

REPORT
ON THE
SCIENTIFIC RESULTS
OF THE
VOYAGE OF H.M.S. CHALLENGER
DURING THE YEARS 1873-76

UNDER THE COMMAND OF
CAPTAIN GEORGE S. NARES, R.N., F.R.S.
AND THE LATE
CAPTAIN FRANK TOURLE THOMSON, R.N.

PREPARED UNDER THE SUPERINTENDENCE OF
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AND NOW OF
JOHN MURRAY
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REPORT on the RADIOLARIA collected by H.M.S. CHALLENGER during the years
1873-1876.

By ERNST HAECKEL, M.D., Ph.D., Professor of Zoology in the University of Jena.

PLATES.

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MAP, SHOWING THE GEOGRAPHICAL DISTRIBUTION OF THE RADIOLARIA.

PLATE 1.

Legion SPUMELLARIA.

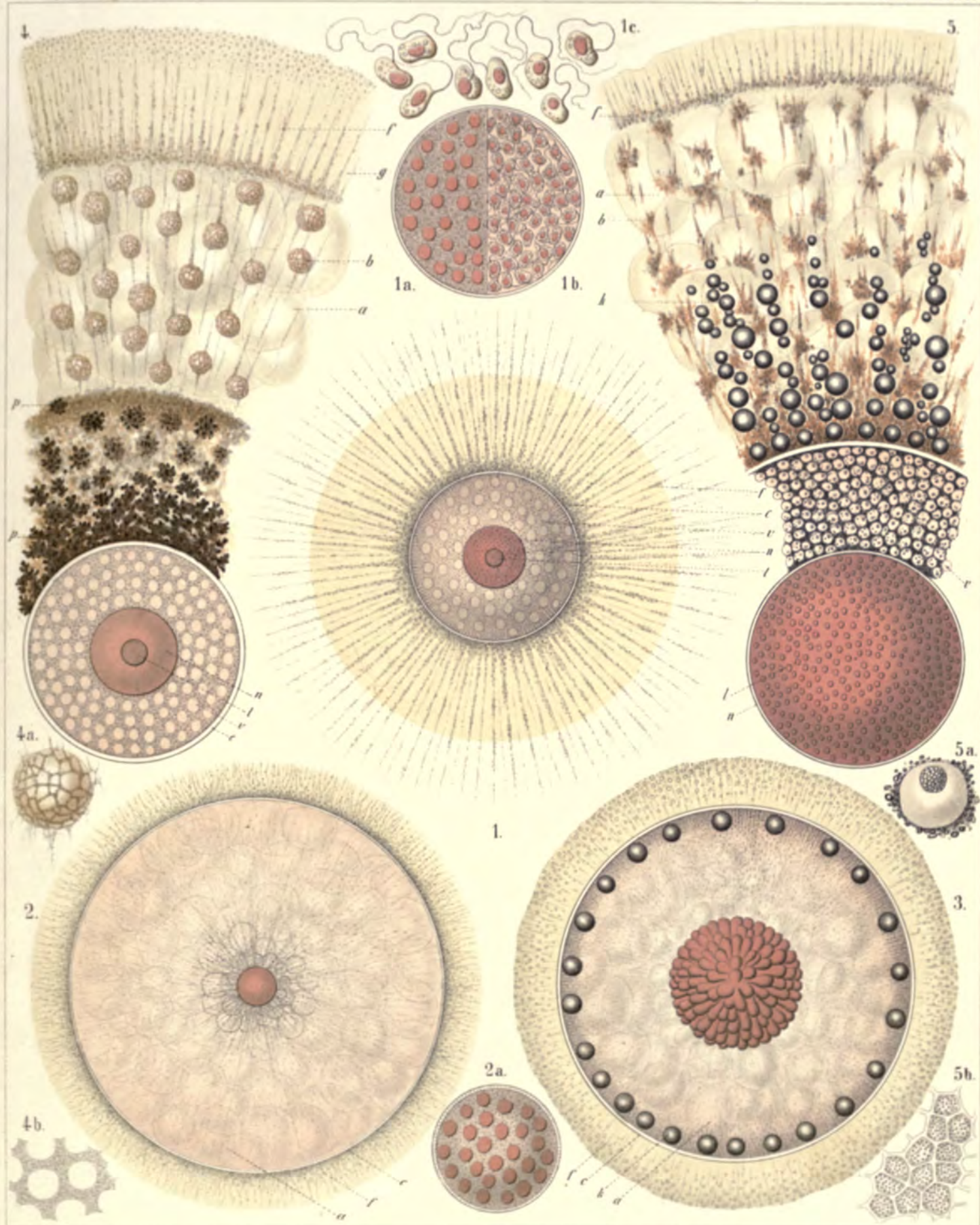
Order COLLOIDEA.

Family THALASSICOLLIDA.

PLATE 1.

THALASSICOLLIDA.

