stouter (1 to 2 lines). Corallum with the tubiform apical calicle of the ramicles 1 to $1\frac{1}{2}$ lines long; the lateral calicles appressed-tubiform, or round-nariform.

Plate 36, fig. 3, corallum, natural size; 2 a, branchlets, ditto.—Feejee Islands.—*Exp. Exp.*

34. *MADREPORA ROSARIA* (*Dana*).—Erect arborescent, stem above closely subdivided, and throughout laterally ramiculose; ramicles much crowded,

very obtuse, 3 to 4 lines thick even at apex, subterete, often proliferous. Corallum having the apical calicles of the ramicles large (1 to $1\frac{1}{2}$ lines broad), a little exsert; the lateral stout, short, and compressed-nariform, striated, sometimes subseriate; star 12-rayed, distinct.

Plate 36, fig. 3, corallum, natural size; 3 *a*, branchlet, natural size.—Feejee Islands.—*Exp. Exp.*

35. *MADREPORA FLORIDA* (*Dana*).—Arborescent, very large, broad and remotely ramose, branches $1\frac{1}{4}$ inches thick, gradually tapering, bearing over the surface small clusters of polyps. Corallum covered with calicular tubercles $\frac{1}{4}$ of an inch broad, calicles unequal, very short tubiform, rather stout, striated; some tubo-nariform, with immersed cells interspersed; star 6-rayed, distinct, two of the lamellæ not more prominent.

Plate 37, fig. 1, corallum, natural size.—Feejee Islands.—*Exp. Exp.*

36. *MADREPORA IMPLICATA* (*Dana*).—Cespitoso-arborescent, closely ramose, branches crowded, curved, and tortuously entangled, often coalescing, slenderly attenuate; stems $\frac{1}{2}$ of an inch thick, branchlets one-sixth of an inch. Corallum scabrous and striated with linear pores; apical calicle cylindrical, four-fifths of a line in diameter; the lateral obsolete below two inches from the summit, above this, short, round, nariform, and fragile, scattered; star obsolescent.

Plate 37, fig. 2, part of corallum, natural size; 2 *a*, part of section of branch, enlarged.—Feejee Islands.—*Exp. Exp.*

37. *MADREPORA TORTUOSA* (*Dana*).—Cespitoso-arborescent, close-ramose, branches crowded, often coalescing, a little tortuous, below, $\frac{1}{2}$ an inch thick, branchlets often 2 inches long, and 2 to 4 lines thick, acuminate and subacute. Corallum having the surface scabrous, but not at all striate; apical calicle $\frac{3}{4}$ of a line long and broad; the lateral below 3 inches obsolete; above, short round-nariform, fragile; star obsolescent, two of the lamellæ but slightly prominent.

Plate 37, fig. 3, part of corallum, natural size.—Feejee Islands.—*Exp. Exp.*

38. *MADREPORA ASPERA* (*Dana*).—Arborescent, spreading, ramose, branches terete, $\frac{1}{2}$ an inch thick, summits conical and proliferous. Corallum quite porous, surface scabrous; apical calicle stout ($1\frac{1}{2}$ lines), a little prominent; the lateral short labellate, fragile, divaricate, not crowded, many obsolete, cells quite large, star very short-rayed, two of the lamellæ prominent.

Plate 38, fig. 1, branch, natural size; 1 *a*, polyp, enlarged; 1 *b*, part of section of branch, enlarged.—Feejee Islands.—*Exp. Exp.*

39. *MADREPORA HEBES* (*Dana*).—Arborescent, spreading ramose, proliferous at apex; branches neatly terete, $\frac{1}{2}$ an inch thick, very obtuse. Corallum having the apical calicle very broad ($1\frac{1}{4}$ to 2 lines), a little tumid, but scarcely

exsert; the lateral very closely crowded, short labellate, equal and erect, nearly four-fifths of a line broad; stars rather distinct, two of the lamellæ most prominent.

Plate 35, fig. 5, corallum, natural size.—Feejee Islands.—*Exp. Exp.*

40. *MADREPORA EXIGUA* (*Dana*).—Arborescent, spreading ramose, slender, branches terete, scarcely 3 lines thick, curved and acuminate. Corallum having the lateral calicles very short, round-nariform, hardly $\frac{1}{4}$ of a line broad, a little crowded, cell round, six-rayed, sometimes two of the lamellæ a little prominent.

Plate 38, fig. 2, corallum, natural size; 2*a*, extremity of a branch, ditto; 2*b*, profile of calicles.—Feejee Islands.—*Exp. Exp.*

41. *MADREPORA CRIBRIPORA* (*Dana*).—Arborescent or cespitoso-arborescent, spreading ramose, branches neatly terete, 4 to 5 lines thick, branchlets long (some 3 inches), attenuate, and subacute. Corallum scabrous, very porous; apical calicle stout (1 to 1½ lines), quite long, striate; the lateral very short, round-nariform, fragile, a little crowded, cell open; star obsolescent, one inner lamella prominent.

Plate 31, fig. 1, zoophyte expanded, natural size; 1*a*, polyp enlarged; 1*b*, extremity of branch of corallum; 1*c*, surface of corallum, enlarged; transverse section of branch, enlarged.—Feejee Islands, about shallow parts of reefs.—*Exp. Exp.*

42. *MADREPORA GRAVIDA* (*Dana*).—Arborescent, very large, spreading and distant ramose, branches very stout (1 to 2 inches), terete, summits gradually becoming conical, and sides covered with oblong conical ramificuli, $\frac{1}{2}$ an inch in length. Corallum having the apical calicles broad (1 to 1½ lines), a little tumid, but not prominent; the lateral calicles of the ramificuli quite small and very closely crowded, short labellate and fragile, the others throughout obsolescent.

43. *MADREPORA VIRGATA* (*Dana*).—Slender arborescent, spreading and remotely ramose, branches scarcely $\frac{1}{2}$ inch in diameter, very long, neatly terete and even, subarcuate, polyps not proliferous. Corallum scarcely porous, minutely granulous, lateral calicles small, rather crowded, very short and thin tubular, margin acute; cell circular, star with six short rays, two a little the most prominent.

Plate 39, fig. 1, corallum, natural size.—The Feejee Islands.—*Exp. Exp.*

44. *MADREPORA HORRIDA* (*Dana*).—Arborescent, very large, divaricately and remotely branched, branches below 1 to 2 inches thick, nearly terete, curved, gradually attenuate, throughout very proliferous, with divaricate ramificuli 1 to 2½ inches long. Corallum bristled with calicles and scabrous; apical calicle tubiform, not incrassate; the lateral, thin-tubiform, divaricate, and

sometimes reversed; very unequal, some $\frac{1}{3}$ of an inch long, others interspersed obsolescent, others proliferous; star six-rayed.

Plate 39, fig. 2, corallum, natural size; 2*a*, extremity of branch, natural size.—Feejee Islands.—*Exp. Exp.*

45. *MADREPORA FORMOSA* (*Dana*).—Arborescent, spreading, and much ramose, slender; branches scarcely terete, 3 to 6 lines thick, branchlets curved, alternate, proliferous. Corallum smooth, apical calicle nearly four-fifths of a line broad, and 1 line exsert; the lateral, small, erect, and stout tubiform, 1–1½ lines long, scarcely crowded, rounded at summit; below much smaller, but none obsolete; cell very minute and circular; star distinct.

Plate 38, fig. 4, corallum, natural size; 4*a*, extremity of branch; plate 31, figs. 2*a*, 2*b*, views of calicle, enlarged.—Feejee Islands, and Sooloo Sea, East Indies.—*Exp. Exp.*

46. *MADREPORA BRACHIATA* (*Dana*).—Arborescent, spreading, and remotely ramose; branches long, straight, nearly terete, 6 to 8 lines thick, upper branchlets often 3 inches long, apex sparingly proliferous. Corallum rather smooth, lateral calicles crowded, subequal, erect, compressed tubiform, stout, obliquely truncated at apex; exterior very minutely striated, aperture oblong; star distinct, two of the lamellæ much the most prominent.

Plate 38, fig. 3, part of corallum, natural size; 3*a*, extremity of branch; 3*b*, profile of calicle, natural size.—The Sooloo Sea, East Indies.—*Exp. Exp.*

47. *MADREPORA ARBUSCULA* (*Dana*).—Arborescent, spreading ramose, branches terete, 6 to 9 lines thick, upper branchlets often more than 3 inches long, arcuate, gradually attenuate. Corallum somewhat scabrous, apical calicle quite broad (1½ lines), exsert, cell $\frac{1}{2}$ a line broad; the lateral equal, rather crowded, tubiform, and striate, truncated at apex a little obliquely, erect, not compressed, 1 to 1½ lines long, but on the inferior side of the branches very short; star very distinct.

Plate 40, fig. 2, extremity of branch, natural size.—Sooloo Sea, East Indies.—*Exp. Exp.*

48. *MADREPORA ROBUSTA* (*Dana*).—Arborescent, spreading ramose, branches $\frac{3}{4}$ to 1 inch thick, terete, branchlets but little smaller, 2 to 3 inches long, abruptly tapering at apex and conical. Corallum having the apical calicles stout (1½ lines broad), but slightly exsert; the lateral every where much crowded, standing erect on the surface, a little unequal, mostly tubiform, and 1½ lines long, scarcely compressed, neatly striate, the smaller very oblique at summit; star 6-rayed, distinct, 2 of the rays most prominent.

Plate 39, fig. 3, part of corallum, natural size; 3*a*, extremity of branch; plate 31, figs. 3*a*, *b*, *c*, views of calicles, enlarged.—Feejee Islands.—*Exp. Exp.*

49. *MADREPORA HYSTRIX* (*Dana*).—Low fruticose, spreading ramose, proliferous, branches and polyps very divaricate and sometimes reflexed. Corallum with the apical calicle oblong, a line broad; the lateral unequal ($1\frac{1}{2}$ to 4 lines long), divaricate, scattered, tubiform or tubo-nariform, some obsolescent, some proliferous, very finely scabro-striate, stout, but margin not thick.

Plate 40, fig. 1, corallum, natural size; plate 31, figs. 5, 5a, view of calicle and cell, enlarged.—Feejee Islands.

50. *MADREPORA DIVARICATA* (*Dana*).—Shrubby arborescent, much and spreading ramose, a little proliferous; branches divaricate, arcuate, subterete, $\frac{2}{3}$ of an inch thick; branchlets attenuate, 4 to 6 lines thick. Corallum smooth; apical calicle large ($1\frac{1}{2}$ lines broad), exsert; the lateral remote, divaricate, very stout, scarcely striate, some long-tubiform (2 lines long), a few larger and proliferous, many short and round-nariform; star sometimes distinct, with two of the lamellæ most prominent.

Plate 41, fig. 2, part of corallum, natural size; 2a, extremity of branch.—Feejee Islands.—*Exp. Exp.*

51. *MADREPORA ABROTANOIDES* (*Lamarck*).—Fruticose, spreading ramose, branches scarcely terete, $\frac{1}{2}$ to $\frac{3}{8}$ of an inch thick, summit branchlets 3 to 4 lines thick, arcuate and pyramidato-attenuate, very proliferous, with short and unequal incipient branchlets. Corallum nearly smooth; apical calicle a line broad, exsert; the lateral, crowded, compressed, tubiform or tubo-nariform, with the margin stout, very unequal, many proliferous, many obsolescent; others 2 lines long and four-fifths of a line thick, scarcely striate; aperture oblong, star distinct, two of the lamellæ most prominent.

Plate 41, fig. 1, part of corallum, natural size; 1a, extremity of branch.—Feejee Islands?—*Exp. Exp.*

52. *MADREPORA AUSTERA* (*Dana*).—Fruticose, spreading ramose, and very proliferous, branches nearly terete, and tapering above, with numerous unequal lateral branchlets and proliferous polyps. Corallum scabrous; apical calicle stout (1 to $1\frac{1}{2}$ lines broad), exsert; the lateral ascending, rather crowded, tubiform and tubo-nariform, 1 to $2\frac{1}{2}$ lines long, rough and striate; aperture circular, star distinct but deep, six-rayed, with two of the rays most prominent.

53. *MADREPORA CERVICORNIS* (*Lamarck*).—Arborescent, very large, spreading and remotely ramose, below, $1\frac{1}{2}$ to 2 inches thick, branchlets very long, $\frac{1}{2}$ to $\frac{3}{8}$ of an inch thick, arcuate, terete, gradually attenuate. Corallum scabrous, apical calicle stout ($1\frac{1}{2}$ lines), and elongate; the lateral subequal, round-nariform, scarcely compressed, $1\frac{1}{2}$ to 2 lines long, and nearly a line in diameter, strongly striate, margin not thick, star distinct.

West Indies.

54. *MADREPORA PROLIFERA* (Lamarck).—Arborescent, shrubby, spreading ramose, branches long, terete, a little arcuate, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch thick, (below rarely 1 inch), proliferous above, and the branchlets often in a plane. Corallum scabrous; apical calicle very stout (nearly 2 lines), and exsert; the lateral subequal, crowded, long-nariform, but little compressed, mostly $1\frac{1}{2}$ lines long, neatly striated, aperture nearly circular.

West Indies.

55. *MADREPORA NOBILIS* (Dana).—Shrubby arborescent, very large, spreading ramose, subproliferous; branches stout (often 1 inch thick), divaricate, terete, summit branchlets $\frac{3}{8}$ to 1 inch in diameter, conical at apex. Corallum scabrous; apical calicles large ($1\frac{1}{2}$ lines broad), scarcely exsert; the lateral much crowded, nearly erect, hardly stout, mostly $1\frac{1}{2}$ lines long, (with others obsolescent), dimidiate, not compressed, margin scarcely thick, striate, rarely proliferous; star six-rayed and very distinct, two of the lamellæ the most prominent.

Plate 40, fig. 3, branch of corallum, natural size; 3a, extremity of branch.—East Indies, Singapore.—*Exp. Exp.*

56. *MADREPORA SECUNDA* (Dana).—Arborescent, spreading, ramose; branches numerous, terete, $\frac{1}{2}$ to $\frac{3}{8}$ of an inch thick; summit branchlets $\frac{1}{3}$ of an inch thick, gradually tapering. Corallum scabrous; apical calicle nearly a line broad; the lateral, rather crowded, equal, nariform, and dimidiate, and very much compressed, hardly stout, 1 to $1\frac{1}{2}$ lines long, obsolescent on the inferior side of the branches; margin not incrassate; aperture oblong; star distinct, two of the lamellæ quite prominent.

Plate 40, fig. 4, part of corallum, natural size; 4a, extremity of branch; 4b, profile of calicle.—Singapore, East Indies.—*Exp. Exp.*

57. *MADREPORA GRACILIS* (Dana).—Arborescent, spreading ramose; branches slender, neatly terete, 3 to 5 lines thick, arcuate, gradually attenuate. Corallum smooth; apical calicle a line long and broad; the lateral equal, rather crowded, stout, compressed-nariform, small (1 line long); aperture narrow, star distinct, and two of the lamellæ most prominent.

Plate 41, fig. 3, part of corallum, natural size; 3a, extremity of branch; 3b, calicle, natural size.—The Feejee Islands and Sooloo Sea.—*Exp. Exp.*

58. *MADREPORA HUMILIS* (Dana).—Low fruticose, spreading and short ramose, stout, subproliferous; branches terete, obtuse, nearly $\frac{1}{2}$ an inch thick. Corallum having the apical calicle very stout (often 2 lines broad), scarcely exsert; the lateral equal and even, somewhat crowded, very stout, neat nariform; aperture oblong; star scarcely distinct, two of the lamellæ most prominent, and nearly meeting below.

Plate 41, fig. 4, corallum, natural size; 4a, profile of calicle; plate 31, fig. 4a, b, c, views of calicles, enlarged.—Feejee Islands.—*Exp. Exp.*

59. *MADREPORA POCILLIFERA* (*Lamarck*).—Low, spreading ramose; stout, short ramose, subproliferous; branches terete, obtuse. Corallum with the apical calicle very large; the lateral much crowded, striate, short, and very broad, cochleariform, with a very stout incrassate margin.

Tongatabu, Friendly Islands.—*Quoy & Gaymard*.

60. *MADREPORA DEFORMIS* (*Dana*).—Subcespitose, a few simple branches, an inch or more thick, and often irregularly bent, rising from a solid base, branches long, subterete, obtuse and subproliferous, often coalescent. Corallum rough with unequal calicles, some tubiform, 2 to 3 lines long, and 1 line thick, others proliferous and acervate, others very short, but none obsolete; exterior striate.

Plate 43, fig. 1, corallum, natural size; 1 *a*, extremity of branch; 1 *b*, profile of calicle.—Tahiti, Society Islands.—*Exp. Exp.*

61. *MADREPORA CUSPIDATA* (*Dana*).—Subcespitose, several nearly simple, long cuspidate branches, an inch thick, and 2 to 6 inches long, rising from a common solid base. Corallum having the calicles prominent only on one side, short sublabbellate, erect, and fragile, with immersed cells interspersed; star six-rayed, distinct, two of the lamellæ the most prominent.

Plate 42, fig. 1, corallum, natural size; 1 *a*, extremity of a branch.—Tahiti, Society Islands.—*Exp. Exp.*

62. *MADREPORA LABROSA* (*Dana*).—Laminate, plates erect, obtuse, 1 to 2 inches broad, and $\frac{1}{2}$ to $1\frac{1}{2}$ inches thick, margin rounded. Corallum having the lateral calicles very crowded, erect, short and very stout, nearly $1\frac{1}{2}$ lines broad, and 1 to $1\frac{1}{2}$ lines long, cochleariform, not striate, margin $\frac{1}{2}$ a line thick; star distinct, two lamellæ a little the most prominent; apical calicles scarcely smaller but coalescent.

Plate 43, fig. 3, part of corallum, natural size; plate 31, figs. 10 *a*, 10 *b*, views of calicle, enlarged.—The Sooloo Sea.—*Exp. Exp.*

63. *MADREPORA SECURIS* (*Dana*).—Cespitose laminate, plates erect, oblong, quadrate at apex, and strongly truncate, scarcely lobed, $\frac{1}{2}$ to 1 inch thick, surface uneven. Corallum with the lateral calicles very closely crowded, stout and short tubiform, $\frac{3}{4}$ to 1 line broad, scarcely striate, aperture entire, circular, star distinct.

Plate 43, fig. 2, corallum, natural size; 2 *a*, extremity of a small branch.—East Indies (?)—*Exp. Exp.*

64. *MADREPORA CUNEATA* (*Dana*).—Incrusting and spreading, with a few distinct, erect, broad plates or lobed, cuneate above and subacute at margin, surface uneven. Corallum having the calicles closely crowded, subequal, stout, tubiform, 1 to $1\frac{1}{2}$ lines long, and $\frac{3}{4}$ of a line broad; not striate.

Feejee Islands.—*Exp. Exp.*

Appendix.—MADREPORA LAXA (*Lamarck*).—Loose ramose, branches terete, spreading, proliferous at apex. Corallum having the calicles tubiform, unequal, with the exterior echinulate.

GENUS II.—MANOPORA.—DANA.

Foliaceous, glomerate, or subramose, never arborescent, and branches not terete, having short tentacles, often alternately large and small, and no apical parent-polyp distinguishable. Corallum with the calicles irregular, often spinuloso-laciniate, often wholly obsolete.

The described species of division IV constitute the genus *Montipora* of Blainville; and the rest (including Ehrenberg's species) are part of the old genus *Porites*.

Arrangement of the Species.

I. Short tubiform calicles, more or less angular, surface not papillose.

- | | |
|-------------------------|--------------------------|
| 1. <i>M. gemmulata.</i> | 3. <i>M. caliculata.</i> |
| 2. <i>M. lichen.</i> | |

II. No distinct calicles; surface of the coralla papilloso-asperate.

a. Free foliaceous or subramose.

- | | |
|-----------------------------|----------------------------|
| 4. <i>M. palmata.</i> | 9. <i>M. hispida.</i> |
| 5. <i>M. compressa.</i> | 10. <i>M. foliosa.</i> |
| 6. <i>M. crista-galli.</i> | 11. <i>M. expansa.</i> |
| 7. <i>M. spumosa.</i> | 12. <i>M. grandifolia.</i> |
| 8. <i>M. circumvallata.</i> | |

b. Glomerate, incrusting, but not subramose (except becoming so by incrusting other bodies).

- | | |
|------------------------|---------------------------|
| 13. <i>M. effusa.</i> | 16. <i>M. nodosa.</i> |
| 14. <i>M. stilosa.</i> | 17. <i>M. scabricula.</i> |
| 15. <i>M. venosa.</i> | |

III. Cells immersed; surface of the coralla very uneven; but not regularly papillose.

- | | |
|---------------------------|----------------------|
| 18. <i>M. incrassata.</i> | 19. <i>M. erosa.</i> |
|---------------------------|----------------------|

IV. Cells immersed; surface of the coralla not spinuloso-asperate; interstitial spaces prominent, or with rounded verrucæ or long rugæ.

- | | |
|--------------------------|----------------------------|
| 20. <i>M. capitata.</i> | 24. <i>M. verrucosa.</i> |
| 21. <i>M. nudiceps.</i> | 25. <i>M. tuberculosa.</i> |
| 22. <i>M. lima.</i> | 26. <i>M. planiuscula.</i> |
| 23. <i>M. papillosa.</i> | |

V. Cells immersed, situated at the bottom of deep circular pits; surface of the coralla not verrucose or papillose.

27. *M. foveolata*.

VI. Cells superficial, immersed, surface of the coralla evenly smooth, zoophytes branched.

28. *M. digitata*.

29. *M. tortuosa*.

1. *MANOPORA GEMMULATA*.—Explanate, contorto-foliaceous, near a Gemmipora in habit; folia clustered into a broad clump; thickness 1 to $1\frac{1}{2}$ lines; calicles scattered, short subtubiform; cells very neatly 12-rayed, a little elliptical, the centre of the bottom a short thin line; outer surface smooth and not wrinkled.

2. *MANOPORA LICHEN* (*Dana*).—Incrusting explanate, much contorted and uneven, often lobed, $\frac{1}{3}$ of an inch thick. Corallum having very short or obsolescent tubiform calicles; cells 6-rayed, with the intermediate rays sometimes distinct.

Tahiti, Society Islands(?).—*Exp. Exp.*

3. *MANOPORA CALICULATA* (*Dana*).—Glomerate, subgibbous, with a thick revolute margin. Corallum porous; calicles subtubiform, often angular, crowded, $\frac{1}{2}$ of a line broad, very short or obsolescent; cells 12-rayed.

Plate 44, fig. 1, corallum, natural size.—Feejee Islands.—*Exp. Exp.*

4. *MANOPORA PALMATA* (*Dana*).—Small; ramose, often irregularly palmate, branches much compressed, rarely terete and close digitate, two or three lines thick; polyps of a pale brown color, with the disk spotted, tentacles flattened, the alternate pale bluish or lilac, the others pale brown, with a whitish spot on the upper surface near the apex. Corallum fragile, papilloso-asperate, cells numerous, 6 to 12-rayed.

Plate 44, fig. 2, flabellate variety, natural size; 2*b*, polyp, enlarged; 2*c*, cells, showing also the surface, magnified 12 diameters; 2*d*, surface of corallum, natural size; 2*e*, transverse section of a branch magnified 3 diameters; 2*f*, part of a transverse section, enlarged 12 diameters; fig. 2*a*, another variety.—Feejee Islands.—*Exp. Exp.*

5. *MANOPORA COMPRESSA* (*Linn.*) *Dana*.—Caullescent ramose, subdichotomous and lobate; somewhat compressed. Corallum fragile, granuloso-asperate; cells every where a little prominent, scabrous, stellate, and generally with 6 rays.

Mediterranean Sea?

6. *MANOPORA CRISTA-GALLI* (*H. & Ehrenberg.*) *Dana*.—Erect-subcespitose, inciso-lobate, compressed, angular and alate, lobes often cultrate. Corallum

fragile, surface partly spinuloso-asperate, cells rarely bordered by papillæ, very distinctly 6-rayed; crests without cells.

Plate 46, fig. 1, part of corallum, natural size.—Red Sea, *Ehrenberg*.—Singapore, *Exp. Exp.*

7. *MANOPORA SPUMOSA* (*Lamarck*), *Dana*.—Subcespitose, erect, gibboso-subramose, lobes short, stout, often tuberculato-gibbous, rarely angular, sometimes subclavate at summit. Corallum fragile, crowdedly spinuloso-asperate, papillæ at apex much stouter than elsewhere and obtuse; cells immersed, margin not tumid, star 6 to 12-rayed.

Plate 44, fig. 4, corallum, natural size.—Singapore, East Indies, *Exp. Exp.*—Red Sea, *Ehrenberg*.

8. *MANOPORA CIRCUMVALLATA* (*H. & Ehrenberg*), *Dana*.—Cespitose, half a foot high, irregularly ramulose, branchlets angular, irregular, lobato-ramulose, rounded at summit and not crested. Corallum having the cells unequal, crowded, bordered by a lobed (quadrilobate) margin, making it subinfundibuliform; interstices setuloso-asperate.

Red Sea.—*Ehrenberg*.

9. *MANOPORA HISPIDA* (*Dana*).—Broad foliato-explanate at base, a little convex, with a somewhat lobed or undulated margin, and $\frac{1}{3}$ of an inch thick; bearing above a few very stout erect stems, gibbously divided and tuberose, never angular. Corallum fragile, every where densely spinuloso-asperate, even over the summits; spinules slender and fragile, a line long; cells immersed, $\frac{1}{3}$ of a line broad, very distinctly 6-rayed; under surface of the corallum naked.

Plate 44, fig. 5, corallum, natural size.—Singapore, East Indies.—*Exp. Exp.*

10. *MANOPORA FOLIOSA* (*Ehrenberg*), *Dana*.—Explanate, concave, either convoluted-foliate, or tuberculoso-subramose, usually crispate. Corallum porous, spinuloso-asperate; cells minute, unequal, surrounded by a prominent border, and sometimes subtubular; under surface plane and nearly even.

The Red Sea.—*Ehrenberg*.

11. *MANOPORA EXPANSA* (*Dana*).—Thin foliaceous, ($1\frac{1}{2}$ to 2 lines thick,) wide-spreading, and a little ascending, often broad dish-shape, sometimes incrusting in part; margin a little undulate, scarcely plicate; under surface alive for 2 inches from the edge; tentacles white, tuberculiform. Corallum fragile, spinuloso-asperate; cells minute (nearly $\frac{1}{4}$ of a line broad): often imperfectly obvallate; below, a few distant, long (3 lines), tubiform calicles, close appressed to the folium, and also a few scattered cells.

Plate 45, fig. 2, outline of a specimen, natural size; 2*a*, polyp, enlarged; 2*a'*, natural size of the same; 2*b*, part of a folium, showing the upper and under surfaces; 2*c*, upper surface, with the cells magnified; 2*d*, transverse section, magnified twelve diameters.—Singapore, East Indies.—*Exp. Exp.*

12. *MANOPORA GRANDIFOLIA* (Dana).—Thin, foliaceous ($1\frac{1}{2}$ lines thick), nearly erect, broad, and subflabellate; margin sparingly lobed; exterior alive for five of six inches from the edge; tentacles flattened, short, yellowish; disk pale ash-color, and marked with 12 white radiating lines. Corallum fragile, spinuloso-asperate, and resembling that of the *expansa*; cells minute ($\frac{1}{3}$ of a line), often imperfectly obvallate; outer surface covered crowdedly with very short obsolescent calicles, having acute margins.

Plate 45, fig. 1, natural size; 1 *a*, the animal enlarged; 1 *a'*, natural size of the same; 1 *b*, upper and under surface of the corallum, natural size; 1 *c*, upper surface, magnified; 1 *d*, part of a transverse section of the corallum, magnified twelve diameters.—Singapore, East Indies.—*Exp. Exp.*

13. *MANOPORA EFFUSA* (Dana).—Explanately incrusting, margin free for a short distance; often covering growing *Serpulas*, and thus become ramose, with the branches tortuous, cylindrical, $\frac{2}{3}$ of an inch thick. Corallum papilloso-asperate, spinules $\frac{1}{2}$ to 1 line long, some compressed, and for very short distances confluent; cells $\frac{1}{2}$ of a line broad; 12-rayed.

Plate 46, fig. 4, corallum, natural size; 4 *a*, view of surface, ditto.—Tahiti, Society Islands.—*Exp. Exp.*

14. *MANOPORA STILOSA* (H. & Ehrenberg,) Dana.—Spreading glomerate, incrusting, reddish, surface convex and tuberculous; polyps bright violet, or verging towards red, disk marked with 12 white and violet lines, tentacles 12, papilliform, minute. Corallum asperate; cells minute ($\frac{1}{2}$ a line), immersed, surrounded by rough minute lamellæ, interstices setose, setæ slender, rough, obtuse, subequal, lamellate about the cells.

Red Sea.—*Ehrenberg.*

15. *MANOPORA VENOSA* (H. & Ehrenberg,) Dana.—Spreading, glomerate, gibbous. Corallum rough with extremely minute points; cells quite large (1 line broad), with callous margins, which are reticulately united and uneven, giving a venose appearance to the surface; stars distinctly 12-rayed.

