

ILLUSTRATED TRILINGUAL GLOSSARY
OF
MORPHOLOGICAL AND ANATOMICAL TERMS
APPLIED TO OCTOCORALLIA

EDITED BY

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INTRODUCTION

From 1 to 15 September 1981, the Australian Institute of Marine Science (Cape Ferguson, Townsville, Queensland, Australia) organized the First International Workshop on Octocorals, in order to stimulate research and enhance exchange of information between workers in this relatively neglected group of marine animals.

One item on the agenda was a critical revision of the English, French and German terms used in the description of octocorals, an idea that had its genesis in Washington, D.C. in 1978 when Verseveldt met with Bayer and Muzik at the Smithsonian Institution on his way to Australia as a consultant with the Roche Research Institute of Marine Pharmacology. Such a revision was badly needed, because of the confusion resulting from the large number of terms used, sometimes in quite different ways, by different authors. As a result of the discussions in Washington, Bayer and Muzik compiled from the literature a list of terms applied to sclerites, and Verseveldt drew up a glossary of anatomical and general terms. With these as a starting point, Weinberg prepared a list of terms applied to the shapes and growth forms of colonies and all other members of the workshop at Townsville contributed through several days - and evenings - of critical and sometimes heated discussion. Although practical considerations precluded the inclusion of terminology in languages other than English, French and German - the major languages of the classical literature on octocorals - Dr. M. Mahendran of Sri Lanka, then a visitor at the Department of Chemistry of James Cook University in Townsville, and Dr. S. Shirai of the Institute for the Development of Pacific Natural Resources, Akeno, Japan, contributed materially to the clarity of terminology and definitions through their viewpoints in other languages.

We found that a large number of synonyms exist for some terms. Even though all of these are included, those that we consider obsolete or for some reason undesirable are so indicated. In a few cases it has been necessary to devise a new term. These are indicated by *.

This glossary is divided into four sections: I, general terms, including gross morphology and anatomy; II, growth forms and colonial branching patterns; III, sclerite forms and characters; and IV, index of German and French terms. In each of these sections, terms are arranged alphabetically so the glossary may be used in the same way as any dictionary. However, contrary to good lexicographical practice and indexing procedures, we have listed many terms under the qualifying word rather than the noun proper, e.g., 'pinnate tentacles' is indexed under the letter 'P' rather than 'T'.

Although we have tried to include all the special terms used in the description of octocorals, it is inevitable that omissions exist. For these we beg indulgence, in view of the fact that the glossary was assembled and composed by a diverse group of people in a remote location. The editors, working on two continents, have subsequently attempted to remove inconsistencies and clear up ambiguities, but in the end must accept responsibility for the final version.

Although all members of the AIMS Octocoral Workshop participated in the compilation of the glossary, special mention must be made of the major contributions by Dr. Steven Weinberg, to whom the editors and the members of the Workshop express their gratitude.

The scanning electron micrographs illustrating the various sclerite forms were made by Walter R. Brown, Chief of the S.E.M. Laboratory, Smithsonian Institution, using Cambridge Stereoscan models Mark II, S4-10 and 250 Mark II, and Coates & Welter Cwikscan model 106. Photographic laboratory work to prepare the micrographs for publication was carried out by Michael R. Carpenter. Typescript of the text was produced on computerized equipment by Elizabeth Harrison and Mary Parrish of the Department of Invertebrate Zoology, Smithsonian Institution. To all of these

the editors take pleasure in expressing their best thanks. Two of the drawings reproduced here are included with the permission of the editors, *Studies in Tropical Oceanography*. The remainder are taken from the classic literature in the public domain and are gratefully acknowledged.

Needless to say, this glossary would never have been produced had the AIMS Octocoral Workshop not taken place. We all join in expressing our appreciation to Dr. John S. Bunt, Director of the Australian Institute of Marine Science and to the Australian Department of Science and Technology for making possible this unprecedented event.

The names of the editors of this glossary are given in alphabetical order. Contributing authors are: P.N. Alderslade, F.M. Bayer, John Coll, Zena Dinesen, Manfred Grasshoff, Stéphane LaBarre, Katherine Muzik, J. Verseveldt, and Steven Weinberg.

I. General terms

1. ACCESSORY SCLERITES: in most *Dendronephthya* species, small sclerites not *en chevron* located between the anthocodial sclerites and those belonging to the supporting bundle. Fig. 1.
G: Nebensklerite; F: sclérites accessoires.
2. ANTHOCODIA: the distal part of a polyp, bearing the mouth and the tentacles; in many cases it can be retracted within the calyx, the stem, the branch (Alcyonacea, Stolonifera) or within the cortex (Gorgonacea). The term *anthocodia* was introduced by Bourne (1900: 522), who derived it from the Greek *anthos* = flower, and *codia* = head (of a poppy). Although the correct plural in Latinized form is *anthocodiae*, some authors have used *anthocodia* as a plural under the impression that the singular form is *anthocodium*. However, that spelling would require derivation from the neuter *codium*, a diminutive term for fleece or sheepskin. Bourne's terms *anthodeté*, *apodeté* and *syndeté*, introduced at the same time, did not achieve general acceptance.
G: Anthocodie, pl. Anthocodien; F: anthocodie, pl. anthocodies.
3. ANTHOCODIAL GRADE and FORMULA: for *Dendronephthya* six grades were introduced in accordance with the number of anthocodial sclerites in each point, and a formula, which shows characteristics of the point sclerites, presence or absence of a crown, the quality of the supporting bundle, and the number of intermediates; sometimes the formula is also used in *Stereonephthya* and *Siphonogorgia*. Figs. 2-7.
G: Anthocodientyp, Anthocodienformel; F: formule anthocodiale.
4. ANTHODETÉ: unused term denoting alcyonacean colonies, proposed by Bourne, 1900.
5. ANTHOSTELE: the proximal, rigid part of some polyps, often stiffened by sclerites, and into which the anthocodia may be withdrawn; equivalent to calyx. Fig. 8.
G: Anthostele, Polypenkelch; F: anthostèle.
6. APODETÉ: unused term for the totality of anthocodiae of an alcyonacean colony; proposed by Bourne, 1900.
7. ASULCAL SIDE [dorsal side]: the side of a polyp opposite the siphonoglyph. Fig. 9.
G: asulcale Seite; F: côté asulcal.
8. AUTOZOOID: polyp with eight well-developed tentacles and mesenteries; the only kind of polyp in monomorphic species; the larger polyp in dimorphic species, often just termed polyp. Figs. 8; 31; 40; 44.
G: Autozooïd; F: autozoïde.
9. AXIAL POLYP: the tallest polyp of a group of polyps, which produces secondary (daughter) polyps by lateral budding from its body wall. Analogous to the axial corallites of the scleractinian genus *Acropora*. In Telestacea, axial polyps may arise directly from the stolons. Fig. 11.
Examples: *Telesto*, *Carijoa*, Pennatulacea.
G: Axialpolyp; F: polype axial.
10. AXIAL SHEATH: that part of the colonial coenenchyme immediately surrounding the axis in Gorgonacea, usually delimited by the longitudinal stem canals and characterized by sclerites commonly different in form from those of the overlying coenenchyme. Fig. 8. Example: most Gorgonacea.
G: Achsenscheide; F: gaine axiale*.

11. **AXIS:** the inner supporting structure of Gorgonacea and Pennatulacea; it may be calcareous or horny or both; the calcareous matter may be spicular or non-spicular. Figs. 8, 10.
G: Achse; F: axe.
12. **AXIS CORTEX:** layer around the central chord, deposited by an axis epithelium. Figs. 8, 10.
G: Achsenrinde; F: cortex axial.
13. **AXIS EPITHELIUM:** layer of cells derived from ectoderm that produces the axis of Holaxonia. Fig. 10.
G: Achsenepithel; F: épithélium axial.
14. **BACK OF A COLONY:** the side of a colony that has few or no polyps, or away from which most of the anthocodiae are directed; usually applies to planar colonies.
G: Rückseite, Hinterseite; F: derrière.
15. **BARK:** obsolete historical term indicating all the non-axial components of Gorgonacea.
G: [Rinde]; F: [écorce].
16. **BODY-WALL:** wall of polyp body enclosing the gastric cavity.
G: Körperwand; F: paroi polypaire.
17. **BOUNDARY CANALS:** canals separating the cortex from the medulla (Scleraxonia). Fig. 13.
G: Kranz von Längskanälen; F: canaux de séparation.
18. **BULB:** a thickening in the upper part of the stalk in many pennatulaceans; the 'upper swelling' or 'sphincter swelling' in Hickson's terminology. Fig. 17.
G: Bulbus; F: bulbe.
19. **BUNDLE (OF POLYPS):** in *Dendronephthya*, a group of polyps arising from the tip of a twig. Fig. 23.
G: Polypenbündel; F: faisceau de polypes.
20. **CALCAREOUS PLATE:** radially disposed group of large needles supporting the polyp-leaves in some pennatulaceans (e.g. *Stylatula*); analogous to the rays in other genera (e.g. *Pteroeides*). Fig. 18.
G: Spiculaplatte, Kalkplatte; F: plaque en spicules.
21. **CALYX (pl. CALYCES) [obsolete VERRUCA (VERRUCAE)]:** cylindrical or wartlike projecting anthostele. Fig. 8.
G: Kelch, Polypenkelch; F: calice.
22. **CAPITULUM:** more or less disk-shaped or hemispherical, polypiferous part of an alcyonacean colony. The corresponding part of pennatulacean colonies, whether elongate, clavate or discoidal, is termed 'rachis' (See 86). Figs. 19, 20, 44.
G: Kopf, Kapitulum; F: capitule.
23. **CATKIN (OF POLYPS):** a number of polyps on a terminal branchlet forming an oblong body resembling in shape the catkins of willow. Figs. 21, 22.
G: Kätzchen, Läppchen; F: chaton.
24. **CELL, POLYP-CELL:** obsolete term roughly equivalent to CALYX, but sometimes the whole polyp, chiefly in English language works of the 18th and 19th Centuries.
G: Zelle, Zellchen [obsolete]; F: cellule [obsolete].
25. **CELL STRINGS, CELL VESSELS:** strands of cells in the mesogloea, sometimes occurring in empty spaces called cell vessels (Zellkanäle). In *Plexaura* they may be composed of unusually crowded cells, but in other genera consist only of narrow strands. Figs. 9, 10.
G: Zellstränge; F: chapelets de cellules.
26. **CENTRAL CHORD or CORE:** the central part of the axis in Holaxonia, made up of horny

- material alone or of horny material more or less heavily permeated with calcareous substance; in some families the central chord is hollow and cross-chambered. Figs. 8, 10.
G: Zentralstrang, Achsenstrang; F: cordon central.
27. CENTRAL WART: in many *Sinularia* species, the heads of the clubs of the surface layer consist of a terminal central wart and a subterminal whorl of lateral warts. Fig. 73.
G: Zentralwarze; F: verrue centrale.
28. CLAVATE BRANCH: terminally enlarged branch. Fig. 57.
G: verdicktes Zweigende; F: branche claviforme.
29. CNIDE, see NEMATOCYST.
30. COELENTERON, COELENTERIC CAVITY, see GASTRIC CAVITY.
31. COENENCHYME: the colonial tissue between the polyps, consisting of mesogloea usually containing sclerites and penetrated by the network of solenia and the larger gastrodermal canals. Figs. 8, 10.
G: Coenenchym; F: coenenchyme.
32. COLLARET, see CROWN.
33. COLONY: a group of interconnected, genetically identical, elementary functional units, the polyps.
G: Kolonie, Stock [obsolete]; F: colonie.
34. CONTRACTILE POLYP: a polyp that can diminish in size without introversion. The tentacles alone may be folded inward over the mouth, but there is no neck zone or introvert that permits withdrawal of the entire anthocodia into the anthostele or general coenenchyme. Compare RETRACTILE POLYP (88). Figs. 24-26.
G: kontraktiler Polyp; F: polype contractile.
35. CORE, see CENTRAL CHORD.
36. CORTEX: (1) the coenenchymal layer surrounding the medulla and containing the polyps of Gorgonacea, esp. Scleraxonia. Fig. 13. (2) The outer horny layer of the holaxonian axis as opposed to its medulla or central chord. Figs. 8, 10. The term *cortex* was for some years incorrectly used for the outermost layer of coenenchyme in Alcyonacea; see Verseveldt, 1973: 69.
G: Cortex, [Rinde]; F: écorce.
37. CROWN or COLLARET: the ring of transversely placed, usually bow-shaped sclerites encircling the anthocodia below the tentacles; see POINTS (77) and OPERCULUM (69). In German, the terms *Kronenring* (Kranz transversaler Spindeln) and *Kronenspitzen* (konvergierende Doppelreihen) would indicate the parts of the Krone. Figs. 8, 36, 75, 76.
G: Krone, Kranz transversaler Spindeln; F: couronne, collier.
38. CROWN AND POINTS: the combined arrangement of the sclerites of the crown and the points, see CROWN and see POINTS. The term *Krone* in German publications referred to the crown and points together, structurally identical to the *Deckel* (= operculum) of Paramuriceidae. Figs. 8, 36, 75, 76.
G: Krone; F: couronne et pointes.
39. DIMORPHISM: the presence of two kinds of polyps: autozooids and siphonozooids.
G: Dimorphismus; F: dimorphisme.
40. DORSAL SIDE [obsolete in reference to polyps; see ASULCAL SIDE]: in pennatulacean colonies, that side of the colony derived from the asulcal side of the oozoid; in sea pens having well-developed polyp leaves, this is the side adjacent to the oldest (often largest) autozooids.

41. DORSAL TRACK: the more or less naked strip extending along the rachis between the oldest polyps of the polyp-leaves in many pennatulaceans; equivalent to Bourne's term 'prorachis' and 'Ventralseite' in Kölliker's terminology. It corresponds to the asulcal side of the primary zooid. Figs. 17, 28.
G: Dorsalfeld, dorsales nacktes Kielfeld; F: bande dorsale.
42. END BULB: terminal (basal) swelling of the stalk present in some pennatulaceans. Fig. 16.
G: Endblase; F: bulbe terminal.
43. FERTILE: obsolete term denoting the parts of the colony with polyps. Biologically, the term applies to those polyps having functional gonads.
G: fertil; F: fertile.
44. FILAMENTS, see MESENTERIAL FILAMENTS.
45. FISTULOUS BRANCH: terminal branch with inrolled edges that may be fused partially or completely (*Iciligorgia*, *Solenocaulon*, *Suberia*). Fig. 30.
G: fistulöser Zweig*; F: branche fistuleuse*.
46. FOUNDER POLYP (PRIMARY POLYP): the first polyp of a colony formed by metamorphosis of the planula larva; may become the axial polyp. Fig. 31.
G: Gründerpolyp, Primärpolyp; F: polype fondateur, polype primaire.
47. FRONT OF A COLONY: when the polyps grow more densely on one side of a colony, this side is described as the front, the other side is the back.
G: Vorderseite; F: devant.
48. GASTRIC CAVITY, GASTROVASCULAR CAVITY, COELENTERON: interior space of a polyp. Figs. 8, 10.
G: Gastralraum; F: cavité gastrique.
49. GASTRODERMAL CANAL: wide canal connected with the narrower solenia and originating from them; in some cases, the gradually narrowing basal part of the gastric cavity of the polyps. Figs. 8, 10.
G: Gastrodermalkanal [obsolete: Ernährungskanal]; F: canal gastrodermique.
50. HOLDFAST: the portion of an octocoral colony attaching it to or in the substrate. Figs. 34, 41, 57, 58.
G: Basis; F: pied.
51. INTERMEDIATES, INTERMEDIATE SCLERITES: in some *Dendronephthya* species, tiny sclerites situated between each pair of points; in the anthocodial formula abbreviated as 'M'. 1/2M means one intermediate, 1M one pair of intermediates, etc. Figs. 1, 4.
G: intermediäre Sklerite; F: sclerites intermédiaires.
52. INTERNODE: the hard, calcareous segment of an axis of some Gorgonacea (Melithaeidae, Isididae). Fig. 32.
G: Internodium; F: internoeud.
53. INTROVERT, see NECK ZONE.
54. LAPPET (OF POLYPS): equivalent to CATKIN (23).
55. LOCULUS: calcified area or fibre-filled space in holaxonian axis, especially in Plexauridae, that in cross section may appear crescentic or lenticular. Fig. 8, 10.
G: Loculus; F: locule.
56. LONGITUDINAL CANALS: (1) In pennatulaceans, the four main canals formed by the gastric cavity of the primary polyp, one dorsal, two lateral, and one ventral, extending the

length of the colony. Lateral canals are not developed in some species.

G: Hauptkanäle, Seitenkanäle; F: canaux principaux, canaux latéraux.

(2) In other octocorals, the larger canals extending in a longitudinal direction.

G: Längskanäle; F: canaux longitudinaux.

57. **MEDULLA**: the inner supporting structure of a scleraxonian; see also **AXIS** (11). Fig. 13.
G: Medulla, Markschicht; the central column of the medulla has sometimes been designated in German as 'Markstrang'; F: moelle.
Rarely the central chord of a holaxonian axis; see **CENTRAL CHORD** (26). Figs. 8, 10.
G: Zentralstrang; F: zone centrale compartimentée.
58. **MESENTERIAL FILAMENTS**: the thickened convoluted edges of the mesenteries; the filaments of the two mesenteries opposite the siphonoglyph are very long and heavily flagellated, whereas the remaining six are shorter and glandular. Fig. 8.
G: Mesenterialfilamente; F: filaments mésentériaux.
59. **MESENTERIES** [obsolete in Octocorallia: **SEPTA**]: thin, radial, non-calcareous partitions joining the pharynx to the body wall and dividing the gastrovascular cavity of the polyp. Figs. 8, 9.
G: Mesenterien; F: mésentères.
60. **MESOGLOEA**: the jelly-like substance separating the two epithelial layers and containing more or less numerous cells, including scleroblasts and cell strings. In *Plexaura*, the latter may be composed of unusually crowded cells but in other genera consist only of narrow strands.
G: Mesogloea; F: mésoglée.
61. **MESOOZOID**: a polyp intermediate between an autozoid and a siphonozoid.
G: Mesozoid; F: mésozoïde.
62. **METARACHIS** [unused]: the narrow strip along the rachis between the youngest autozooids of the polyp-leaves in many pennatulaceans; equivalent to the 'ventral track' in Hickson's terminology and the dorsal side in Kölliker's usage. It corresponds to the sulcal side of the primary zoid.
63. **MONOMORPHISM**: the presence of only one kind of polyp, the autozoid.
G: Monomorphismus; F: monomorphisme.
64. **NECK ZONE** or **INTROVERT**: the soft, thin-walled basal part of an anthocodia, poor in sclerites, and allowing the introversion of the anthocodia into the anthostele (calyx). Fig. 8.
G: Halszone; F: cou.
65. **NEMATOCYST** or **CNIDA** [obsolete: **THREAD-CELL**]: the stinging capsule characteristic of coelenterates.
G: Nesselzelle; F: nématocyste, cnida.
66. **NEMATOCYTE** or **CNIDOBLAST**: the cell producing a nematocyst.
G: Cnidoblast; F: nématocyte, cnidoblaste.
67. **NODE**: the flexible horny joint of the calcified axis in Melithaeidae and Isididae; less commonly, the point of origin of a branch of an unjointed gorgonian stem. Fig. 32.
G: Nodium; F: noeud.
68. **OOZOID**: the persistent and modified primary polyp of Pennatulacea.
G: Oozoid; F: oözoïde.
69. **OPERCULUM**: (1) eight triangular scales covering the withdrawn tentacles in Primnoidae;