	Diam.	Page
Fig. 1. <i>Actissa princeps</i> , n. sp.,	× 300	13
The entire living Spumellarium. <i>c</i> , The spherical central capsule containing finely granulated protoplasm, which is radially striated in the cortical zone; <i>v</i> , spherical vacuoles enclosed by the protoplasm; <i>n</i> , the spherical nucleus in the centre; <i>l</i> , the concentric nucleolus; <i>f</i> , the radial pseudopodia which pierce the calymma or the (yellowish) jelly-envelope of the central capsule and arise from the granular sarcomatrix.		
Fig. 1a. Half of the central capsule of another specimen, in which the original central nucleus is cleft into numerous small nuclei,	× 400	
Fig. 1b. Half of the central capsule of another specimen, filled up by flagellate spores,	× 400	
Fig. 1c. Eight isolated flagellate spores,	× 800	
Fig. 2. <i>Thalassolampe maxima</i> , n. sp.,	× 8	17
The entire living Spumellarium. <i>c</i> , The big spherical central capsule; <i>a</i> , the large alveoles filling the central capsule and surrounding a central nucleus; <i>f</i> , the pseudopodia piercing the extracapsular calymma.		
Fig. 2a. The nucleus alone, with numerous nucleoli,	× 30	
Fig. 3. <i>Thalassopila cladococcus</i> , n. sp.,	× 20	17
<i>c</i> , The big central capsule; <i>a</i> , numerous large alveoles contained in the central capsule; <i>k</i> , oil globules, many of which are placed in the radially striped cortical zone; the nucleus placed centrally, is covered with numerous radial apophyses or caecal sacs. <i>f</i> , The radially striped calymma.		
Fig. 4. <i>Thalassicolla maculata</i> , n. sp.,	× 100	21
<i>c</i> , The central capsule; <i>v</i> , vacuoles filling this capsule; <i>n</i> , the central nucleus; <i>l</i> , the concentric nucleolus; <i>g</i> , the voluminous calymma, a small radial piece of which is only represented; <i>a</i> , the large alveoles; <i>b</i> , peculiar exoplasmatic bodies; <i>p</i> , black pigment in the inner zone; <i>f</i> , the retracted pseudopodia in the outer zone.		
Fig. 4a. An exoplasmatic body,	× 300	
Fig. 4b. Vacuoles in the endoplasm,	× 300	
Fig. 5. <i>Thalassicolla melacapsa</i> , n. sp.,	× 300	21
<i>n</i> , The large nucleus; <i>l</i> , numerous small nucleoli inside the nucleus; <i>v</i> , the vacuoles filling up the central capsule and separated by black pigment; <i>a</i> , large alveoles in the calymma; <i>k</i> , oil globules; <i>b</i> , exoplasmatic bodies; <i>f</i> , the retracted pseudopodia in the outer zone of the calymma.		
Fig. 5a. An endoplasmatic vacuole, resembling a cell,	× 600	
Fig. 5b. A piece of the central capsule,	× 600	



1. ACTISSA, 2. THALASSOLAMPE, 3. THALASSOPILA,
4. 5. THALASSOCOLLA.

PLATE 2.

Legion SPUMELLARIA.

Order BELOIDEA.

Family THALASSOSPHERIDA.

PLATE 2.

THALASSOSPHERIDA.

- | | Diam. | Page |
|--|-------|------|
| Fig. 1. <i>Lampoxanthium pandora</i> , n. sp., | × 120 | 38 |
| The central capsule exhibits distinct pore-canals in its membrane, and a clear interval between this and the coagulated and vacuolated protoplasm. The central nucleus contains numerous dark nucleoli. The spicula are scattered throughout the alveolate calymma. | | |
| Fig. 2. <i>Thalassoplancta brevispicula</i> , n. sp. (vel <i>Lampoxanthium brevispiculum</i>), | × 120 | 36 |
| The central capsule contains numerous clear vacuoles, and in the cortical zone a layer of large oil-globules. The central nucleus includes numerous dark nucleoli. The calymma is alveolate. The spicula lie only in the cortical zone. | | |
| Fig. 3. <i>Thalassoxanthium cervicorne</i> , n. sp., | × 300 | 33 |
| The central capsule is filled up by clear vacuoles and contains a large central nucleus, with a single nucleolus. The spicula surround the thin calymma. | | |
| Fig. 4. <i>Thalassoxanthium cervicorne</i> , n. sp., | × 600 | 33 |
| A single spiculum. | | |
| Fig. 5. <i>Thalassoxanthium medusinum</i> , n. sp., | × 120 | 32 |
| The central capsule is filled up by clear vacuoles and contains on its cortical zone a layer of large oil-globules. The central nucleus contains numerous dark nucleoli. The calymma is radially striped, contains numerous small xanthellæ, and is surrounded by the spicula. | | |
| Fig. 6. <i>Thalassoxanthium octoceras</i> , n. sp., | × 400 | 34 |
| Three isolated spicula. | | |