16. *MANOPORA NODOSA* (Dana).—Incrusting, glomerate; surface tuberculous, with the tubercles subconical; polyps pale lilac, tentacles obsolete, disk with 12 short crenations and a white margin. Corallum hardly fragile, spinuloso-asperate; spinules very much crowded, scarcely $\frac{1}{2}$ a line long, a little compressed and obtuse; cells minute (one-fifth of a line broad), 6-rayed.

Plate 46, fig. 2, zoophyte, natural size; 2 *a*, part of surface and polyps, enlarged; 2 *b*, surface of corallum and cells, enlarged; 2 *c*, transverse section, enlarged.—Feejee Islands at Mathuata, Island of Venua Lebu.—*Exp. Exp.*

17. *MANOPORA SCABRICULA* (Dana).—Incrusting, glomerate, gibbous, with the tubercles of the surface rounded; polyps olive-green, tentacles obsolete; disk 12-rayed, with 6 alternate rays larger, and most prominent. Corallum

rather firm, every where very minutely spinuloso-asperate, spinules scarcely one-sixth of a line long, and never lamellate; cells very minute (one-fifth to one-sixth of a line broad), 6 to 12-rayed.

Plate 46, fig. 3, zoophyte, natural size; 3*a*, part of surface with the polyps enlarged; 3*b*, surface of corallum, enlarged; 3*c*, vertical section, ditto.—Feejee Islands, Mathuata, Island of Venua Lebu.—*Exp. Exp.*

18. *MANOPORA INCRASSATA* (*Dana*).—Thick explanate ($\frac{1}{2}$ an inch), a little undulate, sparingly lobed; surface angulately rough, or covered with very irregular polygonal prominences. Corallum hardly fragile, not spinulous, cells numerous, $\frac{1}{3}$ of a line broad, every where scattered, some with an elevated margin, 6 to 12-rayed.

Plate 47, fig. 1, corallum, natural size.—Feejee Islands.—*Exp. Exp.*

19. *MANOPORA EROSA* (*Dana*).—Glomerato-ramose, erect, stems subangular, stout, acervately tuberculous, erose, obtuse. Corallum without papillæ, cells immersed, every where scattered, even at the summits; star 6-rayed.

Plate 46, fig. 5, corallum, natural size; 5*a*, vertical section, enlarged.—Feejee Islands.—*Exp. Exp.*

20. *MANOPORA CAPITATA* (*Dana*).—Cespitoso-ramose, branches $\frac{1}{2}$ to 1 inch thick, often irregularly inflated or nodose, and very frequently coalescing, rounded at apex or capitate. Corallum every where crowdedly papillose, even at apex, papillæ oblong, $\frac{1}{2}$ to 1 line thick, obtuse; cells immersed, minute.

Plate 47, fig. 4, corallum, natural size.—Sandwich Islands, Hawaii, Hido Bay.—*Exp. Exp.*

21. *MANOPORA NUDICEPS* (*Dana*).—*Madrepora abrotanoides* of Audouin, Egypte, Zoophytes, Plate iv, fig. 4.

22. *MANOPORA LIMA* (*Lamarck*,) *Dana*.—Broad foliaceous, subcucullate, exterior alive for 3 inches or so. Corallum scarcely fragile, above, crowdedly rugose, rugæ thin (hardly $\frac{1}{2}$ a line thick), sometimes reticulate.

“Austral Seas,” *Peron & Lesueur*.—Sooloo Sea, *Exp. Exp.*

23. *MANOPORA PAPILLOSA* (*Lamarck*,) *Dana*.—Foliaceous, fronds subflabellate. Corallum above papillose, papillæ obtuse, rounded, a line thick, attenuate towards the margin, longitudinally seriate.

“Austral Seas.”—*Peron & Lesueur*.

24. *MANOPORA VERRUCOSA* (*Lamarck*,) *Dana*.—Undato-gibbous, explanate. Corallum with deep immersed cells, interstices verruciferous, verrucæ convex, and various in size.

25. *MANOPORA TUBERCULOSA* (*Lamarck*,) *Dana*.—Incrusting, irregular in form, not lobed. Corallum having the cells minute, with the interstices tuberculate; tubercles echinate, prominent, columniform, sometimes confluent in ridges.

26. *MANOPORA PLANIUSCULA* (*Dana*).—Glomerate, incrusting, nearly plane above; interstices 1 to $1\frac{1}{2}$ lines broad, a little convex. Corallum porous; cells deep, rather indistinctly 12-rayed.

Plate 47, fig. 3, corallum, natural size; 3 a, vertical section, enlarged.—Feejee Islands.—*Exp. Exp.*

27. *MANOPORA FOVEOLATA* (*Dana*).—Glomerate, incrusting, nearly plane or a little undulate above. Corallum profoundly alveolate, the radiated cells situated at the bottom of deep pits a line broad; interstices very thin and sometimes subacute.

Probably the Feejee Islands.—*Exp. Exp.*

28. *MANOPORA DIGITATA* (*Dana*).—Small, ramose, often digitate, branches subterete, somewhat compressed, often tortuous, $\frac{1}{4}$ of an inch thick, subequal, obtuse; polyps yellow, tentacles short, equal. Corallum quite smooth, cells immersed, one-sixth of a line broad.

Plate 48, fig. 1, zoophyte, natural size; 1 a, polyp, enlarged; 1 b, extremity of branch, natural size; 1 c, cell and surface around, enlarged; 1 d, part of transverse section of branch, enlarged.—Feejee Islands.—*Exp. Exp.*

29. *MANOPORA TORTUOSA* (*Dana*).—Ramosse, branches often 4 inches long, $\frac{1}{4}$ of an inch thick, curved or tortuous, subterete, somewhat compressed. Corallum quite smooth, cells immersed, $\frac{1}{4}$ of a line broad.

Plate 48, fig. 2, corallum, natural size.—Singapore, East Indies.—*Exp. Exp.*

FAMILY II.—FAVOSITIDÆ.

Polyps intermittedly coralligenous at base, cells, therefore, solid at bottom, and internally the corallum cells crossed by septa, or quite closed by the secretions; calicles none.

The Favositidæ may be divided into three subfamilies:—

1. *ALVEOPORINÆ*. Cells contiguous, slenderly echinulate within; parietes cribrate.

2. *FAVOSITINÆ*. Cells contiguous, at the summits at least; rays entire or obsolete.

3. *HELIOPORINÆ*. Cells in no part contiguous, circular.

SUBFAMILY I.—ALVEOPORINÆ.

Favositidæ, forming spongy calcareous secretions; cells angular, contiguous, internally slenderly echinulate.

GENUS I.—ALVEOPORA.—BLAINVILLE.

Glomerate or furcato-ramose; coralla spongy; cells contiguous, with the sides very thin, and thickly pierced with holes; transverse septa remote.

1. ALVEOPORA RETEPORA (*Ellis*,) *Blainville*.—Glomerato-globose. Corallum with the cells angular, and having an erect margin, scabrous with minute teeth.

2. ALVEOPORA DEDALEA (*Forskal*,) *Blainville*.—Lobato-glomerate; expanded polyps, brownish-umber, or ash-colored, tentacles filiform; when contracted, greenish-bronze. Corallum spongy and tender; cells a line in diameter, rarely wider, septa spinulous above, and the surface of the corallum, therefore, throughout hispid.

Red Sea.—*Forskal*, *Savigny*, and *Ehrenberg*.

3. ALVEOPORA SPONGIOSA (*Dana*).—Large, lobato-glomerate, alive for 10 to 12 inches. Corallum spongy and very tender; cells a line in diameter, scarcely as deep as broad, filiferous within; at apex much smaller; parietes filamento-cribrate, porules narrow-oblong.

Plate 48, fig. 3, corallum, reduced two diameters; 3*a*, part of same, natural size; 3*b*, cells of surface, enlarged; 3*c*, vertical section of a cell; 3*d*, vertical section of corallum, enlarged.—*Feejee Islands*.—*Exp. Exp.*

4. ALVEOPORA RUBRA (*Quoy & Gaymard*).—Furcato-ramose, branchlets long, erect; polyps red, with short and stout tentacles. Corallum with spinous cells, sex-dentate within.

Port Carteret, New Ireland.—*Quoy & Gaymard*.

5. ALVEOPORA FENESTRATA (*Lamarck*,) *Dana*.—Furcato-ramose; branches stout, subgibbous, very obtuse. Corallum having the cells deep, subangular, filiferous within; parietes fenestrate.

“Austral Seas.”—*Peron & Lesueur*.

SUBFAMILY II.—FAVOSITINÆ.

Cells of the corallum at the summits at least contiguous and angular; lamellæ entire, often very narrow or obsolete.

GENUS II.—SIDEROPORA.—BLAINVILLE.

Furcato-ramose; cells with 6 lamellæ meeting at centre in an axis, and forming a star of six rays.

1. *SIDEROPORA DIGITATA* (Pallas,) *Blainville*.—Branches $\frac{1}{3}$ to $\frac{1}{2}$ an inch thick, rarely $\frac{1}{4}$ of an inch, obsoletely compressed, often a little tumid at intervals.

Red Sea and East Indies. Sooloo Sea.—*Exp. Exp.*

2. *SIDEROPORA ELONGATA* (Lamarck,) *Blainville*.—Branchlets elongate, cylindrical. Corallum with the cells sex-dentate; superior margin a little prominent.

The Indian Ocean?—*Lamarck*.

3. *SIDEROPORA SUBDIGITATA* (Lamarck,) *Blainville*.—Lobato-ramulose; branches short, subdigitate. Corallum with the stars sex-dentate; interstices a little prominent and echinulate.

The Indian or Austral Ocean.—*Lamarck*.

4. *SIDEROPORA PALMATA* (Blainville).—Branches much compressed and thinner above, flabellate, sparingly digitate lobed, or subpalmate, often 1 to 2 inches broad, and 3 to 5 lines thick at apex. Corallum having the cells slightly margined, and the columella a little prominent.

East Indies.—*Exp. Exp.*

5. *SIDEROPORA MORDAX* (Dana).—Branches nearly simple, much compressed, not thinner at apex, scarcely flabellate, $\frac{1}{2}$ to 1 inch broad, and $\frac{1}{3}$ an inch thick; polyps with a pale yellowish disk, and short tentacles of a bright green color, deep brown at base. Corallum with the cells strongly vaulted, and the surface, therefore, decidedly scabrous.

Plate 49, fig. 1, zoophyte, natural size; 1 *a*, polyp, enlarged; 1 *b*, cells of surface, at summit, enlarged.—Feejee Islands.—*Exp. Exp.*

GENUS III.—SERIATOPORA.—LAMARCK.

Slenderly ramose; branches and branchlets terete, polyps vertically more or less seriate, cells of corallum obsolescently rayed, not deep, and becoming filled and solid internally.

1. *SERIATOPORA SUBULATA* (Lamarck).—In very ramose hemispherical clumps, branches quite stout (2 lines thick and at base sometimes 4 lines),

rarely coalescing; polyps in 4 to 6 series, greenish. Corallum with the branchlets subulate, ramuloso-verrucose above, and 4 to 6-winged at summit.

The Red Sea and East Indies.

2. *SERIATOPORA LINEATA* (*Esper*), *Schweigger*.—Branches quite stout, 3 lines thick at base, slenderly subulate at apex, and not verrucose. Corallum six-winged at summit, cells slightly vaulted, $\frac{1}{2}$ of a line broad.

Red Sea.—*Ehrenberg*.

3. *SERIATOPORA HYSTRIX* (*Dana*).—Branches stout, below, 3 lines thick, often coalescing; branchlets conically subulate and acute, 2 lines thick; polyps in 8 to 10 series, tentacles rose-red. Corallum with the branchlets not winged at summit; cells vaulted, $\frac{1}{2}$ of a line broad; below, cells sometimes scattered.

Plate 49, fig. 3, central part of a hemispherical clump, natural size; 3*a*, from the outer part of the same; 3*b*, part of a transverse section, enlarged.—Feejee Islands.—*Exp. Exp.*

4. *SERIATOPORA OCTOPTERA* (*H. & Ehrenberg*).—Branches rather slender (scarcely 2 lines thick), below, often coalescing; polyps in 6 to 8 series, greenish. Corallum with the branchlets rather obtuse at apex, 6 or 8-winged, cells slightly vaulted.

Red Sea, *Ehrenberg*.—Singapore and Sooloo Sea, *Exp. Exp.*

5. *SERIATOPORA CALIENDRUM* (*H. & Ehrenberg*).—Branches 2 lines thick at base, minutely asperate, intricate and coalescing; branchlets very slender, with finely subulate extremities. Corallum with the cells not vaulted; apex of the branchlets 6-winged.

Red Sea.—*Ehrenberg*.

GENUS IV.—POCILLOPORA.—LAMARCK.

Furcato-ramose; coral secretions of the interstices nearly solid; branches never terete, often verrucose; cells contiguous, and at apex angular, the lamellæ very narrow, and generally rather indistinct.

I. *Slenderly branched, not verrucose.*

1. *POCILLOPORA ACUTA* (*Lamarck*).—Hemispherically shrubby-cespitate, much branched; branches 2 to 4 lines thick, subterete, flexuous; upper branchlets 1 to 1½ lines thick, rather distant, subacute, half an inch long.

The Pacific and Indian Oceans. Feejee Islands and Sooloo Sea.—*Exp. Exp.*

II. *Regularly cespitose, furcato-ramose or subdivided; branches verrucose.*

2. *Pocillopora cespitosa* (Dana).—Low and even-topped cespitose, much and crowdedly branched, branches much shorter than in the *acuta*, tortuous, 2 to 3 lines thick, and stouter at base; summit branchlets verruciform, 2 lines long, and often subacervate. Corallum having the cells large ($\frac{1}{4}$ a line broad), and without star or columella.

Plate 49, fig. 5, part of a clump, natural size; 5 a, extremity of a branch, natural size.—Sandwich Islands.—*Exp. Exp.*

3. *Pocillopora brevicornis* (Lamarck).—Low and broad cespitose, convex, ramose, branches very short and much crowded, scarcely 2 lines apart, 4 to 6 lines thick, often somewhat compressed above or lobed at apex, very obtuse and verrucose, with the verrucæ 1 to $1\frac{1}{2}$ lines long, and sometimes acervate. Corallum having the cells $\frac{1}{3}$ to $\frac{1}{2}$ a line broad, and without a columella.

Plate 49, fig. 8, outline sketch of part of a clump, natural size.—East Indies, *Peron & Lesueur*.—Feejees and Sandwich Islands, *Exp. Exp.*—Ceylon, *Rev. G. A. Aphthorp*.

4. *Pocillopora bulbosa*.—Cespitose, very ramose, lax, branches tortuous, incrassate at base ($\frac{1}{2}$ to $\frac{3}{4}$ of an inch), above $\frac{1}{3}$ to $\frac{1}{2}$ of an inch thick, apex often digitato-palmate, summit branchlets 4 to 6 lines long. Corallum with the cells rather large (nearly $\frac{1}{2}$ a line), star scarcely distinct, columella none.

Plate 49, fig. 6, outline sketch of branch of corallum, natural size; 6 a, extremity of a branch, ditto.—Singapore, East Indies.—*Exp. Exp.*

5. *Pocillopora damicornis*.—Cespitose, very ramose and lax, branches rather stout, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch below, 3 to 6 lines above, and at base often very much incrassate, variously subdivided, verrucose, subdilata at apex and covered with verrucæ $1\frac{1}{2}$ to 2 lines long, more or less acervate. Corallum with the cells rather large; star and columella obsolete.

Plate 49, fig. 7, outline sketch of branch of corallum, natural size; 7 a, extremity of branch, ditto.—East Indies and Pacific Ocean. Feejee Islands and Singapore.—*Exp. Exp.*

6. *Pocillopora favosa* (Ehrenberg).—Shrubby-cespitose, branches stout, alternately compressed, subtortuous, at apex clavato-incrassate, verrucose, lobate or sublobate; polyps green.

Plate 50, fig. 1, corallum, natural size.—Red Sea, *Ehrenberg*.—Feejee Islands and Sandwich Islands, *Exp. Exp.*

7. *Pocillopora verrucosa* (Lamarck).—Hemispherically cespitose, branches stout, nearly straight, subdivided, often dilated or compressed at apex, $\frac{1}{2}$ an inch thick, and 1 to 2 inches broad, every where neatly verrucose even over the summits, verrucæ short, simple, the apical a little smaller than the lateral. Corallum with the cells rather large; columella obsolete.

Plate 50, fig. 3, branch in outline, of specimen from the Sandwich Islands; 3 *a*, verrucæ, natural size.—East Indies and Pacific Ocean. Sooloo Sea and Sandwich Islands.—*Exp. Exp.*

8. *POCILLOPORA CLAVARIA* (*Ehrenberg*).—Suffruticose, branches nearly simple, dichotomously subdivided, $\frac{1}{2}$ an inch thick, lateral surface and obtuse apex ramuloso-verrucose, verrucæ subequal, obtuse, subovate, sometimes lobed and obsoletely proliferous, middle of the apex more distinctly proliferous. Corallum having the cells $\frac{1}{2}$ to $\frac{3}{8}$ of a line broad, with a slender columella.

9. *POCILLOPORA SQUARROSA* (*Dana*).—Rudely hemispherical, branches very closely crowded, stout, nearly straight, unequally compressed, and uneven, summits rounded, $\frac{1}{2}$ to 1 inch thick, and $\frac{3}{4}$ to 2 inches broad; surface coarsely verrucose, verrucæ stout, subglobose, very irregular, and sometimes like large tubercles; often obsolete at summit. Corallum having the cells small ($\frac{1}{3}$ of a line); star scarcely distinct, with one lamellæ quite broad.

Plate 50, fig. 3, part of a branch, natural size; 5 *a*, extremity, showing surface, ditto.—Tahiti, Society Islands.—*Exp. Exp.*

10. *POCILLOPORA ELONGATA* (*Dana*).—Hemispherical, branches widely separate, nearly straight, and very long, subterete, $\frac{3}{4}$ of an inch thick, dilated at apex ($\frac{1}{2}$ an inch thick and often 2 inches broad), every where below and above even to the very apex verrucose, verrucæ even, obtusely conical. Corallum having the cells small ($\frac{1}{3}$ of a line broad), star neat and quite distinct, and situated rather deep within the cell; a minute columella sometimes seen.

Plate 50, fig. 4, branch in outline, natural size; 4 *b*, cells, enlarged.—Ceylon, Indian Ocean.—*Rev. G. A. Aphthorp.*

11. *POCILLOPORA LIGULATA* (*Dana*).—Hemispherical, branches subdivided, rather remote, straight, thin (2 to 3 lines), much compressed and complanate, $\frac{1}{2}$ to 1 $\frac{1}{4}$ inches wide, verrucæ small, ascending, and appressed to the branch, obsolete at apex. Corallum having the cells short stellate, columella very distinct, and united by one of the lamellæ to the side of the cell.

Plate 50, fig. 2, branch, natural size; 2 *a*, surface and cells, enlarged.—Sandwich Islands.

12. *POCILLOPORA ELEGANS* (*Dana*).—Neat hemispherical, branches lamellar, subsimple, 1 to 2 $\frac{1}{2}$ inches broad, and $\frac{1}{3}$ of an inch thick, evenly and crowdedly verrucose, summits naked, verrucæ small. Corallum having small cells ($\frac{1}{3}$ of a line); star and columella indistinct.

Plate 51, fig. 1, corallum, natural size; 1 *a*, verrucæ, natural size.—Feejee Islands.—*Exp. Exp.*

13. *POCILLOPORA MEANDRINA* (*Dana*).—Cespitose, neatly hemispherical; branches lamellar, often sinuous, nearly simple, $\frac{1}{3}$ to $\frac{1}{2}$ an inch thick, 1 to 3 inches broad, neatly verrucose, summits naked. Corallum with the verrucæ

a little oblong, angular, sometimes proliferous, with the cells of the same quite large (often $\frac{2}{3}$ of a line); star and columella indistinct.

Plate 50, fig. 6, branch of corallum, natural size; 6 *a*, some of the verrucæ, ditto; 6 *b*, transverse section, ditto.—Sandwich Islands.—*Rev. Mr. Baldwin*.

14. *Pocillopora grandis* (*Dana*).—Neat hemispherical; branches lamellar, $\frac{1}{2}$ an inch thick (sometimes $\frac{2}{3}$), 2 to 4 inches wide, evenly verrucose, apex broad and naked. Corallum having the verrucæ nearly globose, with the cells constituting them small, $\frac{1}{3}$ of a line broad; star indistinct, columella obsolescent.

Plate 51, fig. 2, outline sketch of part of corallum; 2 *a*, portion of a plate, natural size; 2 *b*, verrucæ, ditto; 2 *c*, surface and cells, enlarged.—Feejee and Society Islands.—*Exp. Exp.*

15. *Pocillopora plicata* (*Dana*).—Cespitose, neat hemispherical; branches broad laminate, $\frac{1}{3}$ of an inch thick, and 1 to 5 inches broad, sparingly subdivided, truncate and naked at summit, sides remotely verrucose, often distantly plicate, or having the verrucæ arranged in crests. Corallum having the cells rather large; star and columella distinct.

Plate 50, fig. 7, plate, natural size; 7 *a*, oblique view of surface, with cells enlarged; 7 *b*, same in vertical view; 7 *c*, vertical section, enlarged; 7 *d*, transverse section, ditto.—Feejee Islands, *Exp. Exp.*—Sandwich Islands, *Rev. Mr. Baldwin*.

III. *Glomerato-cespitose*.

16. *Pocillopora informis* (*Dana*).—Glomerato-cespitose, solid at base, branching irregular, often gibbous and acervate, in part naked, in part remotely and irregularly verrucose. Corallum having the cells small ($\frac{1}{3}$ of a line), a slender columella, and one lamella very distinct.

Plate 51, fig. 3, corallum, natural size; 3 *a*, view of surface and cells.—The Sandwich Islands.

GENUS V.—FAVOSITES.—LAMARCK.

Glomerate or ramose Favositidæ; polyps segregato-aggregate, the coralla therefore prismatic in structure or basaltiform; cells every where contiguous, subangular; lamellæ sometimes 12 and broad, but usually quite obsolete.

GENUS VI.—CATENIPORA.

Favositidæ with the buds acrogenous and aggregated laterally in a single series; the corallum, therefore, consisting of vertical laminae, often intersecting one another, and containing a single series of cells; transverse septa numerous.

SUBFAMILY III.—HELIOPORINÆ.

Favositidæ, with scattered polyps; cells of the corallum circular, not contiguous, rays very narrow.

GENUS VII.—HELIOPORA.—BLAINVILLE.

Glomerate or ramose. Corallum with the cells quite small and unequal, remote, interstices minutely cellular and internally fine tubular.

HELIOPORA CÆRULEA (Pallas,) *Blainville*.—Glomerato-laminate, laminae erect, variously lobed or digitate, lobes sometimes very short; summits $1\frac{1}{2}$ to 2 lines thick, at base often over $\frac{3}{4}$ of an inch; internal color blue.

East Indies. Balabac Passage, north of Borneo.—*Exp. Exp.*

GENUS VIII.—HELIOLITES.—GUETTARD.

Glomerate; cells of the corallum rather large, distant; interstices cellular throughout, and not tubular.

GENUS IX.—MILLEPORA.

Incrusting, glomerate, laminate or ramose, with the branches never terete; polyps scattered. Coralla with the cells very minute and unequal, not contiguous, rays obsolete, interstices scarcely porous.

I. *Ramose, often lamellate, and ramoso-lobate above.*

1. *MILLEPORA ALCICORNIS* (Pallas).—Large, sublamellate, incrusting at base, fronds stout, multifid, laciniato-palmate, and often much subdivided or

ramose, branchlets subacute; surface smooth. Corallum having the cells rather large, and very numerous.

West Indies.—*M. moniliformis*, D., a Millepora in disjointed pieces incrusting axes of Gorgoniæ, W. Indies.

2. *MILLEPORA RAMOSA* (*Pallas*).—Lax, ramose, branches every way divaricate and long flexuous, nearly terete, $\frac{1}{4}$ to $\frac{1}{2}$ an inch thick, remotely coalescent, attenuated above, and subacute at apex. Corallum having the cells quite minute and scattered.

3. *MILLEPORA PUMILA* (*Dana*).—Small (1 to 2 inches), cespitose, slenderly palmato-ramose, branches about one and a half lines broad; branchlets mostly straight and simple, truncate, slender, many $\frac{1}{2}$ an inch long, others very short.

Plate 52, fig. 4, corallum, natural size.—The harbor of Carthage, east coast of South America.—*T. R. Peale*.

4. *MILLEPORA TORTUOSA* (*Dana*).—Cespitose, much and slenderly ramose, branches compressed, mostly subdigitate, often crowdedly intricate and tortuous, sometimes in a single plane and reticulately coalescent; branchlets flexuous, $1\frac{1}{2}$ to 2 lines broad, compressed, obtuse, not acuminate. Corallum with the cells very minute.

Plate 52, figs. 3, 3a, different varieties, natural size; 3b, extremity of branch, showing the minute cells.—Feejee Islands.—*Exp. Exp.*

II. *Lamellate or glomerate, never ramose nor digitato-lobate.*

5. *MILLEPORA PPLICATA* (*Esper*).—Large, neatly lamellate, erect, thin, above for several inches from the margin $\frac{1}{2}$ of an inch, and at apex acute; incisoblate, sometimes coalescent; lateral surface minutely rugose, and vertically carinate.

West Indies (Surinam).

6. *MILLEPORA COMPLANATA* (*Lamarck*).—Very broad lamellate, smooth; fronds erect, surface plane, apex somewhat subdivided, subpiculate, round-truncate.

West Indies.—*Lamarck*.

7. *MILLEPORA SQUARROSA* (*Lamarck*).—Sublamellate, fronds erect, verrucose at base; sides vertically lamelliferous, lamellæ subremote.

Var. *incrassata*, pl. 53, f. 1, Raraka I., Paumotus.

8. *MILLEPORA PLATYPHYLLA* (*Ehrenberg*).—Spreading at base, lamellate fronds erect, very broad, 10 inches high, sides lamelliferous and coalescent (and hence zoophytes reticulate with intervals 4 to 6 inches broad), acute at summit; surface smooth, obsolete tuberculous, tubercles hemispherical, nearly equal.

Red Sea, *Ehrenberg*.—Feejees, *Exp. Exp.*—Plate 52, fig. 5.

FAMILY III.—PORITIDÆ.

Polyps closely crowded, forming continuous porous coral secretions in their lower portions, and not coralligenous towards the summits,—when expanded, therefore, prominent above the surface, and the coralla without calicles, with the cells shallow or superficial and scarcely traceable through the interior of the corallum.

GENUS I.—PORITES.—CUVIER.

Polyps with 12 tentacles, and not exceeding a line in breadth; zoophytes glomerate and furcato-ramose; branches never neatly terete, obtuse at apex. Coralla throughout porous; cells shallow or superficial, radiately granulous within.

Arrangement of the Species.

A. Ramose, branches often compressed, but not plicate.

I. *Cells excavate.*

- | | |
|-------------------------|--------------------------|
| 1. <i>P. mordax.</i> | 5. <i>P. furcata.</i> |
| 2. <i>P. compressa.</i> | 6. <i>P. recta.</i> |
| 3. <i>P. clavaria.</i> | 7. <i>P. divaricata.</i> |
| 4. <i>P. flexuosa.</i> | |

II. *Cells superficial or none.*

- | | |
|--------------------------|---------------------------|
| 8. <i>P. nigrescens.</i> | 10. <i>P. levis.</i> |
| 9. <i>P. palmata.</i> | 11. <i>P. cylindrica.</i> |

B. Branches plicate.

12. *P. contigua.*

C. Glomerate or lobato-glomerate.

I. *Cells excavate.*

- | | |
|-----------------------------|---------------------------|
| 13. <i>P. astræoides.</i> | 17. <i>P. limosa.</i> |
| 14. <i>P. conglomerata.</i> | 18. <i>P. favosa.</i> |
| 15. <i>P. lobata.</i> | 19. <i>P. cribripora.</i> |
| 16. <i>P. fragosa.</i> | |

II. *Cells none.*

- | | |
|-------------------------|----------------------------|
| 20. <i>P. informis.</i> | 22. <i>P. monticulosa.</i> |
| 21. <i>P. erosa.</i> | |

D. Thin incrusting.

23. *P. lichen*.25. *P. arenacea*.24. *P. reticulosa*.

1. *PORITES MORDAX* (*Dana*).—Cespitose, alive for $3\frac{1}{2}$ to 4 inches; branches subsimple and somewhat compressed, below, often coalescing into a plate, branchlets $1\frac{1}{2}$ to 2 inches long, $\frac{1}{8}$ of an inch thick, and $\frac{1}{3}$ to 1 inch broad, plano-rotund at apex, not clavate. Corallum strong and firm, with the surface harsh; cells large ($\frac{2}{3}$ of a line), deep and conical; septum acute, scabrous.

Plate 53, fig. 3, corallum, natural size; 3a, cell, enlarged.—Sandwich Islands.—*Exp. Exp.*—Var. *elongatum*, plate 53, fig. 4.