- (2) an inappropriate term for crown and points. Fig. 79.
G: Deckel; F: opercule.
70. **PARARACHIS** (pl. **PARARACHIDES**) [unused]: the two sides of the rachis along which the polyp-leaves are situated in many pennatulaceans.
G: Pararachis; F: pararachis.
71. **PEDICEL**: a stalk especially stiffened externally by large sclerites, in Paralcioniidae. Fig. 33.
G: Pedicellus; F: pédicule.
72. **PEDUNCLE**: the lower part of the pennatulacean colony, lacking polyps or polyp-leaves; = stalk.
G: Stiel; F: pédoncule.
73. **PERISTOME** [obsolete in Octocorallia: **ORAL DISC**]: the area of a polyp immediately surrounding the mouth, formed by the inner basal parts of the tentacles. Fig. 8.
G: Mundregion [obsolete: Mundscheibe]; F: péristome [obsolete: disque buccal].
74. **PHARYNX** [obsolete in Coelenterata: **STOMODAEUM**]: the tubular passageway between the mouth and the gastric cavity. Figs. 8, 9.
G: Pharynx, Schlundrohr; F: pharynx.
75. **PINNATE TENTACLES**: tentacles bearing pinnules, characteristic of the Octocorallia. Figs. 8, 31, 40.
G: gefiederte Tentakel; F: tentacules pinnés.
76. **PINNULES**: the lateral processes of a tentacle. Fig. 8.
G: Pinnulae; F: pinnules.
77. **POINTS**: the eight rows of chevroned sclerites in the distal part of an anthocodia, superposing the crown if present. See also **CROWN AND POINTS** (38). Figs. 8, 36, 75, 76, 81.
G: konvergierende Doppelreihen, Kronenspitzen; F: doubles rangées, chevrons.
78. **POLYMORPHISM**: having several kinds of polyps.
G: Polymorphismus; F: polymorphisme.
79. **POLYP** [obsolete: **ZOOID**]: any individual of the octocorallian colony regardless of anatomical structure, but usually equivalent to **AUTOZOOID** (8); see also **FOUNDER POLYP** (46), **AXIAL POLYP** (9), **SIPHONOZOOID** (95), **MESOZOOID** (61), **OOZOOID** (68).
G: Polyp; F: polype.
80. **POLYPARIUM, POLYPARY**: the part of a colony bearing anthocodiae.
G: Polyparium, Polypar; F: polypaire.
81. **POLYPIDOM**: the whole octocoral colony [obsolete].
G: no equivalent; F: polypier.
82. **POLYP LEAVES** [obsolete: **WINGS**]: the flattened expansions bearing the secondary polyps in some Pennatulacea. Figs. 17, 18, 27-29.
G: Polypenträger, polypentragende Wülste, Blätter; F: feuilles.
83. **PRIMARY POLYP**, see **FOUNDER POLYP**.
G: Primärpolyp; F: polype primaire.
84. **PRORACHIS** [unused]: the more or less naked strip extending between the oldest polyps of the polyp leaves along the rachis in many pennatulaceans; equivalent to 'dorsal track' in Hickson's terminology and 'Ventralseite' in Kölliker's system. It corresponds to the asulcal side of the primary zooid.
85. **PSEUDOSEPTA**: spinelike or toothlike skeletal projections in calices of Helioporacea, bearing no constant relationship with the mesenteries of the polyps.
G: Pseudosepta; F: pseudoseptes.

86. RACHIS (RHACHIS): (1) the main part of a tentacle bearing the pinnules; Fig. 8; (2) the polypiferous part of Pennatulacea. Figs. 16, 17, 27, 28.
G: Rhachis, Rachis; F: rachis.
87. RAYS: radiating bundles of large sclerites on the underside of the polyp-leaves in some pennatulaceans. Figs. 29, 35.
G: Hauptstrahlen; F: rayons principaux.
88. RETRACTILE POLYP: a polyp in which the anthocodia can invert into the anthostele or into the coenenchyme. Compare CONTRACTILE POLYP (34). Fig. 8.
G: retraktiler Polyp; F: polype rétractile.
89. RHIZOIDS: the rootlike processes (coenenchymal in Alcyonacea, axial in Gorgonacea) extending from the base of the colony. Figs. 34, 44.
G: Rhizoiden, wurzelförmige Fortsätze; F: rhizoïdes.
90. RIND: an obsolete historical term indicating all the non-axial components of gorgonacean colonies; also was used as equivalent of cortex. Because of this confusion, the term should not be used.
G: [Rinde]; F: [écorce].
91. SCLERITE: a calcareous element, irrespective of form, in the mesogloea; also occurring in the axis of Scleraxonia. See also ACCESSORY SCLERITES (1), INTERMEDIATES (51). Figs. 86-218.
G: Sklerit; F: sclérite.
92. SCLEROBLAST: a cell in the mesogloea that produces a sclerite.
G: Skleroblast; F: scléroblaste.
93. SEPTA, obsolete: see MESENTERIES (59). The term *septa* should be restricted to the calcareous partitions of scleractinian calices.
94. SIPHONOGLYPH: the strongly ciliated groove extending down one side of the pharynx; = sulcus. Fig. 9.
G: Siphonoglyphe, Flimmerrinne, [Wimpergrube], Wimperrinne; F: siphonoglyphe.
95. SIPHONOOZOID: a polyp with strongly developed siphonoglyph and reduced tentacles or none, commonly with reduced mesenterial filaments; usually much smaller than autozooids.
G: Siphonozoid, often simply Zooid; F: siphonozoïde.
96. SIPHONOOZOID PLATE: a band, or tract, of closely crowded siphonozooids on the underside of the polyp-leaves in some pennatulaceans. Fig. 35.
G: Zooidplatte; F: plaque en siphonozoïdes.
97. SOLENIUM: a small canal lined with gastrodermis, penetrating the coenenchyme, forming a network, and interconnecting the gastric cavities of polyps and larger canals. See GASTRODERMAL CANAL (49). Figs. 8, 10.
G: Solenium; F: solénium.
98. SPICULE: see Section III.
99. STALK: (1) in Alcyonacea and Pennatulacea, the barren basal part of the colony, in the latter embedded in the substrate; Figs. 16, 17, 27, 28. (2) In Nephtheidae, the narrow proximal part of a non-retractile polyp; Fig. 26.
G: Stiel; F: pédoncule.
100. STEM: (1) In Gorgonacea, the basal part of the colony from which branches may or may not

arise (= main stem); Figs. 51, 54. (2) In Alcyonacea, the polypiferous part of the colony usually giving rise to branches; see also STALK (99); Fig. 47.

G: Hauptstamm, Stamm; F: tronc.

101. STERILE: not producing sexual cells, has often been used erroneously for parts of the colony without anthocodiae.
102. STIPULES: clusters of siphonozooids forming small accessory lobes at the dorsal end of the polyp-leaves in some pennatulaceans. Fig. 29.
G: Stielwülste, Nebenblätter; F: no equivalent.
103. STOLON: a rounded or flattened elongate or membranous coenenchymal expansion growing over or into the substrate and peripherally producing new polyps. Fig. 40.
G: Stolo; F: stolon.
104. SULCAL SIDE [obsolete in reference to polyps: VENTRAL SIDE]: the side of a polyp nearest the siphonoglyph.
G: sulcale Seite; F: côté sulcal.
105. SULCUS, see SIPHONOGLYPH.
106. SUPPLEMENTARY SCLERITES: anthocodial sclerites occurring below the crown and arranged en chevron (some *Dendronephthya* species). Fig. 1.
G: zusätzliche Sklerite; F: sclérites supplémentaires.
107. SUPPORTING BUNDLE: often abbreviated as S.B.; sheath of sclerites below the anthocodiae of nephtheid polyps; sometimes it consists of one large spicule. Figs. 2-7, 23, 26.
G: Stützbündel; F: faisceau de soutien.
108. SYNDETE: unused term denoting that part of the alcyonacean colony consisting of the fused anthostelar parts of the polyps; see comments at ANTHOCODIA (2).
109. TEETH: more or less pointed lobes of the calicular margin, usually stiffened by sclerites, typically eight in number when present but only two in a few gorgonaceans and pennatulaceans. Figs. 36-38.
G: Kelchzähne, Zähne; F: dents, dents caliculaires.
110. TERMINAL POLYP: the distal end of the primary polyp in many pennatulaceans.
G: Terminalpolyp; F: polype terminal.
111. THREAD CELL [obsolete]: see NEMATOCYST.
112. TRIMORPHISM: in Pennatulacea and one genus of Alcyonacea (*Heteropolypus* Tixier-Durivault), the presence of three kinds of polyps, autozooids, siphonozooids and mesozooids in addition to the primary polyp.
G: Trimorphismus; F: trimorphisme.
113. TRUNK: used for stalk or stem. See STALK (99) and STEM (100).
114. VENTRAL SIDE, obsolete in reference to polyps; see SULCAL SIDE. For usage in Pennatulacea, see 40.
115. VENTRAL TRACK: the narrow naked strip extending along the rachis between the youngest polyps of the polyp-leaves in some pennatulaceans; equivalent to 'metarachis' in Bourne's terminology and Kölliker's 'Dorsalseite'. Fig. 27.
G: ventrales nacktes Kielfeld; F: bande ventrale.
116. VERRUCA: see CALYX (21).
117. WINGS, obsolete: see POLYP LEAVES.
118. ZOOID, obsolete: see POLYP, SIPHONOOZOID.
119. ZOOXANTHELLAE: unicellular symbiotic algae.
G: Zooxanthellen; F: zooxanthelles.

II. Colony Shapes and Branching Patterns

In the following section we give some genera as examples. This does not mean that the entire genus is representative, but that representative examples can be found in the genera given.

120. **ARBORESCENT**: tree-like colonies having a definite stalk (Alcyonacea) or stem (Gorgonacea). Figs. 48, 51.
Examples: *Nephthea*, *Dendronephthya*, *Lemnalia*, *Verrucella*, *Ellisella*.
G: baumförmig; F: arborescent.
121. **BOTTLEBRUSH**: pinnately branched colonies in which numerous, crowded, short branchlets arise all around the main stem. Figs. 55, 56.
Examples: *Thouarella*, *Xenogorgia*.
G: flaschenbürstenförmig; F: brosse à bouteille*.
122. **BRANCHED**: erect colonies having branches; the branches may consist of either primary and subordinate polyps (*Telesto*, *Coelogorgia*, *Pseudocladochonus*) or axial structures (Gorgonacea).
Examples: most gorgonians, many alcyonaceans.
G: verzweigt; F: ramifié.
- A. **MONOPODIAL BRANCHING**: the main axis of the colony maintains a single line of growth but gives rise to lateral branches, few or many. Figs. 11, 15.
Examples: *Telesto*, *Carijoa*, *Plumarella*, *Metallogorgia*.
- B. **SYMPODIAL BRANCHING**: the main axis of the colony is formed by the proximal parts of a series of shorter lateral branches and has a zigzag or spiral form. Fig. 14.
Examples: *Pseudocladochonus*, *Chrysogorgia*.
- C. **IRREGULAR BRANCHING**: colonies in which the pattern of branching seems random although structurally monopodial or sympodial.
Examples: *Eunicella*, *Muricea*.
123. **BUSHY**: colonies with abundant branches arising immediately above the holdfast and not forming an obvious main stem. Fig. 57.
Examples: *Stereonephthya*, *Plexaurella*, *Rumphella*.
G: buschig; F: buissonnant, en buisson.
124. **CAPITATE**: unbranched colonies with a broad distal part on a distinctly narrower stalk. Figs. 19, 20, 44.
Examples: *Xenia*, *Nidalia*, *Anthomastus*, *Heteroxenia*, *Metalcyonium*.
G: pilzförmig; F: capité.
125. **DICHOTOMOUSLY BRANCHING**: branched colonies in which the branching pattern is a repeated bifurcation. Fig. 52.
Examples: *Melithaea*, *Plexaurella*.
G: dichotom verzweigt; F: ramifié de façon dichotome.
126. **DIGITATE**: colonies consisting of several slender, fingerlike lobes. Figs. 45, 46.
Examples: *Alcyonium*, *Sinularia*, *Lobophytum*, *Nephthyigorgia*.
G: handförmig, fingerig; F: digité.
127. **DIGITIFORM**: unbranched, fingerlike colonies. Fig. 41.
Examples: *Bellonella*, *Minabea*.
G: fingerförmig; F: digitiforme.

128. DIVARICATE COLONIAL FORM: in *Dendronephthya*, arborescent colonies that are profusely branched, with long, slender branches bearing distinctly separated and diverging bundles of polyps. Characteristic of the 'Divaricatae' group of species. Fig. 49.
Example: *Dendronephthya cirsium* Kükenthal.
No equivalent in German and French.
129. ENCRUSTING: colonies consisting of a thick fleshy layer covering the substrate. Fig. 43.
Examples: *Sinularia*, *Lobophytum*, *Erythropodium*.
G: inkrustierend; F: encroûtant.
Note: strictly speaking, 136 and 143 are both encrusting, as opposed to erect forms, but we have chosen to use 'encrusting' in a more restricted sense.
130. FILIFORM: thin, thread-like unbranched colonies.
Examples: *Leptogorgia*, *Eunicella filiformis*.
G: fadenförmig; F: filiforme.
131. FLAGELLIFORM [WHIP-LIKE]: stout, unbranched, whip-like colonies.
Examples: *Ellisella*, *Junceella*, *Lepidisis*.
G: peitschenförmig; F: flagelliforme.
132. GLOMERATE COLONIAL FORM: in *Dendronephthya*, arborescent colonies that are sparsely branched, with numerous bundles of polyps crowded to form roundish bunches. Characteristic of the 'Glomeratae' group of species. Fig. 48.
Example: *Dendronephthya gigantea* (Verrill).
No equivalent in German and French.
133. LATERAL BRANCHING: gorgonian colonies, planar or nearly so, in which the branching originates irregularly, neither pinnate nor dichotomous. Figs. 58, 59.
Examples: *Leptogorgia*, *Plexaura*.
G: seitlich verzweigt; F: ramifié latéralement.
134. LOBATE: colonies consisting of several stout lobes. Fig. 42.
Examples: *Alcyonium*, *Asterospicularia*, *Cladiella*.
G: in Loben; F: en lobes.
135. LYRIFORM, LYRATE, CANDELABRIFORM, PECTINATE: planar colonies in which the secondary branches are upright and approximately parallel with each other. Fig. 60.
Examples: *Ctenocella*, *Trichogorgia*.
G: lyraförmig, kandelaberförmig; F: lyriforme, candélabriforme.
136. MEMBRANOUS [SHEET-LIKE]: colonies consisting of a thin membrane covering the substrate. See also ENCRUSTING.
Examples: *Sympodium*, *Parerythropodium fulvum*.
G: membranös; F: membraneux.
137. MULTIPLANAR: branched colonies in which the branches grow in several planes.
Example: *Melithaea*.
G: in mehreren Ebenen; F: multiplan.
138. PINNATE: branched colonies in which the branching pattern is feather-like, with the branchlets in one plane. Figs. 53, 54.
Examples: *Pseudopterogorgia*, *Callogorgia*, *Lophogorgia*.
G: federförmig, fiederig; F: penné.
139. PLANAR: branched colonies in which the branches grow more or less in one plane. Figs. 51, 61, 62.

- Examples: *Melithaea*, *Iciligorgia*, *Gorgonia*.
G: in einer Ebene (Fächer); F: dans un plan, en éventail.
140. PSEUDOSOLITARY: colonies consisting of a single autozoid and numerous smaller siphonozoids.
Examples: *Bathyalcyon*, *Umbellula monocephala*.
G: pseudosolitär; F: pseudosolitaire.
141. RETICULATE: branched colonies in which the branches anastomose to form a net-like structure. Figs. 61, 62.
Examples: *Gorgonia*, *Subergorgia*, *Pacifigorgia*.
G: netzförmig; F: rétifforme.
142. SOLITARY: Octocorals consisting of a single polyp. Fig. 39.
Example: *Taiaroa*. This is the only confirmed case in which octocorals do not form colonies.
G: solitär; F: solitaire.
143. STOLONATE, STOLONIFEROUS, [CREEPING]: colonies consisting of several polyps interconnected by stolons. The term 'stoloniferous' does not necessarily imply membership in the order Stolonifera, but only the presence of stolons. The term 'creeping' does not necessarily imply the presence of stolons, nor do all stolons creep. Fig. 40.
Examples: *Cornularia*, *Clavularia*.
G: stolonat; F: stoloné.
144. UMBELLATE COLONIAL FORM: in *Dendronephthya*, arborescent colonies with numerous bundles of polyps grouped to form umbel-like or corymb-like aggregates, all polyps disposed on the surface of the colony. Characteristic of the 'Umbellatae' group of species. Fig. 50.
Example: *Dendronephthya florida* (Esper).
No equivalent in German and French.
145. UNBRANCHED: erect colonies devoid of lateral parts. Fig. 41.
G: unverzweigt; F: non-ramifié.

III. Sclerites

Although John Ellis (1755) had early described and illustrated the coenenchymal sclerites in octocorals such as *Paramuricea* and *Corallium*, he applied no special name to them. The term 'spicule' for these structures was used by Dana (1846), Milne Edwards & Haime (1850, 1857) and Valenciennes (1855). However, it was Valenciennes, in his pioneering essay (1855) on the taxonomic importance of these skeletal structures, who distinguished between the sharp 'spicules' or 'acicules' that he found in the polyps from the 'nombreuses concrétions calcaires' of the common coenenchyme: 'Je donnerai à ces corpuscules le nom de *sclérites*.' Without using the term 'sclerite', Kölliker (1865) continued to draw this distinction, using instead 'Kalkkörper, *Corpuscula calcarea*' as a general term and pointing out that *Spicula calcarea* is not so appropriate because they are not always needles. Verrill, a prolific investigator of octocorals, immediately accepted the taxonomic significance of sclerites but consistently used the plural term 'spicula', even for scale-like and plate-like forms. Perhaps it was his influence that led most, if not all, English-speaking investigators to use the word 'spicule' in a general sense for all of these skeletal structures regardless of shape.

Kükenthal used the term 'Sklerit' in his later work (e.g., 1924, but not in 1919 or 1915), as did Versluys (1902, 1906) and Toeplitz (1929), but in general the word 'spicule' has been the more commonly used term.

As mentioned by Kölliker (1865), 'spicule' is not always applicable because not all sclerites are needles, i.e. sharply pointed. 'Spicule' is derived from the Latin *spiculus* (or *-a*, fem., *-um*, neuter), diminutive from *spicus*, meaning an ear of grain or a point, and clearly is appropriate only for relatively narrow, monaxial, pointed forms. A very large number of 'spicules' are not pointed, so the general term 'sclerite', from Greek *skleros*, hard, originally proposed by Valenciennes, is here recommended.

No specialized terminology has been developed for octocoral sclerites as was the case for sponge spicules. This is both an advantage and a disadvantage; an advantage in that octocoral specialists are not obliged to learn, nor non-specialists to comprehend, the obscure polysyllabic terms applied to analogous structures in their specimens, but a disadvantage in that the terms that have been applied are based on the vernacular of the authors who coined them and are subject to the wildest misinterpretations. The meanings of words change, often rapidly, in vernaculars, and the same word may often -- perhaps usually -- connote different things to different people. This makes it difficult to interpret the meaning intended by authors, especially those (all too many) who did not accompany their words with illustrations. Typical examples are spindle, rod, club, star, capstan, collar-button, double disk, opera-glass, and a variety of other descriptive terms based on the names of common objects. To Nutting (1912) the term 'collar-button' evoked a special shape that was similar to the sclerites of *Bebryce*, but who, half a century later, knows what a collar-button looked like? Who but a seaman knows the shape of a capstan? Even if the shapes are unmistakable, the application may be ambiguous: is a double disk a pair of disks joined by their edges and lying in one plane? In planes at right angles? Or two disks joined by an axle like a pair of wheels? We hope to eliminate, at least partially, such ambiguities, and to clarify and stabilize the use of these traditional terms by providing brief descriptions and illustrations of typical examples.