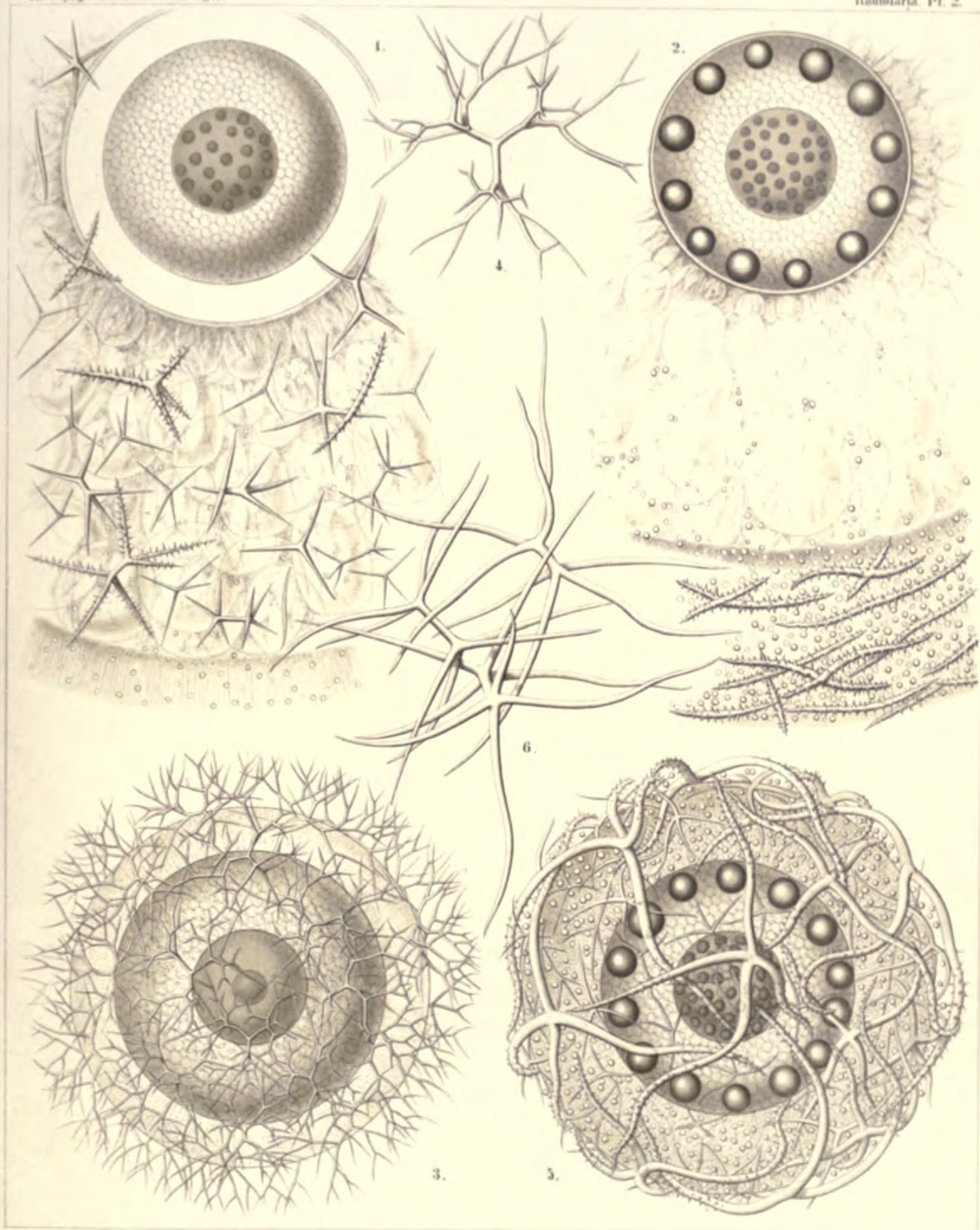


PLATE 3.

Legion SPUMELLARIA.

Order COLLOIDEA.

Family COLLOZOIDA.

PLATE 3.

COLLOZOIDA.