2. *PORITES COMPRESSA* (*Dana*).—Cespitose, alive for $1\frac{1}{2}$ to 2 inches, sublaminar, and erect, coalescing below, lobed above or lobato-ramose, lobes compressed, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch broad (rarely $1\frac{1}{2}$ inches), short ($\frac{1}{2}$ an inch), subtruncate at summit, and 3 to 4 lines thick, not at all clavate. Corallum firm; cells $\frac{1}{2}$ a line broad, neatly polygonal, quite shallow, plano-conical; septa acute and very thin.

Plate 53, fig. 5, corallum, natural size; 5a, cell, enlarged; fig. 8, outline of same.—Sandwich Islands.—*Exp. Exp.*

3. *PORITES CLAVARIA* (*Ellis*, *Lamarck*).—Short cespitose, alive for 2 inches; branches flexuous, and quite stout, broad clavate, with the summits compressed and lobed, 1 to 2 inches broad, and $\frac{1}{2}$ to $\frac{3}{4}$ of an inch thick, sometimes subflabellate, very obtuse; polyps very salient; tentacles whitish, short, disk brown, margin of the mouth white. Corallum very porous, spongy at summit; cells shallow, subconical or plane within, rather large (nearly $\frac{3}{4}$ of a line broad); septa thin and acute.

West Indies.—*Ellis*, *Lesueur*.

4. *PORITES FLEXUOSA* (*Dana*).—Short cespitose, alive for $2\frac{1}{2}$ inches; branches flexuous, divaricate, quite short, $\frac{1}{2}$ to $\frac{3}{8}$ of an inch thick, dilated at apex, very obtuse or subtruncate, sometimes subflabellate, 1 inch broad, and lobed. Corallum quite porous, spongy at apex; cells large (nearly four-fifths of a line broad), shallow, flat at bottom, septa obtuse.

Barbadoes, West Indies.

5. *PORITES FURCATA* (*Lamarck*).—Short cespitose, alive for 1 to $1\frac{1}{4}$ inches, tortuously ramose, branches divaricate, somewhat compressed, $\frac{1}{3}$ to $\frac{1}{2}$ an inch thick, sometimes 1 inch broad, and subflabellate; apex subtruncate, furcate or trifurcate. Corallum quite porous, apex rather spongy; cells small, scarcely $\frac{1}{3}$ of a line broad, a little excavate, subconical or flat at bottom; septa thin and acute.

West Indies.

6. *PORITES RECTA* (*Lesueur*).—Cespitose, alive for 1 to 1½ inches; branches straight, remote, somewhat compressed, divaricately furcate, rounded at summit; polyps salient, cylindrical, tinged with brown; tentacles short. Corallum rather porous, the cells small, excavate; rays denticulate.

St. Bartholomew and St. Christopher's, West Indies.—*Lesueur*.

7. *PORITES DIVARICATA* (*Lesueur*).—Cespitose, alive for 1 to 1½ inches; branches quite slender (3 to 4 lines thick), somewhat compressed, divaricate and flexuous, sometimes reflexed; apex rounded, often furcate. Corallum fragile; cells small (½ a line broad), excavate.

Guadaloupe, West Indies.—*Lesueur*.

8. *PORITES NIGRESCENS* (*Dana*).—Ramosae, cespitose, alive for 6 or 8 inches; branches elongate, rather crowded, sometimes coalescing, flexuous, subterete, gradually tapering, obtuse; stems occasionally 1 to 1½ inches thick at base, branchlets ⅓ to ½ an inch thick and 2 to 2½ inches long. Corallum firm; cells rather large, scarcely excavate or superficial; septa broad and granulous.

Plate 54, fig. 1, corallum, natural size; 1 *a*, surface with the cells enlarged; 1 *b*, transverse section, enlarged.—Feejee Islands.—*Exp. Exp.*—Var. *micronata*, plate 54, fig. 2; Sooloo Sea.

9. *PORITES PALMATA* (*Dana*).—Cespitose, alive for 3 or 4 inches; branches broad flabellate, sometimes 2 inches broad, ¼ thick, and short-lobed or digitate at apex; below often coalescing, lobes compressed, ½ to 1 inch long, obtuse, occasionally elongate and terete. Corallum somewhat fragile; cells superficial or slightly excavate, small (half a line); septa about the upper parts of the branches acute.

Plate 54, fig. 3, corallum, natural size; 3 *a*, cells, enlarged.—Sooloo Sea, East Indies.—*Exp. Exp.*

10. *PORITES LEVIS* (*Dana*).—Cespitose, alive for 6 inches or more; branches long, furcate, subterete, scarcely compressed, irregularly inflated, below 1–1½ inches thick, obtuse at apex and 3 to 4 lines broad; polyps very short, brown; tentacles minute, with whitish tips. Corallum rather firm, surface smooth; cells wholly superficial, scarcely distinguishable.

Plate 54, fig. 5, part of zoophyte, natural size; 5 *a*, 5 *b*, polyps, enlarged; 5 *c*, surface, enlarged; 5 *d*, cross section, ditto.—Feejee Islands.—*Exp. Exp.*

11. *PORITES CYLINDRICA* (*Dana*).—Cespitose, alive for 1 to 2 inches; branches erect and very much crowded together, often coalescing, neatly cylindrical, below ½ to ⅔ of an inch thick, often furcate at apex, and rounded; branchlets 1 inch long and ⅓ an inch thick. Corallum rather firm; cells wholly superficial, indistinct.

Plate 54, fig. 4, corallum of part of a clump, natural size.—Feejee Islands (?).—*Exp. Exp.*

12. *PORITES CONTIGUA* (*Esper*), *Dana*.—Cespitose, crowdedly ramose, above convex, alive for $2\frac{1}{2}$ inches; branches compressed, crispate, lobed and angular, $1\frac{1}{2}$ to 3 lines thick at summits, obtuse. Corallum firm; cells none, a very minute indistinct pore (seen by a lens), surrounded by six granules, other granules scattered.

Plate 54, fig. 6, part of clump of corallum, natural size; 6 *a*, surface, enlarged.—Feejee Islands.—*Exp. Exp.*

13. *PORITES ASTRÆOIDES* (*Lesueur*).—Incrusting, undate and somewhat gibbous, polyps sulphur-yellow; tentacles brown, yellow at tip, with a black puncture at the extremity. Corallum firm, cells rather large, subangular or circular, cylindrical and deep, with 12 radiating lamellæ, nearly vertical and narrow, and at centre a very short columella.

Guadaloupe, West Indies.—*Lesueur*.

14. *PORITES CONGLOMERATA*.—Subglobose, gibboso-glomerate. Corallum having the cells angular, quite shallow, flat-conical, rather small ($\frac{2}{3}$ of a line); septa very thin and acute.

Plate 55, fig. 3, corallum, natural size; 3 *a*, cell, enlarged.—The Pacific and Indian Oceans. Feejee Islands.—*Exp. Exp.*

15. *PORITES LOBATA* (*Dana*).—Lobato-glomerate, very thick lamellar, and gibbous. Corallum having the cells angular, plano-conical, rather large (nearly $\frac{3}{4}$ of a line); septa very thin and acute.

Plate 55, fig. 1, corallum, natural size; 1 *a*, 1 *b*, cells, enlarged.—Sandwich Islands.—*Exp. Exp.*

16. *PORITES FRAGOSA* (*Dana*).—Erect-glomerate, with the surface subangular and coarsely monticulose. Corallum having the cells subangular, shallow, rather small ($\frac{2}{3}$ of a line broad), plane at bottom; septa obtuse.

Plate 55, fig. 9, surface of corallum, natural size; 9 *a*, cells enlarged.—Feejee Islands.—*Exp. Exp.*

17. *PORITES LIMOSA* (*Dana*).—Gibboso-subglobose. Corallum having the cells shallow, large (four-fifths of a line broad), plane at bottom; septa obtuse, but thin.

Plate 55, fig. 2, corallum, natural size; 2 *a*, cells, enlarged.—The Feejee Islands, in shallow waters, near the shores, where often muddy.—*Exp. Exp.*

18. *PORITES FAVOSA* (*Dana*).—Stout columniform, surface subgibbous, summit truncate. Corallum having the cells deep, rather large, conical; septa acute and durable.

Plate 55, fig. 4, corallum, natural size; 4 *a*, cells, enlarged.—Feejee Islands.—*Exp. Exp.*

19. *PORITES CRIBRIFORA* (*Dana*).—Incrusting and glomerate, margin of the incrusting mass stout, and involuted or folded under; surface small gib-

bous. Corallum having the cells quite small, punctiform or conical; septa obtuse.

Plate 55, fig. 5, corallum, natural size; 5 *a*, cell, enlarged.—Feejee Islands.—*Exp. Exp.*

20. *PORITES INFORMIS* (*Dana*).—Stout erect glomerate, gibbous lobed, and sparingly erose; polyps pale-yellow, surrounded by brown, tentacles obsolete. Corallum without cells, stars scarcely distinguishable, central pore very minute, and surrounded by six granules; the outer 12 granules scattered.

Plate 55, fig. 6, corallum, natural size; 6 *a*, polyps and surface of zoophyte, enlarged; 6 *b*, cells and surface of corallum, enlarged; 6 *c*, part of transverse section.—Feejee Islands.—*Exp. Exp.*

21. *PORITES EROSA* (*Dana*).—Stout erect glomerate, columniform, alive for 2½ inches; truncate at summit, erose and deeply incised; lateral surface sparingly monticulose, and rarely subcarinate. Corallum without cells, stars rather distinct, except at apex, circles of 6 and 12 granules regular.

Plate 55, fig. 8, corallum, natural size; 8 *a*, cell, enlarged.—Sooloo Sea.—*Exp. Exp.*

22. *PORITES MONTICULOSA* (*Dana*).—Stout erect glomerate, columniform or erect lobed, apex round-truncate; surface every where angularly erose or monticulose; lateral monticles crowded, often subtriangular and ascending, never coalescing into carinate ridges, the apical a little smaller; polyps brown, the lips semilunate and yellow, tentacles whitish, obsolete. Corallum with no cells, stars scarcely distinguishable, central pore very minute.

Plate 55, fig. 7, corallum, natural size; 7 *a*, polyps, enlarged; 7 *b*, cells, enlarged; 7 *c*, part of transverse section, ditto.—Feejee Islands.—*Exp. Exp.*

23. *PORITES LICHEN* (*Dana*).—Incrusting, ¼ of an inch thick, undulate, margin subacute, often flexed upward, and free for a third of an inch; under surface smooth, or obsoletely plicate. Corallum having the cells shallow, and often prominent in minute, thin ridges, which give the surface a reticulate appearance.

Plate 56, fig. 2, corallum, natural size.—Feejee Islands.—*Exp. Exp.*

24. *PORITES RETICULOSA* (*Dana*).—Incrusting, undulate, margin scarcely at all free, surface mammillate and tuberoso. Corallum very porous, cells neatly angular, shallow, rather large (¾ of a line), plane at bottom, septa thin, and often prominent in thin ridges, like the *lichen*.

Plate 55, fig. 1, corallum, natural size.—Feejee Islands.—*Exp. Exp.*

25. *PORITES ARENACEA* (*Lamarck*).—Incrusting, quite simple. Corallum having the cells superficial, subconcave, very small.

The Red Sea, incrusting the *Mytilus margaritiferus*.—*Lamarck*.

GENUS II.—GONIOPORA.—QUOY & GAYMARD.

Erect glomerate, and lobed; polyps with 16 to 24 tentacles, and 1 to 2 lines broad. Coralla throughout light porous; cells scarcely as deep as their breadth or superficial, granulous within.

1. GONIOPORA PEDUNCULATA (*Quoy & Gaymard*).—Glomerate; polyps 2 to 3 lines salient, bright green; tentacles oblong, obtuse. Corallum very porous; cells small (1 line broad), polygonal; margin granulate, or irregularly denticulate.

Port Dorey, New Guinea.—*Quoy & Gaymard*.

2. GONIOPORA COLUMNA (*Dana*).—Erect, 1 to 2 feet high, compressed cylindrical, and subclavate, 2 to 4 inches thick; summits rounded, furcately subdividing above; alive for 2 to 3 inches; polyps cylindrical, 2 to 3 lines salient, of a pale lilac tint, tentacles 18 to 24 in number. Corallum very porous; cells angular, excavate, $1\frac{1}{2}$ lines broad; margin acute, granulate; cells below obsolete.

Plate 56, fig. 5, zoophyte, natural size; 5a, polyp, enlarged; 5b, part of summit, showing the cells, natural size.—Feejee Islands.—*Exp. Exp.*

 TRIBE MADREPORACEA:—APPENDIX.

The animals of the following genera are unknown; and the species are so imperfectly understood, that their connexion with the tribe Madreporacea is uncertain.

ERRINA.—GRAY.

Ramose; branches covered with calicles; calicles tubular, a little prominent, having a longitudinal fissure below; near *Millepora* in habit.

ERRINA ASPERA (*Esper*,) *Gray*.—Ramose, 4 inches high; subcompressed, somewhat flabellate; branchlets short, subacute; calicles scattered every where, even over the summits, the surface, therefore, throughout rough.

Mediterranean Sea.—*Lamarck, Esper*.

CERiopora.—Blainville.

Minute; glomerate or lamellose. Coralla consisting of concentric beds; surface covered with very minute circular cells, irregularly scattered.

TEREBELLARIA.—LamouRoux.

Quite small; ramose; branches oblong conical, and spirally annulate; cells minute, oval, or subtriangular, and arranged in quincunx order.

APSENDESIA.—LamouRoux.

Quite small. Coralla consisting of aggregated crest-like plates, having the margin celliferous; cells minute, pore-like, subangular, irregularly scattered.

TRIBE IV.—ANTIPATHACEA.

Actinaria having 6 equal tentacles; gemmiparous, with the gemmation inferior.

FAMILY I.—ANTIPATHIDÆ.

Attached zoophytes, caulescent, and usually ramose; forming no coral secretions, except epidermic foot-secretions, which constitute the axis of the branches.

GENUS ANTIPATHES.

Antipathidæ having the corneous axis spinulose, and the polyp-covering wholly fleshy.

Arrangement of the Species.

I. Quite simple.

1. *A. spiralis.*

2. *A. anguina.*

II. Simple, with lateral pinnules.

3. *A. larix.*

4. *A. eupteridea.*

III. Branching in a plane.

1. *Branches pinnate.*

5. *A. pectinata.*

7. *A. subpinnata.*

6. *A. myriophylla.*

8. *A. reticulata.*

2. *Not pinnate.*

9. *A. flabellum.*

10. *A. ericoides.*

IV. Not branched in a plane.

11. *A. mimosella.*

17. *A. corticata.*

12. *A. pinnatifida.*

18. *A. lacerata.*

13. *A. cupressus.*

19. *A. pyramidata.*

14. *A. pennacea.*

20. *A. Boscii.*

15. *A. scoparia.*

21. *A. alopecuroides.*

16. *A. fœniculum.*

22. *A. arborea.*

1. ANTIPATHES SPIRALIS.—Quite simple, somewhat spirally twisted, polyps with a long beak; the minute spinules of the axis acicular and very numerous. The Mediterranean, and Indian Ocean.

2. ANTIPATHES ANGUINA (*Dana*).—Quite simple, somewhat spirally flexuous; polyps greenish, scarcely beaked; tentacles fuscous at base; axis with faint articulations at long distances; spinules rather remote, compressed, subacute.

Plate 56, fig. 1, extremity of zoophyte, natural size; 1 *a*, axis; 1 *b*, 1 *c*, polyps, enlarged; 1 *d*, section of axis, enlarged.—From the reefs off Mathuata, Venua Lebu, Feejee Islands.—*Exp. Exp.*

3. ANTIPATHES LARIX (*Esper*).—Simple, very long; branchlets very long (2 to 4 inches), pointing every way, and having a setiform axis.

The Mediterranean, Gulf of Venice.—*Lamarck.*

4. *ANTIPATHES EUPTERIDEA* (*Lamarck*).—Simple, pinnate, pinnules simple, elegantly incurved; axis of the stem nearly triangular, of the pinnules setaceous.

Coast of Martinique.—*Lamarck, Lamouroux.*

5. *ANTIPATHES PECTINATA* (*Lamarck*).—Flabellate, 9 inches high; branches pinnato-pectinate, axis of the branches compressed; of the branchlets filiform, subulate; spinules few.

6. *ANTIPATHES MYRIOPHYLLA* (*Pallas*).—Large (18 to 20 inches high), much and spreading ramose, incurvate, paniculate in a plane, subtripinnate, pinnules short ($\frac{3}{4}$ of an inch or less), much crowded; axis of the pinnules setaceous, scabrous.

Indian Ocean.—*Ellis, Lamouroux.*

7. *ANTIPATHES SUBPINNATA*.—Ramoses, pinnate, pinnules alternate, scarcely an inch long, a few at right angles with the others; axis of the pinnules setaceous.

Mediterranean Sea.—*Lamouroux.*

8. *ANTIPATHES RETICULATA* (*Esper*).—Branching in a plane, branches irregularly ascending, crowded, often bipinnate, pinnules sometimes coalescing, divaricate, about $1\frac{1}{2}$ lines distant, short and unequal; axis of branches and branchlets very slender, and of pinnules setaceous, scabrous.

East Indies(?).

9. *ANTIPATHES FLABELLUM* (*Pallas*).—Flabellate, much branched, coarse reticulate; axis striated, laterally compressed, somewhat spinous.

Indian Ocean.

10. *ANTIPATHES ERICOIDES*.—Flabellate, much branched, interwoven; axis of branches and branchlets filiform, finely hispid; branchlets short, and setaceous.

Indian Ocean(?).—*Esper, Lamarck.*

11. *ANTIPATHES MIMOSELLA* (*Lamarck*).—Much branched, 2 feet high, paniculate, spreading, branches open, alternate, decomposed-pinnate, pinnules distichous; axis of the pinnules setaceous, hispid.

East Indies.

12. *ANTIPATHES PINNATIFIDA* (*Lamouroux*).—Ramoses, 2 feet high; branches open, alternate, pinnatifid, branchlets and pinnules distichous, or somewhat scattered, straight; the axis of the branchlets rigid, echinate.

East Indies.

13. *ANTIPATHES CUPRESSUS* (*Pallas*).—Elongate arborescent, lateral branchlets quite short and crowded, a little recurved, bipinnate.

14. *ANTIPATHES PENNACEA*.—Ramosé, somewhat incurved; pinnules much crowded; axis of the pinnules setaceous, hispid.

Indian Ocean.—*Lamarck*.

15. *ANTIPATHES SCOPARIA* (*Lamarck*).—Sparingly ramosé, above paniculato-corymbose; branches and branchlets long and slender; axis of branchlets filiform, finely hispid, scabrous.

Mediterranean Sea.—*Marsilli*.

16. *ANTIPATHES FENICULUM* (*Lamarck*).—Much branched, lax, subpaniculate; axis of the branches somewhat compressed, spinous, of the terminal branchlets setaceous, smooth.

East Indies (?).—*Lamarck*.

17. *ANTIPATHES CORTICATA* (*Lamarck*).—Stem sparingly ramosé, 15 inches in height, corticate, echinate, with numerous spines; cortex without pores.

Indian Ocean.

18. *ANTIPATHES LACERATA* (*Lamarck*).—Stem ramosé, nearly 2 feet high, echinate with spiniform branchlets; branches sarmentose, tortuous, gradually attenuate; branchlets lateral, very numerous, slender, sublacerate.

Indian Ocean (?).—*Lamarck*.

19. *ANTIPATHES PYRAMIDATA* (*Lamarck*).—Stem rigid and undivided; branchlets lateral, much crowded, scattered, and pointing every way, forming together a pyramid, dichotomous; axis a little shining, yellowish-olive.

East Indies (?).—*Lamarck*.

20. *ANTIPATHES BOSCHII* (*Lamouroux*).—Flexuous, ramosé, branches numerous and divaricate; axis at summits setaceous.

Shores of Carolina.—*Bosc*.

21. *ANTIPATHES ALOPECUROIDES* (*Ellis*).—Ramosé, branches close paniculate; axis hispid, setaceous, brittle.

Shores of South Carolina.—*Ellis, Lamouroux*.

22. *ANTIPATHES ARBOREA* (*Dana*).—Arborescent, lax and spreading ramosé, very large (3 feet high); branches subflexuous; axis throughout hispid, of branchlets, long and slender setiform, fragile; polyps brownish-yellow, mouth prominent; on branchlets, nearly in a single series.

Plate 56, fig. 2, part of a branch, with the expanded polyps, natural size; 2a, polyp, enlarged; 2b, part of trunk, natural size.—Sandalwood Bay, Feejees, in ten fathoms.—*Exp. Exp.*

Appendix.—*ANTIPATHES DICHOTOMA* (*Pallas*).—*ANTIPATHES GLABERRIMA* (*Esper*).

SUBORDER II.—ALCYONARIA.

Zoophytes wholly fleshy or coralligenous, gemmiparous. Polyps having the tentacles eight in number, papillose, with the papillæ perforate at apex. Visceral lamellæ eight. Coral secretions formed from the foot of the polyps, or by the internal tissues, but never by the visceral lamellæ; the foot-secretions, for the most part, either corneous or calcareous, rarely siliceous; the tissue-secretions calcareous.

The families may be briefly characterized as follows:—

1. PENNATULIDÆ.—Free, or with the base buried.
2. ALCYONIDÆ.—Attached; no coral secretions, or only calcareous spicula within, and no axis.
3. CORNULARIDÆ.—Attached; coralla tubular, corneous.
4. TUBIPORIDÆ.—Attached; coralla tubular, calcareous.
5. GORGONIDÆ.—Attached; a separable axis to the branches.

FAMILY I.—PENNATULIDÆ.

Unattached Alcyonaria, either free or with the base buried. This family may be subdivided as follows:

SUBFAMILY I. PENNATULINÆ.—Polyps retractile.

- G. 1. *Renilla*.—Free, explanate, unifacial (reniform).
2. *Veretillum*.—Very stout, oblong cylindrical, simple, with scattered polyps.
3. *Virgularia*.—Slender virgate, with very short pinnules or none.
4. *Pennatula*.—Pinnate and stout, or plumiform, with long pinnules.

SUBFAMILY II. PAVONARINÆ.—Polyps not retractile.

5. *Pavonaria*.—Virgate, polyps secund.
6. *Umbellularia*.—Virgate, polyps in a terminal cluster.

SUBFAMILY I.—PENNATULINÆ.

Polyps retractile.

GENUS I.—RENILLA.

Free, explanate, unifacial; polyyps scattered, retractile.

1. *RENILLA AMERICANA* (Ellis).—Reniform, margin acute; behind caudate, with the caudal appendage, below, longitudinally sulcate.

West Indies. Off Rio Janeiro.—*Exp. Exp.*

GENUS II.—VERETILLUM.—CUVIER.

Stout cylindrical, and not branched; polyyps scattered, retractile.

1. *VERETILLUM CYNOMORIUM* (Pallas,) Cuvier.—Orange-colored, stout cylindrical ($\frac{1}{2}$ an inch in diameter); base subgranulous, polyyps whitish, axis very slender.

Mediterranean Sea.—*Pallas, Lamarck, Edwards.*

2. *VERETILLUM PHALLOIDES* (Pallas,) Cuvier.—Cinereous, scarcely as large as the finger, nearly 6 inches long, cylindrical, subclavate; axis subulate, quadrangular.

East Indies, near Amboyna.

Appendix.—*PENNATULA STELLIFERA* (Müller).—*VERETILLUM CLAVATUM* (Leuckart).

GENUS III.—VIRGULARIA.—LAMARCK.

Long filiform Pennatulidæ, having short or obsolete polypiferous pinnules; axis somewhat stony.

1. *VIRGULARIA MIRABILIS* (Müller,) Lamarck.—Filiform, 6 to 12 inches long; pinnules oblique, arcuate, lax, mostly alternate; axis calcareous, white, terete, fragile.

Seas of Norway and Britain.

2. *VIRGULARIA JUNCEA* (Pallas).—Filiform, very long (2 to 3 feet), base vermiform, 5 to 6 inches long, a little stouter than the rachis; pinnules arranged in two opposite series, very short; when contracted, transverse, close appressed, and often a little remote, resembling series of raised wrinkles; axis terete, calcareous, fragile.

The Indian Ocean.—*Rumphius, Pallas.* *Esper*, who received his specimens from M. Chemnitz.

GENUS IV.—PENNATULA.—LINNÆUS.

Penniform or plume-shape, pinnules on opposite sides, broad and spreading, with the upper margin polypiferous; axis osseous.

1. *PENNATULA PHOSPHOREA*.—Reddish-purple, basal portion terete, fleshy, and rather long; back of the rachis crowdedly scabrous with papillæ, and sulcate down the middle; margin of the pinnules pectinate, with dentato-setaceous calices.

European seas.

2. *PENNATULA RUBRA* (*Linnaeus*).—Five inches in length, base terete; back of the rachis dilated, with a sulcus along the middle, and the sides granulous; margin of the pinnules pectinated with dentato-setaceous calices.

Mediterranean Sea.

3. *PENNATULA GRISEA* (*Gmelin*).—Cinereous, 8 inches long; rachis fleshy, with the back smooth; plume oblong-ovate; pinnules quite broad, and when contracted long spinous.

Mediterranean Sea.

4. *PENNATULA ARGENTEA* (*Ellis*).—Narrow lanceolate and very long (sometimes a foot and a half); pinnules crowded imbricate, short and dentate, silvery in appearance.

East Indies.

Appendix.—*PENNATULA GRANDIS* (*Ehrenberg*).

SUBFAMILY II.—PAVONARINÆ.

Polyps not retractile.

GENUS V.—PAVONARIA.—CUVIER.

Virgate Pennatulidæ, having the polyps along one side of the stem, and not retractile.

PAVONARIA QUADRANGULARIS (*Pallas*), *Blainville*.—Long (2 feet), and slender; polyps crowded in three longitudinal series, arranged in quincunx order.
Mediterranean Sea.

GENUS VI.—UMBELLULARIA.—CUVIER.

Virgate Pennatulidæ, having the polyps terminal, and not retractile.

UMBELLULARIA GREENLANDICA (*Lamarck*).—Very long (6 feet) attenuate above; polyps forming an umbel.

Seas of Greenland.

FAMILY II.—ALCYONIDÆ.

Attached Alcyonaria, fleshy, often coalescing disseminated calcareous spicula.

This family includes the following subfamilies and genera:

SUBFAMILY I. XENINÆ.—Texture carnose. Polyps not retractile.

G. 1. *Rhizoxenia*.—Polyps attached in lines which are often reticulate.

2. *Anthelia*.—Forming spreading plates.

3. *Xenia*.—Forming thick lobed or subramose masses.

SUBFAMILY II. ALCYONINÆ.—Texture carnose. Polyps partly or wholly retractile.

1. *Polyp semi-retractile*, leaving wart-like prominences or verrucæ.

G. 4. *Ammothea*.—Ramoso or fruticulose, verrucæ unarmed.

5. *Sympodium*.—Effuse, not stipitate, verrucæ unarmed.

6. *Nephthya*.—Verrucæ armed with calcareous spicula.

2. *Polyps wholly retractile*.

G. 7. *Alcyonium*.—Lobed or branched; fringe of tentacles short.

SUBFAMILY III. SPOGGODINÆ.—Texture membranous, and very open cellular within; polyps minute, not retractile, in clusters of calcareous spicula.

G. 8. *Spoggodia*.

SUBFAMILY I.—XENINÆ.

Carnose, and surface not harsh; polyps not retractile.

GENUS I.—RHIZOXENIA.—EHRENBERG.

Carnose Alcyonidæ; polyps not retractile and budding by means of creeping filiform shoots.

1. RHIZOXENIA THALASSANTHA (*Lesson*), *Ehrenberg*.—Body claviform, longitudinally striate, tentacles filiform, pinnate.

2. RHIZOXENIA ROSEA (*Philippi*), *Dana*.—Polyps of the zoophyte few (6 to 10), each about 2 lines long; color rose-red; tentacles fringed with papillæ. Near Naples, incrusting barnacles, &c.—*Philippi*.

3. RHIZOXENIA PRIMULA (*Dana*).—Pale rose or lilac; polyps 4 to 5 lines high, tentacles not fringed, each nearly $1\frac{1}{2}$ lines long, papillæ scattered, obsolescent, verruciform.

Plate 57, fig. 2, polyps, natural size; 2a, one of them, enlarged.—Ovolau, one of the Feejee Islands, along the shores, in shallow water.—*Exp. Exp.*

GENUS II.—ANTHELIA.—SAVIGNY.

Carnose, explanato-gemmate Alcyonidæ; polyps not retractile.

1. ANTHELIA GLAUCA (*Savigny*).—Glaucous, pale bluish; polyps subventricose below, sometimes becoming coalescent.

Red Sea.—*Savigny*.

2. ANTHELIA STRUMOSA (*Ehrenberg*).—Glaucous; polyps inflated below the mouth, strumous, an inch in height.

Red Sea.—*Ehrenberg*.

3. ANTHELIA PURPURASCENS (*Ehrenberg*).—Exterior pale violet; tentacles purplish violet within; papillæ on each side in three series.

Red Sea.—*Ehrenberg*.

4. ANTHELIA DESJARDIANA (*Templeton*), *Dana*.—Pale livid blue; widely spreading, with the base $\frac{1}{3}$ of an inch thick; polyps very prominent, sides horizontally wrinkled.