Many forms of sclerites are of widespread occurrence in octocorals. Others are more or less typical of species, genera or families, in which case the name of such species, genus or family is given in parentheses as an example in the following list. However, this should not be taken to mean that all species of that genus, or all genera of that family, have that special kind of sclerite. The location in the colony where the sclerite occurs, e.g., in the anthocodial wall or in the outer layer of coenenchyme, is not mentioned; the investigator can find these details for himself by means of the literature.

Surface Ornamentation

The surface of octocoral sclerites is completely smooth in rather few cases, notably the three-flanged rods and the fingerbiscuit shaped platelets of many pennatulaceans. In most instances, the surface is ornamented by sculpture varying from minute granules through more or less smooth tubercles and compound warts to conspicuous thorns and spines. In many cases in Gorgonacea, the inner surface, especially of scale-like forms, is covered with complicated processes whereas the outer surface has smoother granules, tubercles, ridges or wrinkles. In some species, the tubercles may be unilaterally developed as thin or thick leaves or fused into nearly complete wheels or disks.

It is impossible to categorize and name the almost infinite variation of ornamentation, so authors

have used descriptive terms taken from ordinary language in describing the sclerite forms characteristic of various genera and species. We have not attempted to define these common words, which often are of a highly subjective nature, but have indicated in the explanation of the plates the major types where they occur.

Sclerite Forms

146. ANTLER: small scale with antlerlike ramifications. Fig. 203.
Example: *Dendronephthya*.
G: geweihförmige Platte*; F: andouiller*, bois*.
147. BALL, SPHEROID; (usually in combination with a descriptive term indicating the type of sculpture, e.g., FOLIATE SPHEROID, SPINY BALL). Figs. 129-136.
Examples: *Euplexaura*, *Asterospicularia*.
G: Kugel; F: boule.
148. BALLOON CLUB, [unused: CONE CLUB, TORCH-LIKE SCLERITE]: club with practically smooth, spheroidal or pyriform head, sometimes ornamented with low warts, or with two or three whorls of spinules around the middle part of the handle. See 198. Figs. 172-174.
Example: *Eunicella*.
G: Ballonkeule, dütenförmige Spicula [obsolete: Tütenkeule, Dütenkeule]; F: massue arrondie.
149. BARREL, DOUBLE SPHERE: short, wide double sphere with two thorny or warty heads and a short waist. Fig. 158.
Examples: *Cladiella*, *Lobophytum*, *Ctenocella*.
G: Fäßchen; F: tonnelet.
150. BRACKET: curved sclerite with two long rays and two median warts. Fig. 146.
Example: *Lemnalia*.
No equivalent in German and French.
151. BRANCHED SPINDLE: a spindle, often crooked, with some of the processes much elongated and branchlike. Figs. 102-104.
Examples: *Sinularia*, *Briareum*.
G: verzweigte Spindel; F: fuseau ramifié.
152. BUTTERFLY-FORM: four-rayed sclerite with two of the rays usually somewhat shorter, derived from six-radiate capstan by hypertrophy of four rays and suppression of two. Fig. 145.
Example: *Plexaurella*.
G: Schmetterlingsform; F: forme en papillon.
153. CAPSTAN: rod with two whorls of tubercles or warts and terminal tufts. [= Roller, obsolete; used chiefly by Deichmann, 1936.] Figs. 148-151.
Examples: *Lobophytum*, *Lophogorgia*.
G: Gürtelstab; F: cabestan.
154. CATERPILLAR; UNILATERALLY SPINOSE SPINDLE: spindle with unilaterally developed spines. Fig. 121.
Example: Nephtheidae.
G: Raupe*; F: chenille.

155. CLUBS: monaxial sclerites enlarged at one end, the head, and tapered at the other end, the handle. Figs. 163-178.
G: Keulen; F: massues.
156. CRESCENT [not SCAPHOID]: spindle bent in the form of a 'C' and more or less regularly covered by prominences, those on the convex side usually higher. The term 'scaphoid' (i.e., canoe-like, introduced by Saville Kent, 1870: 90) is customarily applied to curved, outer coenenchymal spindles characteristic of certain genera of Gorgoniidae. They are derived from simple spindles with tubercles arranged in transverse belts by a gentle curvature and (usually) suppression of the tubercles of the convex side. Because of their curved profile they have been called 'Klammern' (i.e., 'parenthesis,' 'round bracket' or 'clamp') in German by some authors, 'crochets' and 'croissants' in French, 'bracket-shaped,' 'crescent-shaped' and 'scaphoid scales' in English. Because of this inconsistency of usage, we recommend the term 'crescent' be limited to those curved spindles (e.g., in *Lemnalia*) with sculpture uniform all around and not suppressed or modified on the convex side. Fig. 116.
Example: *Lemnalia*.
G: halbmondförmiges Sklerit*; F: croissant.
157. CROSS, [obsolete: TWIN, DOUBLE FORM]: stellate sclerite with four rays in one plane. Figs. 138-140.
G: Kreuz, [Zwilling, Doppelbildung]; F: croix.
158. CROWN SPINES: circumoral spindles having the distal part modified as a long, nearly or quite smooth projecting spine. Figs. 74, 111.
Example: *Acanthogorgia*.
G: Kronstachel; F: épine longue circumorale.
159. CRUTCH: a spindle bifurcated at one end. Figs. 113, 114.
Example: some species of *Placogorgia*.
G: krückenförmiges Sklerit; F: sclérite en béquille.
160. CYLINDER: a blunt-ended, roller-shaped sclerite. Fig. 127.
Example: *Lobophytum meandriforme*.
G: Walze; F: cylindre.
161. DISK-SPINDLE: a spindle with the tubercles of 4 or more whorls fused more or less completely into disks. Figs. 122, 123.
Example: some *Leptogorgia* spp.
G: Scheibenträger; F: fuseau à disques.
162. DOUBLE CLUB [obsolete: OPERA-GLASS]: bispheroidal, two-handled sclerite; actually a six-radiate sclerite with two rays enormously enlarged, two remaining tuberculate and forming the 'handles', and two more or less suppressed. Figs. 177-178.
Examples: some spp. of *Corallium* and *Paragorgia*.
G: Doppelkeule, [Opernglas]; F: double massue.
163. DOUBLE CONE [inaccurate: DOUBLE SPINDLE]: short spindle with median waist. Used chiefly by Deichmann (e.g., 1936). See 167. Figs. 109, 110.
Examples: some Alcyonacea; *Thesea* spp.
G: Doppelkegel*, [inaccurate: Doppelspindel]; F: double cône, [inaccurate: double fuseau].
164. DOUBLE CUP, ROSETTE, SPINY ROSETTE*: sclerite consisting of a cuplike or funnel-shaped projecting part formed by minute, radiating spinules, and a smaller, rounded,

multituberculate base, those with crowded spinules resembling a chalice or wine-cup. [=Collar button, obsolete, used chiefly by Deichmann, 1936]. Figs. 179-182.

Example: *Bebryce*.

G: kelchförmiges Sklerit, Rosette, Stachelrosette*; F: corbeille, rosette, double rosette, rosette à épines*.

165. DOUBLE DISC, DOUBLE WHEEL, BIROTULATE: derivative of capstan, with tubercles of two whorls fused into disks or wheels; in *Adelogorgia* sometimes with longitudinal crests. Figs. 152-157.
Examples: *Eugorgia*, *Subergorgia*, *Adelogorgia*.
G: Doppelscheibe, Doppelrad; F: double disque.
166. DOUBLE HEADS: a general term for symmetrically developed sclerites with a narrow, smooth middle or 'waist' and terminal clusters of crowded processes not radially arranged. Figs. 159-160.
167. [DOUBLE SPINDLE, obsolete]: a long, tapered spindle with median waist. The term is ambiguous and inaccurate. Such sclerites are 'double' only in the sense that they have two similar halves separated by a median waist. See 163, 192.
168. DOUBLE STAR: rod with two whorls of irregularly shaped, more or less spiny projections. Figs. 161, 162.
Example: *Junceella*.
G: Doppelstern; F: double étoile.
169. DUMB-BELL: sclerite with two more or less spherical, warty heads and a distinct waist that is longer than in the double sphere. See also 149, 166. Fig. 160.
Example: Ellisellidae.
G: Doppelkugel; F: boule double, haltère.
170. EIGHT-RADIATE: capstan with two whorls of three tubercles each and terminal tubercles. Figs. 148-150.
Examples: *Corallium*, *Paragorgia*.
G: Achtstrahler [Achter]; F: cabestan octoradié.
171. FINGER-BISCUITLIKE FORM: Minute, flattened rod. Figs. 184, 185, 187.
Examples: *Anthelia*, *Ptilosarcus*.
G: Biskuitförmige Platten.
172. FOLIATE SPHEROID: spheroidal sclerite with foliate sculpture. Figs. 132-134.
Examples: *Wrightella*, *Mopsella*, *Pleurogorgia*.
G: Blattkugel; F: sphère foliacée, globule foliacée.
173. HOCKEY-STICK SPINDLE: spindle with a long distal part forming an obtuse angle with a shorter proximal part (*Dendronephthya*). Fig. 107.
Example: *Dendronephthya*.
G: Hockeyschläger*; F: crosse*.
174. LEAF CLUB: club with head ornamented by foliate, sometimes unilaterally placed processes. Figs. 167-170.
Examples: *Capnella*, *Mopsella*.
G: Blattkeule; F: massue foliacée, [massue aplatie].
175. LEAF SPINDLE: spindle with unilaterally placed foliaceous processes. Figs. 124-126.
Examples: *Muriceopsis*, *Pseudoplexaura*.
G: Blattspindel; F: fuseau foliacé.

176. LEPTOCLADOS-TYPE CLUB: small leaf club with a few apparently foliate processes on the head and a girdle of spines just above the base of the handle. Fig. 175.
Example: some *Sinularia* species.
177. NEEDLE: long, thin, nearly smooth monaxial sclerite. Figs. 86, 87.
Examples: *Lemnalia*, *Paralemnalia*.
G: Nadel; F: aiguille.
178. OBLONG: short, bluntly rounded rod.
G: längliches Ellipsoid; F: oblong.
179. OVAL, OVOID: short rod, sometimes more or less flattened, having gently rounded outline. Fig. 128.
Example: *Discogorgia campanulifera*.
G: Ellipsoid, Oval, eirund; F: ovale.
180. PLATE: flat sclerite much thicker than scales, usually larger than 0.05 mm and of diverse outline, from circular to oval or polygonal, commonly irregular. See also 193. Figs. 188-191, 194, 198.
Examples: *Paracis squamata*, *Scleracis petrosa*, *Scleranthelia*.
G: Platte; F: plaque.
181. PLATELETS: small flattened sclerites of diverse outline, appearing smooth in the light microscope, but having exceedingly fine sculpturing visible with the scanning electron microscope; usually smaller than 0.05 mm in greatest dimension. Figs. 183-187.
Examples: Xenidiidae, *Ifalukella*, many pennatulaceans.
G: Plättchen; F: plaquettes.
182. RADIATES: sclerites with processes radiating in one plate (i.e., stellate forms) or in various planes in a more or less symmetrical order. Figs. 137-150, 199-201.
183. ROD: straight or curved monaxial sclerite blunt at both ends. Figs. 88-92, 96-98.
G: Stab; F: bâtonnet, baguette.
184. ROOTED HEAD*: clublike sclerite consisting of a thick, rounded head and a more or less branched, root-like base. Fig. 176.
Examples: some spp. of *Echinogorgia* and *Pseudoplexaura*.
G: Wurzelkopf*; F: tête à racines*.
185. ROOTED LEAF*, [inaccurate: PLATE CLUB]: clublike form consisting of a thick or thin, flattened, discoidal head (with numerous transitions to foliate and spinous variants) and a branched, tuberculate handle. Figs. 212-214.
Examples: *Menella* (= *Plexauroides*), *Echinogorgia*.
G: Wurzelblatt*, [inaccurate: Schuppenkeule]; F: feuille à racines*, [inaccurate: massue à plaque].
186. SCALE: thin, flat or nearly flat sclerite. Buccal scales: the distalmost pair of body scales of the primnoid genera *Narella* and *Paracalyptrophora*, immediately below the opercular scales (Figs. 77, 78, *bu.*). Basal scales: the proximalmost pair of large bodyscales of those genera (Figs. 77, 78, *ba.*). Medial scales: the pair (sometimes two pairs) of body-scales lying between the basal and buccal scales of the same genera (Fig. 77, *med.*). Infrabasal scales: one or more pairs of small scales lying between the basal scales and the sclerites of the coenenchyme in *Arthrogorgia*, *Calyptrophora* and *Paracalyptrophora* (Fig. 78, *ib.*).
Examples: most Primnoidae and Chrysogorgiidae.
G: Schuppe (Rumpfschuppen, Basalschuppen, Medialschuppen, Bukkalschuppen, Infra-

- basalschuppen); F: écaille (sclérites de la base, sclérites du milieu; sclérites buccaux).
187. SCAPHOID, CANOE-SHAPED SCLERITE [obsolete: BRACKET, see 150]: spindle more or less distinctly curved in the form of a 'C' and with the warts of the convex side suppressed or modified. Figs. 117, 118.
Examples: several genera of Gorgoniidae.
G: Klammer; F: scaphoïde, crampon.
188. SEVEN-RADIATE: rod with two whorls of three tubercles each and a terminal tubercle at one end only. Fig. 147.
G: Siebenstrahler, [Siebener]; F: heptaradiaire.
189. SHUTTLE: nearly smooth, fusiform sclerite sculptured by only a few low, blunt, ridge-like longitudinal prominences. Fig. 112.
Example: *Lobophytum*.
G: Webschiffchen*; F: navette*.
190. SIX-RADIATE: rod with two terminal whorls of three tubercles each. Figs. 141-144.
Examples: *Corallium*, *Paragorgia*.
G: Sechsstrahler, [Sechser]; F: hexaradiaire.
191. SPICULES: the word 'spicule' has often been used as a synonym of sclerite, but because its derivation implies something pointed, it should be confined to elongated monaxial forms such as spindles and needles.
G: Spikeln, Spicula; F: spicules.
192. SPINDLE: straight or curved monaxial sclerite pointed at both ends; very common. Figs. 93-95.
G: Spindel, [Doppelspindel], Gürtelspindel; F: fuseau, [double fuseau].
193. STELLATE PLATE: flat sclerite with deeply lobed margins, more or less radially symmetrical. Figs. 199-201.
Example: *Bebryce*.
G: sternförmige Platte*; F: étoile à tubercule*, plaque étoilée à bosse centrale*.
194. THORN CLUB: club with head ornamented by sharp, thornlike or spinelike processes. Fig. 166.
Example: *Acabaria*, *Sinularia*.
G: Stachelkeule; F: massue à épines.
195. THORNSCALE: flat sclerite with a central or marginal spinelike or digitiform process; many stages transitional to THORNSTAR (197) occur in various paramuriceid genera. Figs. 205-210, 215-218.
Example: Paramuriceidae.
G: Stachelplatte; F: plaque à aiguillon.
196. THORNSPINDLE: spindle with unilaterally developed thorn-like processes. Fig. 105.
Example: *Muriceides*.
G: Stachelspindel; F: fuseau à aiguillon.
197. THORNSTAR: modification of the thornscale, in which one or more projecting thorns arise vertically from the middle of the divided, rootlike base and may be more or less leaflike; many stages transitional to THORNSCALE (195) occur in various paramuriceid genera. Figs. 205, 210, 215-218.
Examples: *Placogorgia*, *Villogorgia*.
G: Stachelfuß; F: étoile à aiguillon*.

198. TORCH: club with foliate processes of the head strongly laciniate and slanted to one side, resembling a burning torch. Fig. 168.
Examples: *Eunicea*, *Capnella*.
G: Fackel*; F: torche*.
199. THREE-FLANGED ROD/NEEDLE/SPINDLE: rod, needle or spindle with three longitudinal flanges. Figs. 96-100.
Examples: many Pennatulacea.
G: dreiflügeliger Stab, dreiflügelige Nadel/Spindel; F: bâtonnet/aiguille/fuseau à trois ailes.
200. TRIRADIATE, [inaccurate: BRANCHED SPINDLE, TRIPOD]: sclerite with three rays, more or less in one plane. See 151. Fig. 137.
Example: *Titanideum*.
G: Dreistrahler, [Drilling]; F: triradiaire*, sclérite trirayonnée, [étoile à trois pointes, trépied].
201. VILLOGORGIA-TYPE SCLERITES: flattened, more or less twisted, boomerang-shaped rods commonly with the convex edge serrated near the wider end; present in the proximal part of tentacles. Fig. 202.
Examples: *Villogorgia* and several related genera.
G: Drachenflügel*; F: no equivalent.
202. WART CLUB: club with head ornamented by warts. Figs. 164, 165.
Examples: *Acabaria*, *Rumphella*, *Hicksonella*.
G: Warzenkeule; F: massue verruqueuse.

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IV. INDICES OF ENGLISH, GERMAN, AND FRENCH TERMS

Numbers refer to the numbers of the words in Parts I-III, not to pages.