		Diam.	Page
Fig. 1.	<i>Collozoum serpentinum</i> , n. sp. (vel <i>Collophidium serpentinum</i> , Hkl.), .	× 10	26
	A living cœnobium, with expanded pseudopodia. The spherical calymma (or the common jelly-mass of the colony) is alveolate and contains numerous cylindrical, serpentine, central capsules. Numerous yellow cells or xanthellæ are scattered between the radial pseudopodia in the periphery.		
Fig. 2.	<i>Collozoum serpentinum</i> , n. sp.,	× 50	26
	An isolated, cylindrical, worm-shaped, central capsule, with an axial series of oil-globules; the red points are nuclei.		
Fig. 3.	<i>Collozoum serpentinum</i> , n. sp.,	× 150	26
	An isolated, cylindrical, serpentine, central capsule. <i>k</i> , Oil-globules forming an axial series; <i>n</i> , densely placed, red-coloured nuclei; <i>c</i> , the capsule membrane under which are scattered small black pigment spots in the colourless cortical zone of the endoplasm; <i>a</i> , extracapsular alveoles; <i>x</i> , xanthellæ or "yellow cells."		
Fig. 4.	<i>Collozoum amœboides</i> , n. sp.,	× 100	28
	A spherical cœnobium or jelly-colony. Each amœboid central capsule contains an oil-globule; the small red points are nuclei.		
Fig. 5.	<i>Collozoum amœboides</i> , n. sp.,	× 400	28
	<i>c</i> , A single isolated central capsule; <i>n</i> , nuclei; <i>k</i> , oil-globule.		
Fig. 6.	<i>Collozoum vermiforme</i> , n. sp.,	× 30	27
	<i>g</i> , A spherical cœnobium or jelly-colony; <i>a</i> , large alveoles, forming a cortical zone; <i>c</i> , central capsules; <i>k</i> , oil-globules.		
Fig. 7.	<i>Collozoum vermiforme</i> , n. sp.,	× 100	27
	<i>c</i> , A single isolated central capsule; <i>x</i> , xanthellæ surrounding this central capsule; <i>k</i> , oil-globules; <i>n</i> , nuclei.		
Fig. 8.	<i>Collozoum ellipsoides</i> , n. sp.,	× 2	26
	A spherical colony; the red points are central capsules.		
Fig. 9.	<i>Collozoum ellipsoides</i> , n. sp.,	× 150	26
	<i>c</i> , A single isolated central capsule; <i>k</i> , oil-globules; <i>n</i> , nuclei.		
Fig. 10.	<i>Collozoum inerme</i> , Hkl.,	× 2	25
	An old, cylindrical, articulated cœnobium; the red points are central capsules.		
Fig. 11.	<i>Collozoum inerme</i> , Hkl.,	× 2	25
	A young cylindrical cœnobium; the red points are central capsules.		
Fig. 12.	<i>Collozoum inerme</i> , Hkl.,	× 400	25
	A piece of a young colony with eight small central capsules, without oil-globules. <i>n</i> , The central nucleus in different stages of division. Two capsules are also dividing. <i>x</i> , Xanthellæ in the jelly-like calymma (blue), which also contains numerous vacuoles.		

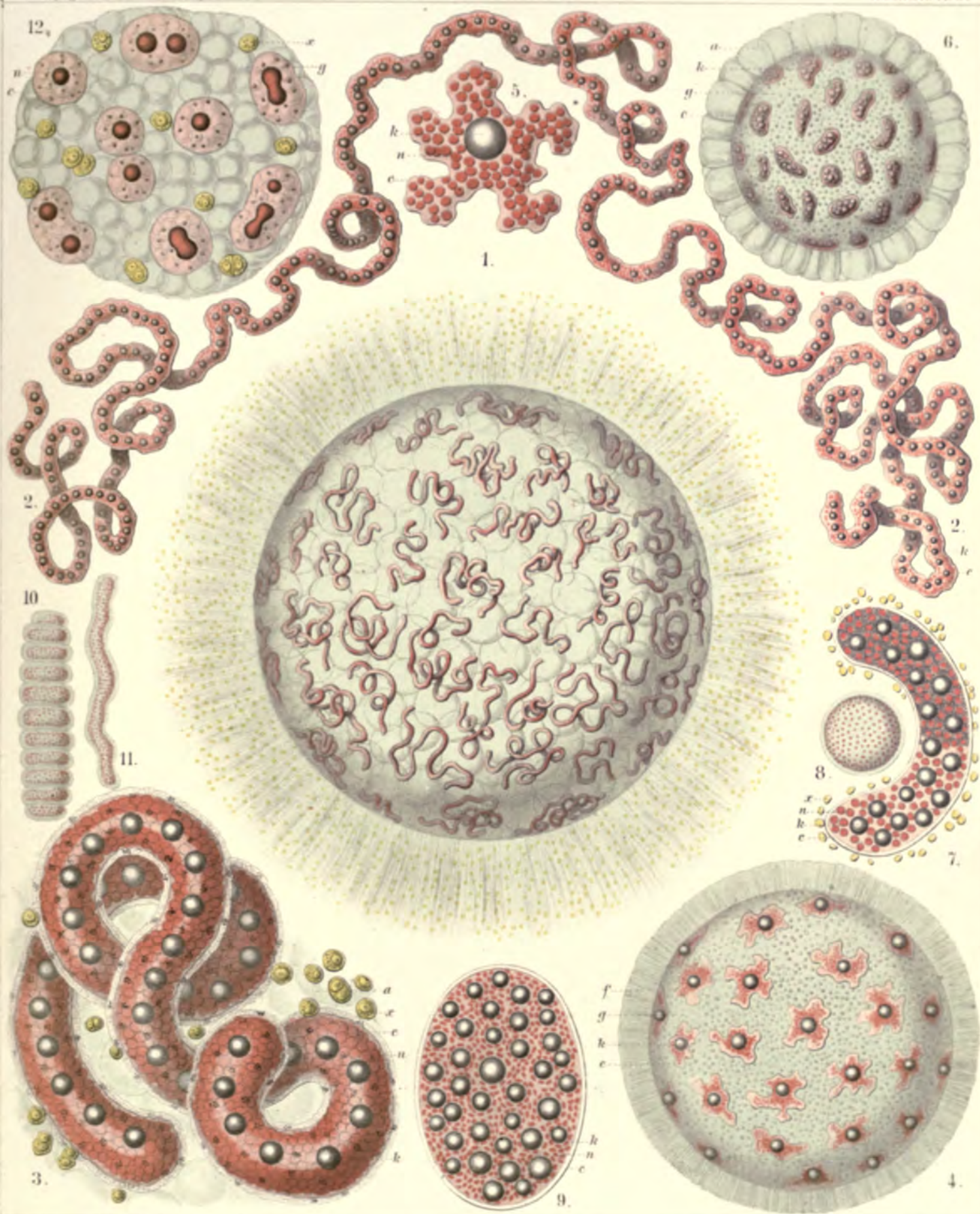


PLATE 4.