Isle of France.—*Templeton*.

GENUS III.—XENIA.—SAVIGNY.

Fleshy Alcyonidæ, erect lobed and subramose, polyps subacrogenous, budding both at base and from both sides.

1. *XENIA UMBELLATA* (*Savigny*).—Polyps bluish-glaucous, tentacles long, papillæ long, in three series; base $\frac{1}{4}$ inches thick.

Red Sea.—*Savigny, Ehrenberg*.

2. *XENIA FUSCESCENS* (*H. & Ehrenberg*).—Polyps brownish, papillæ in 4 series on each side of the tentacles.

Red Sea.—*Ehrenberg*.

3. *XENIA CÆRULEA* (*H. & Ehrenberg*).—Small and more delicate than the preceding, blue; papillæ of the tentacles fewer; trunk shorter, an inch thick at base.

Red Sea.—*Ehrenberg*.

4. *XENIA FLORIDA* (*Lesson, Dana*).—Pale bluish glaucous, lobed; polyps $\frac{2}{3}$ of an inch broad, $\frac{1}{2}$ an inch prominent when fully expanded; tentacles lanceolate; papillæ very short, but little longer than broad, in 3 series.

Plate 57, fig. 4, clump of polyps, natural size; 4*a*, upper view of tentacles; 4*b*, under view of the same.—Feejee Islands.—*Exp. Exp.*

5. *XENIA ELONGATA* (*Dana*).—Lobate, brownish; polyp-stars 8 to 9 lines broad, 1 to $1\frac{1}{2}$ inches salient; tentacles narrow oblong; limb pale, the interval above between the papillæ a little narrower than the fringe; papillæ deep brown, in 3 to 4 series, crowded, slender and elongate, 20 to 24 in the outer series.

Plate 57, fig. 5, group, natural size; 5*a*, under view of tentacles, enlarged; 5*b*, upper view of the same.

SUBFAMILY II.—ALCYONINÆ.

Carnose; polyps retractile; surface of contracted zoophytes either smooth or verrucose.

GENUS IV.—AMMOTHEA.—SAVIGNY.

Carnose Alcyonidæ, ramulous or fruticulose; polyps retracting, with verrucæ not armed with spicula.

1. *AMMOTHEA VIRESCENS* (*Savigny*).—Greenish, spreading, finely and lax ramulous, soft, tentacles yellowish.

Red Sea.—*Savigny, Ehrenberg*.

2. *AMMOTHEA THYRSOIDES* (*H. & Ehrenberg*).—Spreading, branches cylindrical, an inch long, erect, simply carnosé, verrucose.

Red Sea.—*Ehrenberg*.

GENUS V.—SYMPODIUM.—H. & EHRENBURG.

Carnose, forming spreading, incrusting plates, and not stipitate; polyps retracting into verrucæ which are not armed with spicula.

1. *SYMPODIUM FULIGINOSUM* (H. & Ehrenberg).—Fuliginous, 2 inches; tentacles quite pale, short; polyps 6 lines long, and expanded star 3 lines broad.

Red Sea.

2. *SYMPODIUM CERULEUM* (H. & Ehrenberg).—Fuliginous, tentacles bright blue, small, slender.

Red Sea.

3. *SYMPODIUM ROSEUM* (Ehrenberg).—Suberose, of varying form, rose-colored, $2\frac{1}{2}$ to 3 lines thick; verrucæ but little prominent or obsolete; tentacles white.

St. Thomas, West Indies, incrusting axis of Gorgonia.

GENUS VI.—NEPHTHYA.—SAVIGNY.

Carnose Alcyonidæ, fruticulose; polyps retracting into verrucæ armed with spicula.

1. *NEPHTHYA SAVIGNII* (H. & Ehrenberg).—Greenish, fruticulose; tentacles yellow, spicula of the verrucæ green.

Red Sea.—Savigny, Ehrenberg.

GENUS VII.—ALCYONIUM.

Carnose Alcyonidæ, fruticulosoramoso, explanate and glomerate, and usually very stout stipitate; polyps wholly retractile, and the zoophytes without verrucæ when contracted; pedicel perforated to its base with the visceral tubes of the polyps.

Arrangement of the Species.

I. *Ramoso or lobuloso, not becoming more firm and solid below.*

1. *A. digitatum.*

3. *A. palmatum.*

2. *A. cydonium.*

4. *A. stellatum.*

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| 5. <i>A. spherophora</i> . | 12. <i>A. flexile</i> . |
| 6. <i>A. pauciflorum</i> . | 13. <i>A. flavum</i> . |
| 7. <i>A. polydactylum</i> . | 14. <i>A. trichanthinum</i> . |
| 8. <i>A. brachycladum</i> . | 15. <i>A. confertum</i> . |
| 9. <i>A. aurantiacum</i> . | 16. <i>A. rigidum</i> . |
| 10. <i>A. viride</i> . | 17. <i>A. murale</i> . |
| 11. <i>A. flabellum</i> . | |

II. *Explanate, surface flat.*

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| 18. <i>A. glaucum</i> . | 19. <i>A. latum</i> . |
|-------------------------|-----------------------|

III. *Glomerate and not lobulose.*

20. *A. pulmo*.

IV. *Ramose, surface of the pedicel becoming nearly solid from calcareous excretions, and zoophyte retractile into the same.*

21. *A. elegans*.

1. *ALCYONIUM DIGITATUM* (*Linn.*).—Mammillary or digitate, from an incrusting base; lobes few, cylindrical or conoid, often $\frac{1}{2}$ to 1 inch thick, and several inches long: exterior subcoriaceous, grayish and orange, scattered over with stellate pores; polyps, when expanded, 4 to 5 lines exsert, and summit $1\frac{1}{2}$ lines in breadth.

Coast of Britain and Northern Europe.

2. *ALCYONIUM CYDONIUM* (*Müller*).—Glomerate, often conoid, not divided or lobate; exterior coriaceous and harsh; internal calcareous spicula very numerous, and often those at the surface tricuspidate.

Island of Fulah and Norst.—*Jameson*.

3. *ALCYONIUM PALMATUM* (*Pallas*).—Erect, stipitate, above irregularly ramoso-palmate; branchlets terete or subcompressed, unequal, $1\frac{1}{2}$ to 2 lines thick, few; polyps $1\frac{1}{2}$ lines exsert, expanded star about a line in diameter.

Mediterranean Sea.

4. *ALCYONIUM STELLATUM* (*Milne Edwards*).—Rose-red, short ramose or lobato-subdivided; branches 3 to 4 lines thick and rounded; polyps scattered, the expanded star of tentacles nearly a line and a half in diameter; surface a little rough.

Island of Chaussey.—*Milne Edwards*.

5. *ALCYONIUM SPHEROPHORA* (*H. & Ehrenberg*), *Dana*.—Efiuse, subhemispherical, membrane of the margin sterile, surface cerebriform, very short lobed; lobes 2 to 3 lines broad, semiglobose, subdividing; pale, polyps fuscous.

Red Sea.—*Ehrenberg*.

6. *ALCYONIUM PAUCIFLORUM* (H. & Ehrenberg,) Dana.—Substipitate, lobately divided, suberect; lobes compressed, obtuse, 4 lines thick, and about $\frac{1}{2}$ an inch long; surface very finely areolate, glabrous; polyps scattered and few; fuscous.

Red Sea.—Ehrenberg.

7. *ALCYONIUM POLYDACTYLUM* (H. & Ehrenberg,) Dana.—Yellowish, car-nose, 4 inches high, and 6 to 12 broad, with a short base, lobulose above, lobes subramose, nearly an inch in size; lobules 4 to 5 lines long, anguloso-gibbous; polyps much crowded, reddish fuscous, with the head contracted nearly $\frac{1}{2}$ a line broad.

Red Sea.—Ehrenberg.

8. *ALCYONIUM BRACHYCLADUM* (H. & Ehrenberg,) Dana.—Yellowish, car-nose, 4 inches thick, base $1\frac{1}{2}$ inches; above lobato-ramulous, branches $1\frac{1}{2}$ inches, ramuloso-vertucose, branchlets 3 to 4 lines thick, obtuse, gibbous, shorter and more slender than in the *polydactylum*; polyps crowded, reddish fuscous.

Red Sea.—Ehrenberg.

9. *ALCYONIUM AURANTIACUM* (Quoy & Gaymard).—Soft, orange-colored, erect, sparingly ramose; branches obtuse, a little oblong, 2 lines thick.

New Zealand, in eight to ten fathoms.—Quoy & Gaymard.

10. *ALCYONIUM VIRIDE* (Quoy & Gaymard).—Large, stout, rather soft; branches much compressed, very broad, (often 3 to 4 inches,) lobato-digitate, 3 to 4 lines thick; lobes obtuse, 4 to 8 lines broad.

Island of Vanikoro, Quoy & Gaymard.—Tongatabu, *Exp. Exp.*

11. *ALCYONIUM FLABELLUM* (Quoy & Gaymard).—Large, rather soft; branches compressed, digitately subdivided and ramose; digitations often 2 to 3 inches long, terete or compressed, subacute or obtuse, 3 to 5 lines thick.

Port Carteret, New Ireland, Quoy & Gaymard.—Tongatabu, *Exp. Exp.*

12. *ALCYONIUM FLEXILE* (Quoy & Gaymard).—Large, very soft, pale ful-vous, fruticose, stipitate; branchlets numerous, slender, 2 to $2\frac{1}{2}$ lines thick, subattenuate, mostly simple, very flexible, often 2 to $2\frac{1}{2}$ inches long, polyps small and crowded.

Plate 57, fig. 6, unexpanded, natural size.—Island of Vanikoro, Quoy & Gaymard.—Feejee Islands, *Exp. Exp.*

13. *ALCYONIUM FLAVUM* (Quoy & Gaymard).—Coriaceous, subdendroid, small, compressed at base, yellowish; branches cylindrical, $1\frac{1}{2}$ lines thick, 1 to 2 inches long, subacute, simple.

Island of Vanikoro.—Quoy & Gaymard.

14. *ALCYONIUM TRICHANTHINUM* (*Dana*).—Soft, flexible, ramose; branches numerous, terete, 3 to 4 lines thick, and 6 to 9 long, obtuse; polyps crowded, tentacles long, very slender.

Plate 58, fig. 1, zoophyte as it appears expanded, and part unexpanded.—Feejee Islands.—*Exp. Exp.*

15. *ALCYONIUM CONFERTUM* (*Dana*).—Four inches high, coriaceous, rigid, erect, very stout stipitate ($1\frac{1}{2}$ inches); branches crowded above, short and simple, or sparingly ramose, terete, 2 to $2\frac{1}{2}$ lines thick, and about $\frac{1}{2}$ an inch long, rounded at apex; internal spicula much crowded; polyps minute, $\frac{2}{3}$ of a line apart.

Plate 57, fig. 7, unexpanded zoophyte, natural size; 7 *a*, some of the spicula; 7 *b*, polyp, partly expanded.—Feejee Islands.—*Exp. Exp.*

16. *ALCYONIUM RIGIDUM* (*Dana*).—Rigid, spreading, incrusting and sub-explanate; branches usually simple, short digitiform, scarcely 1 inch long, and 2 to 4 lines thick, obtuse, frequently very remote.

Plate 58, fig. 2, the unexpanded zoophyte, natural size.—Feejee Islands, at Mathuata, Venua Lebu.—*Exp. Exp.*

17. *ALCYONIUM MURALE* (*Dana*).—Rigid coriaceous, stout, spreading, branches simple, subremote, stout lamellar, erect, often 2 inches long, $\frac{1}{2}$ to 1 high, and $\frac{1}{3}$ of an inch thick, sometimes sinuous; polyps much crowded, green.

Plate 58, fig. 3, the zoophyte unexpanded, natural size.—Tongatabu.—*Exp. Exp.*

18. *ALCYONIUM GLAUCUM* (*Quoy & Gaymard*).—Soft, stipitate, broad explanate, margin much undulate, revolute, and often lobed; polyps mostly a line distant, fuscous, tentacles at apex light yellowish-green.

Plate 58, figs. 4, 5, and plate 59, fig. 6, unexpanded, natural size.—Tongatabu, *Quoy & Gaymard*.—Tongatabu and Feejees, *Exp. Exp.*

19. *ALCYONIUM LATUM* (*Dana*).—Rather rigid, very stout stipitate and very broad explanate, margin sinuously undulate, scarcely revolute; polyps about a line distant, and surrounded by a series of points.

Plate 58, fig. 6 *a*, surface, magnified; 6 *b*, one of the polyps, magnified; 6 *b'*, same, natural size.—Feejee Islands.—*Exp. Exp.*

20. *ALCYONIUM PULMO* (*Esper*).—Carnose, glomerate, half a foot to one foot thick, surface uneven or sublobate, pedicel stout; polyps 3 lines long, expanded star 3 lines broad, white.

Red Sea.—*Ehrenberg*.

21. *ALCYONIUM ELEGANS* (*Milne Edwards*), *Dana*.—Ascending and erect, subramose, below cylindrical, and the surface becoming nearly solid by calcareous secretions.

Mediterranean, near Algiers.—*Milne Edwards*.

Appendix.—Ehrenberg describes from preserved specimens the following species of "Lobularia."—LOBULARIA RUBIFORMIS (A. rubiforme, *Pallas*).—LOBULARIA CORIACEA (A. coriaceum, *Esper*).—LOBULARIA ARBOREA (A. arborium, *Esper*).

SUBFAMILY III.—SPOGGODINÆ.

Membranaceous and internally spatiuously cellular; polyps not retractile.

GENUS SPOGGODIA.—LESSON.

Ramose Alcyonidæ, internally very open cellular; polyps minute, not retractile, in clusters which are armed with calcareous spicula.

1. SPOGGODIA CELOSIA.—White, stem short and stout, subdividing into several branches; the polypiferous ramuscles crimson.

One of the Moluccas, Bay of Cajeli, near New Guinea.—*Lesson*.

FAMILY III.—CORNULARIDÆ.

Coralligenous Alcyonaria; the coralla corneous, tubular.

GENUS CORNULARIA.—LAMARCK.

Non-acrogenous Cornularidæ, producing corneous tubular coralla, and budding by means of creeping filiform shoots.

CORNULARIA RUGOSA (*Lamarck*).—Polyps pale yellowish; tentacles prominently fringed with papillæ, which are arranged in a single series; tubes 2 to 4 lines long, subclavate, rugose.

Mediterranean Sea.

FAMILY IV.—TUBIPORIDÆ.

Coralligenous Alcyonaria; coralla tubular, calcareous or semi-calcareous; tubes not striate within.

GENUS I.—AULOPORA.

Non-acrogenous Tubiporidae, budding from a creeping filiform stolon. Coralla calcareous, tubular, incrusting, often reticulately anastomosing; cells subremote, sometimes a little prominent.

AULOPORA TENUIS (*Dana*).—Red; tubular corallum filiform, reticulate, mostly $\frac{1}{3}$ of a line broad; cells circular, not prominent.

Plate 59, fig. 5, corallum, natural size.—The Paumotu Archipelago.—*Exp. Exp.*

GENUS II.—TELESTO.—LAMOUROUX.

Acrogenous, segregato-ramose; polyps retractile; tubes semi-calcareous.

1. *TELESTO AURANTIACA* (*Lamouroux*).—Sparingly ramose, orange-colored; 1 to 1 $\frac{1}{2}$ inches high, exterior striate.

Australia.

2. *TELESTO FRUTICULOSA* (*Dana*).—Fruticulose, 3 to 4 inches high; polyps orange; branchlets numerous, many short (2 to 4 lines), $\frac{2}{3}$ of a line in diameter, cylindrical.

Charleston, South Carolina.—*Prof. C. U. Shepard.*

GENUS III.—TUBIPORA.

Acrogenous Tubiporidae; coralla calcareous, tubular; tubes fasciculate; no internal dissepiments.

1. *TUBIPORA MUSICA*.—Tubes of the corallum scarcely $\frac{1}{2}$ of a line broad, very densely crowded (16–22 in an inch), and parallel, septa much crowded.

Indian Ocean.

2. *TUBIPORA PURPUREA* (*Lamarck*).—Tubes of the corallum $\frac{2}{3}$ of a line thick, much crowded, septa quite numerous.

Red Sea.

3. *TUBIPORA FIMBRIATA* (Dana).—Disk of the polyps brownish-red, mouth yellow, tentacles pale yellow, loosely fringed, papillæ violet, in 2 or 3 series; tubes of the corallum scarcely $\frac{3}{8}$ of a line thick, very much crowded and irregular, septa quite numerous.

Plate 59, fig. 2, polyp, enlarged; 2*a*, part of tentacle.—Feejee Islands, on the outer reefs.—*Exp. Exp.*

4. *TUBIPORA SYRINGA* (Dana).—Polyps pale violet, papillæ in contact and arranged neatly in an even plane; tubes of the corallum as in the *fimbriata*.

Plate 59, fig. 1, part of zoophyte, expanded; 1*a*, polyp, enlarged; 1*b*, section of a polyp, showing the interior; 1*c*, part of a visceral lamella, with clusters of ovules attached.—The Feejee Islands, in shallow waters along the shores.—*Exp. Exp.*

5. *TUBIPORA CHAMISSONIS* (Ehrenberg).—Papillæ of the tentacles arranged in two series; tubes of the corallum $\frac{3}{8}$ of a line broad, rather closely crowded (10 to 15 in an inch); septa quite numerous.

Radack Archipelago, Pacific Ocean, *Chamisso*.—East Indies.

6. *TUBIPORA HEMPRICHII* (Ehrenberg).—Tentacles bluish or greenish, in a simple series; tubes of the corallum four-fifths of a line thick (9 to 12 in an inch), rather lax, septa remote (3 to 5 lines).

Red Sea.—*Ehrenberg*.

7. *TUBIPORA RUBEOLA* (Quoy & Gaynard).—Tentacles reddish; papillæ in 2 series; tubes of the corallum long, lax and large, septa often 1 to 3 inches apart.

New Ireland, *Quoy & Gaynard*.—East Indies, *Exp. Exp.*

GENUS IV.—SYRINGOPORA.—GOLDFUSS.

Acrogenous Tubiporidae, fasciculate; the tubes of the corallum divided within by transverse conical septa and having a tubular axis.

FAMILY V.—GORGONIDÆ.

Alcyonaria forming foot secretions, and usually other subcalcareous tissue-secretions, which are separable from the former.

The following subdivisions of the Gorgonidæ adopted in this work depend on the modes of budding and growth just explained, on the nature of the foot-secretions, and the consideration whether the polyps are retractile or not.

SUBFAMILY I. CORALLIINÆ.—Axis inarticulate, solid calcareous; polyp-crust fleshy, without coral-secretions.

G. 1. *Corallium*.

SUBFAMILY II. GORGONINÆ.—Axis inarticulate, corneous, or semi-solid, with calcareous or siliceous secretions; tissue-secretions forming a persistent crust to the axis.

G. 2. *Hyalonema*.—Axis not solid, consisting mostly of siliceous threads or spicula.

3. *Briareum*.—Axis not solid, suberose or containing calcareous spicula.

4. *Gorgonia*.—Axis solid, corneous; polyps retractile, with or without fixed verrucæ on the surface after retraction.

5. *Primnoa*.—Axis solid; polyps retractile into oblong movable verrucæ, imbricately squamous.

6. *Bebryce*.—Axis solid corneous; polyps not retractile.

SUBFAMILY III. ISINÆ.—Axis jointed, budding being periodical.

G. 7. *Mopsea*.—Joints alternately calcareous and corneous, furcato-ramose with corneous axils; cortex thin.

8. *Isis*.—Joints alternately calcareous and corneous; branches proceeding from the calcareous joints; cortex thick.

9. *Melitæa*.—Joints alternately calcareous and suberose; cortex thin.

SUBFAMILY I.—CORALLIINÆ.

Gorgonidæ forming an inarticulate solid stony axis.

GENUS I.—CORALLIUM.

Stony axis covered with a fleshy polyp crust.

1. CORALLIUM NOBILE.—Dichotomously and lax ramose; branches flexuous, sometimes coalescent; polyps every where scattered; disk and tentacles white; axis red, rarely white.

Mediterranean Sea.

2. *CORALLIUM SECUNDUM* (*Dana*).—Ramulose, branching in a plane; polyps confined to one surface, mostly placed at the apex of very small branchlets and often in twos: axis calcareous, smooth, pale flesh-red or white, crust scarlet.

Plate 60, fig. 1, zoophyte, natural size.

SUBFAMILY II.—GORGONINÆ.

Gorgonidæ secreting an inarticulate corneous or sublapideous axis, and a semi-calcareous cortex.

GENUS II.—HYALONEMA.—GRAY.

Gorgonidæ secreting an inarticulate axis made up mostly of siliceous threads or spicula.

HYALONEMA SIEBOLDI.—Simple, subcylindrical, attenuate at base, and not attached (?) but planted in a sponge; surface granulous and verrucose, verrucæ large, truncate.

Japan.—*Dr. Siebold*.

GENUS III.—BRIAREUM.—BLAINVILLE.

Gorgonidæ having a non-jointed axis, containing calcareous spicula, or suberose; polyps scattered.

1. *BRIAREUM GORGONIDEUM* (*Blainville*).—Cinereous, subramose, terete; branches nearly an inch thick, elongate; axis consisting mostly of purple calcareous spicula.

West Indies.—*Ellis*.

2. *BRIAREUM SUBEROSUM* (*Ellis*,) *Dana*.—Eight inches high; ramose, subdichotomous; branches stout, subsimple; surface smooth; oscules substellate; axis suberose, pale red; cortex miniateous within.

Indian Ocean.

3. *BRIAREUM ARBOREUM* (*Pallas*,) *Dana*.—Carnoso-suberose; large (3 feet) and arborescent, sparingly and lax ramose; younger branches nodose, with the protuberances especially polypiferous; polyps large; exterior surface red or yellow; within yellowish and suberose.

Norwegian Sea.

GENUS IV.—GORGONIA.

Gorgonidæ forming an inarticulate corneous axis and a sub-calcareous cortex; polyps retractile, surface, on retraction, either smooth or verrucose; verrucæ not movable.

The subgenera are as follows:

SUBGEN. I. PTEROGORGIA. Polyps seriate, or bifarious, with a naked space between the ranges of polyps.

SUBGEN. II. GORGONIA. Polyps irregularly scattered, not bifarious; surface of zoophyte, after retraction of polyps, smooth or more or less verrucose, without exsert spicula.

SUBGEN. III. MURICEA. Polyps irregularly scattered, surface after retraction of polyps verrucose, and verrucæ armed with spicula or scales.

SUBGENUS I.—PTEROGORGIA.

Gorgoniæ with bifarious polyps.

*Arrangement of the Species.*I. *Branches much flattened or two-edged.*

- | | |
|---------------------------|--------------------------|
| 1. G. Pter. quercifolia. | 6. G. Pter. acerosa. |
| 2. G. Pter. anceps. | 7. G. Pter. pinnata. |
| 3. G. Pter. citrina. | 8. G. Pter. petechizans. |
| 4. G. Pter. fasciolaris. | 9. G. Pter. patula. |
| 5. G. Pter. Thomasiensis. | |

II. *Branches terete or but slightly compressed.*A. *Ramose in a plane, or pinnate.*

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|------------------------|------------------------------|
| 10. G. Pter. setosa. | 15. G. Pter. fusco-purpurea. |
| 11. G. Pter. turgida. | 16. G. Pter. sulcifera. |
| 12. G. Pter. violacea. | 17. G. Pter. pectinata. |
| 13. G. Pter. laxa. | 18. G. Pter. ochrostoma. |
| 14. G. Pter. rosea. | 19. G. Pter. leucostoma. |

B. *Not ramose in a plane, or simple.*

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|--------------------------|-----------------------|
| 20. G. Pter. sarmentosa. | 21. G. Pter. setacea. |
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III. *Appendix.*

- G. pustulosa.

1. *G. PTEROGORGIA QUERCIFOLIA* (*Ehrenberg*,) *Dana*.—Bright yellow; eight inches high and four broad, ramulous, complanate, flabellate and lobatofoliaceous, subdivided nearly like the lobations of an oak-leaf, lobes nearly an inch wide; nerves sterile, other parts polypiferous, oscules small (one-third of a line).

2. *G. PTEROGORGIA ANCEPS* (*Linn.*) *Ehrenberg*.—Violaceous, and also yellowish with purple margins; two feet high, paniculate; branches long linear, generally two to two and a half lines wide and often a foot long, two-edged or sometimes three to four winged, with a single series of oscules along the edge: axis black, slightly compressed, in the branchlets wax-yellow.

West Indies.

3. *G. PTEROGORGIA CITRINA* (*Esper*,) *Dana*.—Low (four inches); sulphur-yellow, with the margin dotted with purple; subpinnato-ramose and nearly flabellate; branches two-edged, branchlets one to two inches long and one line broad; polyps marginal in a single series; axis of branches black, of branchlets yellowish.

Near Cape Florida, West Indies, *Bost. Soc. Nat. Hist.*—British Coast?

4. *G. PTEROGORGIA FASCIOLARIS* (*Ehrenberg*).—Low (five inches high and ten broad), sparingly ramose; branches erect, simple, much compressed and flat throughout, four and a half inches long and one and a half lines broad; margin thin and uniseriately dotted with red, the polyps being uniseriate.

West Indies.—*Ehrenberg*.

5. *G. PTEROGORGIA THOMASIENSIS* (*Ehrenberg*).—Low (four inches high), violaceous; sparingly ramose; branches simple, two-edged, erect, uniformly three inches long, less than a line broad at apex.

Island of St. Thomas, West Indies.—*Ehrenberg*.

6. *G. PTEROGORGIA ACEROSA* (*Esper*,) *Ehrenberg*.—Yellowish; ramulous, nearly flabellate, pinnate; pinnules subopposite, compressed, one to one and a half lines broad; polyps arranged seriatly along the margin, in either single or double series; oscules very minute (hardly one-fourth of a line long), and crowded; axis of branches and branchlets nearly black.

West Indies.

7. *G. PTEROGORGIA PENNATA* (*Ellis*).—Yellowish, ramulous, pinnate, pinnules subopposite, much compressed and complanate, one to one and a quarter lines broad, not pendulous, four to six inches long; polyps marginal, in one or two series, large; axis of branchlets of a very pale yellowish color.

8. *G. PTEROGORGIA PETECHIZANS* (*Pallas*,) *Dana*.—Yellow, with the margin dotted with purple; one to two feet high; flabellate and ramuloso-pinnate; pinnules numerous, short (one to two inches), a line broad, nearly parallel,

compressed; polyps scarcely prominent, mostly marginal, but not generally in regular series.

Atlantic and coast of Africa.—*Lamarck*.

9. *G. PTEROGORGIA PATULA* (*Ellis*,) *Dana*.—Deep red; eight inches high; ramose, subpinnate, tortuous; branches compressed, not crowded; polyps subdistichous; axis fuscous.

Mediterranean Sea.

10. *G. PTEROGORGIA SETOSA* (*Linn.*).—Purple; very large, often five feet high; ramose and very densely ramulous; pinnules nearly opposite or somewhat scattered, subterete, very long filiform (two to six inches in length), and hardly one line thick, longitudinally faint sulcate along the middle, becoming pendulous when adult, not verrucose; polyps subseriate, the opposite series often double; axis black.

Fig. 32, page 72, extremity of a branch.—West Indies, where it is common.—Var. *sericea*, West Indies.—*Bost. Soc. Nat. Hist.*

11. *G. PTEROGORGIA TURGIDA* (*Ehrenberg*).—Yellow, with the habit of the *acerosa*; eight inches high, and seven broad; pinnules turgid, narrower and shorter (two inches long), with a double series of pores on the sides furnished with red papillæ.

St. Thomas, West Indies.—*Ehrenberg*.

12. *G. PTEROGORGIA VIOLACEA*.—Violaceous; ramose in a plane, pinnate; polyps arranged for the most part in four series, and the branches therefore quadrangular; verrucæ nearly obsolete, contiguous.

American Seas.

13. *G. PTEROGORGIA LAXA* (*Lamarck*).—Lax ramose, flabellate; branches somewhat depressed, smooth; branchlets crowded, a little curving; polyps submarginal.

14. *G. PTEROGORGIA ROSEA*.—Rose-red; dichotomously branched, in a plane; branches subpinnate; branchlets terete, unequally ascending; polyps subseriate.

Mediterranean, and Atlantic Ocean.—*Lamarck*.

15. *G. PTEROGORGIA FUSCO-PURPUREA* (*Ehrenberg*,) *Dana*.—Dark brownish-purple, dichotomously branched, flabellate; branchlets parallel, compressed, the summit branchlets nearly terete (three-fourths of a line thick), flexuous at base, long before branching, and virgate; polyps forming two lateral bands.

16. *G. PTEROGORGIA SULCIFERA*.—Reddish-yellow; very tall, and branching in a plane; branchlets mostly secund, ascending, obsoletely verrucose, every where with a medial sulcus; cortex thin.

Indian Ocean.

17. *G. PTEROGORGIA PECTINATA*.—Reddish; one to one and a half feet high and broad; stem dichotomising and bearing above nearly simple erect branchlets, long and pectinately arranged, one and a half lines thick, nearly terete, subverrucose; polyps sublateral, with a flat medial area naked.