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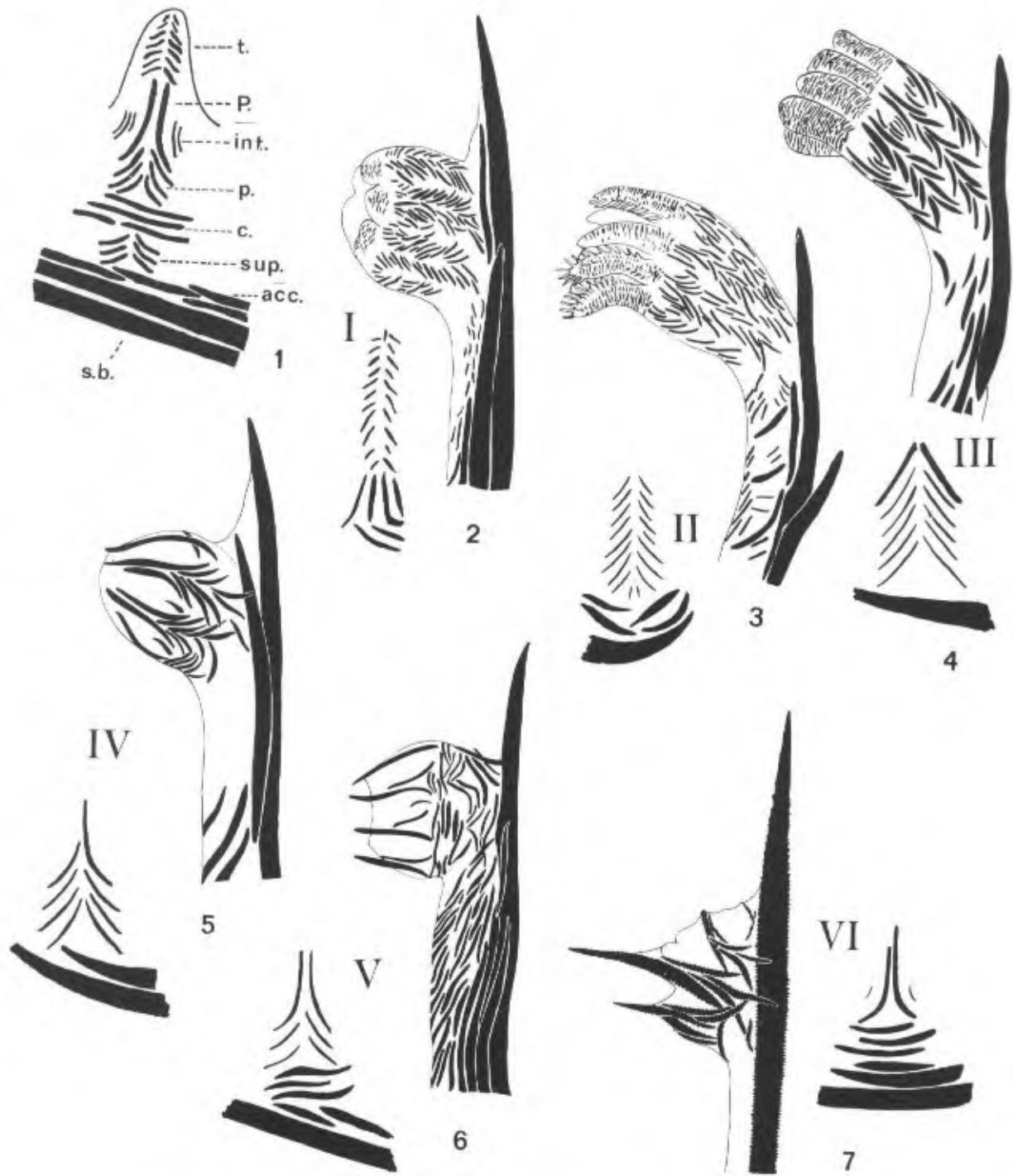
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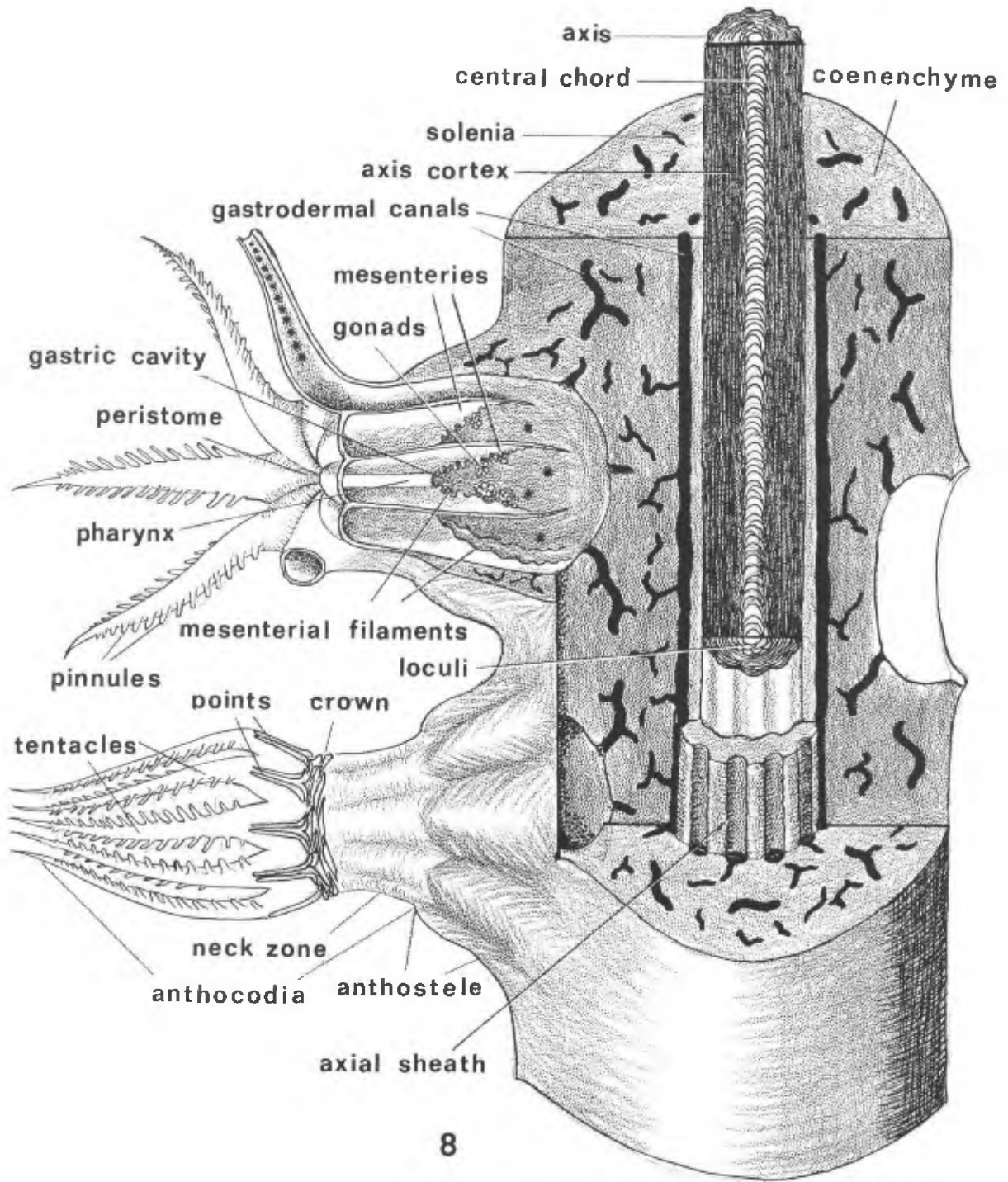
EXPLANATION OF PLATE I

- Fig. 1. Diagram of anthocodial armature of *Dendronephthya flammea* Sherriffs, after Tixier-Durivault & Prevorsek, 1960; *acc.*, accessory sclerites; *c.*, crown; *int.*, intermediates; *t.*, tentacle with chevroned sclerites; *P.*, pair of sclerites predominating over the other point sclerites; *p.*, arranged en chevron; *sup.*, supplementary sclerites; *s.b.*, supporting bundle.
- Fig. 2. Anthocodial Grade I, diagram after Thomson & Dean, 1931; profile of polyp, *Dendronephthya villosa* Kükenthal, after Tixier-Durivault & Prevorsek, 1962.
- Fig. 3. Anthocodial Grade II, diagram after Thomson & Dean, 1931; profile of polyp, *Dendronephthya repens* Kükenthal, after Tixier-Durivault & Prevorsek, 1962.
- Fig. 4. Anthocodial Grade III, diagram after Thomson & Dean, 1931; profile of polyp, *Dendronephthya mutabilis* (Tixier-Durivault & Prevorsek), after Tixier-Durivault & Prevorsek, 1962.
- Fig. 5. Anthocodial Grade IV, diagram after Thomson & Dean, 1931; profile of polyp, *Dendronephthya acaulis* Kükenthal, after Tixier-Durivault & Prevorsek, 1962.
- Fig. 6. Anthocodial Grade V, diagram after Thomson & Dean, 1931; profile of polyp, *Dendronephthya boschmai* Verseveldt, after Verseveldt, 1966.
- Fig. 7. Anthocodial Grade VI, diagram after Thomson & Dean, 1931; profile of polyp, *Dendronephthya decussatospinosa* Utinomi, after Tixier-Durivault & Prevorsek, 1960.



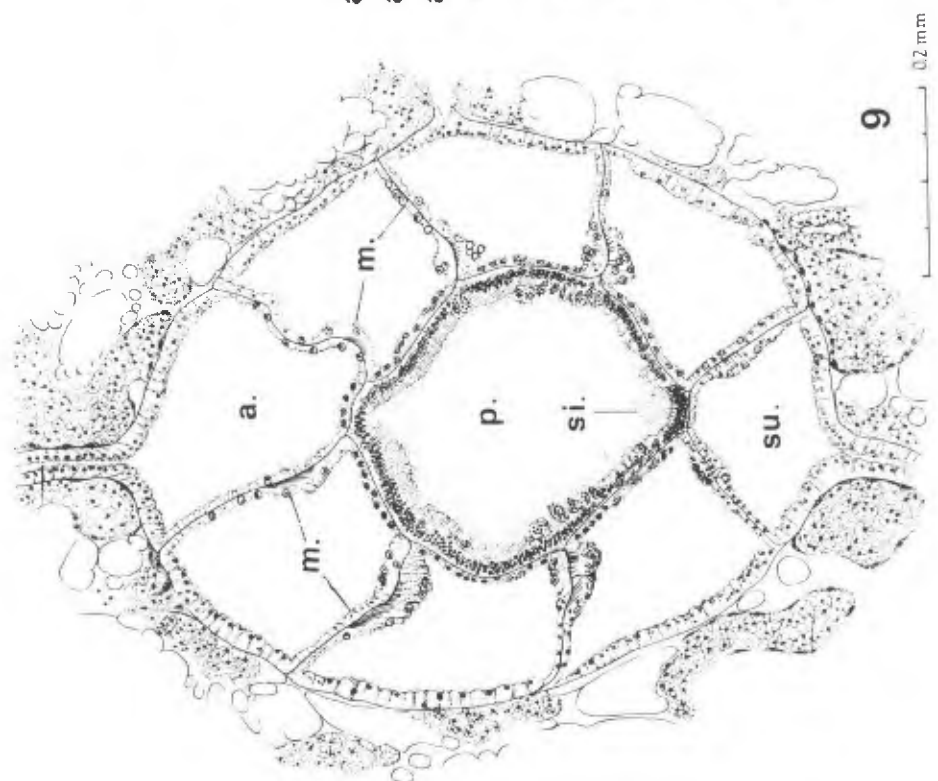
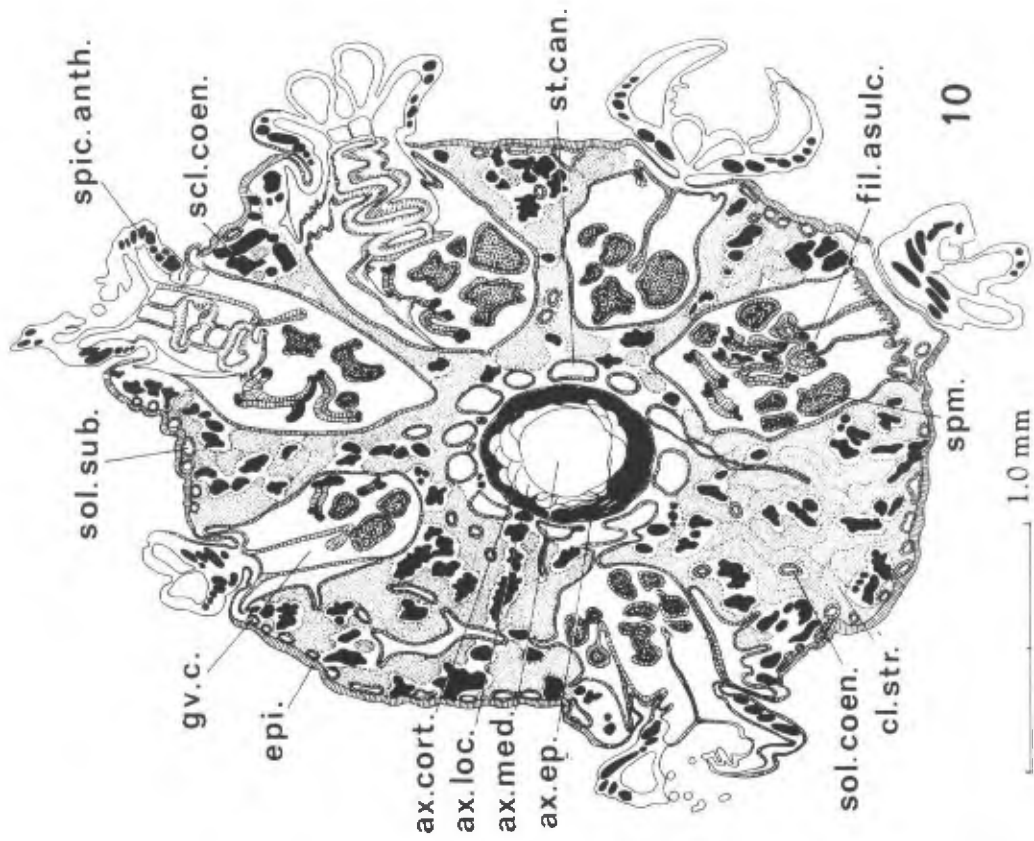
EXPLANATION OF PLATE 2

Fig. 8. General diagram of gorgonian anatomy.



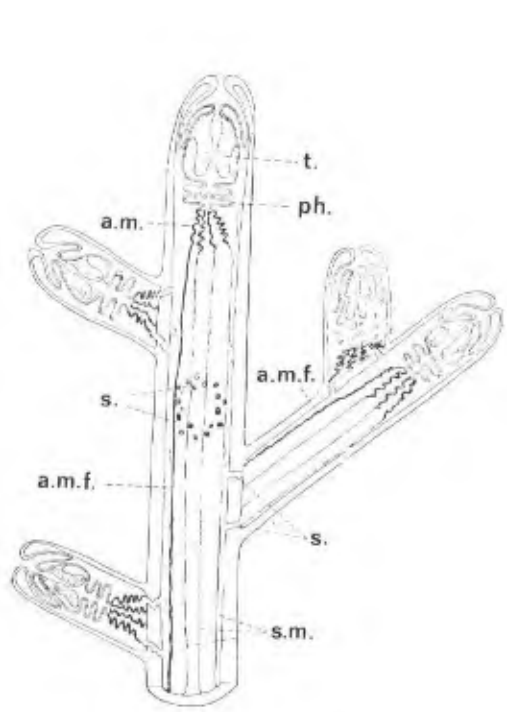
EXPLANATION OF PLATE 3

- Fig. 9. Cross-section of polyp of *Plexaura homomalla*, after Bayer, 1974; *a.*, asulcal side of polyp; *m.*, mesenteries; *p.*, pharynx; *si.*, siphonoglyph; *su.*, sulcal side of polyp.
- Fig. 10. Cross-section of branchlet of *Plexaura homomalla*, after Bayer, 1974; *ax. cort.*, cortex of axis; *ax. ep.*, axis epithelium; *ax. loc.*, loculi of axial cortex; *ax. med.*, central chord or medulla of axis; *cl. str.*, cell strings in coenenchyme; *epi.*, epidermis; *fil. asulc.*, asulcal mesenterial filaments; *gv. c.*, gastric cavity of polyp; *sol. coen.*, solenia deep in coenenchyme; *sol. sub.*, superficial solenia in coenenchyme; *spic. anth.*, sclerites of anthocodia; *scl. coen.*, sclerites of coenenchyme; *spm.*, male gonad, or spermary; *st. can.*, longitudinal stem canals.

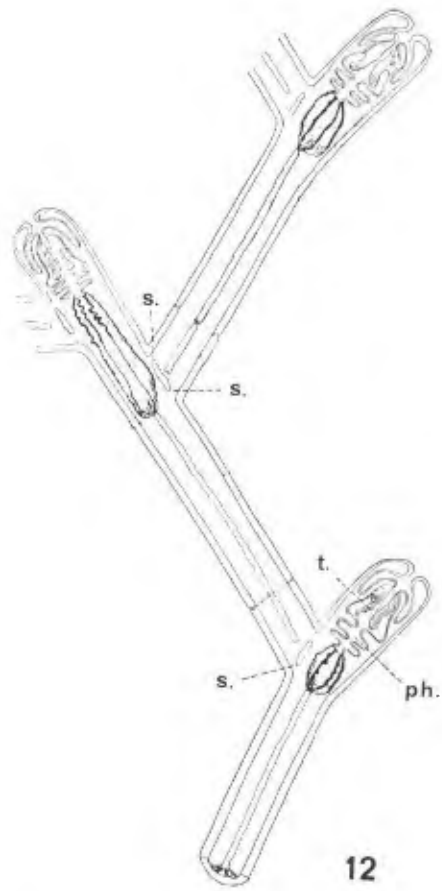


EXPLANATION OF PLATE 4

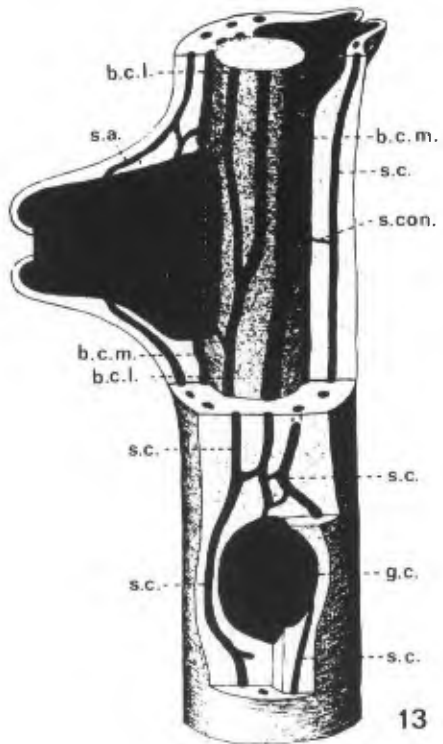
- Fig. 11. Axial polyp of *Telesto*, producing lateral daughter polyps, diagrammatic, after Versluys, 1907; *a.m.*, asulcal mesentery; *a.m.f.*, mesenterial filament; *ph.* pharynx; *s.*, solenia connecting gastric cavities of lateral polyps with that of axial polyp; *s.m.*, sulcal mesenteries; *t.*, tentacles. This is also an example of monopodial branching.
- Fig. 12. Sympodially budding polyps of *Pseudocladochonus*, diagrammatic, after Versluys, 1907. Lettering as in Fig. 11.
- Fig. 13. Diagram of scleraxonian structure. *Diodogorgia ceratosa* Kükenthal; *b.c.l.*, lateral boundary canals; *b.c.m.*, median boundary canals; *c.*, cortex; *g.c.*, gastric cavity of polyp; *s.a.*, solenia of anthosteles, entering gastric cavities; *s.c.*, solenia of cortex; *s.con.*, connecting solenia between boundary canals and longitudinal cortical solenia. From Verseveldt, 1940.
- Fig. 14. Sympodial branching, diagrammatic. Original.
- Fig. 15. Monopodial branching, diagrammatic. Original.