Legion SPUMELLARIA.

Order LARCOIDEA.

Family THOLONIDA.

PLATE 4.

SPHÆROZOIDA.

	Diam.	Page
Fig. 1. <i>Sphærozoum trigeminum</i> , n. sp.,	× 50	43
An annular colony. The main mass of the jelly-colony is filled up by large alveoles; the entire surface is densely covered with spicula, and beyond this skeleton-cover lie the spherical central capsules, each with an oil-globule. This species is by mistake not mentioned in the text.		
Fig. 2. <i>Sphærozoum alveolatum</i> , n. sp.,	× 50	43
Section through a spherical colony; displaying the inside of a hemisphere. All the central capsules lie in a single stratum on the surface of the jelly-sphere, each being surrounded by a thick-walled alveole. The spicula lie between the alveole and the capsule, which includes a central oil-globule.		
Fig. 3. <i>Sphærozoum alveolatum</i> , n. sp.,	× 400	43
A single central capsule, filled up by crystal-spores. Numerous geminato-radiate spicula and spherical xanthellæ lie between the capsule and the including thick-walled alveole. In the jelly-calymma, between the capsule and the alveole, numerous thin ramified pseudopodia are expanded.		
Fig. 4. <i>Sphærozoum geminatum</i> , n. sp.,	× 400	45
A single central capsule, with a central oil-globule, surrounded by numerous spicula and spherical xanthellæ. The jelly-substance of the calymma is expanded between the points of the spicula.		
Fig. 5. <i>Sphærozoum variabile</i> , n. sp.,	× 300	45
Three isolated spicula.		
Fig. 6. <i>Sphærozoum pandora</i> , n. sp. (vel <i>Rhaphidozoum pandora</i>),	× 300	49
A group of various spicula.		
Fig. 7. <i>Sphærozoum verticillatum</i> , n. sp.,	× 300	44
A single spiculum.		
Fig. 8. <i>Sphærozoum arborescens</i> , n. sp.,	× 300	44
A single spiculum.		
Fig. 9. <i>Sphærozoum armatum</i> , n. sp.,	× 300	43
A single spiculum.		