The East Indies.—*Lamarck*.

18. *G. PTEROGORGIA OCHROSTOMA* (*Ehrenberg*,) *Dana*.—Rose-red, with the margin yellow; very densely branched; branchlets flexuous, not coalescing, subflabellate, rather rigid, branchlets compressed, shorter, a little broader, and with somewhat larger polyps than in the *G. flabellum*.

19. *G. PTEROGORGIA LEUCOSTOMA* (*Ehrenberg*,) *Dana*.—Rose-red, with a whitish margin; a foot high and nine inches broad; densely ramulous, subflabellate, not coalescing, rigid; branches flexuous, nearly terete, half a line thick, margin polypiferous.

20. *G. PTEROGORGIA SARMENTOSA* (*Esper*).—Pale yellowish; large; lax paniculate, branchlets slender (half a line), and flexuous, nearly terete, often sulcate; polyps lateral, often in a single series, margin of branchlets uneven, with obsolescent verrucæ; cortex thin.

Mediterranean.—*Esper*.

21. *G. PTEROGORGIA SETACEA* (*Pallas*).—Whitish; simple, rigid, rarely with a single branch; surface subverruculose, verruculæ minute (one-third of a line) and obsolete, numerous and crowded, mostly on two opposite sides, with a narrow naked interval between.

The American Seas, *Pallas*.—*Laguayra*, S. A., *Z. Collins*.

SUBGENUS II.—GORGONIA.

Polyps retractile; when contracted, surface of zoophytes either smooth or verrucose, with the verrucæ, when any, unarmed with spicula or scales.

A. Cortex thin, less than half a line in thickness. Polyps closely scattered.

I. *Flabellate, throughout reticulate, without any free branchlets.*

22. *G. flabellum.*

25. *G. umbella.*

23. *G. clathrus.*

26. *G. ventilabrum.*

24. *G. reticulum.*

27. *G. verriculata.*

II. *Flabellate; in part reticulate or not at all so—not pinnate.*

28. *G. umbraculum.*

31. *G. stricta.*

29. *G. cancellata.*

32. *G. retellum.*

30. *G. venusta.*

33. *G. tamarix.*

- | | |
|-----------------------------|---------------------------|
| 34. <i>G. tuberculata</i> . | 37. <i>G. verrucosa</i> . |
| 35. <i>G. granulata</i> . | 38. <i>G. apiculata</i> . |
| 36. <i>G. flexuosa</i> . | 39. <i>G. nivea</i> . |

III. *Flabellate ; pinnate, not reticulate.*

- 40.
- G. flammea*
- .

IV. *Not flabellate ; verrucæ none or very short.*

- | | |
|----------------------------|------------------------------|
| 41. <i>G. virgulata</i> . | 48. <i>G. furcata</i> . |
| 42. <i>G. miniacea</i> . | 49. <i>G. flavida</i> . |
| 43. <i>G. sanguinea</i> . | 50. <i>G. elongata</i> . |
| 44. <i>G. graminea</i> . | 51. <i>G. juncea</i> . |
| 45. <i>G. Bertolonii</i> . | 52. <i>G. suffruticosa</i> . |
| 46. <i>G. sasappo</i> . | 53. <i>G. ramulosa</i> . |
| 47. <i>G. humilis</i> . | 54. <i>G. spicifera</i> . |

B. Subflabellate or not at all so ; polyyps few and at distant intervals on the branches, subalternate.

- | | |
|------------------------------|-------------------------|
| 55. <i>G. trichostemma</i> . | 56. <i>G. exserta</i> . |
|------------------------------|-------------------------|

C. Cortex (including verrucæ) thick—half a line or more.

I. *Surface smooth or short verrucose.—(Plexaura.)*

- | | |
|----------------------------|-------------------------------|
| 57. <i>G. antipathes</i> . | 61. <i>G. quincuncialis</i> . |
| 58. <i>G. homomalla</i> . | 62. <i>G. dichotoma</i> . |
| 59. <i>G. anguiculus</i> . | 63. <i>G. vermiculata</i> . |
| 60. <i>G. olivacea</i> . | 64. <i>G. crassa</i> . |

II. *Verrucæ prominent.—(Eunicæa.)*

- | | |
|-----------------------------------|-----------------------------|
| 65. <i>G. papillosa</i> . | 69. <i>G. plantaginea</i> . |
| 66. <i>G. clavaria</i> . | 70. <i>G. lima</i> . |
| 67. <i>G. pseudo-antipathes</i> . | 71. <i>G. mammosa</i> . |
| 68. <i>G. madrepora</i> . | |

D. Unarranged species.

- | | |
|------------------------------|-----------------------------|
| 72. <i>G. purpurea</i> . | 76. <i>G. coccinea</i> . |
| 73. <i>G. Richardii</i> . | 77. <i>G. rhizomorpha</i> . |
| 74. <i>G. penna</i> . | 78. <i>G. alba</i> . |
| 75. <i>G. moniliformis</i> . | |

22. **GORGONIA FLABELLUM.**—Large, yellow or red ; flabellate, and throughout finely reticulate ; spaces one to two and a half lines in area, branchlets flattened, three-fourths to one and a half lines wide, sometimes very prominently winged ; verrucæ obsolete, except about the margin of the frond, where they are often distinct but minute.

West Indies.

23. *GORGONIA CLATHRUS*.—The *Gorgonia clathrus*, of Pallas, characterized by terete branchlets, may be only a red variety of the *flabellum*, and this view is strengthened by their similarity of form, and by the occasional occurrence of red and yellow colors in the same specimen. Yet in some specimens with terete branchlets, examined by the author, the main branches are more regularly ascending than usual in the *flabellum*, and the polyps are more or less seriate, with the medial line of the branchlets bare. The cortex sometimes appears smooth, with even the oscules indistinct; and again, a series of granules (about eight to half an inch), range along each side of the medial space, as if the surface were minutely verruculose. These different appearances arise from the states of retraction in the polyps at the time the zoophytes were dried, the latter condition being due to a partial retraction only. A yellowish-white specimen, of similar character, without verrucæ, but with the polyps in four series, belongs to the Nat. Hist. Society collections of Boston.

24. *GORGONIA RETICULUM* (*Pallas*), *Lamarck*.—Red, much branched, flabellate; throughout reticulate, branchlets nearly terete, decussately coalescent, obsoletely granulous.

Indian Ocean.

25. *GORGONIA UMBELLA* (*Esper*).—Red; flabellate, sometimes with the surfaces proliferous, height exceeding the breadth (twelve inches by nine), finely reticulate, spaces two to two and a half lines in area; branchlets subterete, nearly one line broad, irregularly rough, and sometimes appearing a little contorted, owing to the scattered verrucæ, which are unequally prominent and minute (one-fourth of a line); axis pale wood-brown.

East Indies.—*Esper*.

26. *GORGONIA VENTILABRUM* (*Pallas*).—Deep red, reticulate, branches compressed, verrucose.

East Indies.

27. *GORGONIA VERRICULATA* (*Esper*).—Whitish; flabellate, large, throughout coarsely reticulate; spaces mostly six lines broad, branchlets subterete, nearly one line thick, verrucose and uneven.

Indian Ocean.

28. *GORGONIA UMBRACULUM* (*Lamarck*).—Fronde red; flabellate, nearly circular and densely ramulous, subreticulate, ribbed with subflexuous or nearly straight branches, about one-third of an inch apart; branchlets two-thirds to one line thick, subterete; every where short verrucose.

The East Indies.

29. *GORGONIA CANCELLATA* (*Dana*).—Whitish; flabellate, nearly circular, very much branched throughout, for the most part coalescent, ribbed with nearly straight parallel branches, which are one-fourth to one-third of an inch

apart, and are united at intervals of one-half to two inches by flexuous branchlets; branches and branchlets one to one and a half lines thick, every where small verrucose.

30. *GORGONIA VENUSTA* (*Dana*).—Red or ochreous; flabellate and much reticulate, spaces often three lines long, but usually very much larger; branchlets terete, one line thick; cortex thick, and throughout entirely smooth; oscules scattered.

East Indies, *Esper*.—Isle of France, *J. S. Phillips*.

31. *GORGONIA STRICTA* (*Lamarck*).—Red, flabellate, subreticulate, branches crowded and close, lateral branchlets short, and rather spreading; polypiferous granules minute, much crowded; cortex thin.

32. *GORGONIA RETELLUM* (*Lamarck*).—Whitish; flabellate, subreticulate; lateral branchlets short, subtransverse, granulous.

Indian Ocean?—*Lamarck*.

33. *GORGONIA TAMARIX* (*Ehrenberg*).—Isabella yellow; a little higher than broad; much branched, slender, subflabellate; branches flexuous, thin, short, setaceous, subreticulate, but mostly free; margin of the summit branchlets crenated, owing to slightly prominent verrucæ.

34. *GORGONIA TUBERCLATA* (*Esper?*) *Lamarck*.—Yellowish; flabellate, subreticulate, ramose, very large; branchlets lax, tortuous, often coalescing; tubercles scattered, unequal.

Mediterranean Sea.

35. *GORGONIA GRANULATA* (*Ehrenberg*).—Yellowish; flabellate, higher than broad (nine inches by four), much branched, subreticulate, slender, branches fragile, branchlets three-fourths of a line thick, verrucose; verrucæ one-third of a line broad, and one-fourth high; axis fuscous.

36. *GORGONIA FLEXUOSA* (*Lamarck*).—Orange; flabellate, much branched, branches and branchlets dichotomously divaricate, flexuous, remotely coalescing, verrucose.

Indian Ocean.—*Esper*, *Lamarck*.

37. *GORGONIA VERRUCOSA*.—Whitish, flabellate, about six inches high and broad, loosely and sparingly ramose; branches flexuous, one to one and a quarter lines thick, rarely coalescing, verrucose, verrucæ one-half to two-thirds of a line broad.

Mediterranean, and seas of America.

38. *GORGONIA APICULATA* (*Ehrenberg*,) *Dana*.—Ash-colored; flabellate, three inches high and five broad; very densely ramulous, branches and branchlets nearly parallel, sometimes coalescing, often free, one-half a line

broad; verrucæ conically acute, one-fourth to one-third of a line high, and broad, crowded.

39. *GORGONIA NIVEA* (*Ehrenberg*), *Dana*.—Snow-white; flabellate, six inches, branchlets flexuous, opposite or alternate, subcompressed, one line thick at apex, with the verrucæ scattered, rather large, a line broad, and half a line high.

40. *GORGONIA FLAMMEA* (*Ellis*).—Scarlet or purple; very large; arborescently flabellate, lax ramose, subpinnate, branches compressed, branchlets one and a half to two lines broad, not verrucose, polyps scattered.

Cape of Good Hope.

41. *GORGONIA VIRGULATA* (*Lamarck*).—Bright yellow, orange, or crimson, sparingly ramose and often nodding; branches long, (often a foot or more long,) even virgate, one to one and a half lines thick, often obsoletely compressed; polyps crowded, sometimes subseriate, verrucæ none, oscules minute and linear.

West Indies.

43. *GORGONIA SANGUINEA* (*Lamarck*).—Purple; ramose, subfastigiata; branches erect, terete-setaceous, polyps of the branchlets subseriate, of the branches every where scattered; axis nearly black.

Isle of France.

44. *GORGONIA GRAMINEA* (*Lamarck*).—Whitish; ramose, branches erect, subfasciculate, slender, terete, rush-like; pores oblong, scattered.

Mediterranean Sea.—*Lamarck*.

45. *GORGONIA BERTOLONII* (*Lamouroux*).—Whitish; near the *virgulata* in habit, branches closely collected together, long and often nodding, rather stouter (one and a half lines), terete, and every where subverrucose.

Mediterranean Sea.

46. *GORGONIA SASAPPO* (*Pallas*).—Red; sparingly ramose; branches terete, long virgate, often five inches long and nodding, close dichotomous, one and a half lines thick, surface every where subpilose and very slightly verrucose, polyps crowded, throughout scattered.

Indian Ocean.—*Pallas*, *Esper*.

47. *GORGONIA HUMILIS* (*Dana*).—Whitish; two to three inches high, and short fusticulose, with the branches crowded, flexible, branchlets short (one to six lines), one and one-third lines thick, not attenuate, surface verruculose, polyps crowdedly scattered.

West Indies?

48. *GORGONIA FURCATA* (*Lamarck*).—White; low, lax ramose, dichotomous; branches terete, slender, variously curved, obsoletely verrucose.

The Mediterranean (?).—*Lamarck*.

49. *GORGONIA FLAVIDA* (*Lamarck*).—Yellow; crowded cespitose, subpinate; branchlets terete, numerous; polyps crowdedly scattered, cortex thick, not verrucose.

West Indies.—*Seba, Mauer*.

50. *GORGONIA ELONGATA* (*Pallas*).—Reddish; very tall (often four feet); branches few, dichotomous, very long, short verrucose; axis pale.

West Indies.—*Ellis, Esper*.

51. *GORGONIA JUNCEA* (*Pallas*).—Color subminiaceous; stem quite simple, very long, terete; surface crowdedly short-verrucose.

Indian Ocean, *Pallas, Esper*.—Amboyna, *Seba*.

52. *GORGONIA SUFFRUTICOSA* (*Dana*).—Ash-colored; fruticulose, very crowdedly ramulous; branches and branchlets flexuous and irregular, mostly terete, some nodose; branchlets one-half to one and a half inches long and one line thick; cortex rather thick, smooth, with punctiform oscules, minute and throughout crowdedly scattered; polyps quite small, yellowish, with the tentacles fringed and short.

Plate 59, fig. 7, part of zoophyte, natural size; 7*a*, polyp, enlarged; 7*a'*, same, natural size.—The Feejee Islands, Mathuata reefs.—*Exp. Exp.*

53. *GORGONIA RAMULOSA* (*Ehrenberg*,) *Dana*.—Yellow; eight inches high and five broad, erect, dichotomous; branches virgate, densely subverticillate, with simple or sparingly divided branchlets, nearly an inch long, and one line thick; surface densely polypiferous, smooth, with the oscules like minute points.

West Indies.—*Ehrenberg*.

54. *GORGONIA SPICIFERA* (*Dana*).—Ash-colored; eight inches high, subdichotomous; branches on all sides densely ramulous, with simple, rigid branchlets, 1½ to 2 inches long and nearly a line thick, terete, finely, crowdedly, and obsolescently verrucose; axis fuscous, cortex rather thick.

West Indies(?).—*Boston Soc. Nat. Hist.*

55. *GORGONIA TRICHOSTEMMA* (*Dana*).—Brown, summits flesh-colored; low, and sparingly ramose in a plane; branches coarsely nodulous, one to three lines thick; polyps few, very distant, tentacles long fimbriate, the papillæ being capillary and recurved; verrucæ irregularly tuberculiform, somewhat alternate, stout, suberose, above obsolescent.

Plate 59, fig. 3, natural size, polyps expanded; 3*a*, one of the polyps, enlarged; 3*b*, a papilla, more enlarged.—Feejee Islands, in ten fathoms.—*Exp. Exp.*

56. *GORGONIA EXSERTA* (*Ellis*).—Whitish; low, sparingly ramose; branches alternate, a line thick; polyps few, and three or four lines reinote, alternate; verrucæ tuberculiform, but little prominent, a line broad; axis corneous, fuscous.

American Seas.—*Ellis*.

[*Plexauræ.*]

57. *GORGONIA ANTIPATHES*.—Very large (three feet); paniculato-ramose, branches terete; cortex thick, smooth; oscules large; axis black, flexuously striate, of branchlets setiform, of base often one to two inches thick.

Indian Ocean.

58. *GORGONIA HOMOMALLA* (*Esper*).—Much branched; branches terete, dichotomous, ascending and somewhat nodding; cortex thick, oscules scattered.

Mediterranean? *Esper*.—West Indies, *Lamarck*.

59. *GORGONIA ANGUICULUS* (*Dana*).—Fulvous; ramose dichotomous; branches terete, branchlets one and a half to two lines thick, long; surface scarcely smooth, a little pitted; oscules very much crowded, nearly circular, quite small; axis fuscous, of the branchlets very slender; axils compressed.

West Indies.

60. *GORGONIA OLIVACEA* (*Lamouroux*), *Lamarck*.—Much branched; branches scattered or subpinnate; branchlets one to one and a half lines thick; cortex thick, olivaceous, oscules scattered.

East Indies.—*Lamouroux*.

61. *GORGONIA QUINCUNCIALIS* (*Ehrenberg*), *Dana*.—Dark ash or reddish; two feet high; dichotomously branched, branches suberect, flexuous, crowded, one and a half lines thick at summits, terete; surface a little verrucose (and therefore rough), verrucæ appressed, opening upward, two-thirds of a line long, and about one-third of a line broad; axis fuscous.

West Indies.

62. *GORGONIA DICHOTOMA* (*Esper*).—Furcato-dichotomous, two feet high, axils arcuate; branches terete, slightly attenuated; branchlets often a foot long, two to three lines thick; oscules linear, numerous; cortex a line thick, axis wood-brown and not flexible.

West Indies.

63. *GORGONIA VERMICULATA* (*Lamarck*).—Ramose, one to two feet high, dichotomous; branches erect, long, terete; above nearly two to three lines thick; surface smooth, oscules large and round; axis black, axils not compressed.

West Indies? East Indies?—*Lamarck*.

64. *GORGONIA CRASSA* (*Ellis*).—Sparingly ramose, dichotomous, branches five to six lines thick, and often five inches long, nearly cylindrical; surface nearly smooth, oscules scattered, large and round, under margin sometimes prominent; axis corneous, pale fuscous.

West Indies.—*Ellis*.

[*Euniceæ.*]

65. GORGONIA PAPILLOSA (*Esper*).—Whitish or yellowish; flabellate, branches flexuous or incurved, upper branchlets mostly two to two and three-fourths lines thick; surface crowdedly verrucose, verrucæ three-fourths of a line long and half a line broad.

West Indies?

66. GORGONIA CLAVARIA (*Lamouroux*), *Edwards*.—Somewhat fuscous; ramose, very stout; branches subterete, clavato-elongate, five to ten lines thick; verrucæ unequal, aperture one line broad.

West Indies.

67. GORGONIA PSEUDO-ANTIPATHES (*Lamarck*).—Somewhat fuscous; one foot in height; ramose, dichotomous; branches ascending, four to five lines thick, terete, not attenuate; surface of cortex verrucose, verrucæ stout, one line long, and two-thirds broad, opening upward, outer lip prolonged and often a little incurved.

West Indies.

68. GORGONIA MADREPORA (*Dana*).—Pale, five inches high; sparingly ramose; branches four to five lines thick, elongate, with the surface strongly verrucose, verrucæ numerous, subcylindrical, standing nearly erect upon the surface, three-quarters of a line thick, and one to one and a quarter long; cortex very thick; the corneous axis hardly a line broad, black.

West Indies.—*Philad. Acad. Nat. Sci.*

69. GORGONIA PLANTAGINEA (*Lamarck*).—Fuscous; ramose, stout, erect; branches terete, echinulate; cortex spongy, verrucæ conical, erect, much crowded.

West Indies?—*Lamarck*.

70. GORGONIA LIMA (*Lamarck*).—Whitish; ramose, dichotomous; branchlets two and a half lines thick; verrucose, verrucæ slender, very densely crowded; axis corneous, black, compressed at the axils.

West Indies.—*Tournefort, Lamarck*.

71. GORGONIA MAMMOSA (*Lamouroux*), *Edwards*.—Eight inches; ramose, subdichotomous; verrucæ terete, one to three lines long, imbricate.

West Indies.

[*Appendix.*]

72. GORGONIA PURPUREA (*Pallas*).—Violaceous, subdichotomous, branches divaricate, virgate, subverrucose.

73. GORGONIA RICHARDII (*Lamouroux*).—Yellowish, much branched; branches scattered or sublateral, a little flabellate; axis irregular, sometimes compressed, suberose, white; cortex thin, verrucæ conical, half a line high.

West Indies.

74. *GORGONIA PENNA* (*Lamarck*).—Whitish, eight to ten inches high, lax-ramose, complanate; branches furcate, pinnate, pinnules distichous, crowded, filiform, surface remotely verrucose; verrucæ ascending, bifarious.

From New Holland.—*Peron & Lesueur*.

75. *GORGONIA MONILIFORMIS* (*Lamarck*).—Whitish, simple, filiform, erect; verrucæ prominent, umbilicate at apex, somewhat scattered; cortex very thin.

From New Holland.

76. *GORGONIA COCCINEA* (*Lamouroux*).—Ramose; branches short, scattered, chladoniiform; cortex scarlet.

Australian seas.

77. *GORGONIA RHIZOMORPHA* (*Lamouroux*).—Ramose; branches scattered, elongate, like the fibres of a root; cortex brown, axis subcorneous.

Near Bayonne.

78. *GORGONIA ALBA* (*Lamarck*).—Ramose; subcompressed; branches subpinnate, erect; branchlets terete; cortex white, oscules scattered.

SUBGENUS III.—MURICEA.

Verrucose, in the retracted state of the polyps, the verrucæ armed with spicula or scales, and not movable.

Arrangement of the Species.

I. *Verrucis spiculo-armatis.*

79. *G. Mur. spicifera.*

81. *G. Mur. placomus.*

80. *G. Mur. elongata.*

82. *G. Mur. cerea.*

II. *Verrucis squamulo-armatis.*

83. *G. Mur. verticillaris.*

84. *G. Mur. myura.*

79. *G. MURICEA SPICIFERA* (*Lamouroux*).—Pale, a foot high; fruticose, with the branches much compressed and three to four lines broad, and branchlets subcompressed; surface crowdedly covered with armed subimbricate verrucæ; axis black, throughout very much flattened and two-edged, axils broad.

West Indies.

80. *G. MURICEA ELONGATA* (*Lamouroux*).—Sulphur-yellow; a foot high; fruticulose, ramulous, but not in a plane; branchlets nearly terete, one and a half lines broad, obtuse, elongate, verrucose; verrucæ much crowded, imbricate, scarcely a line long.

West Indies.

81. *G. MURICEA PLACOMUS* (Linn.,) Ehrenberg.—Cinereous or fuscous, large, flabellate, much ramose; branches flexuous, sometimes coalescing, one and a half to three lines thick, strongly verrucose, verrucæ three-fourths of a line broad and high, divaricate, and laxly arranged; surface armed, closed at summit by a calyptra made of eight convergent spicula; axis brownish, axils scarcely compressed.

Mediterranean Sea(?). Norwegian Sea.

82. *G. MURICEA CEREAE* (Esper,) Ehrenberg.—Low, slender, fruticulose, subflabellate, covered every where with spreading, reddish spicula; branches nearly terete, rather broader than a line, obtuse; polyps densely and throughout scattered, yellow above, one-third of a line in breadth.

East Indies.—Esper.

83. *G. MURICEA VERTICILLARIS* (Linn.,) D.—Ramosae, flabellate, one and a half feet high; branches pinnate; pinnules setaceous; verrucose, verrucæ ascending, incurved, verticillate, less than a line long.

Mediterranean Sea.

84. *G. MURICEA MYURA* (Lamarck).—Whitish; simple, filiform, caudate; surface verrucose, the verrucæ scattered, often bifarious, oblong ascending, subpyriform, incurved, cortex thin.

GENUS V.—PRIMNOA.—LAMOUROUX.

Gorgonidæ secreting an inarticulate axis; polyps, when contracted, long verruciform, and having motion at base; their sides armed with imbricate scales.

PRIMNOA LEPADIFERA (Linnæus,) Lamouroux.—Lax ramose, dichotomous, subflabellate; verrucæ long ($2\frac{1}{2}$ to 3 lines), subpyriform, closed by 8 scales; axis of the branches testaceous; of the branchlets corneous.

Seas of Northern Europe.

GENUS VI.—BEBRYCE.—PHILIPPI.

Gorgonidæ having an inarticulate corneous axis; polyps large and not retractile.

BEBRYCE MOLLIS (Philippi).—Arborescent; polyps remotely scattered; cortex spongy.

Mediterranean Sea.—Philippi.

SUBFAMILY III.—ISINÆ.

Gorgonidæ forming a jointed axis.

GENUS I.—MOPSEA.—LAMOUROUX.

Isinæ having the joints alternately calcareous and corneous; ramose, with corneous axils; cortex thin.

1. MOPSEA DICHOTOMA (*Pallas*,) *Lamouroux*.—Five inches high; ramose, dichotomous, branchlets 1 line thick; calcareous joints laterally compressed or subcylindrical; main stem 3 lines thick.

Indian Ocean.

2. MOPSEA ENCRINULA (*Lamarck*,) *Ehrenberg*.—Ramosé, subbipinnate; branchlets filiform, verrucose; verrucæ scattered, ascending, sometimes verticillate.

Seas of New Holland.—*Peron & Lesueur*.

3. MOPSEA GRACILIS (*Lamouroux*,) *Ehrenberg*.—Explanate at base, lacinate; calcareous joints of stem a little stout, those of the branches very long, translucent, smooth, white.

The Antillas.—*Lamouroux*.

4. MOPSEA ERYTHREA (*H. & Ehrenberg*).—Dichotomous, fruticulose, verrucose, scarlet; joints concealed by the cortex; scarcely narrower at the geniculations; branches flexible at the geniculations; calcareous joints of the axis somewhat terete, longitudinally sulcate; geniculations a little tumid; polyps with the tentacles ramulous, white.

Red Sea.—*Ehrenberg*.

Appendix.—ISIS CORALLOIDES (*Lamarck*).—From the "Austral Seas."—*Peron & Lesueur*.

GENUS II.—ISIS.—LINNÆUS.

Isinæ consisting of corneous and calcareous joints alternately; branches proceeding from the calcareous joints; cortex thick, deciduous.

ISIS HIPPURIS (*Linnaeus*).—Springly ramose, branches stout; calcareous joints of the axis white, strongly sulcate.

East Indies.

ISIS (?) *ELONGATA* (*Esper*).—Red, lax ramose, branches terete; calcareous joints of the axis much elongate, striate; internodes very short.

Near Naples, Mediterranean.—*Philippi*.

GENUS MELITÆA.—LAMOUROUX.

Isinæ, consisting of an alternation of calcareous and suberose joints.

1. *MELITÆA OCHRACEA*.—Large, much branched, generally arboriform nearly in a plane; branches and branchlets suberect, not coalescing.

East Indies. Feejee Islands, of crimson and orange colors.—*Exp. Exp.*

2. *MELITÆA RETIFERA*.—Flabelliform, much branched in a plane; branches suberect and flexuous, branchlets often subreticulately coalescing, thickly verrucose.

East Indies.—*Peron & Lesueur*.

3. *MELITÆA COCCINEA*.—Small, branching in a plane; branches slender (1 line thick), tortuous, divaricate, often reticulately coalescing; internodes obsolete, verrucæ rather remotely scattered.

Indian Ocean. New Holland.—*Exp. Exp.*

4. *MELITÆA TENELLA* (*Dana*).—Fruticulose, 3 inches high; deep scarlet; much branched, branches and branchlets very slender, in no part a line thick, flexuous; joints 3 to 8 lines long; cortex verrucose, verrucæ small ($\frac{1}{3}$ of a line broad), not at all ascending; polyps bright yellow; calcareous axis nearly smooth.

Sandwich Islands.

ORDER II.—HYDROIDEA.

Zoophytes having a simple tubular visceral cavity; ovules growing externally from the sides.

FAMILY I.—HYDRIDÆ.

Buds deciduous when mature; ovules single, lateral; tentacles tubular.

FAMILY II.—SERTULARIDÆ.

Buds persistent; polyps sessile; ovules included in a vesicle, lateral.

The following are the characteristics of the genera.

I. *Polyps in one series, branches therefore secund.*

1. ANTENNULARIA (Lamarck). *Not plumose. Calicles tubular or campanulate.*

2. PLUMULARIA (Lamarck). *Plumose, pinnate, or decomposed pinnate.*

II. *Polyps in two series.*

a. Series uninterrupted.

3. SERTULARIA. *Calicles urceolate; attached at base, with the summits more or less free.* This genus includes the Dynamene, of Lamouroux, which was instituted for species having the cells opposite, instead of alternate.

4. THUIARIA (Fleming). *Calicles attached by one side as well as at base, not free at apex.* This genus is the Biseriaria, of Blainville, a name substituted by that author for Fleming's.

5. THOA (Lamouroux). *Calicles very short tubular or campanulate.* The habit of the Thoæ, as suggested by Milne Edwards, is much like that of the Campanulariæ, and it may belong to the following family.

b. Polyps in successive groups, arising from a periodicity in budding.

6. PASYTHEA (Lamouroux).

ANTENNULARIA CYATHIFERA (*Dana*).—A simple, erect, filiform stem, half an inch high; polyps subremote; calicles elegantly broad campanulate, with the margin entire; two rudimentary calicles intermediate.

Plate 61, fig. 5, zoophyte, unexpanded, enlarged; 5a, same, natural size. Also, figure 9, page 25.—Balabac Passage, East Indies.—*Exp. Exp.*

SERTULARIA MIMOSA (*Dana*).—Neat plumiform, 3½ inches high, pinnules about 4 lines distant, and 9 lines long, calicles short, and sparingly prominent; polyps very long, exsert, and slender, with the circlet of tentacles placed obliquely, elliptical; tentacles capillary, recurved at apex.