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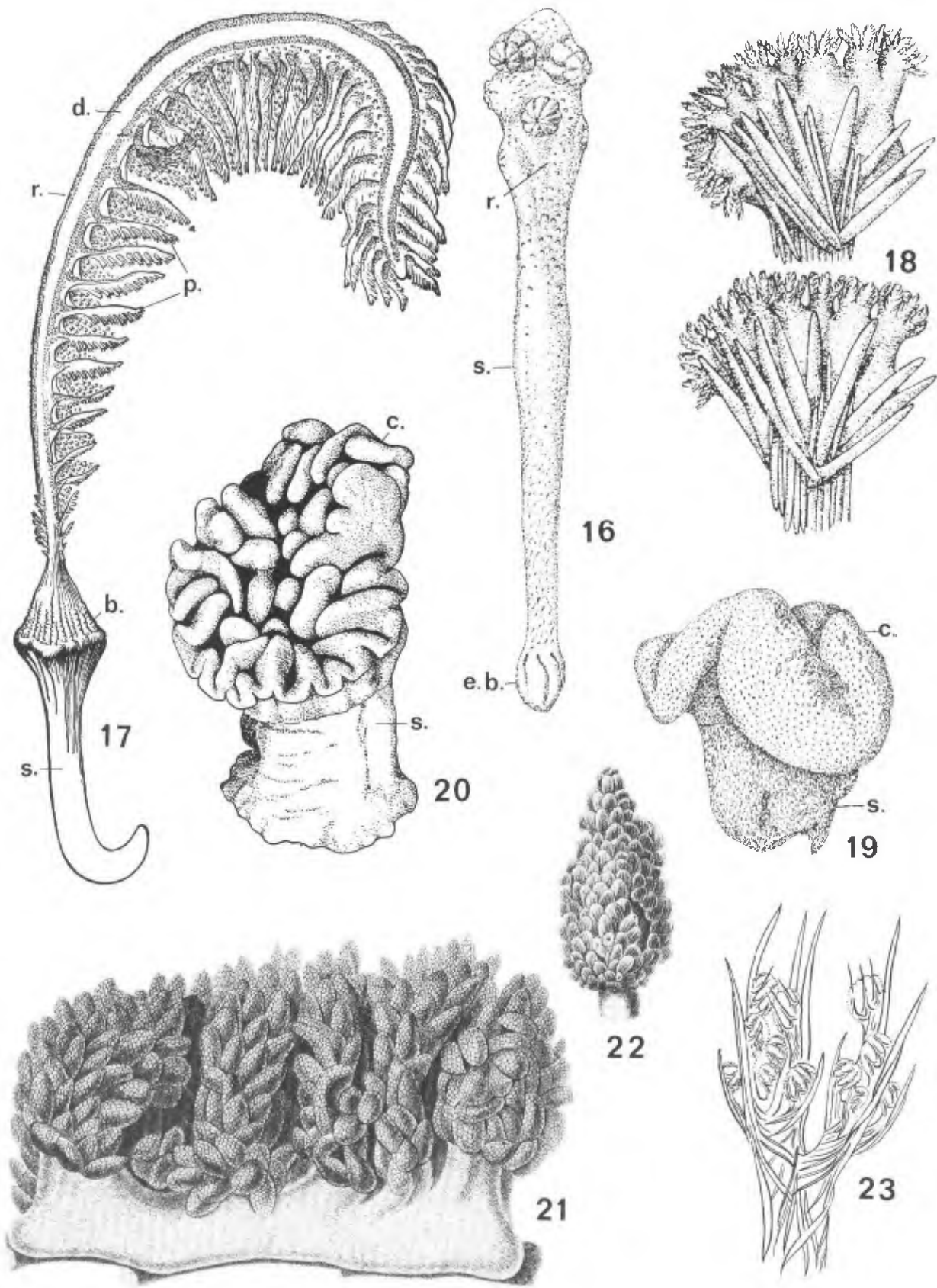
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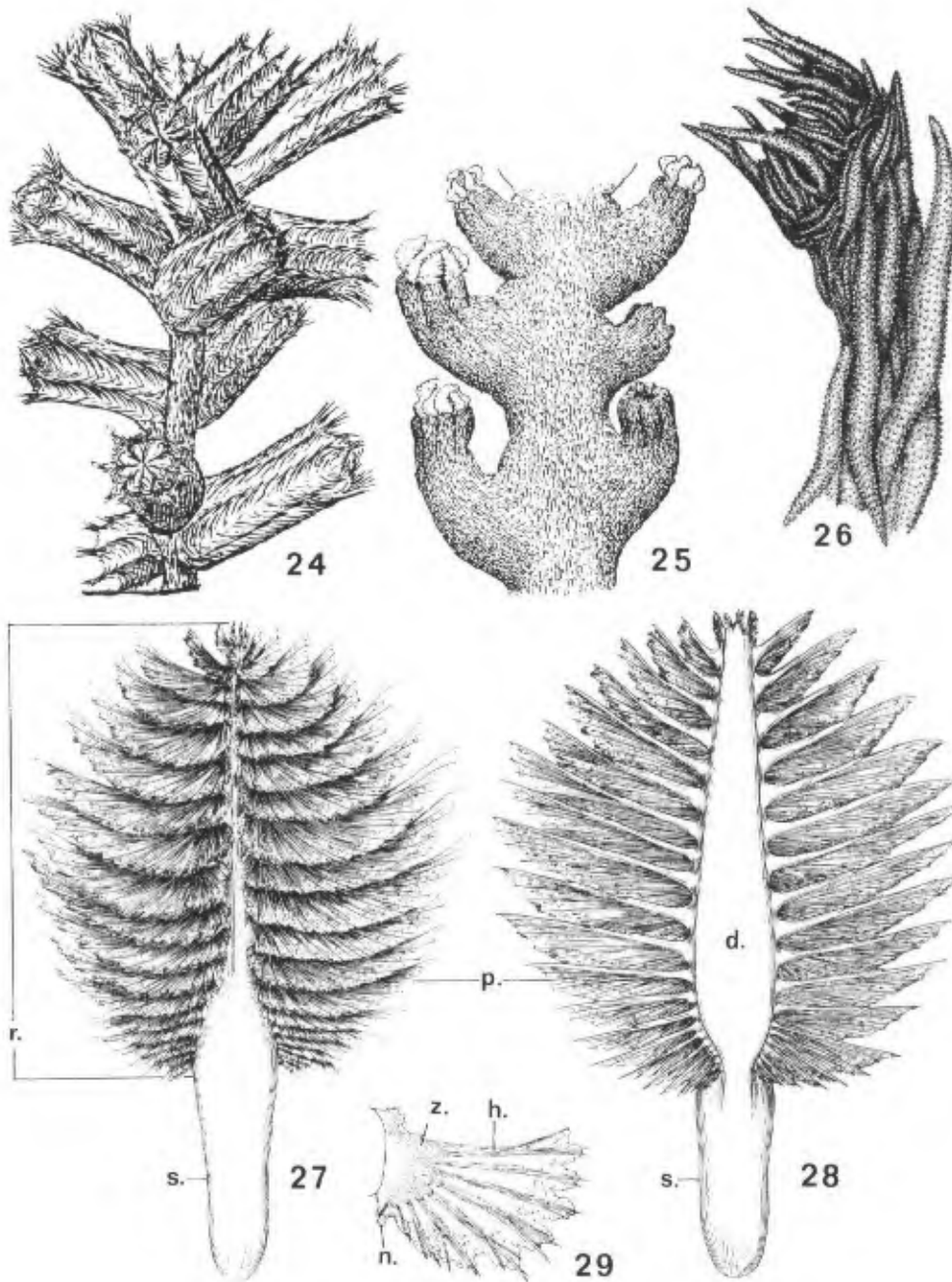
EXPLANATION OF PLATE 5

- Fig. 16. Colony of *Kophobelemnon stelliferum* (Müller), from Verrill, 1883. *e.b.*, end bulb; *r.*, rachis; *s.*, stalk.
- Fig. 17. Colony of *Pennatula grandis* Ehrenberg, from Verrill, 1885. *b.*, bulb; *d.*, dorsal track; *p.*, polyp leaves; *r.*, rachis; *s.*, stalk.
- Fig. 18. Polyp leaves and calcareous plates of *Stylatula antillarum* Kölliker, from Verrill, unpublished.
- Fig. 19. Capitulate colony of *Sarcophyton cinereum* Tixier-Durivault, from Verseveldt, 1982. *c.*, capitulum; *s.*, stalk.
- Fig. 20. Lobate colony of *Lobophytum jaeckeli* Tixier-Durivault, from Tixier-Durivault, 1958. *c.*, capitulum, with lobes; *s.*, stalk.
- Fig. 21. Arborescent colony of *Nephthea chabrolii* Audouin, from Blainville, 1834, after Savigny, 1817.
- Fig. 22. Catkin of polyps of *Nephthea chabrolii* Audouin, from Blainville, 1834, after Savigny, 1817.
- Fig. 23. Bundle of polyps of *Dendronephthya* sp., original.



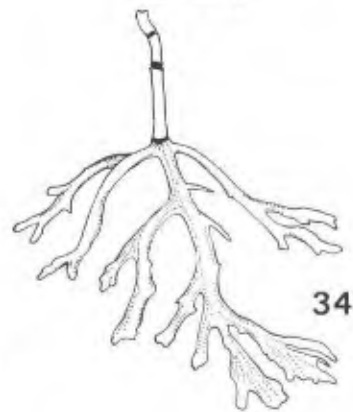
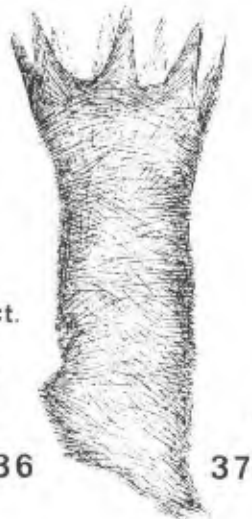
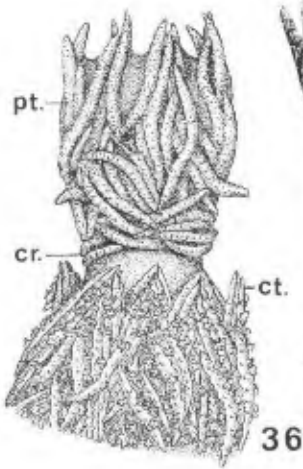
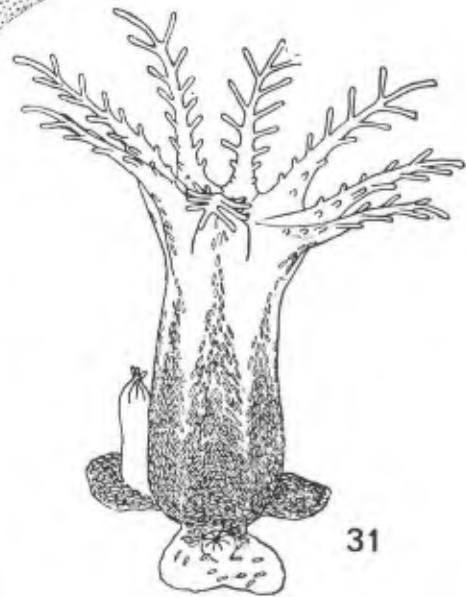
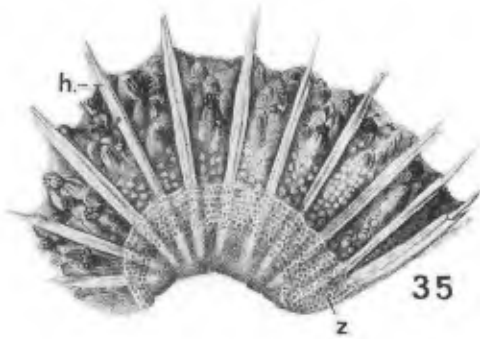
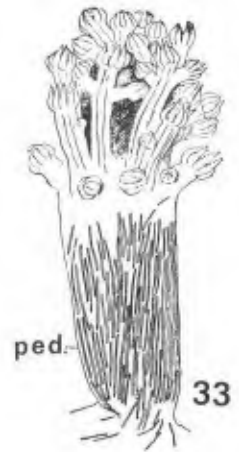
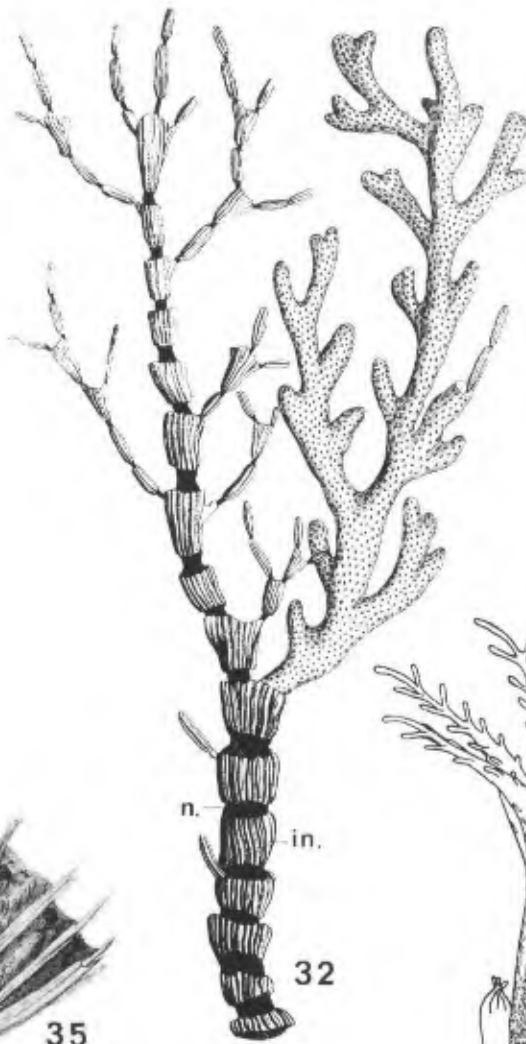
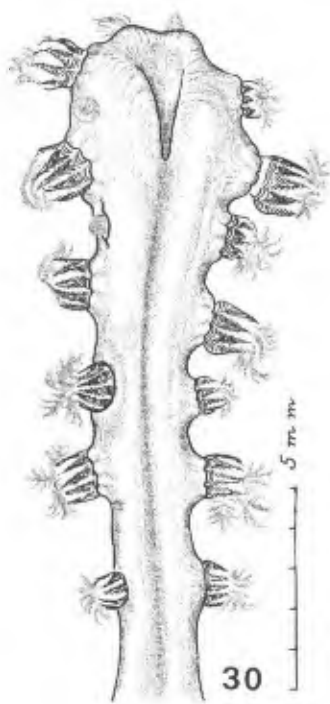
EXPLANATION OF PLATE 6

- Fig. 24. Contractile, but not retractile, polyps of *Acanthogorgia armata* Verrill, from Verrill, 1883.
- Fig. 25. Contractile, but not retractile, polyps of *Ellisella flagellum* (Johnson), from Simpson, 1910.
- Fig. 26. Contractile, but not retractile, polyp of *Stereonephthya portoricensis* (Hargitt), side view, from Verrill, unpublished.
- Fig. 27. *Pteroeides esperi* Herklots, ventral side of colony, from Herklots, 1858. *p.*, polyp leaves; *r.*, rachis; *s.*, stalk.
- Fig. 28. *Pteroeides esperi* Herklots, dorsal side of colony, from Herklots, 1858. *d.*, dorsal track; *p.*, polyp leaves; *r.*, rachis; *s.*, stalk.
- Fig. 29. Single polyp leaf of *Struthiopteris caledonicum* (Kölliker), from Kükenthal, 1915. *h.*, rays; *n.*, stipule; *s.*, stalk; *z.*, siphonozoid plate.



EXPLANATION OF PLATE 7

- Fig. 30. Fistulous terminal branch of *Iciligorgia schrammi* Duchassaing, from Bayer, 1961.
- Fig. 31. Founder polyp with two buds, *Anthoplexaura dimorpha* Kükenthal, from Kinoshita, 1910.
- Fig. 32. Jointed axis of *Isis hippuris* Linnaeus, from Ellis & Solander, 1786. *in.*, internodes; *n.*, nodes.
- Fig. 33. Colony of *Paralcyonium elegans* (Milne Edwards); *ped.*, pedicel.
- Fig. 34. Rhizoid holdfast of *Acanella arbuscula* (Johnson).
- Fig. 35. Polyp leaf of *Pteroeides pellucidum* Kölliker, from Kölliker, 1870. *h.*, rays; *z.*, siphonozoid plate.
- Fig. 36. Teeth of calicular margin, *Swiftia* sp., from Verrill, unpublished; *cr.*, crown; *ct.*, teeth; *pt.*, points.
- Fig. 37. Teeth of calicular margin, *Funiculina armata* Verrill, from Verrill, unpublished.
- Fig. 38. Teeth of calicular margin, *Eunicella modesta* Verrill, from Verrill, 1883.

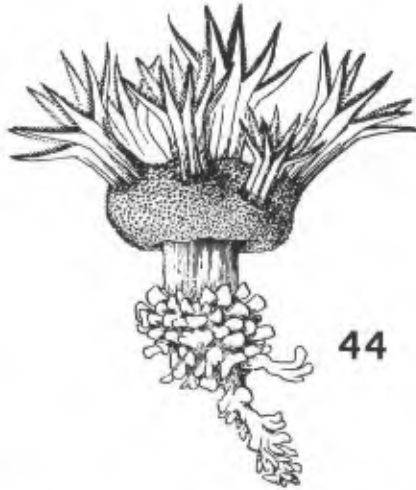


EXPLANATION OF PLATE 8

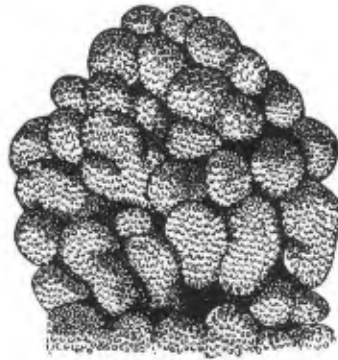
- Fig. 39. Solitary growth form, *Taiaroa tauhou* Bayer & Muzik, retracted and partially expanded polyps, from Bayer & Muzik, 1976.
- Fig. 40. Stolonate growth form, *Clavularia hamra* Gohar, from Gohar, 1948.
- Fig. 41. Digitiform colony, *Bellonella macrospina* (Kükenthal), from Utinomi, 1957.
- Fig. 42. Lobate colony, *Cladiella krempfi* (Hickson), from Tixier-Durivault, 1948.
- Fig. 43. Encrusting colony, *Cladiella tenuis* (Tixier-Durivault), from Tixier-Durivault, 1948.
- Fig. 44. Capitulate growth form, *Anthomastus grandiflorus* Verrill, from Verrill, 1885.



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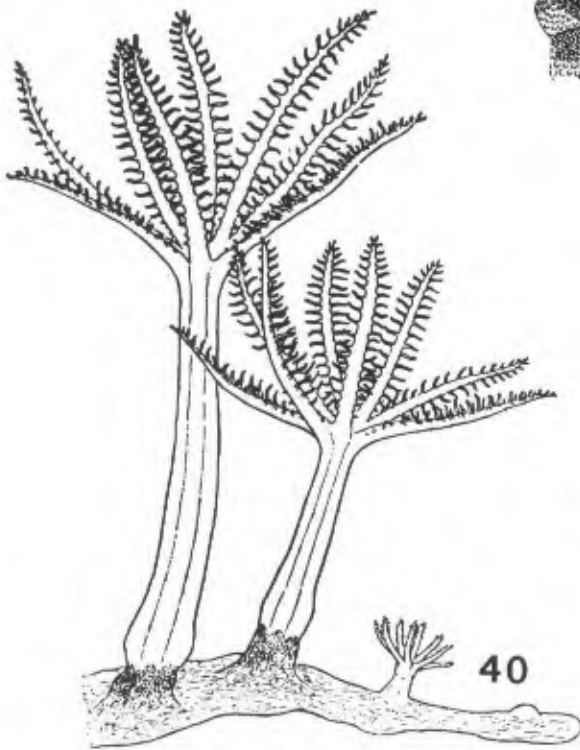
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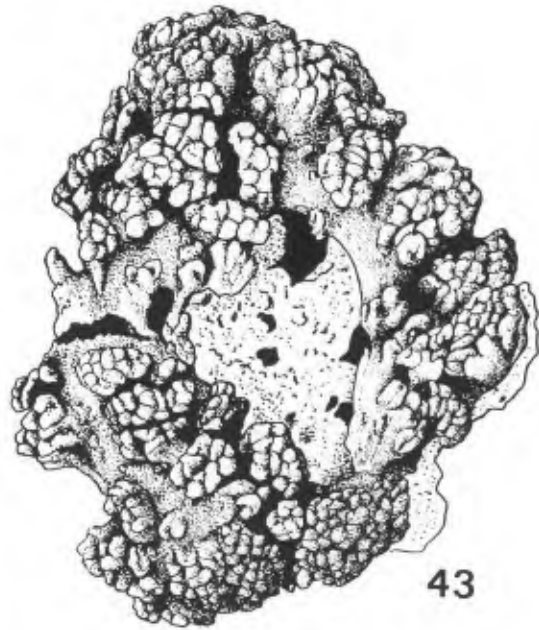
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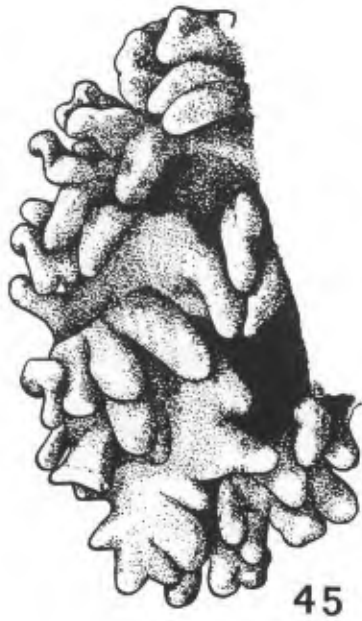
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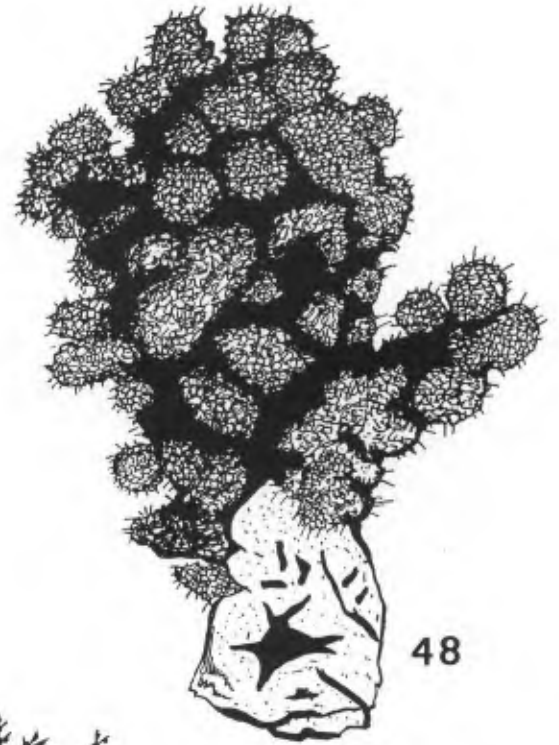
- Fig. 45. Digitate colony, *Lobophytum hirsutum* Tixier-Durivault, from Tixier-Durivault, 1958.
Fig. 46. Digitate colony, *Sinularia capillosa* Tixier-Durivault, from Tixier-Durivault, 1970.
Fig. 47. Arborescent growth form, *Dendronephthya magna* (Tixier-Durivault & Prevorsek); a.,
bundle of polyps. From Tixier-Durivault & Prevorsek, 1970.
Fig. 48. Glomerate growth form of *Dendronephthya*, from Thomson & Dean, 1931.
Fig. 49. Divaricate growth form of *Dendronephthya*, from Thomson & Dean, 1931.
Fig. 50. Umbellate growth form of *Dendronephthya*, from Thomson & Dean, 1931.