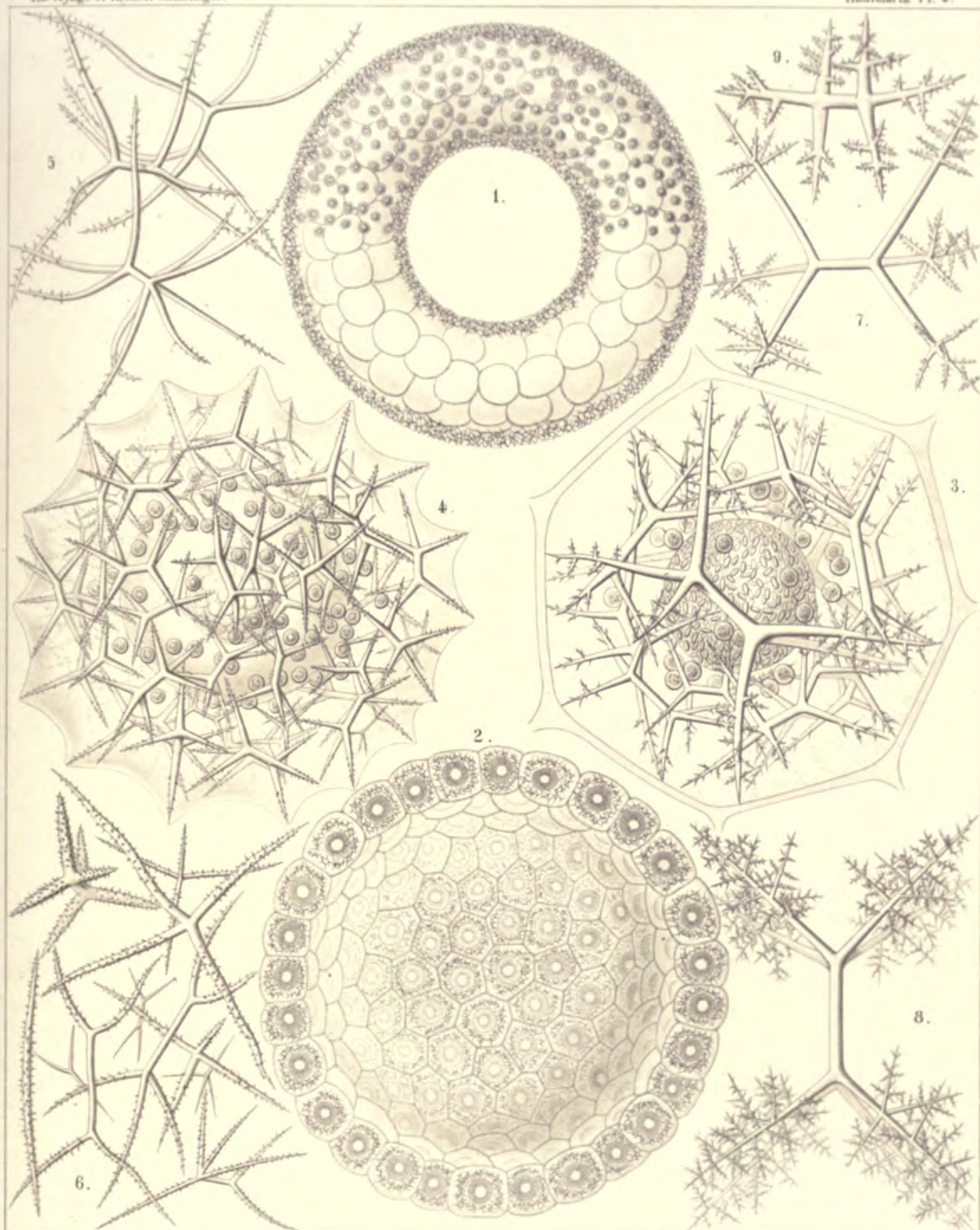


PLATE 5.

Legion SPUMELLARIA.

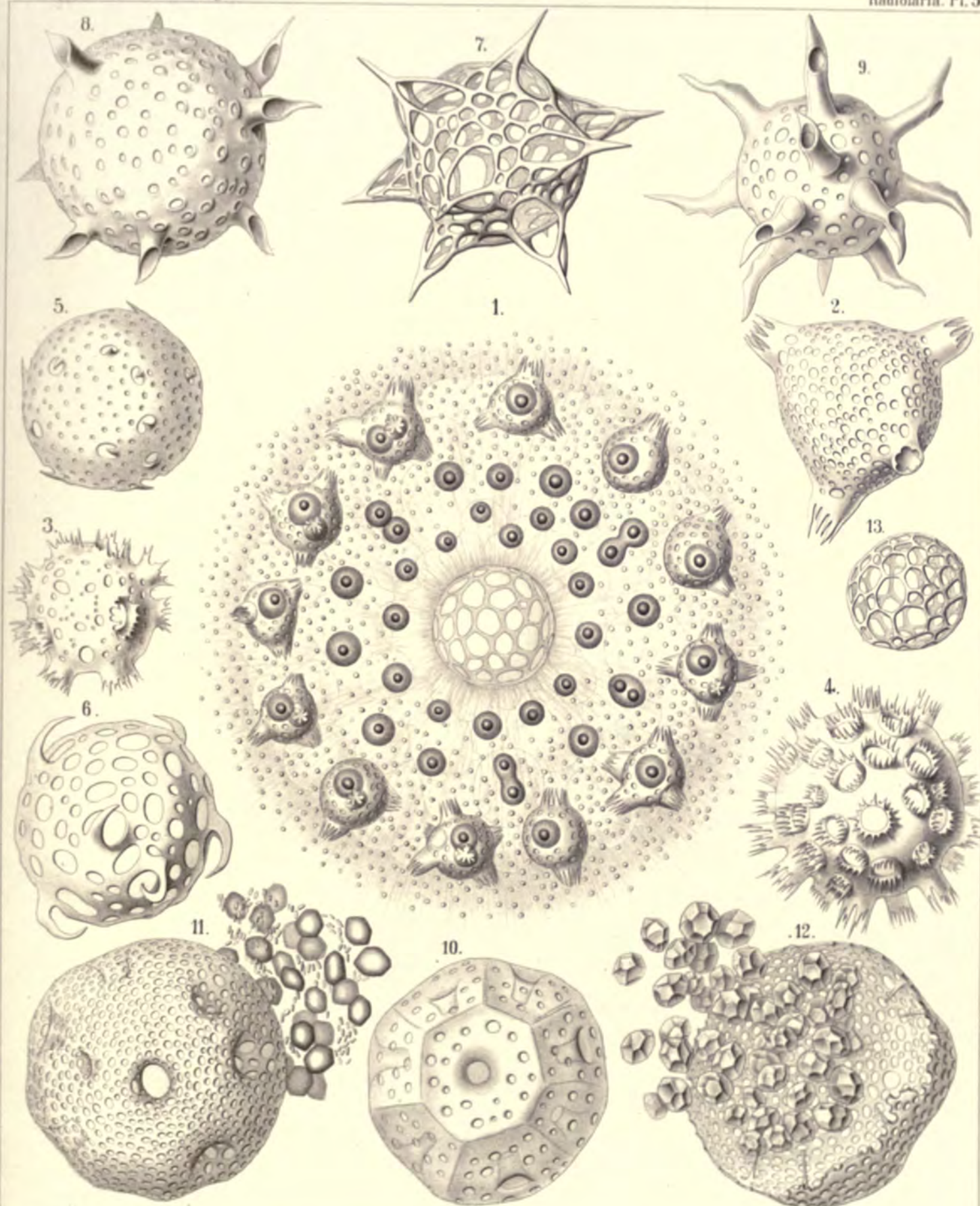
Order SPHÆROIDEA.