Plate 61, fig. 6, zoophyte, natural size, partly in outline; 6a, one of the polyps, expanded, and another contracted, natural size.—The Feejee Islands.—*Exp. Exp.*

PASYTHEA GRACILIS (*Dana*).—Polyps in successive clusters of six; calicles opening outward, not inflated at base.

Fig. 11, page 25, zoophyte, enlarged.—Gulf-weed, Atlantic Ocean.—*Exp. Exp.*

FAMILY III.—CAMPANULARIDÆ.

Hydroidea with persistent buds; polyps long-tubular, calicles pedicellate; in modes of reproduction near the Tubularidæ.

The family includes two genera, as follows:

CAMPANULARIA (*Lamarck*).—Polyps budding from an ascending shoot or stolon, erect, or climbing.

LAOMEDEA (*Lamouroux*).—Polyps alternately arranged, and zoophyte having its branches usually zigzag.

LAOMEDEA GRACILIS (*Pickering*).—Stems 6 to 8 lines high, and rising from a creeping stolon, regularly zigzag in form; the stem for a short distance above the axils, and the pedicels, ringed; calicles campanulate; vesicles oblong-oval, tapering above and below, and truncated at apex, with a short neck.

Plate 61, fig. 7, zoophyte, enlarged; 7*a*, natural size; 7*b*, polyp, partly expanded.—Gulf-weed, Atlantic, lat. 34° 39' N., long. 72° 01' W.—*Exp. Exp.*

LAOMEDEA SIMPLEX (*Dana*).—Stem nearly straight, erect, pedicels not ringed, tubular, no true calicles; tentacles about 20, mouth projecting, obconical.

Plate 61, fig. 8, zoophyte, enlarged; 8*a*, same, natural size; 8*b*, enlarged view of rostriform mouth; fig. 6, p. 21, a wood-cut of the same.—Feejee Islands.—*Exp. Exp.*

FAMILY IV.—TUBULARIDÆ.

Hydroidæ giving out persistent buds; also producing deciduous oviform gemmules near the base of the tentacles, besides other true ova; polyps mostly pedicellate; tentacles not tubular.

The following are the characters of the genera, as laid down by Van Beneden:

I. *Coralligenous*; forming horny coralla.

1. *PENNARIA* (Goldfuss).—Tentacles of two kinds, the superior scattered and in several rows.

2. *TUBULARIA* (Pallas).—Tentacles of two kinds, in two series.

3. *SYNCORYNA* (Ehrenberg).—Tentacles alike, in several series.

4. CORYDENDRIUM (Van Beneden).—*Tentacles alike, scattered.*

5. EUDENDRIUM (Ehrenberg).—*Tentacles in one series.*

II. *Not coralligenous.*

6. CORYNA (Gærtner).—*Tentacles alike, scattered.*

7. HYDRACTINIA (Van Beneden).—*Tentacles in a single series.*

TUBULARIA ORNATA (*Couthouy*).—Filiform, 3 to 4 inches high; polyps large; beak long, subcylindrical; external tentacles filiform, oral tentacles very short; gemmuliferous branchlets much branched, lax and pendent.

Rio Janeiro.—*Exp. Exp.*

CORYNA CAPILLIFERA (*Pickering*).—Summit of polyp long-ovate; tentacles about 20, capillary, and scattered.

Plate 61, fig. 10, polyp, enlarged.—Sandwich Islands.—*Exp. Exp.*

SUPPLEMENT

TO THE DESCRIPTION OF SPECIES.

THIS Supplement includes the following genera of doubtful or undetermined character: Allopora, Myriozoum, Pustulopora, Coscinopora, Receptaculites, Tetradium, Theonea, Limaria, Stomatopora, Chaunopora, Distichopora, Orbulites, Marginopora, and Polytrema,

GENUS ALLOPORA.—EHRENBERG.

Cumulato-ramose, each polyp giving out, in succession, a single bud (branchlets therefore zigzag). Corallum calcareous and solid, not at all penetrated by stellate cells; calicles somewhat prominent, cells quite deep, less than a line broad, funnel-shape, margin crenate, and having a series of cellules between the crenatures.

1. *ALLOPORA FLABELLIFORMIS* (*Lamarck*,) *Dana*.—Eight inches high, much branched, flabellate, secund, branchlets crowded, minute, and very short, flexuous. Corallum smooth, calicles minute (one-sixth of a line broad), lamellæ scarcely distinct.

East Indies.

2. *ALLOPORA ROSEA* (*Pallas*,) *Dana*.—Small, much branched, flabellate, mostly secund; branches attenuate. Corallum rose-colored, often verruciferous, calicles very minute (scarcely one-fourth of a line broad), some lateral and very short, others terminal, lamellæ not exsert.

West Indies.

3. *ALLOPORA INFUNDIBULIFERA* (*Lamarck*,) *Dana*.—Corallum very ramose; subflabellate, branchlets very small, flexuous in zigzag, often coalescent; calicles infundibuliform, internally striate; margin crenulate.

East Indies?—*Lamarck*.

4. *ALLOPORA GEMMASCENS* (*Esper*,) *Dana*.—Ramose, flabellate, somewhat compressed and mostly secund; outer branchlets quite stout, nearly a line thick. Corallum having the cells half a line broad, a little prominent; margin crenulate, surface rough with minute tubercles.

East Indies.

5. *ALLOPORA OCLINA* (*Ehrenberg*).—Small, ramose, compressed, subflabellate, smooth; branches dichotomous, one and a half to two lines thick, obtuse. Corallum having the cells few, scattered, scarcely prominent, distinctly 5 to 9-rayed, mostly 7-rayed.

6. *ALLOPORA NORWEGICA* (*Fabricius*,) *Dana*.—Compressed and almost flabellate, branchlets very short and rather stout. Corallum smooth, calicles obsolete, cells minute, circular, or oblong, lamellæ scarcely at all exsert, nearly equal.

Norwegian Seas.

GENUS MYRIOZOOM.—DONATI, EHRENBERG.

Attached ramose. Coralla naked below, but above punctured with minute cells, not lamellate within, and radiating from the axis of the stem; polyps multitentaculate, and having an operculum.

1. *MYRIOZOOM TRUNCATUM*.—Small; dichotomous; branches terete, truncate at apex.

Mediterranean.

2. *MYRIOZOOM GRACILIS* (*Michelin*,) *Dana*.—Whitish; dichotomously ramose, branches slender, terete, above irregularly inflated, round truncate at apex.

Mediterranean.—*Michelin*.

GENUS PUSTULOPORA.—BLAINVILLE.

Attached. Coralla calcareous, consisting of a series of layers, cylindrical or sparingly ramose; cells scattered, a little prominent or pustuliform, aperture circular.

GENUS COSCINOPORA.—GOLDFUSS.

Attached, cyathiform or incrusting. Coralla calcareous, consisting of fibriform tubes; cells immersed and arranged in quin-cunx order, funnel-shape; interstices narrow.

GENUS RECEPTACULITES.—DEFRANCE.

Coralla calcareous, with quadrangular and nearly contiguous cells.

GENUS TETRADIUM.—DANA.

Coralla massive, consisting of 4-sided tubes, and cells with very thin septa or parietes; cells stellate, with 4 narrow lamellæ.

GENUS THEONEA.—LAMOUROUX.

Quite small. Coralla calcareous, lobulato-glomerate and lacunose; cells opening at the summits of the prominences, tubular without lamellæ; interstices very thin, naked, and smooth.

GENUS LIMARIA.—STEININGER.

Small, ramose; coralla quite solid, cells with a subtriangular aperture; calicles none.

GENUS STROMATOPORA.—GOLDFUSS.

Massive. Coralla convex, concentrically faint rugate, cells pore-like, very minute, situated in the concentric depressions.

GENUS CHAUNOPORA.—PHILLIPS.

Massive. Coralla consisting of concentric or nearly flat beds, perforated by small vermiform flexuous tubules, and others larger, nearly parallel, and non-lamelliferous (?).

GENUS DISTICHOPORA.—LAMARCK.

Ramose, quite small; branched in a plane. Coralla firm; branches often a little compressed, and with a cellular furrow on two opposite sides extending over the extremity.

1. *DISTICHOPORA VIOLACEA* (*Lamarck*).—Violet, with the tips a little yellowish; 2 to 2½ inches high, and ramose; branches somewhat compressed, dichotomous, 1 to 1½ lines broad.

Plate 60, fig. 3; corallum, natural size; 3 *a*, extremity of a branch, magnified.—East Indies and Pacific. Paumotu Archipelago.—*Exp. Exp.*

2. *DISTICHOPORA GRACILIS* (*Dana*).—Reddish; more slender than the *violacea*, ramulous; branchlets one-third as broad, at summit about a third of a line.

Plate 60, fig. 4, corallum, natural size; fig. 5, a variety? natural size; 5 *a*, 5 *b*, views, enlarged.—Paumotu Archipelago.—*Exp. Exp.*

GENUS ORBULITES.—LAMARCK.

Free; disk-shape, circular, nearly flat above and below; both surfaces minutely porulose.

GENUS MARGINOPORA.—QUOY & GAYMARD.

Free; very thin disk-shape, circular. Coralla nearly plane above and below, and concentrically faint striate; margin minutely punctate; internal texture concentrically cellular.

MARGINOPORA VERTEBRALIS (Q. & G.)—Plate 60, fig. 8.—Var. *plicata*, figs. 9 *a*, *b*, *b* showing the interior structure.

GENUS POLYTREMA.—RISSO.

Small; incrusting or subramose, sometimes lacerato-subdivided. Coralla somewhat porous; surface punctate, and with scattered, minute, poriform cells, irregular, and having usually a lacerate margin, either immersed or at the summits of rounded or spiniform elevations.

POLYTREMA MINIACEA.—Bright red; minute, and minutely ramoso-subdivided.

Mediterranean Sea.

POLYTREMA BRUNNESCENS (*Dana*).—Pale brownish; thick incrusting, cavernous, surface gibbous, lacerate, and very irregular.

Plate 61, fig. 3, natural size.—Society Islands.—*Exp. Exp.*

POLYTREMA MESENERINA (*Dana*).—Deep carmine, mesenteriform, consisting of suberect plicately aggregated laminæ; the margin minutely ragged or crispate, and furnished with a few scattered pores of irregular shape.

Plate 61, fig. 4, natural size; 4 *a*, portion enlarged, showing the character of the margin.—Tutuila, Navigator Islands.—*Exp. Exp.*

SYNONYMY AND REFERENCES.



THE synonyms of the species of Corals, which are omitted in the preceding pages are here given. For easy reference, the paging is added.

The titles of some of the works referred to, and the abbreviations used, are as follows :

Rumph. : Rumphius, Amboinsch Rariteit kamer, fol. Amsterdam, 1741; and Herbarium Amboinense, Dutch and Latin, 7 vols. fol. 1741-55, Amsterdam.

Marsilli : Histoire physique de la mer; 1 vol. fol. Amsterdam, 1725.

Seba : Locupletissimi rerum nat. Thesauri descriptio; 1734-1765, 4 vols. fol.—Amsterdam.

Ellis Cor. : Natural History of Corallines. 1 vol. 4to. London, 1754.

Ellis : Ellis and Solander's Natural History of Zoophytes; 1786, 1 vol. 4to. London.

Gmelin : Linnæi Systema Naturæ; ed. xiii, 7 vols. 8vo. Leipsic, 1788.

Esper : Die Pflanzen-thiere, etc.; 3 vols. 4to, with a Supplement (Fortsetzung) in 2 vols. Nuremberg.

Lamx. : Lamouroux, Exposition Methodique de Polypiers; the plates, those of Ellis and Solander, reproduced, with 21 additional; 1 vol. 4to. Paris, 1821.

Lamk. : Lamarck, Système des Animaux sans vertèbres. 2nd ed. Paris, 1836.

Oken : Lehrbuch der Zoologie. Jena, 1815, 2 vols. 8vo.

Schweig. : Schweigger, Beobachtungen auf naturhistorischen Reise; Berlin, 1819, 1 vol. 4to; also Handbuch der Naturgeschichte der skelettlosen ungegliederten Thiere; Leipzig, 1820, 8vo.

Bl. : Blainville, Manuel d'Actinologie ou de Zoophytologie; Paris, 1830-1834, 1 vol. 8vo, and 1 vol. 100 plates.

Ehr. : Ehrenberg, Beiträge zur Kenntniss der Corallenthierie des rothen Meeres; Berlin, 1834.—Trans. Berlin Acad. for 1832.

Q. & G. : Quoy & Gaynard, Voyage de L'Astrolabe, vol. iv, on Zoophytes; Paris, 1833, 8vo, with folio plates.

Edw. : Milne Edwards, 2nd edition of Lamarck's Système des Animaux sans vertèbres; Figures and descriptions in the illustrated edition of Cuvier's Règne Animal, Paris, 1837.

Johnston : History of British Zoophytes; 1 vol. 8vo. London, 1833.

Page 13. *Euphyllia pavonina* D.—Flabellum pavoninum Lesson, Illust. de Zool. pl. 14; *Lamk.* ii, 365.

P. 14. *E. anthophyllum*, D.—Monomyces anthophyllum Ehr.

E. rubra D.—Turbinolia rubra, *Q. & G.* Voy. de L'Ast., pl. 14.—Caryophyllia compressa Bl.

Page 14. *E. glabrescens* D.—Caryophyllia glabrescens, *Chamisso & Eysenhardt*, Nov. Act. Nat. Cur. x.—Lobophyllia glabrescens *Bl.*, p. 355, but not pl. liii, f. 3, which is the *L. angulosa*.

P. 15. *E. gracilis* D.—*Mad. fastigiata?* *Esper*, i, 95, pl. 8.—Caryophyllia angulosa, in part, *Lamk.*—*C. fastigiata?* *Ehr.*

E. aspera D.—*Mad. capitata?* *Esper*, Fortsetz, pl. 81, f. 1.

E. meandrina D.—*Mad. fastigiata?* *Esper*, i, 95, pl. viii A.

Page 16. *Ctenophyllia pectinata* D.—*Madrepora meandrites Ellis*, 161 pl. 48 f. 1.—*Meandrina pectinata Lamk.*; *Lamx.*—*Manicina pectinata Ehr.* is probably a *Mussa*.

Ct. quadrata D.—*Seba* iii, pl. 112, f. 2?

Ct. pachyphylla D.—*Seba* iii, pl. 112, f. 3.—*Manicina pachyphylla Ehr.*

Page 17. *Mussa fastigiata* D.—*Mad. fastigiata Ellis*, pl. 35; *Esper* Fortsetz. pl. 82.—Caryophyllia fastigiata *Lamx.*; *Lamk.*—Lobophyllia fast. *Bl.*—Not *Car. fastigiata Ehr.*

M. carduus D.—*Mad. carduus Ellis*, pl. 35.—*Mad. lacera Esper*, pl. 25, f. 2; *Ehr.*—*Car. carduus Lamk.*—not? *Seba's* pl. 108, 109, 110, vol. iii.

M. angulosa Oken.—Fungus &c. *Seba* iii, pl. 109, f. 6.—*Mad. angulosa Esper* i, pl. 7; *Pallas*, No. 174.—*Car. angulosa Lamk.*; *Lamx.*; *Ehr.*—Lobophyllia angulosa *Bl.*

M. corymbosa D.—*Car. ib. Lamk.*—Lobophyllia *ib. Bl.*

P. 18. *M. sinuosa* D.—*Mad. angulosa* var. γ *Ellis*, pl. 34.—*Mad. cristata?* *Esper* i, pl. 26.—*Car. sinuosa Lamk.*; *Lamx.*—*Lob. sinuosa Bl.*—*Car. cristata Ehr.*

M. multilobata D.—Fungus, &c. *Seba*, iii, pl. 109, f. 4?

P. 19. *M. crispa* D.—*Meandrina crispa Lamk.*; *Bl.*—not? *Seba* iii, pl. 108, Nos. 3 and 5, which appear to be *Manicina fissca*.

M. dipsacea D.—*Mad. lactuca Esper* Fortsetz. i, pl. 33.

M. fragilis D.—Fungus, &c. *Seba* iii, pl. 109, No. 9?; also pl. 111, No. 8?—pl. 109, No. 10 is different and may be *Ehrenberg's* *Manicina gyrosa*.

P. 20. *M. gyrosa* D.—*Mad. gyrosa Ellis*, pl. 51, f. 2; *Esper* Fortsetz. i, pl. 80, f. 1—*Meandrina gyrosa* (in part) *Lamk.*

M. nobilis D.—*Meand. sinuosa Q. & G.* pl. 18, f. 4, 5; *Lamk.*

Page 20. *Manicina amarantum* D.—*Amarantum saxum?* reduced, *Rumph.* Amb. vi, 244, pl. 87, f. 1.—*Turbinolia Geoffroyi Audouin* in *L'Egypte* pl. 4, f. 1 is near this species.—See *Ehrenberg's* *Man. Hemprichii*.

ADD: Variety *stricta* Dana, plate 9, f. 2 is smaller, with narrower fossæ, $\frac{1}{5}$ to $\frac{1}{8}$ in. and $\frac{3}{4}$ in., dilating at margin to a breadth of $\frac{3}{4}$ in. West Indies?

M. fissca Ehr.—*Ellis*, pl. 51, f. 1.—*Folia* etc., *Seba* iii, pl. 108, f. 3 and 5.

M. areolata Ehr.—*Mad. areolata Ellis*, pl. 47, f. 5 (not f. 4).—*Meandrina areolata Lamk.*; *Lamx.*—*Manicina areolata Leuckart* De Zoophytis, etc. 1841, Friburg. pl. 3, f. 3.—*Seba's* f. 23 to 27, pl. 112, vol. iii, represent worn specimens of more than one species; his f. 7, p. 111 is not the areolata.—*Lesueur's* f. 11, pl. 16, vol. vi of *Mém. du Mus.* may possibly belong here.

P. 21. *M. meandrites* Ehr.—Fungus etc., *Sloane's* Jamaica i, 56, pl. 18, f. 5.—*Mad. meandrites Esper*, i, 79, pl. 4.

ADD: *Manicina dilatata* Dana, *Ellis's* f. 4, pl. 47.—*Esper's* *Mad. natans*, i, pl. 23 is near *Man. hispida*.—*Ehrenberg's* *Manicina interrupta* appears to belong to another genus.

Tridacophyllia lactuca *Bl.*—*Mad. lactuca Ellis*, pl. 44; *Esper's* Fortsetz. i, pl. 33 A, from *Seba*, and 33 B from *Ellis*. *Ellis's* figure may be a different species, and the name *T. manicina* is suggested. *Pectinia lact. Oken*; *Pavonia* *ib. Lamk.*

Page 24. *Orbicella radiata* D.—*Mad. radiata Ellis*, pl. 47, f. 8.—*Tubastræa radiata Bl.*—*Explanaria radiata Ehr.*

O. argus D.—*Mad. cavernosa Esper* Fortsetz. i, pl. 37.—*Ast. argus Lamk.*—*Tubastræa cavernosa Bl.*

P. 25. *O. rotulosa* D.—*Mad. rotulosa Ellis*, pl. 55.—*Astræa rot. Lamk.*; *Lamx.*—*Favia rotulosa Ehr.*—*Mad. acropora Esper* Fortsetz. i, pl. 38?

Page 26. *O. pleiades* D.—Mad. pleiades *Ellis*, pl. 53, f. 7, 8.—*Astræa pleiades Lamk.*; *Lamx.*—*Tubastræa Bl.*

O. annularis D.—Mad. annularis *Ellis*, pl. 53, f. 1, 2.—*Astræa ib. Lamk.*—*Tubastræa ib. Bl.*—*Explanaria annulata Ehr.*

O. stellulata D.—Mad. stellulata *Ellis* pl. 53, f. 3, 4.—Not *Astræa stellulata Lamk.* which is an *Astræopera Bl.*

P. 27. *O? crispata* D.—Ast. *crispata Lamk.*; *Lamx.*; *Bl.*

O. microphthalmia D.—Ast. mic. *Lamk.*—*Favia mic. Ehr.*

Page 28. *Siderina galaxea* D.—Mad. galaxea *Ellis*, pl. 47, f. 7.—Mad. astroites *Esper Fortsetz.* i, pl. 35 ?—Ast. galaxea *Lesueur*, Mém. du Mus. vi, 285, pl. 16, f. 13.—Ast. astroites *Ehr.*

Page 28. *Astræa speciosa* D.—Mad. radiata *Esper Fortsetz.* i, pl. 61.—Ast. annularis *Q. & G.* pl. 17, f. 17, 18?

A. uva Schw.—Mad. uva *Esper Fortsetz.* i, pl. 43.—*Favia uva Ehr.*

A. ananas.—Mad. ananas *Ellis* pl. 47, f. 6; not *Esper* i, pl. 19.—Ast. ananas *Lamk.*; *Lamx.*; *Lesueur* Mém. du Mus. vi, 285, pl. 16, f. 12; not of *Q. & G.* pl. 16, f. 6, 7, which appears to be *A. porcata.*—*Favia ananas Oken.*—*Favia porcata var. Ehr.*

P. 29. *A. dipsacea.*—Mad. favosa *Ellis*, pl. 50, f. 1.—Ast. dipsacea *Lamk.*; *Lamx.*; ? *Ehr.*—*Dipsastræa dipsacea Bl.*—Ast. abdita *Q. & G.* pl. 16, f. 4, 5, near this; *A. dipsacea* of *Q. & G.* pl. 17, f. 1, 2, is different.

A. porcata.—Mad. porcata *Esper Fortsetz.* i, pl. 71, f. 1 to 3.—? *A. ananas Q. & G.* pl. 16, f. 6.

P. 31. *A. magnifica.*—*Favastræa magnifica Bl.* Man. pl. 54, f. 3.

A. versipora *Lamk.*—*Dipsastræa vers. Bl.*—*Favia ib. Ehr.*

P. 32. *A. denticulata* *Lamk.*—Mad. dentic. *Ellis*, pl. 49, f. 1.—*Dipsastræa ib. Bl.*—*Favia ib. Ehr.*—? *A. dipsacea Q. & G.*

P. 33. *A. petrosa.*—Mad. detrita *Esper Fortsetz.* i, pl. 41. *A. detrita Lamk.*; *Bl.*

A. pentagona.—Mad. pentagona *Esper Fortsetz.* i, pl. 39.

A. favistella.—? *Esper's* pl. 40 *Fortsetz.* i.

Figs. 3 a, b, plate 13 of the Author's Atlas represents a cellular coral from Wakes' Island, which may be the *A. favistella.*

P. 35. *A. intersepta.*—Mad. intersepta *Esper Fortsetz.* i, pl. 79.—? *A. intersepta Lamk.*—Near this, *A. galaxea Q. & G.* pl. 17, f. 10.

A. abdita.—Mad. abdita *Ellis*, pl. 50, f. 2.—Mad. favosa *Esper Fortsetz.* i, pl. 45 A, f. 2.—*A. abdita Lamk.*; *Lamx.*; *Bl.*; *Ehr.*; not of *Q. & G.* pl. 16, f. 4, 5.

P. 36. *A. heliopora.*—Figs. 11 a, b, pl. 13 represent a coral from Wakes' Island, Pacific, perhaps this species. The lamellæ are stout, cellules coarse.

Page 36. *Meandrina dedalea.*—Mad. dedalea *Ellis*, pl. 46, f. 1; *Esper Fortsetz.* i, pl. 57, f. 1, 2. *Meandrina dedalea Lamk.*; *Lamx.*; *Bl.*

P. 37. *M. spongiosa*, D.—Meand. dedalea *Lesueur*, Mém. du Mus. vi, pl. 16, f. 9. ? *M. labyrinthica.*—Mad. labyr. *Ellis*, pl. 46, f. 3.—Mad. meandrites *Esper*, i, pl. 4 A.—Meand. labyr. *Lamk.*; *Lamx.*; *Lesueur*, Jour. Acad. Nat. Sci. Philad. i, pl. 8, f. 11; *Bl.*—not ? *M. platygyra labyr. Ehr.*, Savigny's f. 4, pl. 5, L'Egypte.

P. 38. *M. phrygia.*—Mad. phrygia *Ellis*, pl. 48, f. 2.—Mad. filograna ? *Gualtieri*, Ind. Test. tab. 97.—Meand. phrygia *Lamk.*; *Lamx.*; *Bl.*

M. gracilis D.—Near *Ellis* pl. 48, f. 2.—? *M. phrygia Ehr.*

M. tenuis D.—*M. cerebriformis, Q. & G.*, pl. 18, f. 2, 3.

M. filograna.—Mad. filograna *Esper*, i, pl. 22, f. 1.—not Mad. filograna *Lamk.*

M. cerebriformis.—*Lapis, &c., Seba* iii, pl. 112, f. 6.—Mad. labyrinthiformis *Esper*, i, pl. 3.—*M. cerebriformis Lamk.*; *Bl.*

P. 39. *M. truncata* D.—*Lapis, &c. Seba* iii, pl. 112, f. 1.

Page 39. *Monticularia microcona.*—Mad. exesa *Ellis*, pl. 49, f. 3. *Mont. microconos Lamk.*; *Lamx.*; *Bl.*; *Ehr.*—*Hydnophora Pallasii Fischer*, Oryct. de Mosc. —*Esper's* pl. 31, figs. 1, 2, vol. i, may be part of an *Agaricia*; it is *Montic. meandrina Lamk.*—*Esper's* f. 3 of same plate is *Hydnophora Esperii Fischer*, Oryct. de Mosc. pl. 31, f. 4.

Page 40. *Monticularia lobata*—*Lamk.*; *Lamx.*; *Bl.*
Mont. polygonata—*Lamk.*; *Bl.*

Page 40. *Merulina ampliata* Ehr.—*Mad. ampliata Ellis* pl. 41, f. 1, 2; *Esper* Fortsetz. i. pl. 77, f. 1, 2, 3, 1 and 2 bad.—*Agaricia ampliata Lamk.*; *Lamx.*; *Bl.*—*Pavonia ampliata Bl.*—*Mycedium ampliatum Oken*, *Zool.* i, 70.

P. 41. *Mer. folium* D.—*Montic. folium Lamk.*; *Bl.*

Mer. laxa D.—*Seba*, iii, pl. 116, f. 5 ?

Page 42. *Echinopora rosularia*.—*Lamk.*; *Lamx.*; *Schweig.* Beobacht. pl. 7, f. 64.—*Echinastræa rosularia Bl.*

Ech. ringens.—*Explanaria ringens Lamk.*—*Echinastræa ringens Bl.*

Ech. reflexa D.—*Mad. lamellosa Esper*, Fortsetz. i, pl. 58. ?

Ech. aspera D.—*Mad. aspera Ellis*, pl. 39.—*Agaricia aspera Schweig.*—*Explanaria aspera Lamk.*; *Lamx.*—*Tridacophyllia aspera Bl.*—*Explanaria gemmacca Lamk.* a gibbous variety ?

Another species is the *Explanaria Hemprichii* of Ehrenberg; and perhaps also his *Stephanocora Hemprichii*.

Page 43. *F. discus* D.—*Stutchbury*, *Linn. Trans.*, xvi. pl. 32, f. 5 a, b. ?

Fungia agariciformis.—*Fungus*, &c. *Seba*, iii, pl. 111, No. 1.—*Mad. fungites Forskal*, *Anim. Egypt*, 134, pl. 42; *Esper* i, pl. 1 (poor); *Ellis* pl. 28, f. 1. *Fungia agaricif. Lamk.*; *Lamx.* etc. *Fungia patellaris Lamk.* young? figured by *Ellis* pl. 28, figs. 1-4, *Esper* Fortsetz. i, pl. 62, figs. 1-6; *Monomyces patella Ehr.*

F. dentata D.—*Mad. fungites Esper* i, pl. 2, f. 2 ?

F. echinata D.—*Mad. echinata Esper* i, pl. 2, f. 1; *Pallas*, *Zooph.* 284.

P. 46. *F. repanda* D.—*Mad. fungites Ellis* pl. 28, f. 5.—*F. agaricif. Lamx.* pl. 28, f. 5. and *Encyc.* pl. 483, f. 1.

F. actiniformis, Q. & G. iv, 180, pl. 14, f. 1, 2; *Lamk.*; *Leuckart.*

F. crassientaculata Q & G. iv, 182, pl. 14, f. 3, 4; *Lamk.*; *Cuv. ed.* 1837, pl. 83, f. 1.

F. parvotensis *Stutchbury*, *Linn. Trans.* xvi, pl. 32, f. 6 a, b.

P. 47. *F. dentigera* *Leuckart*, op. cit. p. 48, pl. 3, f. 1.

F. scutaria.—*Fungus*, &c. *Seba*, iii, pl. 112, f. 29.

F. pectinata Ehr.—? *Seba's* f. 29, No. 112, referred to by Ehrenberg, but *Seba* says *lamelle non-denticulate*.

F. Ehrenbergii D.—*Herpetolithus Ehrenb. Leuckart*, op. cit. pl. 2.

F. aspera, a, D.—*Haliglossa echinata Ehr.*—*Fungus*, &c. *Seba* iii, pl. 111, f. 4 ?

F. Rüppellii.—*Herpetolithus Rüppellii Leuckart*, op. cit. pl. 1. *Fungia echinata* of *Cuv. ed.* 1837, pl. 82, f. 2, has the fine denticulation of this species, but it is represented as crenato-denticulate.