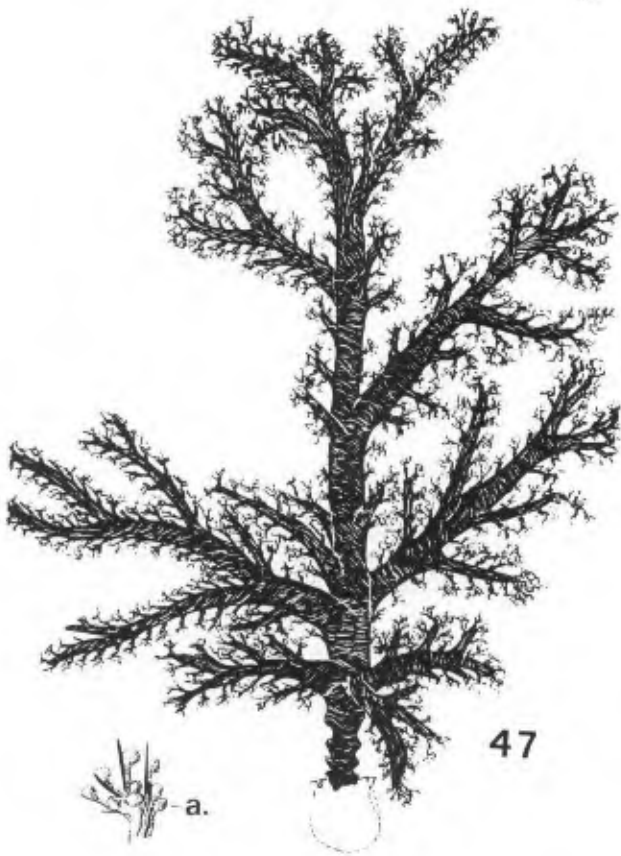
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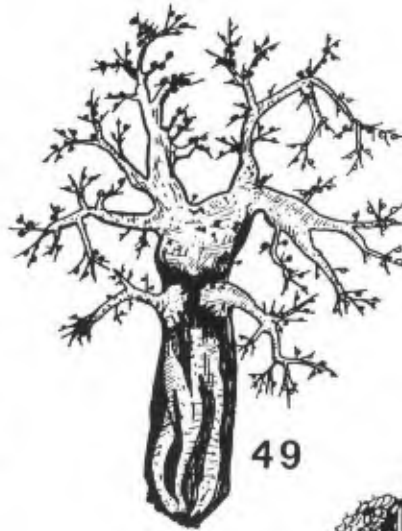
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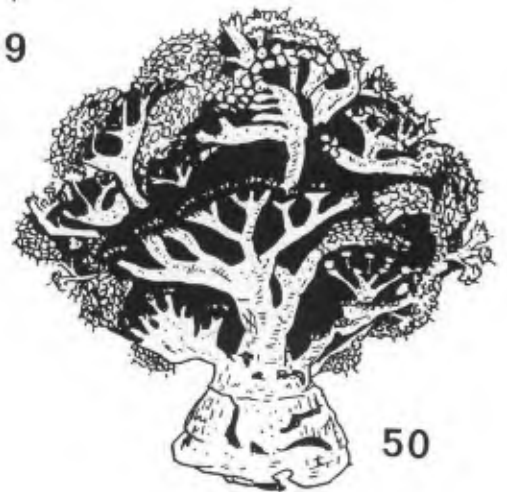
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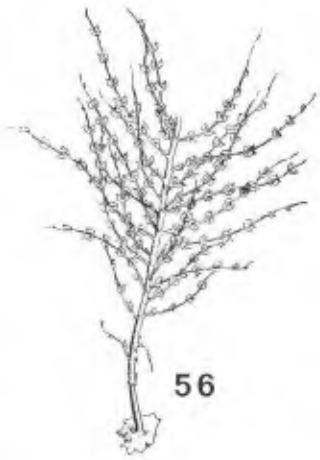
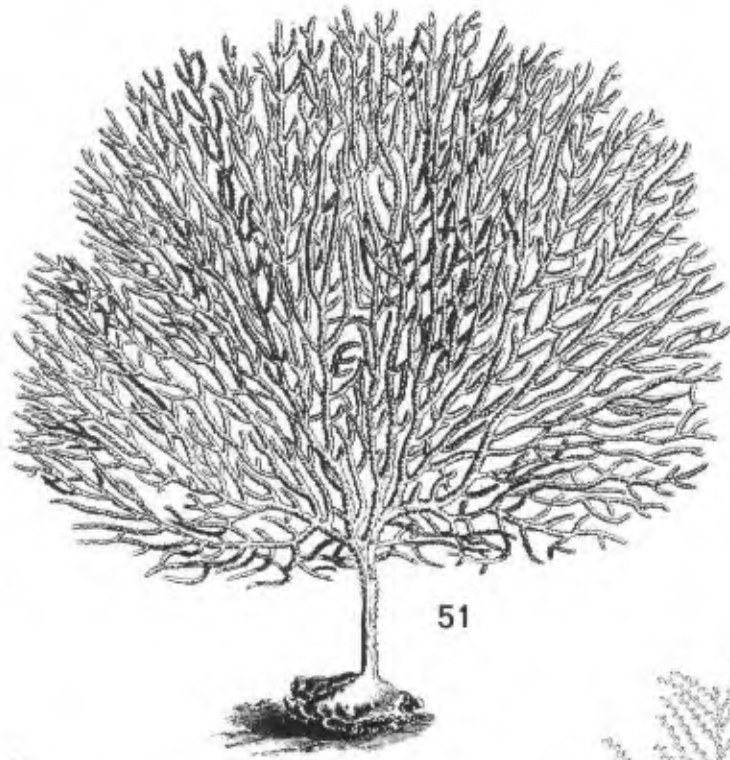
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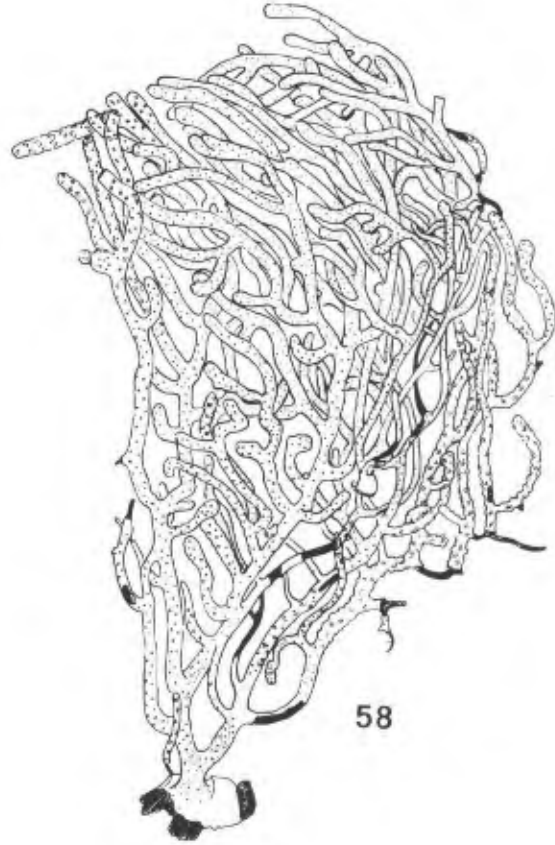
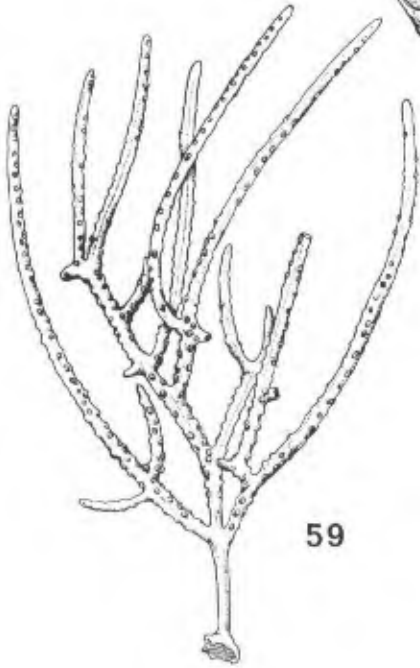
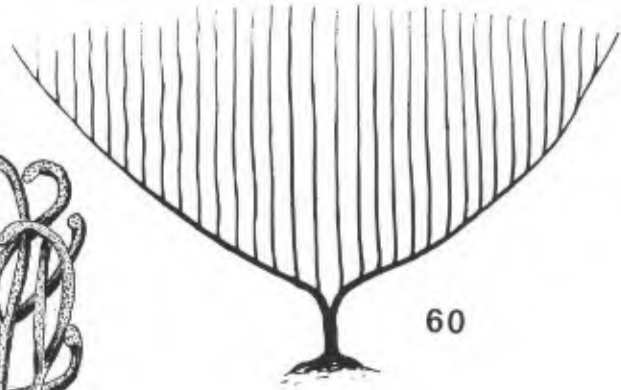
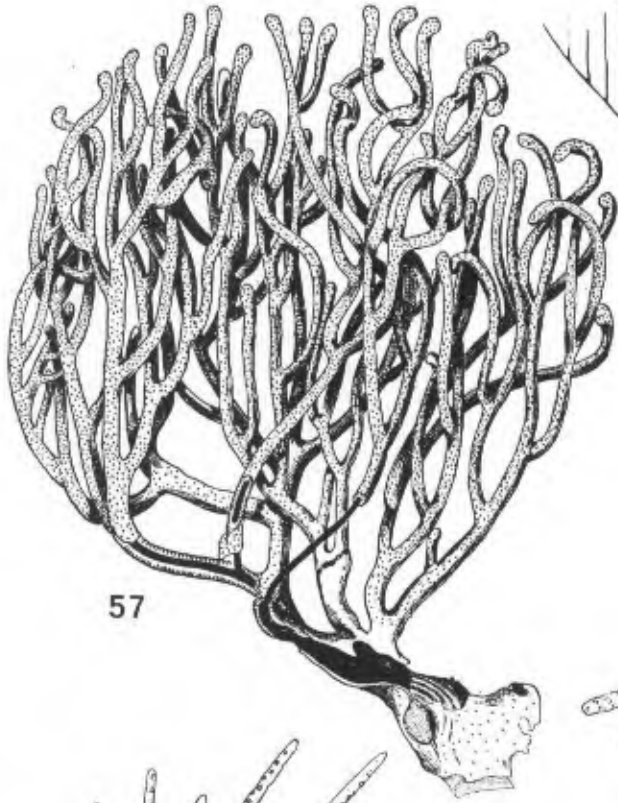
EXPLANATION OF PLATE 10

- Fig. 51. Planar growth form, *Verrucella umbraculum* (Ellis & Solander), from Ellis & Solander, 1786.
- Fig. 52. Dichotomous growth form, *Ascolepis splendens* Thomson & Rennet, from Thomson & Rennet, 1931.
- Fig. 53. Pinnate growth form, *Plumarella pourtalesii* (Verrill), from Verrill, 1883.
- Fig. 54. Pinnate growth form, *Pseudopterogorgia americana* (Gmelin), from Ellis & Solander, 1786.
- Fig. 55. Bottlebrush growth form, *Thouarella longispinosa* Kükenthal, from Thomson & Rennet, 1931. Densely branched colony.
- Fig. 56. Bottlebrush growth form, *Thouarella longispinosa* Kükenthal, from Thomson & Rennet, 1931. Sparsely branched colony.



EXPLANATION OF PLATE 11

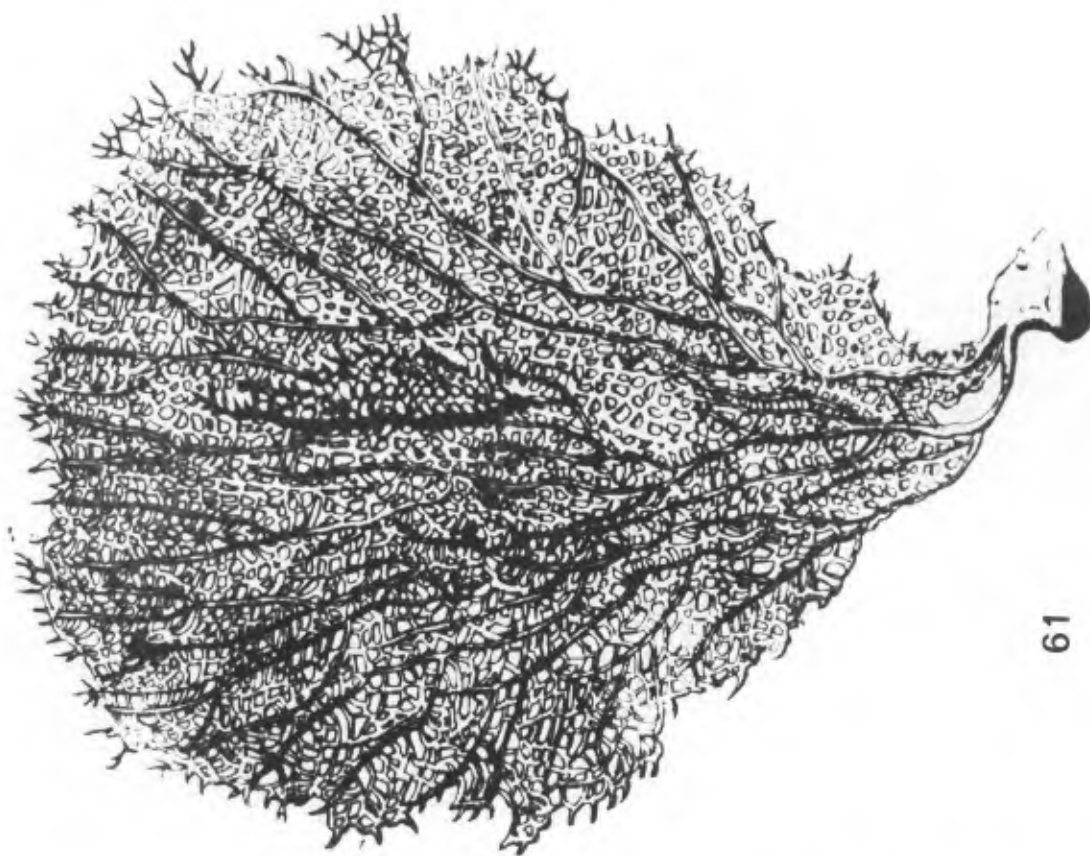
- Fig. 57. Bushy growth form, *Rumphella antipathes* (Linnaeus), from Bayer, 1959.
Fig. 58. Bushy, laterally branched colony, *Adelogorgia phyllosclera* Bayer, from Bayer, 1958.
Fig. 59. Sparse, laterally branched colony, *Ellisella ramosa* (Simpson), from Simpson, 1910.
Fig. 60. Lyrate (pectinate) growth form, *Ctenocella pectinata* (Pallas), from Simpson, 1910.



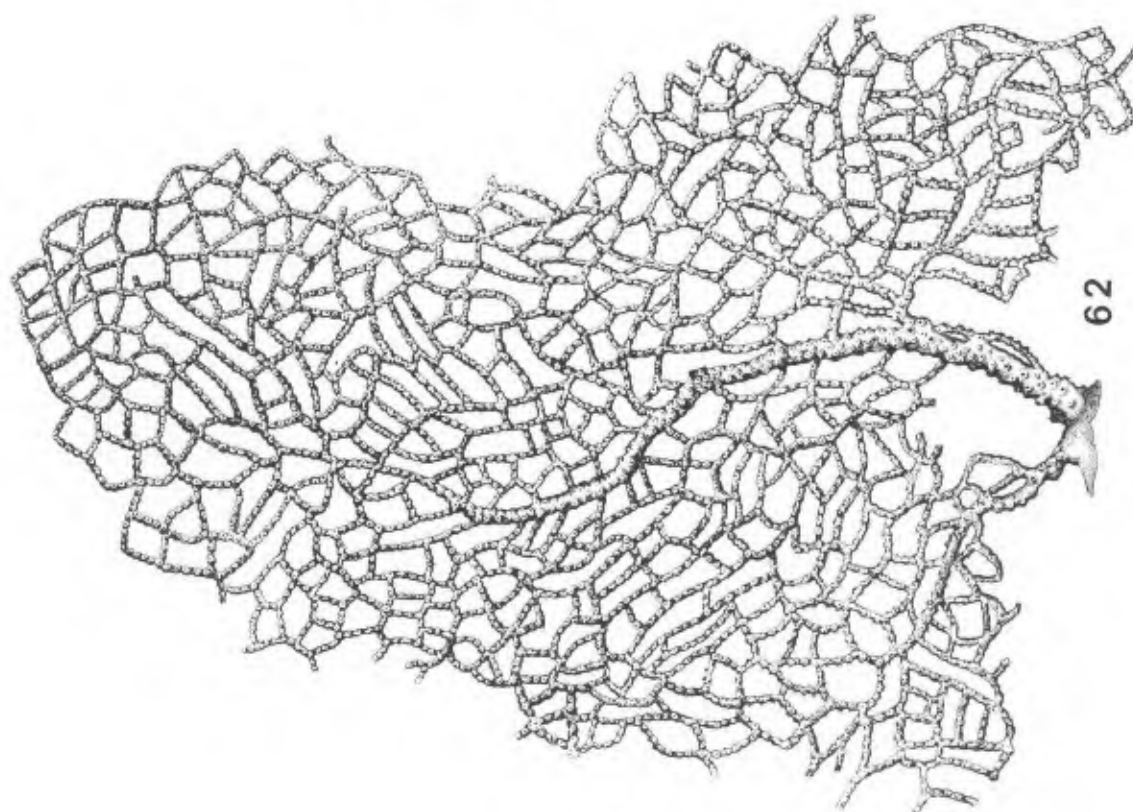
EXPLANATION OF PLATE 12

Fig. 61. Reticulate, planar growth form, *Gorgonia flabellum* Linnaeus, from Ceruto & Chiocco, 1622.