Family COLLOSPHÆRIDA.

PLATE 5.

COLLOSPHÆRIDA.

	Diam.	Page
Fig. 1. <i>Trypanosphæra transformata</i> , n. sp.,	× 150	111
A living colony. The centre of the spherical cœnobium contains a large alveole, surrounded by a net of sarcode. The entire calymma is filled up by smaller, thin-walled alveoles. Its inner part contains numerous small, young, central capsules (each with an oil-globule) without shells; in the cortical zone of the calymma lie larger capsules, each of which is enclosed by a fenestrated shell with from two to four or more dentated tubes. Between the radiant pseudopodia very numerous small yellow cells (xanthellæ), which are scattered everywhere.		
Fig. 2. <i>Trypanosphæra transformata</i> , n. sp.,	× 300	111
A single shell.		
Fig. 3. <i>Trypanosphæra coronata</i> , n. sp.,	× 300	110
Fig. 4. <i>Trypanosphæra trepanata</i> , n. sp.,	× 300	110
Fig. 5. <i>Odontosphæra monodon</i> , n. sp.,	× 300	102
Fig. 6. <i>Odontosphæra cyrtodon</i> , n. sp.,	× 300	102
Fig. 7. <i>Acrosphæra inflata</i> , n. sp.,	× 300	101
Fig. 8. <i>Mazosphæra hippotis</i> , n. sp.,	× 400	108
Fig. 9. <i>Mazosphæra lagotis</i> , n. sp.,	× 300	108
Fig. 10. <i>Pharyngosphæra stomodæa</i> , n. sp.,	× 400	98
Fig. 11. <i>Buccinosphæra invaginata</i> , n. sp.,	× 500	99
Each shell contains numerous larger and smaller crystals.		
Fig. 12. <i>Tribonosphæra centripetalis</i> , n. sp.,	× 500	98
Each shell contains numerous large crystals.		
Fig. 13. <i>Collosp hæra polygona</i> , n. sp.,	× 200	96



1-4. TRYPANOSPHERA, 5-9. MAZOSPHERA, 10. 11. BUCCINOSPHERA.
12. 13. COLLOSPHERA.

PLATE 6.

Legion SPUMELLARIA.

Order SPHÆROIDEA.

Family COLLOSPHÆRIDA.

PLATE 6.

COLLOSPHÆRIDA.

	Diam.	Page
Fig. 1. <i>Siphonosphaera socialis</i> , n. sp.,	× 500	106
A small piece of the surface of a living cœnobium, seen from the surface. Only four individuals are visible, the central capsule of which contains numerous small nuclei and a central oil-globule. The including spherical lattice-shell is provided with a few (one to four) larger apertures, which are prolonged into short cylindrical tubules. Through these latter radiate bundles of fine pseudopodia, branching and anastomosing, and forming a fine sarcode network between the alveoles of the calymma. On the surface of the alveolated jelly-sphere the pseudopodia form a dense radiating zone. Xanthella or yellow cells are everywhere scattered.		
Fig. 2. <i>Siphonosphaera socialis</i> , n. sp.,	× 300	106
A small cœnobium or colony in the state of alveolation, forming a jelly-sphere, composed of a great number of capsulated individuals, densely aggregated. Each central capsule contains an oil-globule, and is enclosed by a spherical lattice-shell, which bears a few (one to four) short cylindrical tubules. Each shell is again enveloped by a membranous polyhedral alveole and separated from it by structureless jelly. The thick cortical jelly-envelope, which surrounds the whole spherical colony, exhibits a fine radial striation, produced by radiating pseudopodia; many xanthellæ or yellow cells are scattered in the calymma.		
Fig. 3. <i>Siphonosphaera pipetta</i> , n. sp.,	× 300	108
Fig. 4. <i>Siphonosphaera tubulosa</i> , J. Müller,	× 300	105
The central capsule, enclosed in the cavity of the shell, has a central oil-globule, and is surrounded by a few xanthella.		
Fig. 5. <i>Siphonosphaera chonophora</i> , n. sp.,	× 300	107
Central capsule as in figs. 4 and 7.		
Fig. 6. <i>Siphonosphaera serpula</i> , n. sp.,	× 300	107
Fig. 7. <i>Siphonosphaera patinaria</i> , n. sp.,	× 300	105
The central capsule, enclosed in the cavity of the shell, contains a central oil-globule, and is surrounded by a few xanthella.		
Fig. 8. <i>Siphonosphaera patinaria</i> , n. sp.,	× 300	105
Fig. 9. <i>Siphonosphaera conifera</i> , n. sp.,	× 300	106
Fig. 10. <i>Siphonosphaera cyathina</i> , n. sp.,	× 300	105