F. crassa D.—*Rumph.* *Amb.* pl. 88, f. 2 ?

Page 48. *Herpetolithus limacinus*.—*Mad. pileus Ellis*, pl. 45 ? —*Mad. lima Esper*, Fortsetz. i, pl. 63 (Ellis reduced).—*Fungia limax Oken*.—*F. limacina* (in part) *Lamk.* etc.—*Haliglossa limacina Ehr.*

H. interruptus.—*Fungus*, &c. *Seba* iii, pl. 111, f. 5.—*Fungia limacina* (in part) *Lamk.*—*Haliglossa interrupta Ehr.*

H. foliosus.—*Fungus*, &c. *Seba*, iii, pl. 111, f. 3.—*Haliglossa foliosa Ehr.*

Fig. 3, plate 20, of the Author's Atlas may be this species.

H. stellaris.—*Mad. trilinguis Boddaert Lyst.* etc. p. 613, pl. 14 (from *Esper*).—*Mad. pileus Esper*, Fortsetz. i, pl. 73.—*Haliglossa stellaris Ehr.*

Page 49. *Halomitra pileus*.—*Bonnet de Neptune Tournefort Acad. R. des Sci.*, 1700, p. 27, plate facing p. 30. *Mitra polonica Rumph.* pl. 88, f. 3. *Fungia pileus Lamk.* etc.

Polyphyllia talpa.—*Fungus*, &c. *Seba*, iii, pl. 111, f. 6. *Fungia talpa Lamk.*—*Herpetolitha talpa, Eschscholtz* in *Oken's Isis* for 1825. *Pol. talpa Bl.*; *Ehr.* *Agaricia talpa Schw.*

Page 50. *P. sigmoides*.—*Talpa marina*, etc. *Seba*, iii, pl. 112, f. 31. *Fungia talpa* (in part) *Lamk.*

P. pelvis Q. & G., pl. 20, f. 8-10. *Lithactinia novæ-hiberniæ*? *Lesson*, *Illust. de Zool.* pl. 6, specimen from New Ireland.

Page 51. *Pavonia explanulata*.—*Mad. pileus* *Esper*, i, pl. 6 (poor). *Agaricia explanulata* *Lamk.* *Ag. explanata* *Lamx.*; *Bl.*; *Schw.*

P. elephantotus.—*Pallas*; *Esper*, i, pl. 18, f. 1-4. *Agaricia ampliata* var. *Lamk.* *Mycedium elephantotus* *Oken.*, *Ehr.*? *Agaricia elephantopus* *Schw.*

P. 52. *P. boletiformis*.—*Mad. cristata* *Ellis*, pl. 31, f. 3, 4. *Mad. boletif.* *Esper*, *Fortsetz.* i, pl. 56 (poor). *Pavonia bolet.* *Lamk.*; *Lamx.* *Ag. boletif.* *Schw.*

P. 53. *P. frondifera*.—Plate 24, f. 3, 3 a of the Author's Atlas, represent var. *brevicristata* of this species, from the *Fecjees*.

P. crassa.—Plate 23, f. 2, is var. *ascia*; pl. 24, f. 1, var. *obtus.* Var. *loculata* is another species from Singapore, having the folia 9 in. broad, 8 high, nearly 1 in. through at base, intersecting with large spaces 2 or 3 inches across.

P. siderea.—*Ellis*, pl. 49, f. 2. *Astræa siderea* *Lamk.*; *Lamx.* *Siderastræa siderata* *Bl.* Not *A. siderea* of *Lesueur*, *Mém du Mus.* vi, pl. 16, f. 14.

P. latistella.—*Astræa diffuens* Q. & G. pl. 17, f. 15, 16.

Page 54. *Agaricia undata*.—*Mad. undata* *Ellis*, pl. 40 (poor); *Esper*, *Fortsetz.* i, pl. 78 (*Ellis*). *Agaricia undata* *Lamk.*; *Lamx.* *Undaria undata* *Oken.*

Page 55. *Mycedia cucullata*.—*Mad. cucullata* *Ellis*, pl. 42; *Esper*, *Fortsetz.* i, pl. 67 (*Ellis*). *Agaricia cucullata* *Lamk.*; *Bl. Man.* pl. 56, f. 3 (bad). *Mycedium cucullatum* *Oken.*

Mycedia purpurea.—*Ag. purpurea* *Lesueur*, *Mém du Mus.* vi, 276, pl. 15, f. 3.

P. 56. *Mycedia agaricites* D.—*Mad. agaricites* *Linn.*; *Pallas*; *Esper*, i, pl. 20 (good); *Ellis* pl. 63 (bad). *Pavonia agaricites* *Lamk.*; *Lamx.*; *Bl.* *Pavonia cristata* *Ehr.*

Psammocora obtusangula D.—*Pavonia obtusang.* *Lamk.* etc. *Pav. obtus.* *Ehr.*?

Psam. plicata D.—? *Pavonia plicata* *Lamk.*; not *Esper's* *Fortsetz.* i, pl. 66.

P. 57. *Psam. fossata* D.—*Ast. meandrina* *Ehr.* related?

Page 57. ADD, AS APPENDIX TO ASTRÆACEA.—*Turbinalopsis* *Lamx.*, pl. 82, f. 4. *Monomyces* *Ehr.* who mentions three species, *M. patella* (see p. 45), *M. anthophyllum* which is near *Euphyllia*, and *M. eburneus* which resembles a young *Dendrophyllia*.

Plate 22, f. 8 of our Atlas represents what appears to be a young *Tridacophyllia*; it seems to resemble the *Monomyces*.

Page 60. *Ecmesus Philippi*.—*Cyathina* *Ehr.* *Stephanophyllia* *Michelin.* *Turbinalia* *Lamk.* *Desmophyllum* *Ehr.* *Culicia Dava.* *Caryophyllia* *Lamk.* *Dendrophyllia* *Bl.* *Ooculina* *Lamk.* *Anthophyllum* *Schweigger.* *Stylina* *Lamk.* *Astroitis* *Boecone.*

P. 61. *Cyathina cyathus*.—*Marsilli* pl. 28, f. 128. *Mad. cyathus* *Ellis*, pl. 28, f. 7. *Mad. anthophyllum* *Esper*, i, pl. 24. *Anthophyllum cyathus* *Schw.* *Galaxea cyathus* *Oken.* *Car. cyathus* *Lamk.*; *Lamx.*

C. Smithii.—*Car. cyathus Broderip* *Jameson's J.* viii, (1830) 312. *C. Smithii* *Stokes & Broderip* *Zool. Jour.* iii, 481, pl. 13, f. 1-6; *Johnston's Brit. Zooph.* 207, f. 30, on page 206. *Caryoph. cyathus* of *Dr. Fleming*, *Wern. Trans.* ii, 249, and *Brit. An.* p. 509, has 40 to 50 larger lamellæ and was from the island *Papa Stour*, *Zetland*.

C. turbinata.—*Cyathina cyathus* of *Leuckart*, de *Zooph. coral.* figs. 5-7, pl. 4, is near this species.

Page 62. *Desmophyllum dianthus*.—*Mad. dianthus* *Esper*, *Fortsetz.* i, pl. 69. *Caryophyllia dianthus* *Bl.* *Mussa dianthus* *Oken.*

Page 63. *Caryophyllia cespitosa*.—*Acropora cespitosa* *Gualtieri* Ind., back of pl. 61. *Mad. flexuosa* *Ellis* pl. 31, f. 5, 6. *M. fascicularis* *Esper* i, pl. 29. *Galaxea cesp.* *Oken.* *Anthoph. cesp.* *Schw.* *Cladocora levigata* *Ehr.* *Clad. cespitosa* *E. Forbes* Rep. Brit. Assoc. 1843, pp. 151 to 155. Not *C. cespitosa* *Ehr.*

Car. conferta.—? *Cladocora cespitosa* *Ehr.*, who received one specimen from the W. Indies. ? *Seba* pl. 108, f. 9.

P. 64. *Car. flexuosa*.—*Ellis* pl. 32, f. 1. *Clad. flexuosa* *Ehr.* Not *Mad. flexuosa* *Linn.* *Amœn. Acad.* i, 96, pl. 4, f. 13 and *Esper* iii, *Pet.* pl. 6.

Car. arbuscula.—*Lesueur* *Mém. du Mus.* vi, 275, pl. 15, f. 2. ? *Cladocora candelabrum* *Ehr.* (from W. Indies).

Car. cornigera *Lamk.*—*Mad. etc.* *Marsilli*, p. 137, pl. 30, f. 130-9. *Mad. ramea Pallas*; *Esper* i, pl. 10. *Dendrophyllia cornigera* *Bl.* *Cladocora* ? *anthophyllum* *Ehr.*

Car. anthophyllum *Lamk.*—*Anthophyllum saxum* *Rumph.* pl. 87, f. 4. *Mad. anthophyllites* *Ellis*, pl. 29; *Esper* i, pl. 72. *Anthophyllum anthophyllites* *Schweig.* *Galaxea anthoph.* *Oken.* *Cladocora anthophyllum* *Ehr.*

Page 65. *Dendrophyllum ramea* *Bl.*—*Marsilli*, pl. 31, f. 144, &c. *Mad. max. arborea* *Shaw* *Travels*, fol. Oxford 1733, *append. p.* 48, and *fig.* *Mad. ramea* *Linn.*; *Pallas*; *Ellis* pl. 38; *Esper* i, pl. 9, 10 A; *Oken.* *Lithodendrum rameum* *Schw.* *Caryophyllia ramea* *Lamk.* *Oculina ramea* *Ehr.* ? Not *Donati* *Nat. Hist. Adriatic*, pl. 7, and *Phil. Trans. Abridg.* x, 154, pl. 5, f. A.

Dend. micrantha *D.*—*Oculina micranthus* *Ehr.*

Dend. coccinea *D.*—*Oculina coccinea* *Ehr.*

Page 66. *Oculina hirtella* *Lamk. etc.*—*Mad. hirtella* *Ellis*, pl. 37.

O. prolifera *Lamk., etc.*—*Corallium album* *etc.* *Seba*, iii, pl. 116, No. 3. *Mad. prolifera* *Linn.*; *Ellis*, pl. 32, f. 2; *Esper* i, pl. 11; *Oken.* *Lithodendrum proliferum* *Schw.*

P. 67. *O. axillaris* *Lamk.*—*Mad. axillaris* *Ellis* pl. 13, f. 5.

O. varicosa, *Lesueur*, *Mém. du Mus.* vi, 291, pl. 17, f. 19.

O. oculata, *D.*—*Corallium album, etc.* *Seba* iii, pl. 116 Nos. 1, 2. *Mad. oculata* ? *Pallas*; *Esper* i, pl. 12, 13; *Oken.* *Oculina virginea* (in part) *Lamk.* *Lith. virgineum* *Schw.* *Dentipora virginea* *Bl.* *Man.* pl. 60, f. 1 (poor).

O. virginea *Bl.*—*Mad. &c.* *Marsilli*, pl. 30, f. 140. *Mad. virginea* *Linn.*; *Pallas*; *Esper* i, pl. 14. *Matrepora virginea* *Oken.*

O. diffusa *Lamk.*—*O. pallens* var. *a* *Ehr.*

Page 68.—*Anthophyllum musicale*, *Schw.*—*Mad. musicalis* *Linn.*; *Esper*, (in part) i, pl. 30, f. 2. *Caryophyllia musicalis* *Lamk.*; *Lamx.* *Galaxea musicalis* *Oken.* *Sarcinula musicalis* *Bl.*

A. fasciculatum *D.*—*Mad. caryophyllites* *Pallas.* *Car. saxum* *Rumph.* pl. 87, f. 3 ? *Mad. fascicularis* *Linn.*; *Ellis* pl. 30. *Car. fasciculata* *Lamk.*; *Lamx.*; *Bl.*; *Q. & G.* iv, 190, pl. 15, f. 3-6 (poor). *Galaxea fascicularis* *Oken.*

A. astreatum.—*Car. astreata* *Lamk.* *Sarcinula astreata* *Bl.* *Anth. astreatum* *Ehr.* ? Not *Esper* pl. 30, f. 1, which appears to be a worn specimen of the *cespitosum*.

A. cespitosum *D.*—*Mad. cespitosa* *Esper* i, pl. 27. *Anth. Esper* *Schw.*

A. cuspidatum *D.*—*Mad. cuspidata* *Esper*, i, pl. 28. *Galaxea cuspidata* *Oken.* *Anth. fasciculare* *Ehr.*

P. 69. ADD *A. spherula* *Ehr.*

Stylina echinulata *Lamk.*; *Bl.* *Man.* 351, pl. 62, f. 5.

Sarcinula perforata *Lamk.* *incertæ sedis.*

Astroitis calicularis.—*Mad. calic.* *Cavolini* *Pol. Mar.* i, pl. 3, f. 1-5; *Delle Chiaje* *Anim. senza Vert. di Nap.*, pl. 17, f. 7; *Esper* i, pl. 16, f. 1, 2. *Ast. calyc.* *Walch* *Naturf.*; *Boccone* *Museo di Fisica.* *Car. calyc.* *Lamk. etc.* *Cladocora calyc.* *Ehr.* *Astroidea lutea* *Q. & G.* *Ann. des Sci. Nat.* x, pl. 9 B, and *Astræa calyc. voy. de l'Ast.* iv, 200, pl. 15, f. 10-23.

A. viridis *D.*—*Astræa viridis*, *Q. & G.* iv, 204, pl. 16, f. 1 to 3.

Page 70. *Gemmipera palifera* Bl.—*Astræa palif. Lamk.; Lamx.*

G. peltata Bl.—*Mad. pelt. Esper, Fortsetz. i, pl. 42, and ii, pl. 86, f. 2. Explanaria crater Schw. Turbinaria cupula Ehr.; not T. peltata Ehr.*

G. patula D.—*Turbinaria patula Ehr.*

G. crater Bl.—*Mad. crater Pallas; Esper, Fortsetz. i, pl. 74 and ii, pl. 86, f. 1. Explanaria infundibulum Lamk.; Lamx. Turbinaria crater Oken.*

P. 71. *G. cinerascens* D.—*Mad. cinerascens Ellis, pl. 43 (good). Expl. mesenterina Lamk.; Lamx. Gen. mesenterina Bl. Turbinaria cin. Oken. Turb. microstoma Ehr. ?; not Expl. cinerascens Ehr.*

Astræopora puvinaria, Bl.—*Astræa pulv. Lamk.; Lamx. Astræa myriophthalma Lamk. near this species. Esper's pl. 54 B, f. 2, Fortsetzung i, is a worn fragment of a Madrepora.*

A. punctifera Bl.—*Astræa punct. Lamk.; Lamx.*

P. 72. *A. fungiformis*, Bl.—*Michelin Guerin Mag. de Zool. 1840, pl. 2.*

A. stellulata, Bl. *Man. 383, pl. 60, f. 4.*

Isaura Hemprichii D.—*Hughea Hemprichii Ehr.*

Isaura Savignii D.—*Hughea Savignyi Ehr.---Palythoa Sav. Aud., Savigny L'Egypte Polypes, pl. 2, f. 1.*

Page 73. *Zoantha Ellisii* Lamk.—*Actinia sociata Ellis, pl. 1, f. 1 and 2, also Phil. Trans. lvii, pl. 19, f. 1, 2. Hydra sociata Gmel. Zoanthus Ellisii Bosc.; Lamx. Zoanthus sociatus Ehr.*

Z. sociata—*Lesueur, Jour. Acad. Nat. Sci. Philad. i, 179; Bl. Lesueur supposed it Ellis's sociata.*

Z. Solandri—*Lesueur, loc. cit. pl. 8, f. 1; Lamk.*

Z. dubia—*Lesueur, loc. cit.; Bl.*

Z. Bertholetii Ehr.—*Palythoa Bertholetii Audouin Savigny l'Egypte Polypes, pl. 2, f. 3.*

Palythoa denudata D.—*Mad. denudata Cavolini, Pol. Mar. pl. 3, f. 6. Cavolinia rosea Schweig. Mammillifera denudata Ehr.*

P. 74. *P. auricula* D.—*Mamm. auricula Lesueur. loc. cit. pl. 8, f. 2; Bl. Man. pl. 50, f. 3.*

P. nymphaea D.—*Mam. nymphaea Lesueur loc. cit.; Bl. Aleyonium mammillosum Esper, iii pl. 7, is near this.*

P. fuliginosa D.—*Mam. fuliginosa Ehr. Pal. Perii of Audouin here? Ehr.*

P. mammillosa Lamx.—*Aleyonium mammillosum Ellis, pl. 1, f. 4, 5; Linn.; Lamk; Sloane's Jamaica i, pl. 21, f. 2, 3. Pal. stellata Lamx. Exp. 70, pl. 1, f. 4, 5. Tethya mamm. Oken. Cavolinia mammillosa Schw. Mamm. mammillosa Bl.; Ehr.*

P. ocellata Lamx.; *Ehr. Aleyonium ocellatum Ellis, pl. 1, f. 6; Lamk.; Sloane's Jamaica i, pl. 21, f. 1. Mamm. ocellata Bl.*

P. glareola D.—*Corticifera glareola Lesueur loc. cit. i, 178, pl. 8, f. 6, 7; Bl. Man. pl. 50, f. 1. Cort. flava Lesueur (ib.) near this.*

P. flavo-viridis Ehr.—*Aleyonium tuberculosum Esper iii, pl. 23, is near this and the P. argus.*

P. 75. *P. caesia* D.—*Corticifera aggregata? Lesson Voy. de la Coquille Zooph. pl. 8, f. 3.*

Page 78. *Madrepora palmata* Lamk.; Bl.—*Corallium, &c. Sloane's Jamaica, etc. i, pl. 17, f. 3 (good). Mad. muricata var. Esper, Fortsetz. i, pl. 51.*

P. 79. *M. alces* D.—*Corallium, &c. Seba iii, pl. 113 (good); Esper, Fortsetz. i, pl. 83, (Seba's reduced). Mad. palmata, in part, of Lamk.; Ehr.; etc.*

M. flabellum Lamk., Bl.—*Heteropora flabellum Ehr. a different species?*

P. 80. *M. spicifera* D.—*Lithodendron etc. Rumph. pl. 86, f. 2. Mad. corymbosa (in part) Lamk.*

P. 84. *M. echidnaea* D.—*Mad. rosea Esper i, pl. 15. Oculina echidnaea Lamk. Heteropora echidnaea Ehr.*

M. plantaginea Lamk.—Mad. *plantaginea* Q. & G. pl. 19, f. 3, not recognizable. *Heteropora decurrens* Ehr. here ?

M. cerealis Lamk.—Mad. *muricata* var. *Esper*, Fortsetz. i, pl. 53 (passable).

P. 88. *M. formosa* D.—*M. muricata* Ellis pl. 57? *M. plantaginea* Q. & G.? *Heteropora Hemprichii* Ehr. near this species ?

M. arbuscula D.—*M. muricata* *Esper*, Fortsetz. i, pl. 49.

M. robusta D.—*Heteropora cervicornis* Ehr. near here ?

P. 89. *M. cervicornis* Lamk.—*Corallium*, &c. *Sloane* Jamaica, etc. i, pl. 18, f. 3; *Seba* pl. 114, f. 1. Not *Heteropora cervicornis* Ehr. *Esper's* Mad. *muricata* pl. 49 is near *M. arbuscula* !

P. 90. *M. prolifera* Lamk.—*Corallium*, &c. *Sloane*, i, pl. 17, f. 2. Mad. *muricata* *Esper*, Fortsetz. i, pl. 50. Not *Heteropora prolifera* Ehr.—not Mad. *prolifera* Q. & G. pl. 19, f. 4.

M. secunda D.—*M. muricata* *Esper*, Fortsetz. i, pl. 52.

P. 91. *M. pocillifera* Lamk.—Q. & G. pl. 19, f. 5, but not figs. 6-10.

Ehrenberg has described also the species of *Madrepora*, *Heteropora imbricata*, *H. spherostoma* and *H. leptostoma*.

Page 93. *Manopora compressa* D.—*Corallium asperum* *Marsilli* pl. 31, f. 149. *Millepora compressa* *Linn.*; *Esper*, i, pl. 10.

P. 94. *M. spumosa* D.—*Porites spumosa* *Lamk.* *Porites spongiosa* Ehr. ?

M. hispida D.—*Porites spumosa* (in part) *Lamk.*

M. foliosa D.—*Porites foliosa* Ehr. Mad. *patiniformis* *Esper*, Fortsetz. i, pl. 75, f. 1, 2, 3. ? Not Mad. *foliosa* *Pallas*?; nor that of *Ellis* pl. 52, which appear both to be *Echinopora*. *Seba's* iii, pl. 110, f. 7, called *M. foliosa* in *Esper*, may be *Man. lima*.

P. 96. *M. incrassata* D.—*Montipora verrucosa* Q. & G. pl. 20, f. 11, here? *Porites complanata* *Lamk.* near here ?

M. lima D.—*Corallium*, &c. *Seba*, iii, pl. 110, f. 7 ? Mad. *foliosa* *Esper*, Fortsetz. i, pl. 58A ? *Agaricia lima* *Lamk.* *Montipora lima* *Bl.*

M. papillosa D.—*Agaricia pap.* *Lamk.* *Montip.* *Bl.*

M. tuberculosa D.—*Porites tuberculosa* *Lamk.*

Page 98. *Alveopora retepora* *Bl.*—Mad. *ret.* *Ellis* pl. 54, f. 3, 4, 5. *Porites ret.* *Lamk.*; *Lamk.* P. *Peronii* *Bl.* *Dict. des Sci. Nat.* xliii, pl. 39, f. 3, and *Alv. retepora* in *Man.* pl. 59, f. 3.

A. dedalea.—Mad. *dedalea* *Forsk.*, *Anim. Egypt.* pl. 37, f. B. *Madrepora Savigny* and *Acyonella Savignii* *Audouin* l'Egypte, *Pol.* pl. 3, f. 4. *Porites ded.* Ehr. *Alv. ded.* *Bl.*

Alv. rubra—Q. & G. pl. 19, f. 11-14.

Alv. fenestrata D.—*Pocillopora fenestrata* *Lamk.*

Alv. viridis Q. & G. has the cells and habit of a *Sideropora*.

Page 90. *Sideropora digitata* *Bl.*—*Pocillopora Andreossyi* *Audouin*, *Savigny*, *L'Egypte Polypes*, pl. 4, f. 3. Mad. *dig.* *Pallas*; *Ellis*. *Porites scabra* *Lamk.* *Sid. scabra* *Bl.* *Porites digitata* Ehr. *Anthopora cucullata* *Gray*, *Zool. Trans.* 1835, p. 85. *Alveopora viridis* Q. & G. pl. 20, f. 1-4, ?

Sid. elongata *Bl.*—*Porites elongata* *Lamk.* Here *Esper's* Fortsetz. i, pl. 60. ?

Sid. subdigitata *Bl.*—*Porites* *Lamk.*

Page 90. *Seriatopora subulata* *Lamk.*, etc.—Mad. *seriata* *Ellis* pl. 31, f. 1 & 2. *Ser. ocellata* Ehr. ?

P. 100. *Ser. lineata* *Schw.*, Ehr.—*Lithodendrum litoreum* *Rumph.* pl. 86, f. 3. *Millepora lineata* *Linn.*; *Esper*, Fortsetz. pl. 19. *Ser. subulata* var. *Lamk.* *Ser. valida* Ehr. where ?

Pocillopora acuta, *Lamk.*; *Bl.*; Ehr., &c.—Mad. *damicornis* *Ellis*, p. 170.

P. 101. *P. bulbosa* Ehr.—Mad. *damicornis* *Esper*. Fortsetz. i, pl. 46; in part *Lamk.*

P. damicornis, *Lamk.*; Q. & G. pl. 20, f. 5-7.—Mad. *dam.* *Esper* Fortsetz. i, pl. 47. *Acropora dam.* *Oken.* *P. apiculata* Ehr. near this ?

P. verrucosa Lamk. etc., but not of *Ehr.* Here *P. Hemprichii Ehr.* ?

Page 104. *Heliopora cœrulea* Bl.—Coralloides, &c. *Pettiver* Gazoph. pl. 10, f. 1, 2. *Millepora cœrulea Ellis*, p. 142 and *Mad. interstincta Ellis*, pl. 56, f. 1-3, and pl. 12, f. 2. *Mad. cœrulea Esper* Fortsetz. i, 3, pl. 32. *Pocillopora cœrulea Lamk.* *Hel. cœrulea Bl.* *Man.* pl. 61, f. 3; *Q. & G.* pl. 20, f. 12-14 (poor).

P. 104. Millepora alcicornis Lamk. &c.—*Sea Ginger*, Hughes's Barbadoes, p. 289, and plate. *Mil. alcic. Esper*, i, pl. 6, and pl. 9. *Palmipora alcicornis Bl.*

Mil. clavaria Ehr. is near *Esper's* pl. 9.

P. 105. M. ramosa.—*Esper*, i, pl. 7.

M. tortuosa D.—Here *Esper's*, i, pl. 26. ?

M. plicata D.—*M. alcicornis* var. *plicata Esper*, i, pl. 8.

M. complanata Lamk.—*Palmipora complanata Bl.* *M. complanata Ehr.* near here.

Page 107. *Porites clavaria* Lamk.—*Mad. porites Ellis*, pl. 47, f. 1. *P. clav. Lesueur* *Mém. du Mus.* vi, 289, pl. 17, f. 17; *Bl.*

P. furcata Lamk.—Here *Lesueur's P. flabelliformis* loc. cit.

P. 108. P. recta Lesueur, loc. cit. pl. 17, f. 16. *Corallium*, etc. *Seba*, iii, pl. 109, f. 11.

P. divaricata Les.—*Esper's Fortsetz.* i, plate 59, *Mad. conglomerata*, is another species.

P. nigrescens, var. *mucronata. Esper's*, i, pl. 21 A.

P. levis D.—*Esper's Mad porites* pl. 21. ?

P. 109. P. contigua D.—*Mad. contigua Esper*, *Fortsetz.* i, pl. 66. *Pavonia plicata Lamk.*; *Bl.*

P. astræoides Lesueur, *Mém. du Mus.* vi, pl. 16, f. 15; *Lamk.*; *Bl.* *Man.* pl. 61, f. 5.

P. conglomerata Lamk. includes all massive species; of *Ellis*, pl. 41, f. 4, is a dried *Alcyonium Ehr.*; of *Q. & G.* pl. 18, f. 6-8, massive, indeterminable; of *Ehr.* may be the above. *Mad. solida Forskål*, *Icon.* p. 131, is one of the solid species.

P. 110. P. arenacea Lamk.—Ehrenberg's a *Manopora* ?

Mad. punctata Esper pl. 70 is an incrusting *Porites*. Ehrenberg has also the species *P. punctata*, *P. armata*, and *P. stromatopora. Porites angulata* Lamk. appears to be a *Manopora*.

Page 111. *Goniopora pedunculata* Q. & G., 218, pl. 16, f. 9-11. *Astræa calycularis* ? *Lamk.* referred here by Q. & G.

Errina aspera Gray, *Zool. Soc. Trans.* 1835, p. 85.—*Mad. etc. Gualt.* *Ind. Test.* back of pl. 55. *Mil. aspera Linn.*; *Esper*, *Fortsetz.* i, pl. Mill. 18; *Lamk.* Here *Mil. tubulifera* and *pinnata* of *Lamk.* according to Gray.

Page 113. *Antipathes spiralis.*—*Palmiuncus anguinus Rumph.* pl. 78, f. C? *Ant. spir. Pallas*; *Ellis*, pl. 19, f. 1-6; *Esper*, ii, pl. 8. *Cirrhipates spiralis Bl.* *Man.* pl. 88, f. 2.

A. anguina D.—*P. anguinus Rumph.*, loc. cit. ?

A. larix *Esper*, ii, pl. 4.—*Lamx.*; *Lamk.*

P. 114. A. myriophylla Pallas.—*Myriophyllum Pettiv.* *Gazoph.* pl. 35, f. 12.—*Ant. myr. Ellis*, pl. 19, f. 11; *Esper*, *Fortsetz.* i, pl. 10; *Lamx.*; *Bl.* *Man.* pl. 87, f. 2.

A. subpinnata *Ellis*, pl. 19, f. 9, 10; *Lamk.*; *Lamx.*; *Bl.*

A. reticulata *Esper*, *Fortsetz.* i, pl. 11.

A. flabellum.—*Flabellum*, &c., *Rumph.* vi, pl. 79 ?—*A. flabellum Pallas*; *Lamk.*, but not *Esper's* pl. 1; *Lamx.*

A. ericoides.—*Pallas* ?; *Lamk.*; *Lamx.*; *A. myriophylla* and *A. ericoides Esper*, ii, pl. 6.

ADD: *A. radians.*—*A. foeniculacea Esper*, ii, pl. 7 is a decorticated *Gorgonia.*—*A. clathrata* *Esper*, ii, pl. 2, ib.—*A. ligulata* *Esper*, ii, pl. 5, ib.