Fig. 62. Reticulate, planar growth form, *Subergorgia reticulata* (Ellis & Solander), from Ellis & Solander, 1786.



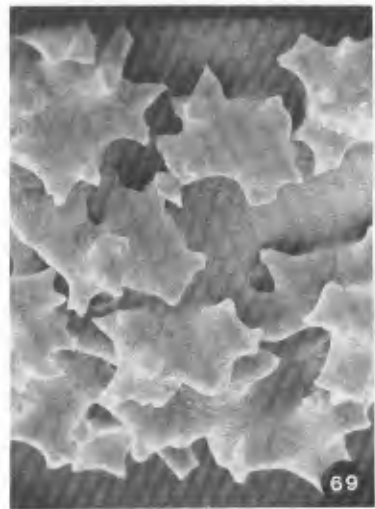
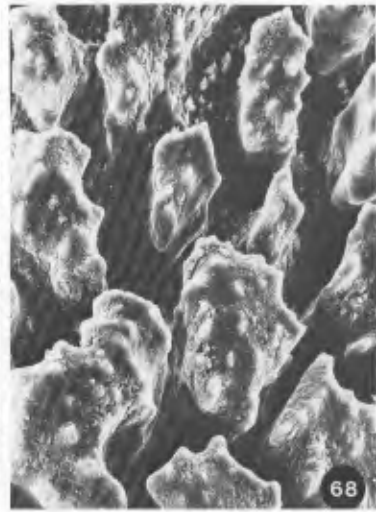
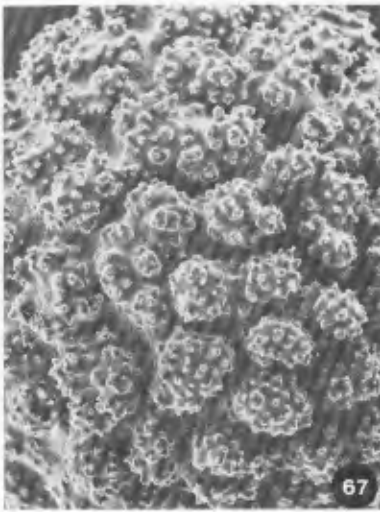
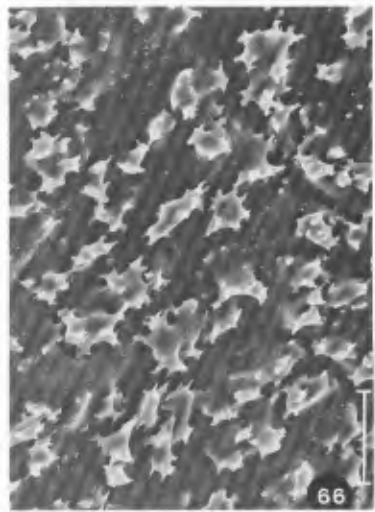
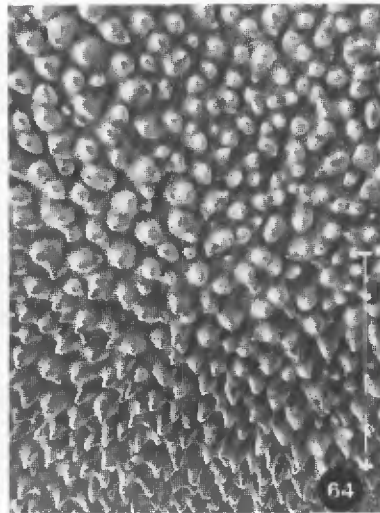
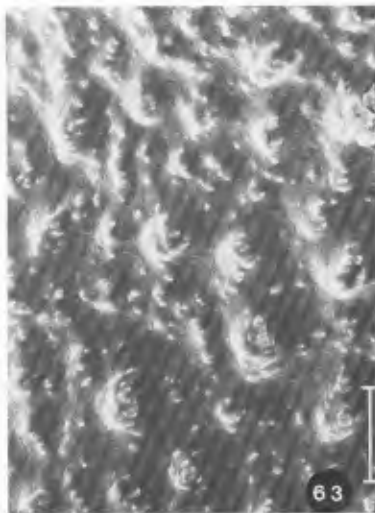
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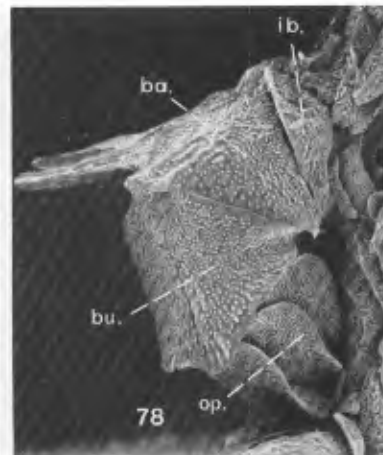
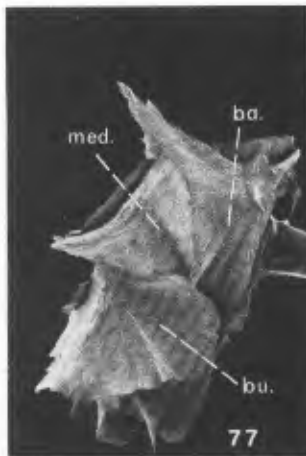
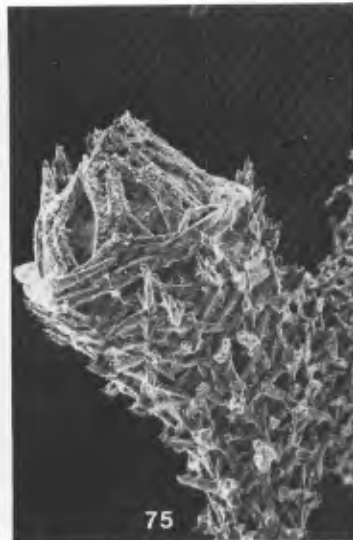
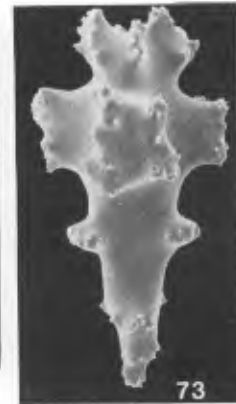
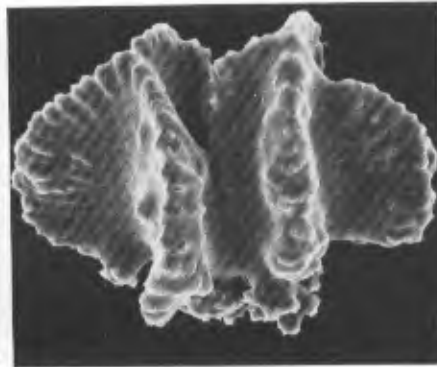
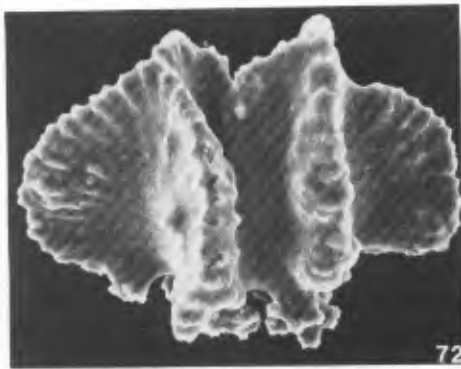
EXPLANATION OF PLATE 13

- Fig. 63. Granular sculpture, outer surface of plate. *Narella* sp. x630.
Fig. 64. Dense thorny sculpture, outer surface of plate. *Primnoa resedaeformis* (Gunnerus). x155.
Fig. 65. Sparse tubercular sculpture of spindle. *Sinularia polydactyla* (Ehrenberg). x220.
Fig. 66. Tubercular sculpture, inner surface of plate. *Narella* sp. x630.
Fig. 67. Dense tubercular sculpture of spheroid. *Euplexaura erecta* Kükenthal. x375.
Fig. 68. Coarse tubercular sculpture, outer surface of plate. *Fanellia* sp. x630.
Fig. 69. Tubercular sculpture of spheroid. *Corallium borneense* Bayer. x630.
Fig. 70. Sparse thorny sculpture of spindle. *Dendronephthya* sp. x155.
Fig. 71. Tubercular sculpture of spindle. *Solenocaulon sterroclonium* Germanos. x945.



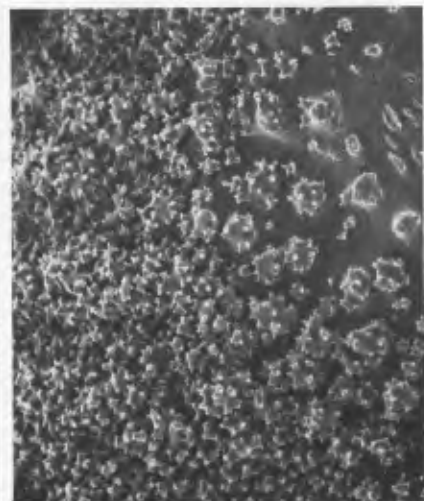
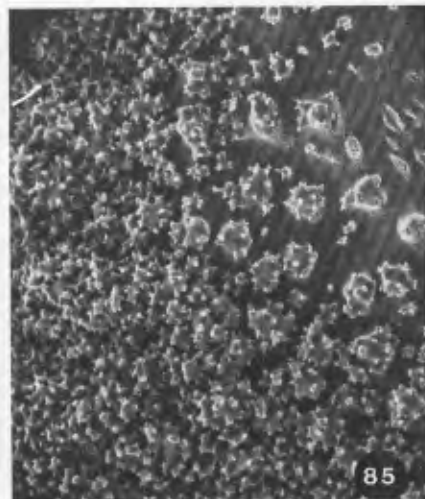
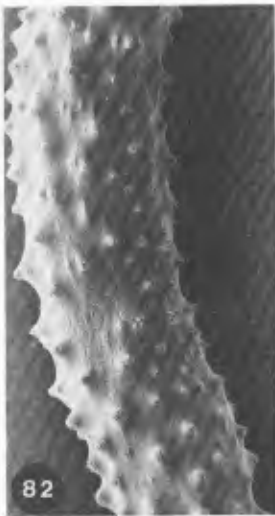
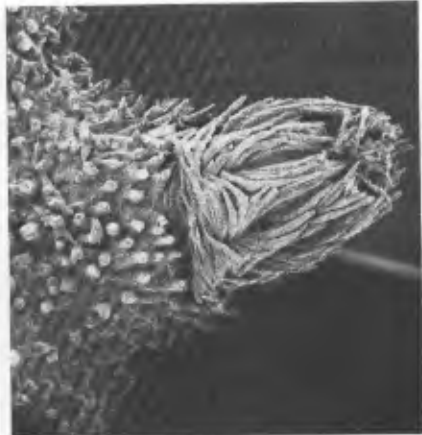
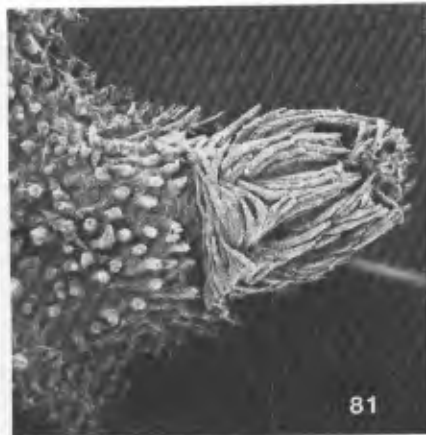
EXPLANATION OF PLATE 14

- Fig. 72. Tubercular sculpture fused to form disks. *Adelogorgia phyllosclera* Bayer. Stereo pair, x525.
- Fig. 73. Wart club with central wart. *Sinularia polydactyla* (Ehrenberg). x560.
- Fig. 74. Stachelkrone. *Acanthogorgia armata* Verrill. x5.
- Fig. 75. Crown and points, side view. *Villogorgia nigrescens* Duchassaing & Michelotti. x40.
- Fig. 76. Crown and points, oral view. *Villogorgia nigrescens* Duchassaing & Michelotti. x40.
- Fig. 77. Body scales. *Narella bowersi* (Nutting). x15. *bu.*, buccal scale; *ba.*, basal scale; *med.*, medial scale.
- Fig. 78. Body scales. *Paracalyptophora josephinae* (Lindstrom). x30. *bu.*, buccal scale; *ba.*, basal scale; *ib.*, infrabasal scale; *op.*, opercular scales.
- Fig. 79. Operculum. *Pterostenella plumatilis* (Milne Edwards & Haime). x50.



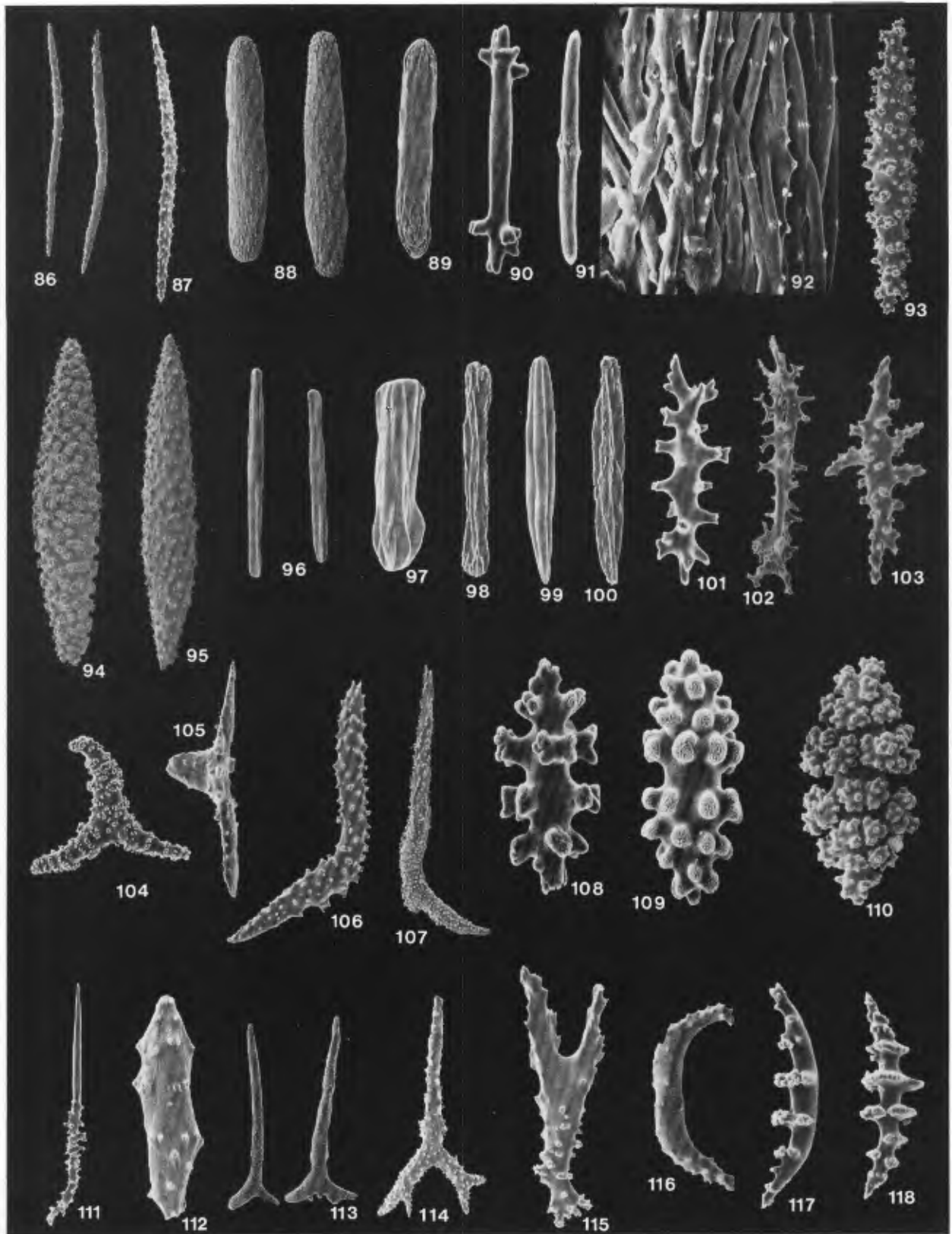
EXPLANATION OF PLATE 15

- Fig. 80. Volcano-shaped processes on spindle of *Sinularia leptoclados* (Ehrenberg). x60.
Fig. 81. Anthostele with exert crown and points. *Muriceides hirta* (Pourtalès). Stereo pair, x20.
Fig. 82. Low thorns on spindle of *Anthothela grandiflora* (Sars). x525.
Fig. 83. Anthostele with retracted crown and points. *Placogorgia* sp. Stereo pair, x30.
Fig. 84. Midsection of three-flanged rod of *Echinoptilum* sp. x525.
Fig. 85. Dense tubercular sculpture of spindle. *Muricea muricata* (Pallas). Stereo pair, x140.