A. mimosella *Lamk.*—*A. ulex Ellis*, pl. 19, f. 7. 8 ? *Lamk.*

A. pinnatifida *Lamx.* *Pol. flex.* pl. 14, f. 4.

A. cupressus *Pallas*; *Ellis*; *Lamk.*—*Cupressus marina Seba*, iii, pl. 106, f. 1.—*Rumph.* pl. 80, f. 2. *Esper*, ii, pl. 3.

- P. 115. *A. pennacea*.—Pallas, p. 269; Lamk.; Bosc; Lamx.
A. scoparia Lamk.—Esper, ii, pl. 14.
A. foeniculaceum Lamk.—*A. foeniculacea* Pallas. Rumph. pl. 80, f. 3. Lamk.; Bl.
A. Boscii Lamx., Pol. Flex., pl. 14, f. 5; Lamk.
A. alopecuroides.—Ellis; Lamx.
A. arborea D.—*A. compressa* Esper, Fortsetz. i, pl. 13. ?
- Page 117. *Renilla americana* Lamk.—*Pennatula reniformis* Ellis; Pallas. R. amer. Schw. Beobacht. pl. 2, f. 10, 11; Bl.
- Page 117. *Veretillum cynomorium* Cuv.—Penn. cyn. Pallas, Misc. Zool. pl. 13, f. 1-4; Ellis Phil. Trans. liii, pl. 21, f. 3-5; Lamk.; Bl. Faune Franc. Zooph. pl. 2, f. 1, 2, and Man. pl. 89, f. 2; Cuvier Reg. An. 1837, pl. 91, f. 1.
V. phalloides Cuv.—Penn. phall. Pallas Misc. Zool. pl. 13, f. 5-9. V. phall. Lamk.; Bl.; Ehr.
- Virgularia mirabilis* Lamk.—Penn. mirab. Müller, Zool. Dan. pl. 11, f. 1-3; Linn.; Ellis; &c. Virg. laxipinna Bl. Scirpearia mirab. Templeton.
- P. 117. *V. juncea* Pallas.—Penn. juncea Pallas; Esper, iii, 87 plate Penn. 4, f. 1-6, from the E. Indies; Cuv.; Bl.; Ehr.
Lamarck says his *V. juncea* was from European seas, and different from that of Pallas. Propose that the *V. juncea* of Esper and Pallas be received as the true *juncea*; that of Lamk. as a different species.
V. australis Bl.; not *australis* of Esper.
- Page 118. *Pennatula phosphorea* Linn.—Ellis; Esper, iii, pl. 3; Lamk. etc. Johnston's Brit. Zooph. f. 22. Penn. rubra Pallas.
P. rubra Linn.—Ellis Phil. Trans. liii, pl. 21, f. 1, 2. Penn. italica Ellis & Solander. Penn. rubra Esper, iii, pl. 2, and P. setacea? pl. 7; Ehr. P. granulosa Lamk.; Bl.
P. grisea Gmelin.—Penna, &c. Seba, iii, pl. 6, f. 8. Bohadsch Mar. 109, pl. 9, f. 1, 2. Ellis Phil. Trans. liii, pl. 21, f. 6-10; P. spinosa Ellis p. 62. Penn. grisea Linn.; Esper, iii, pl. 1, 1A, (the latter after contraction in alcohol); Lamk.; Bl.; Delle Chiaje Anim. iii, pl. 31, f. 1-3.
P. argentea.—Ellis, pl. 8, f. 1-3; Esper, iii, pl. 8; Lamk. &c. Penn. elongata Bl.
- Page 118. *Pavonaria quadrangularis* Bl. Man. pl. 90, f. 1.—Bohadsch Mar. pl. 9, f. 4. Penn. quadr. Pallas. Penn. antenna Linn; Ellis, Phil. Trans. liii, pl. 20, f. 4. Funiculina tetragona Lamk. Pav. anten. Cuv.
- Page 119. *Umbellularia greenlandica* Lamk.—Isis encrinus Linn. Ellis Coralines, pl. 37, f. a, b, c, and Phil. Trans. xlvi. 305, pl. 12, liii, 427. Umb. greenl. Esper, iii, pl. Vort. 2.; Bl. Umb. encrinus Cuv.; Ehr.
- Page 120. *Rhizoxenia thalassantha* Ehr.—Zoantha thalassanthos Lesson, Voy. de la Coquille (1825) Zooph. pl. 1, f. 2. Cornularia thalassanthoidea Bl.; Edw.
R. rosea D.—Eragora rosea Philippi, Wagner's Archiv. viii, 36.
- Page 120. *Anthelia glauca*, Savigny, L'Egypte Polypes, pl. 1, f. 7; Lamk.;—Lamx.; Bl.; Ehr.
- A. Desjardiana* D.—Xenia Desj. R. Templeton Zool. Trans. ii, 25, and pl.
Clavularia violacea Q. & G. pl. 21, f. 13-16 is an Anthelia; so also their *C. viridis*, pl. 20, f. 10-12, if the description is right.
- Page 121. *Xenia umbellata* Savigny, Eryp. Pol. pl. 1, f. 3; Lamk.; Ehr.; Schw. ? X. cærulea Lamx.; Bl.
X. florida D.—Actinantha florida Lesson, Coquille, pl. 1, f. 3. Cornularia floridea Bl. C. subviridis Q. & G. pl. 22, f. 5-7. ?
- Page 121. *Ammonothea virescens* Savigny Eryp. Pol. pl. 2, f. 6; Lamk.; Lamx.; Ehr. Nephthea Cordieri Audouin Explic. des pl. de Sav. Neptæa Savignyii Bl. Man. p. 523; pl. 88, f. 6, and Ammonothea virescens, p. 522.
Ammonothea? Q. & G.'s figs. pl. 22, f. 13-15, and 23, f. 8-14, all bad.

Page 122. *Nephtya Savignii* Ehr.—Savigny Egyp. Pol. pl. 2, f. 5. *Ammothea Chabrolii Audouin* ib. *Neptæa innominata Bl.*; N. Sav. of *Bl.* is the *Ammothea virescens* of Savigny. *Ehr.*'s *N. florida* is a *Spoggodia*.

P. 123. *Alcyonium digitatum* Linn.—*Ellis* Cor. pl. 32, f. a, A, A2; Phil. Trans. liii, pl. 20, f. 10-13, etc. *Lobularia digitata Lamk.* and others; *Johnston's Zooph.* pl. 26 and 26*. *Lob. grandiflora Chamisso* agrees with *Johnston's* figure of this species. *Alc. rubrum Müller* Zool. Dan. iii, pl. 82. *Anthelia rubra Bl.* Man. pl. 83, f. 7. *Symphodium rubrum Ehr.* *Alc. arenosum?* *Shaw's Misc.* viii, pl. 272.

A. cydonium Müller, Zool. Dan. iii, 1, pl. 71, f. 3, 4; *Lamk.* *Cydonium Mülleri Fleming; Bl.; Grant; Johnston.*

A. massa of Müller ib. pl. 71, f. 1, 2, *Massarium Bl.*, is possibly this species very badly figured; the 5 tentacles to the polyp must be wrong.

A. palmatum Pallas; Lamx; Edw. Ann. Sci. Nat. [2], iv, pl. 14, 15, and *Cuv.* Reg. An. 1837, pl. 93, 94.—*Alcyonium exos Gmelin; Esper*, iii, *Alc.* pl. 2. *Lobularia palmata Lamk.; Ehr; Bl.*

A. stellatum Edw. Ann. Sci. Nat. iv, [2], 1835, pl. 16.

A. spherophora Ehr.—Here *Q. & G.* pl. 23, f. 4, 5?

P. 124. *A. pauciflorum D.*—*Savigny* Egyp. pl. 1, f. 8. ?—*Lob. pauciflora Ehr.; Lamk.*

A. polydactylum and *A. brachycladum.* *Lobularia* of *Ehr.*

A. aurantiacum, A. viride, A. flabellum, A. flexile and *A. flavum, A. glaucum, Q. & G.* pl. 22, and pl. 23. *A. amicorum Q. & G.* pl. 22, may be *A. confertum D.*

A. pulmo Esper, iii, pl. 9, f. 1, 2, referred here by *Ehr.* who calls it *Halcyonium pulmo.* *A. incrustans Esper*, pl. 15, is related.

A. elegans D.—*Edw.* Ann. des. Sci., Nat, [2], iv, 323, pl. 12, 13.

Page 126. *Spoggodia celosia Lesson*, *Illust. de Zool.* pl. 21.—*Alcyonium floridum Esper*, iii, pl. 16. *Nephtya florida Ehr.* *Neptæa florida, Bl.*

Page 126. *Cornularia rugosa Lamk.; Lamx.; Bl.*—*Cavolini* Mem. de Pol. mar. pl. ix, f. 11, 12. *Tubularia cornucopiæ Gmelin; Esper*, iii, *Tubul.* pl. 27 (from *Cavolini*); *Lamx.* Pol. flex. pl. 7, f. 5. *Johnston's Brit. Zooph.* f. 27 (from *Cavolini*). *Corn. cornucopia Cuv.* Reg. An. 2nd edit. iii, 300; *Schw.*

See *Johnston* for British species.

Page 127. *Tubipora musica* (in part) Linn.—*Seba*, iii, pl. 110, f. 9: *Ehr.; Q. & G.* pl. 21, f. 9.

T. purpurea Lamk.—*T. musica Ellis* pl. 27; *Seba*, iii, pl. 110, f. 8.?

P. 128. *T. Chamissonis Ehr.; Lamk.*—*Chamisso & Éys.* Mém. Acad. Cur. Nat. Bonn, x, pl. 33, f. 3; *Q. & G.* voy. de l'Uranie, pl. 88.

T. rubeola Q. & G. pl. 21, f. 1-8.

Page 129. *Corallium nobile.*—*Marsilli* Phys. de la Mer, (1725) pl. 40, f. 180, represents the polyps. *Peyssonel*, Phil. Trans. 1753. *Seba*, iii, pl. 115, f. 1-7. *Donati* Storia Nat. 43, and Phil. Trans. Abridg. x, 154, pl. 4. *Isis nobilis Linn.; Esper*, i, pl. 7, 8.; *Edw.* Reg. An. 1837, *Zooph.* pl. 80. *Gorgonia nobilis Ellis*, pl. 13.—*Cor. rubrum Cavolini*, pl. 2; *Lamk.* and others. *C. nobile Ehr.*

Page 130. *Hyalonema Sieboldi*, Gray, Proc. Zool. Soc. 1835, pp. 63-65.

P. 130. *Briareum gorgonideum Bl.*—*Gorg. briareum Ellis* pl. 14, f. 1, 2; *Lamx.; Gmel.*

B. suberosum D.—*Ellis* Cor. pl. 26. f. P., Q., R. *G. suberosa Ellis* pl. 14, f. 1, 2; *Lamk.* *Plexaura* sub. *Lamx.; Bl.* *Alcyonium asbestinum Pallas* here according to *Ehr.* *Lobularia asbestina Ehr.*

B. arboreum D.—*Alc. arb. Pallas; Esper*, iii, pl. 1, 1A, 1B; *Lamk.; Lamx.* *Lob. arborea Ehr.*

Page 132. *Pterogorgia quercifolia D.*—*G. querc. Ehr.* *G. dilatata Esper*, Fortsetz. ii, pl. 51, 56?

- Page 132. *Pt. anceps* Ehr.—*Sloane*, Jam. pl. 22, f. 4. *Gorg. anceps* *Linn.*; *Pallas*; *Ellis*; *Lamk.*; *Lamx.*
- Pt. citrina* D.—*G. citrina* *Esper*, ii, pl. 38. *Ellis* Cor. pl. 27. *G. anceps* *Johnston's* Brit. Zooph. pl. 25, f. 3. Not *G. citrina* *Lamk.*
- Pt. acerosa* Ehr.—*Esper*, ii, 106, pl. 31.
- Pt. pinnata* D.—*G. pinnata* *Ellis*, pl. 14, f. 3; in part *Lamarck* and others. *G. americana* *Gmel.* *Pt. stricta* *Ehr.*?
- Pt. petechizans* D.—*G. pet.* *Pallas*; *Esper*, ii, pl. 13; *Lamk.*; *Lamx.* Exp. Meth. pl. 16; *Bl.*; *Ehr.* *Gorg. abietina* *Ellis*, pl. 16. *G. sanguinolenta* *Pallas*.?
- P. 133. *Pt. patula* D.—*G. patula* *Ellis*, pl. 15, f. 3, 4; *Lamx.*; *Lamk.*
- Pt. setosa* Ehr.—*G. setosa* *Linn.*; *Gmelin*; *Esper*, ii, pl. 17. *G. acerosa* *Pallas*.
- Pt. violacea* Ehr.—*G. violacea* *Pallas*; *Esper*, ii, pl. 12; *Lamk.* etc.
- Pt. rosea* D.—*G. rosea* *Lamk.* *Marsilli* pl. 19, f. 83. *G. ceratophyta* *Esper*, ii, 78, pl. 19 ?; *Ehr.* ?
- P. 134. *Pt. pectinata* D.—*Seba*, iii, pl. 105, f. 1a. *G. pectinata* *Gmel.*; *Pallas*; *Ellis*; *Lamk.*; *Lamx.*
- Pt. sarmentosa* D.—*G. sarm.* *Esper*, ii, pl. 21, Fortsetz. pl. 45; *Lamk.* and others.
- Pt. setacea* D.—*G. setacea* *Pallas*; *Lamx.*; *Lamk.*
- G. sanguinolenta* *Esper*, pl. 22, has branchlets over 1½ lines thick. *G. ceratophyta* *Ellis* pl. 12, has the branches twice as thick as the *ceratophyta* of *Pallas*.
- Page 135. *Gorgonia flabellum* *Linn.*—*Ellis*, Cor. pl. 26, f. A; *Lamk.*, etc.
- P. 136. *G. reticulum* *Lamk.*—*Pallas* *Elench.* Zooph. p. 167, not *Esper*, pl. 44. *G. umbella* *Esper*, Fortsetz. ii, pl. 53.
- G. ventilabrum* *Pallas*; *Lamk.* etc. *G. ventalina* *Esper*, ii, pl. 1 different ?
- G. verriculata* *Esper*, ii, pl. 35; *Lamk.*; *Lamx.*—*G. reticulata* *Esper*, pl. 35. *Plexaura reticulata* *Ehr.* appears to belong to the above division.
- G. umbraculum* *Ellis*, pl. 10; *Lamk.*; *Lamx.*; *Seba*, iii, pl. 107.
- G. cancellata* D.—*G. pseudo-antipathes* *Esper*, Fortsetz. ii, pl. 54, and *Antipathes flabellum*, ii, Antip. pl. 1.
- P. 137. *G. venusta* D.—*G. sasappo* *Esper*, ii, pl. 9A near here ?
- G. retellum* *Lamk.*—*G. furfuracea* *Esper*, Fortsetz. i, pl. 41 ?
- G. tuberculata* *Lamk.*—*Esper*, pl. 37 ? *Eunicea arbuscula* *Ehr.* near here ?
- G. flexuosa* *Lamk.*—*Esper*, Fortsetz. pl. 44. *Rumph.* pl. 79 ? *G. umbratica* *Esper*, has some resemblance to this. *Ehr.* regards *Esper's* fig. the *reticulum* of *Pallas*.
- G. verrucosa* *Linn.* and others.—*Esper*, ii, pl. 16. *Eunicea verrucosa* *Ehr.* Not *Seba*, pl. 106, f. 3 ? *G. verr.* *Johnston*, Brit. Zooph. *G. viminalis* *Sowerby* Brit. Misc. pl. 40, *Fleming* Brit. An., and *Borlase* Cornwall, pl. 24, f. 1, has more the habit of the *flexuosa*.
- G. apiculata* D. *Eunicea apic.* *Ehr.*
- P. 138. *G. nivea* D.—*Eunicea nivea* *Ehr.*
- G. flammea* *Ellis*, pl. 11; *Lamk.* etc. *G. palma* *Ehr.*
- G. virgulata* *Lamk.*—*Catesby's* Carolina pl. 13. *G. viminalis* *Esper*, ii, pl. 11;—*Lamx.* ? *Plexaura viminalis* *Ehr.* ?
- G. miniacea* *Esper*, ii, pl. 36, is *Plex. min.* *Ehr.*
- G. Bertolonii* *Lamx.*—*Marsilli*, pl. 16, f. 80. *G. viminalis* *Esper*, ii, pl. 11 A.—*G. graminea* var. *subtuberculosa* *Lamk.* *G. stricta* *Bertolonii* *Amœn. Ital.* *Eunicea Bertolonii* *Ehr.*
- G. sasappo* *Pallas*; *Esper*, pl. 9; *Lamk.*
- P. 139. *G. flavida* *Lamk.*; *Seba*, iii, pl. 107, f. 8.
- G. elongata* *Pallas*; *Esper*, Fortsetz. ii, pl. 55.
- G. juncea* *Pallas*.—*Seba*, iii, pl. 105, f. 1a. *Esper*, ii, pl. 52. *G. juncea* of *Ellis* was from the West Indies.
- G. trichostemma* D.—Allied to *G. nodulifera* *Lamk.* ?
- G. exserta* *Ellis*, pl. 15, f. 1, 2; *Lamk.*
- P. 140. *G. antipathes* *Linn.*—*Rumph.* pl. 77; *Seba*, iii, pl. 104, No. 2. *G. ant.* *Esper*, ii, pl. 24, 35; *Lamk.* *Plexaura antipathes* *Lamx.*

G. homomalla Esper, ii, pl. 29. Plex. hom. *Lamx.*; *Bl.*
 Var. *cinerea*—*Tournefort* Mém. de l'Acad. Roy. des Sci. 1700 fig. p. 34; *Seba*, iii, pl. 107, No. 4; *Plexaura antipathes Ehr.*; *Esper*, ii, pl. 23.

G. anguiculus D.—*Plex. flexuosa Lamx.* Exp. Meth., pl. 70, f. 1; *Eunicea furcata Ehr.*

G. olivacea Lamk.—*Plexaura oliv. Lamx.*

G. quincuncialis D.—*Eunicea quinc. Ehr.*

G. dichotoma Esper, ii, pl. 14.

G. vermiculata Lamk.—Two species probably included, one E. Indian, *Plexaura friabilis Lamx.* and *Gorg. porosa Esper*, ii, pl. 10. The other W. Indian.

G. crassa Ellis—his pl. 13, f. 3. ? *G. multicauda Lamk.* *Plexaura crassa Lamx.*—*Eunicea turgida Ehr.* *Gorg. heteropora Lamk.* ? according to *Edw.*

P. 141. *G. papillosa* Esper, Fortsetz. pl. 50; also ? ii, pl. 30. *Eunicea pap. Ehr.* ? *Eun. microthela Lamx.*

Eunicea suberosa Ehr. is W. Indian and is referred to Esper, pl. 30; it appears to be the *G. calyculata* of Ellis.

G. clavaria Edw.—*Ellis*, pl. 18, f. 2. *Eunicea clavaria Lamx.*; *Bl.*; *Ehr.*

G. pseud-antipathes Lamk.; *Eunicea Lamx.*; *Ehr.* *G. succinea Esper*, Fortsetz. i, pl. 46 ?

G. plantaginea.—*G. succinea Esper*, Fortsetz. i, pl. 46 ? *G. mollis Gmelin*, Syst. Nat. 3799 ? which is *Eunicea mollis Lamx.*

G. lima Lamk.—*Tournefort* Mém. de l'Acad. Roy. des Sci. 1700, p. 34, pl. 1. *G. muricata Esper*, ii, pl. 8. *Eunicea limiformis Lamx.*

G. mammosa Edw.—*Eunicea mammosa Lamx.* Pol. Flex. 438, and Exp. Meth. pl. 70, f. 3; *Bl.* pl. 87, f. 4. *G. muricata Esper* pl. 39 A. ?

The following are additional species, not arranged above, see Lamarck 2nd Ed.: *G. purpurea*, *Richardii Lamx.*, *penna Lamk.*, *moniliformis Lamk.*, *coccinea Lamx.*, *rhizomorpha Lamx.*, *alba Lamk.*

Page 142. *Muricea spicifera* Lamx. Exp. Meth. pl. 71, f. 1, 2; *Ehr.*—*G. muricata Ellis*; *Lamk.*; *Esper*, ii, pl. 39. *G. laxispica Lamk.* near here ?

M. elongata Lamx., Exp. pl. 71, f. 3, 4; *Bl.* *G. virgata Lamk.* *M. sulphurea Ehr.* near here ?

P. 143. *M. placomus* Ehr.—*Ellis*, pl. 18, f. 1. *G. placomus Linn.*; *Pallas*; *Esper*, ii, pl. 33, 34, 34A; *Lamk.*, but according to *Edw.* his *placomus* is the verrucosa, and his *granifera* is the *placomus*. *Mur. calyptrata Ehr.* is near the *placomus*; *Esper's* pl. 34A *Ehr.* refers to it.

M. cerea Ehr.—*G. cerea Esper*, Fortsetz. i, pl. 47.

M. verticillaris D.—*Ellis*, Cor. pl. 26, f. s, t, v. *G. vertic. Linn.*; *Pallas*; *Esper* Fortsetz. i, pl. 42; *Lamk.*; *Lamx.* *Primnoa vertic. Ehr.* *Primnoa flabellum Ehr.* is near this.

Page 143. *Primnoa lepadifera* Lamx. Pol. Flex., and Exp. Meth. pl. 13, f. 1, 2; *Bl.*; *Ehr.*—*G. lepadifera Linn.*; *Ellis*, pl. 13, f. 1, 2; *Esper*, ii, pl. 18; *Lamk.*

Bebruce mollis Philippi, Wiegman. Archiv. viii, 35.

Page 144. *Mopsea dichotoma* Lamx., Ehr.—*Pettiver*, Gazoph. pl. 3, f. 10. *Isis dich.* *Pallas*; *Linn.*; *Esper*, i, pl. 5; *Schw.*; *Lamk.*

M. encrinula Ehr.—*Isis encrinula Lamk.* *Isis dichot. Schw.* *Mop. verticillata Lamx.* Pol. flex., pl. 18, f. 2.

M. gracilis Ehr.—*Isis gracilis Lamx.*, Pol. flex., pl. 18, f. 1; *Lamk.*; *Bl.*

M. erythraea Ehr.—*Isis erythraea Lamk.*

Page 144. *Isis coralloides* Lamk., a *Mopsea*. ?

Isis hippuris Linn.; *Pallas*; *Ellis*, pl. 3, f. 1-5; *Esper*, i, pl. 1-3; *Lamx.*; *Lamk.*; *Schw.*; *Bl.* Man. pl. 86, f. 1; *Ehr.*

Isis ? elongata Esper, i, pl. 6; *Lamx.*; *Lamk.*; *Bl.*—*Seba*, iii, pl. 106, No. 4. *Mopsea Mediterranea Risso* Merid. Europe 332 referred here by Philippi.

Page 145. *Melitæa ochracea* Lamx.; Schw.; Lamk.; Bl., Man. pl. 86, f. 3, 3a, 3b, (not good); Ehr.—*Seba*, iii, pl. 104, No. 1. *Isis ochracea* Linn.; Pallas; Ellis; Esper, i, pl. 4, 4A and Fortsetz. *Isis* pl. 11 (good).

M. retifera Lamk.; Lamx.; Bl.; Ehr.—*Isis aurantia* Esper, Fortsetz. ii, *Isis*, pl. 9. Austral Seas, Peron and Lesueur.

Is. M. textiformis Lamk. a variety? Lamx. Exp. Meth. pl. 71, f. 5.

M. coccinea Lamk.; Bl.; Ehr.—*Isis coccinea*, Ellis, pl. 12, f. 5; Esper, i, *Isis* pl. 3 A, f. 5 (from Ellis), and Fortsetz. ii, *Isis*, pl. 10. M. Rissoi, Lamx.

Page 149. *Allopora flabelliformis* D.—*Seba*, iii, pl. 110, f. 10. *Oculina flabelliformis* Lamk.; Bl. Oc. gemmascens, Ehr.

A. rosea D.—Mad. rosea Pallas; Ellis; Esper, Fortsetz. i, pl. 36. *Oculina rosea* Lamk.; Bl., Man. pl. 58, f. 1, 1a; Ehr.

A. infundibulifera D.—*Oculina infund.* Lamk.; Bl.

A. gemmascens D.—Esper, Fortsetz. i, pl. 55.

A. norvegica D.—Pontoppidan Norg. Naturl. i, 288, No. 10, pl. 14, f. G., or Eng. Transl. London 1754, p. 159; Norske Vid. Selsk. iv, 56, No. 11, pl. 8, f. 1-4. Mad. virginea Müller Prod. Zool. Dan. Mad. norvegica Fabr. Oken's *Isis*, 1845, p. 52.

Page 149. *Myriozoum truncatum* Ehr.—*Marsilli* pl. 32, f. 154-156. *Miriozoum* Donati Hist. d. Mer Adriat., 55, pl. 7; *Myriozoum*, Phil. Trans. xlvii, 107, pl. 5, or vol. x, Abridg. pl. 5. *Millepora truncata* Linn.; Pallas; Cavolini, pl. 3, f. 9-11; Ellis, pl. 23, f. 1-8; Esper, i, pl. Millep. 4; Lamk.; Lamx.; Oken. *Myriapora truncata* Bl., Man. pl. 71, f. 2; Brit. Assoc. 1843, p. 151. *Delle Chiaje*, Anim. Nap. iii. 40, pl. 33, f. 16, 17.

M. gracilis D.—*Myriapora gracilis* Michelin, Guer. Mag. 1842, Zooph. pl. 4.

Page 151. *Distichopora violacea*, Lamk.; Schw.; Lamx.; Bl. Man. pl. 55, f. 2.—*Millepora violacea* Pallas; Gmel.; Ellis, pl. 26, f. 3, 4; Oken; Schw.

Laminopora contorta Michelin, Guerin Mag. de Zool. 1842, pl. 3, is near *Distichopora*.

Marginopora Q. & G., Voy. de l'Astrolabe. Bl. Man. 412, pl. 69, f. 6.

Page 152. *Polytrema miniacea* Bl.—*Millepora miniacea* Pallas; Esper, i; Oken. Mill. rubra Ellis; Lamk. Pol. corallina Risso, Merid. Europe, v, 340.

ADDENDA.

Euphyllia costata D.—Has the strongly ribbed exterior, non spinulose and nearly smooth of *Mussa fastigiata*, with the size of *E. aspera*. The costæ are stout, smooth, and become quite obsolete, an inch or less from the summit. Star in a transverse section closely multi-radiate, the exterior solid and 1 to 1½ lines thick. Intermediate between *Mussa* and *Euphyllia*.

Orbicella Orion D.—Polyps very small, lamellæ 24. Corallum light and cellular; in a transverse section stars circular, delicately annulate, a line broad, &c.—see p. 720. From Ceylon. Described from a worn specimen. Plate 14, fig. 14, a transverse section; a same enlarged; b vertical section natural size.

Plate 13, f. 15 represents a species near *Astræa porcata* of uncertain locality, but probably from the West Indies.

Fungia distorta, Michelin.—See Revue Zool. par. la Soc. Cuv. 1842, p. 316, Guerin Mag. Zool. 1843, pl. 5.

Dendrophyllia scabrosa Dana. Plate 30, fig. 2 natural size. Exterior surface finely striate and villosa-scabrous or spinulose, margin nearly entire, cell deep lamellæ very unequal, about twelve larger and three smaller intermediate, the latter denticulate.—From Singapore.

Ehrenberg has described also the following species of Madrepora—*Heteropora regalis*, *H. decurrens*, *H. squarrosa*, *H. seriata*, *H. Forskalii*, and *H. tylostoma*.

Favistella D.—Near *Favosites*, but having the cells 6 or 12-rayed. Found only fossil.

See also other additions, on page 154, and several of the following pages.

G L O S S A R Y .

Corallum.—The calcareous, horny, or other firm secretions of polyps, as the coral of the Madrepora, the horny and calcareous secretions of the Gorgonidæ, the membranous of the Sertulariæ.

Segregate.—Groups having the polyps disunited except at base.

Aggregate.—Groups in which the polyps are united laterally.

Acrogenous.—Growing upward indefinitely, increase taking place at summit.

Prolate.—The summits of the polyps widening by growth and budding.

Glomerate.—Massive.

Explanate.—Foliaceous, either oblique or horizontal.

Lamellate.—Erect foliaceous.

Arborescent.—Ramosé like a tree.

Flabellate.—Branching in a plane.

Unifacial.—Having the polyp-mouths on one surface only.

Bifacial.—Having polyp-mouths on both surfaces.

Caliculato-ramose.—Each calicle forming a distinct branch.

Patrio-ramose.—Branches lengthening by means of a terminal polyp.

Cumulato-ramose.—Branches lengthening by means of a terminal group of polyps.

Furcato-ramose.—Branching by spontaneous subdivision at summit.

Calicle (*Caliculus*, a little cup).—The radiated cell or cavity in the corallum corresponding each to a polyp.

Lamella.—One of the radiating plates of a calicle or cell.

Cellule.—The pores in the internal texture of a corallum.

Septum.—The wall between two cells, or that enclosing a cell.

Ovirime.—The small depression in the surface of the coralla of the Fungidæ, being the centre of radiation of the lamellæ, and corresponding to the centre of a polyp, a mouth being over each in the living Zoophyte.

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