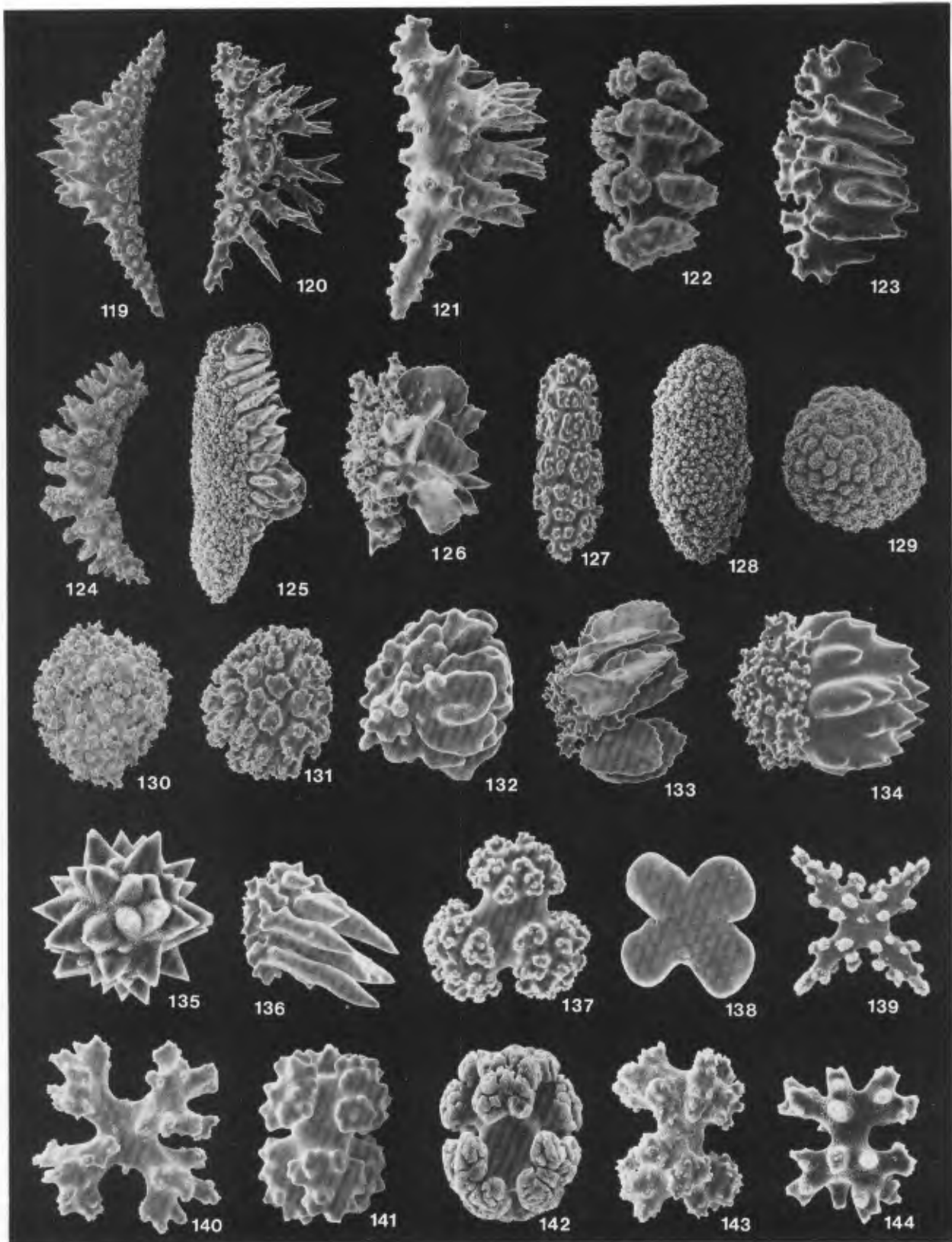
EXPLANATION OF PLATE 16

- Fig. 86. Needles. *Lemnalia humesi* Verseveldt. x100.
Fig. 87. Needle. *Taiaroa tauhou* Bayer & Muzik. x120.
Fig. 88. Rods. *Lepidisis* sp. x50.
Fig. 89. Rod. *Keratoisis ornata* (Verrill). x75.
Fig. 90. Rod with terminal whorls of projections. *Paragorgia arborea* (Linnaeus). x250.
Fig. 91. Rod with median whorl of projections. Axis of *Melithaea ochracea* (Linnaeus). x375.
Fig. 92. Fused rods of axis. *Melithaea ochracea* (Linnaeus). x250.
Fig. 93. Spindle. *Lytreaia plana* (Deichmann). x100.
Fig. 94. Spindle with complex tubercles. *Sinularia polydactyla* (Ehrenberg). x37.
Fig. 95. Spindle with blunt spines. *Sinularia polydactyla* (Ehrenberg). x33.
Fig. 96. Three-flanged rods. *Ptilosarcus sinuosus* Gray. x125.
Fig. 97. Three-flanged rod. *Stachyptilum superbum* Studer. x100.
Fig. 98. Three-flanged rod with serrated edges. *Umbellula guentheri* Kölliker. x100.
Fig. 99. Three-flanged spindle. *Stachyptilum superbum* Studer. x125.
Fig. 100. Three-flanged spindle with serrated edges. *Umbellula guentheri* Kölliker. x100.
Fig. 101. Spiny spindle. *Paragorgia arborea* (Linnaeus). x200.
Fig. 102. Anastomosing branched spindles. *Carijoa* sp. x175.
Fig. 103. Branched spindle. *Echinogorgia flexilis* Thomson & Simpson. x90.
Fig. 104. Branched spindle. *Briareum asbestinum* (Pallas). x75.
Fig. 105. Unilaterally spined flat spindle. *Muriceides hirta* (Pourtales). x100.
Fig. 106. Bent spindle. *Bebryce grandis* Deichmann. x100.
Fig. 107. Hockeystick spindle. *Paramuricea echinata* Deichmann. x35.
Fig. 108. Girdled spindle. *Paragorgia arborea* (Linnaeus). x375.
Fig. 109. Double cone. *Ellisella grandis* (Verrill). x375.
Fig. 110. Double cone. *Adelogorgia telones* Bayer. x250.
Fig. 111. Crown spine. *Acanthogorgia armata* Verrill. x50.
Fig. 112. Shuttle. *Lobophytum meandriforme* Tixier-Durivault. x175.
Fig. 113. Crutches. *Echinomuricea* sp. x37.
Fig. 114. Crutch. *Echinisis armata* Kükenthal. x50.
Fig. 115. Bifurcated rod. *Bebryce grandis* Deichmann. x150.
Fig. 116. Crescent. *Anthomuricea argentea* Wright & Studer. x110.
Fig. 117. Scaphoid (smooth). *Gorgonia ventalina* Linnaeus. x300.
Fig. 118. Scaphoid (with transverse crests). *Pseudopterogorgia bipinnata* (Verrill). x250.



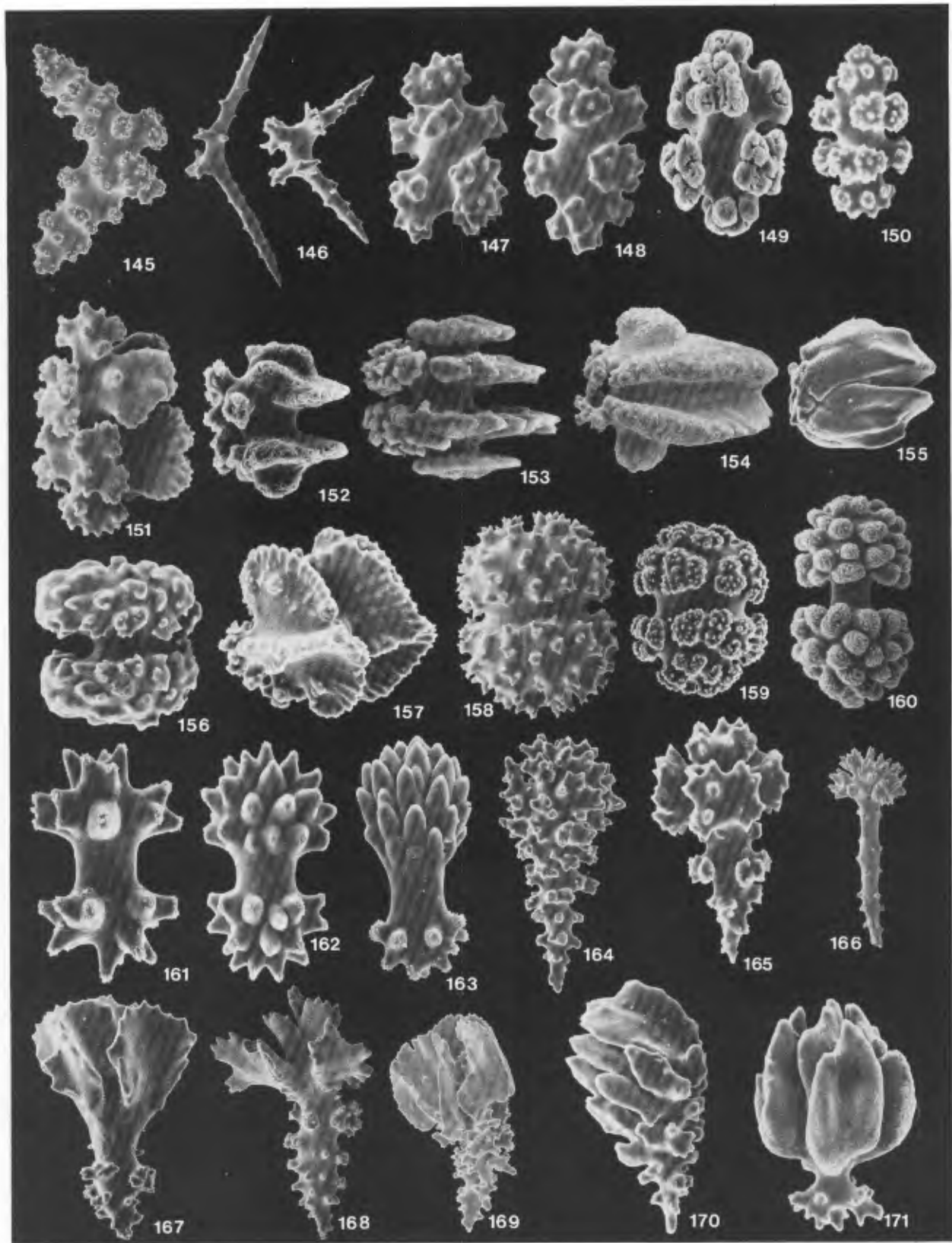
EXPLANATION OF PLATE 17

- Fig. 119. Unilaterally spinose spindle. *Echinogorgia* sp. x75.
Fig. 120. Unilaterally spinose spindle. *Cyclomuricea* sp. x60.
Fig. 121. Caterpillar. *Litophyton viride* Forskål. x200.
Fig. 122. Disk spindle. *Leptogorgia virgulata* (Lamarck). x500.
Fig. 123. Disk spindle. *Wrightella coccinea* (Ellis & Solander). x375.
Fig. 124. Leaf spindle. *Muriceopsis flavida* (Lamarck). x110.
Fig. 125. Leaf spindle. *Echinogorgia* sp. x140.
Fig. 126. Leaf spindle. *Menella praelonga* (Ridley). x65.
Fig. 127. Cylinder. *Lobophytum meandriforme* Tixier-Durivault. x150.
Fig. 128. Oval. *Discogorgia campanulifera* Nutting. x75.
Fig. 129. Tuberculate spheroid. *Euplexaura erecta* Kükenthal. x110.
Fig. 130. Tuberculate spheroid. *Corallium abyssale* Bayer. x100.
Fig. 131. Tuberculate spheroid. *Fanellia compressa* (Gray). x270.
Fig. 132. Foliate spheroid. *Pleurogorgia plana* Versluys. x375.
Fig. 133. Unilaterally foliate spheroid. *Mopsella* sp. x130.
Fig. 134. Unilaterally foliate spheroid. *Wrightella coccinea* (Ellis & Solander). x250.
Fig. 135. Spiny ball. *Asterospicularia randalli* Gawel. x625.
Fig. 136. Unilaterally spiny spheroid. *Mopsella* sp. x250.
Fig. 137. Triradiate. *Titanideum frauenfeldii* (Kölliker). x350.
Fig. 138. Cross. *Cavernulina* sp. x300.
Fig. 139. Cross. *Ellisella* sp. x375.
Fig. 140. Cross. *Gersemia rubiformis* (Ehrenberg). x375.
Fig. 141. Six-radiate. *Corallium borneense* Bayer. x375.
Fig. 142. Six-radiate. *Paragorgia arborea* (Linnaeus). x750.
Fig. 143. Six-radiate. *Epiphaxum micropora* (Bayer & Muzik). x375.
Fig. 144. Six-radiate. *Alcyonium digitatum* Linnaeus. x500.



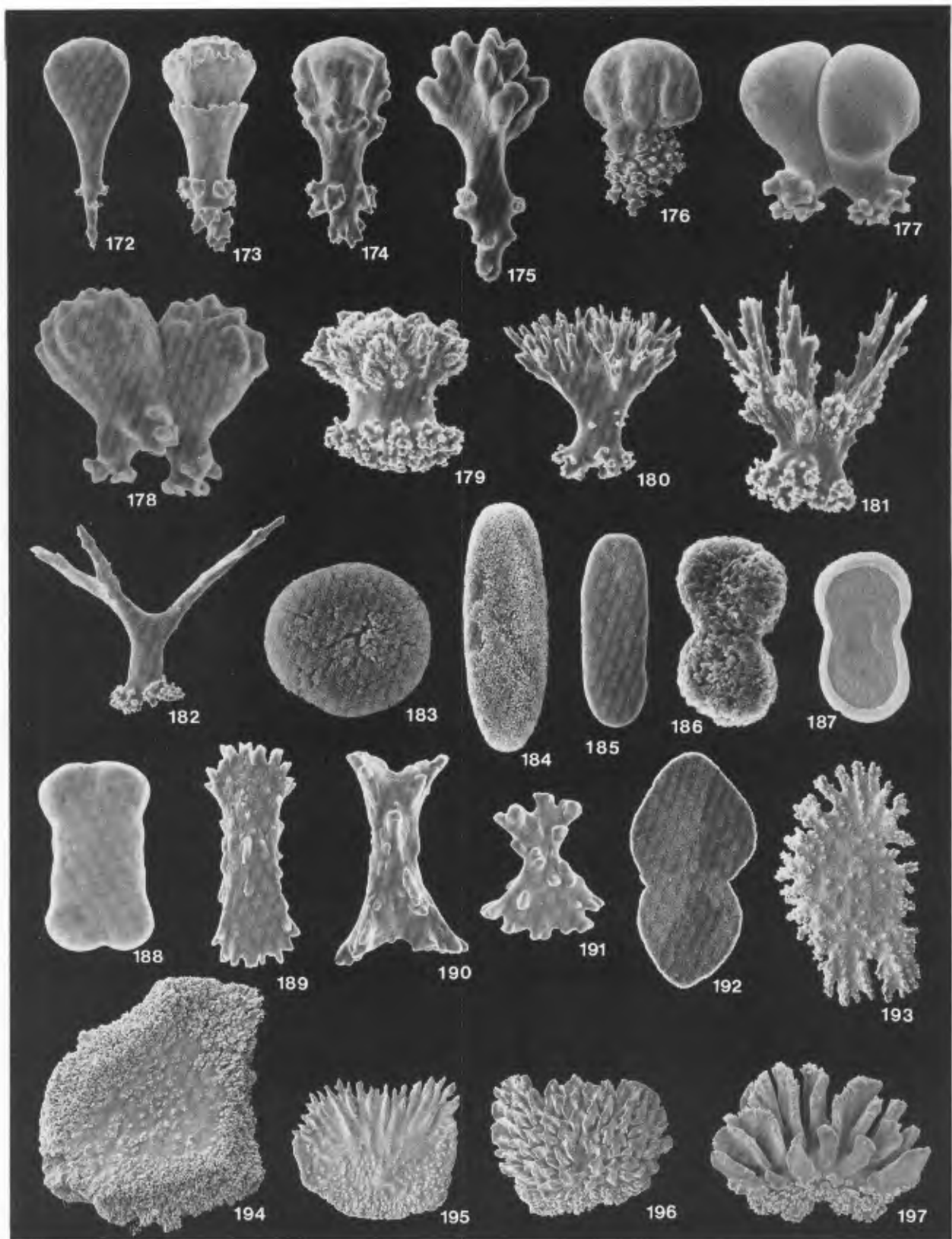
EXPLANATION OF PLATE 18

- Fig. 145. Butterfly. *Plexaurella dichotoma* (Esper). x150.
Fig. 146. Brackets. *Lemnalia humesi* Verseveldt. x250.
Fig. 147. Seven-radiate. *Corallium borneense* Bayer. x375.
Fig. 148. Eight-radiate. *Corallium borneense* Bayer. x375.
Fig. 149. Eight-radiate. *Paragorgia arborea* (Linnaeus). x625.
Fig. 150. Eight-radiate (capstan). *Lophogorgia flammea* (Ellis & Solander). x375.
Fig. 151. Foliate capstan. *Swiftia* sp. x125.
Fig. 152. Double disk. *Subergorgia mollis* (Nutting). x625.
Fig. 153. Double disk. *Eugorgia ampla* Verrill. x750.
Fig. 154. Double disk. *Adelogorgia telones* Bayer. x375.
Fig. 155. Double disk. *Melitella splendens* (Nutting). x500.
Fig. 156. Double disk. *Thesea nivea* Deichmann. x300.
Fig. 157. Double disk in oblique view. *Adelogorgia phyllosclera* Bayer. x325.
Fig. 158. Barrel. *Minabea* sp. x375.
Fig. 159. Double head. *Subergorgia suberosa* (Pallas). x250.
Fig. 160. Double head (Dumb-bell). *Ellisella atlantica* (Bielschowsky). x750.
Fig. 161. Double star. *Junceella* sp. x500.
Fig. 162. Double star (tending toward club). *Junceella juncea* (Pallas). x375.
Fig. 163. Club. *Junceella* sp. x500.
Fig. 164. Wart club. *Acabaria erythraea* (Ehrenberg). x225.
Fig. 165. Wart club. *Hicksonella princeps* Nutting. x375.
Fig. 166. Thorn club. *Sinularia polydactyla* (Ehrenberg). x150.
Fig. 167. Leaf club. *Plexaura flexuosa* Lamouroux. x300.
Fig. 168. Torch. *Eunicea mammosa* Lamouroux. x200.
Fig. 169. Leaf club. *Mopsella* sp. x100.
Fig. 170. Leaf club. *Mopsella* sp. x250.
Fig. 171. Leaf club. *Mopsella* sp. x300.



EXPLANATION OF PLATE 19

- Fig. 172. Balloon club. *Eunicella modesta* Verrill. x225.
Fig. 173. Balloon club. *Eunicella alba* (Esper). x400.
Fig. 174. Balloon club. *Eunicella verrucosa* (Pallas). x480.
Fig. 175. Leptoclados club. *Sinularia leptoclados* (Ehrenberg). x500.
Fig. 176. Rooted head. *Echinogorgia* sp. x150.
Fig. 177. Double club. *Corallium borneense* Bayer. x500.
Fig. 178. Double club. *Corallium medea* Bayer. x500.
Fig. 179. Rosette. *Bebryce* sp. x250.
Fig. 180. Rosette (Double cup). *Bebryce grandis* Deichmann. x200.
Fig. 181. Rosette (Double cup). *Bebryce* sp. x360.
Fig. 182. Spiny Rosette. *Lytreia plana* (Deichmann). x135.
Fig. 183. Platelet. *Xenia* sp. x1750.
Fig. 184. Fingerbiscuit. *Clavularia viridis* Quoy & Gaimard. x1000.
Fig. 185. Fingerbiscuit. *Ptilosarcus gurneyi* (Gray). x375.
Fig. 186. Platelet. *Ifalukella yanii* Bayer. x1000.
Fig. 187. Platelet. *Scytalium splendens* (Thomson & Henderson). x500.
Fig. 188. Bone-shaped plate. *Cavernulina* sp. x300.
Fig. 189. Plate. *Sclerobelemnon theseus* Bayer. x200.
Fig. 190. Plate. *Cavernulina darwini* Hickson. x125.
Fig. 191. Plate. *Cavernulina darwini* Hickson. x125.
Fig. 192. Scale. *Chalcogorgia pellucida* Bayer. x200.
Fig. 193. Stellate plate. *Scleranthelia rugosa* (Pourtalès). x100.
Fig. 194. Plate. *Scleranthelia rugosa* (Pourtalès). x45.
Fig. 195. Scale. *Callogorgia formosa* Kükenthal. x75.
Fig. 196. Plate. *Fanellia* sp. x100.
Fig. 197. Body scale with cristate ornamentation. *Callogorgia* sp. x100.



EXPLANATION OF PLATE 20

- Fig. 198. Circular plate. *Bebryce* sp. x200.
Fig. 199. Stellate plate. *Bebryce cinerea* Deichmann. x150.
Fig. 200. Stellate plate. *Bebryce* sp. x325.
Fig. 201. Stellate plate. *Bebryce grandis* Deichmann. x110.
Fig. 202. Villogorgia-type sclerite. *Villogorgia* sp. x250.
Fig. 203. Antlers. *Dendronephthya* sp. x250.
Fig. 204. Twisted scale. *Lignella richardi* (Lamouroux). x400.
Fig. 205. Thornstar. *Echinomuricea coccinea* (Simpson). x75.
Fig. 206. Thornscale. *Paramuricea placomus* (Linnaeus). x60.
Fig. 207. Thornscale. *Paramuricea placomus* (Linnaeus). x150.
Fig. 208. Thornscale. *Astromuricea polyklados* Germanos. x150.
Fig. 209. Thornscale. *Muriceides hirta* (Pourtalès). x150.
Fig. 210. Thornstar. *Echinomuricea* sp. x75.
Fig. 211. Thornscale. *Astromuricea theophilasi* Germanos. x100.
Fig. 212. Rooted leaf. *Echinogorgia* sp. x100.
Fig. 213. Rooted leaf. *Echinogorgia* sp. x100.
Fig. 214. Rooted leaf. *Echinogorgia flexilis* Thomson & Simpson. x75.
Fig. 215. Thornstar. *Paramuricea echinata* Deichmann. x60.
Fig. 216. Thornstar. *Villogorgia gracilis* (Studer). x125.
Fig. 217. Thornstar. *Villogorgia nigrescens* Duchassaing & Michelotti. x100.
Fig. 218. Thornstar. *Villogorgia nigrescens* Duchassaing & Michelotti. x200.