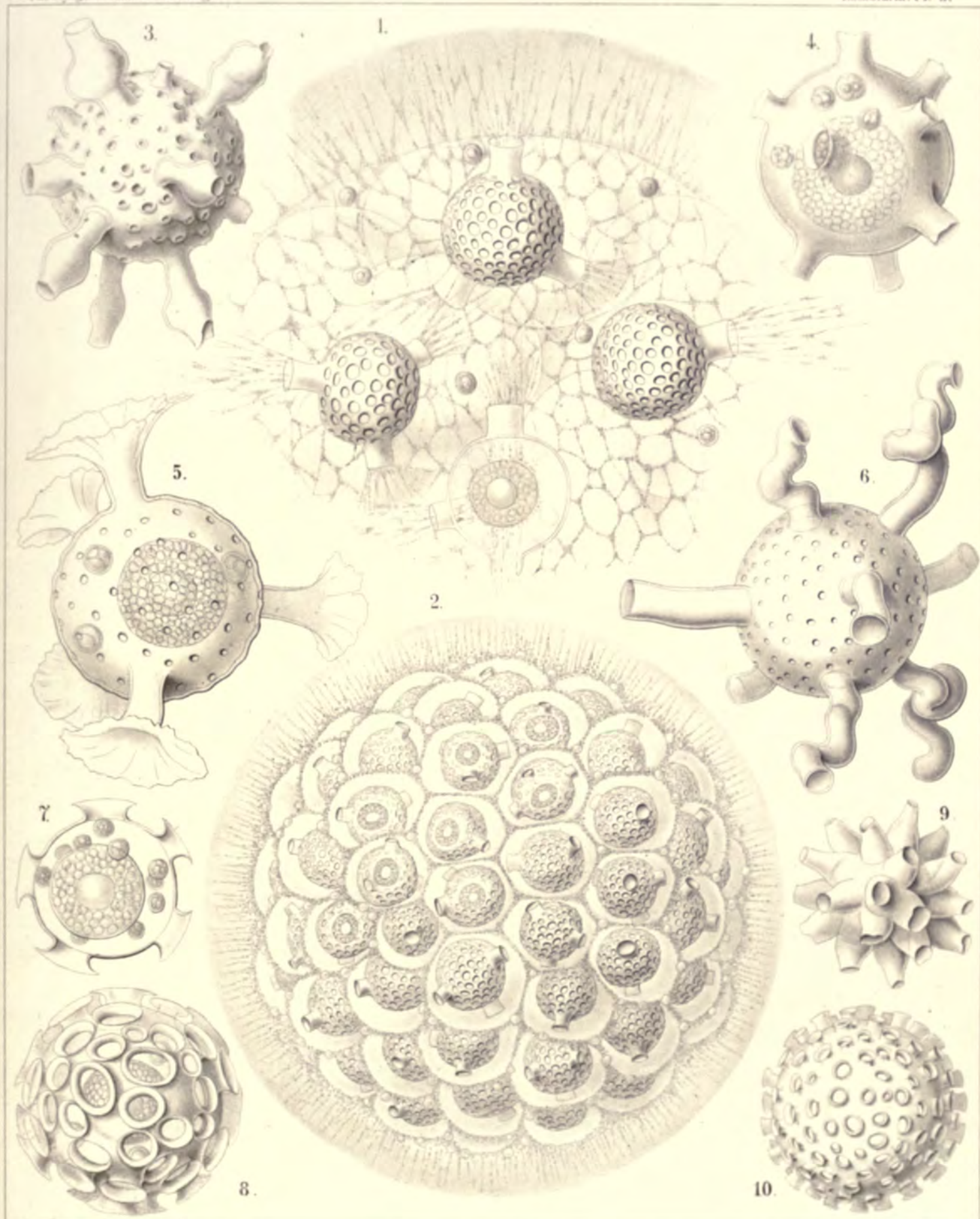


PLATE 7.

Legion SPUMELLARIA.

Order SPHÆROIDEA.

Family COLLOSPHÆRIDA.

PLATE 7.

COLLOSPHÆRIDA.

			Diam.	Page
Fig. 1.	<i>Caminosphæra dendrophora</i> , n. sp.,	.	× 300	112
Fig. 2.	<i>Caminosphæra dichotoma</i> , n. sp.,	.	× 300	112
Fig. 3.	<i>Coronosphæra diadema</i> , n. sp.,	.	× 300	117
Fig. 4.	<i>Coronosphæra calycina</i> , n. sp.,	.	× 300	117
Fig. 5.	<i>Otosphæra auriculata</i> , n. sp.,	.	× 300	116
Fig. 6.	<i>Otosphæra polymorpha</i> , n. sp.,	.	× 300	116
Fig. 7.	<i>Solenosphæra serpentina</i> , n. sp.,	.	× 300	114
Fig. 8.	<i>Solenosphæra cornucopia</i> , n. sp.,	.	× 300	115
Fig. 9.	<i>Solenosphæra ascensionis</i> , n. sp.,	.	× 300	115
Fig. 10.	<i>Solenosphæra pandora</i> , n. sp.,	.	× 300	113
Fig. 11.	<i>Solenosphæra pandora</i> , n. sp.,	.	× 100	113

An entire spherical cœnobium. The shells of the colony bear a variable number of fenestrated radial tubes and are densely crowded in the jelly-sphere of the calymma, the cortical zone of which is radially striped.

PLATE 8.

Legion SPUMELLARIA.

Order SPHÆROIDEA.

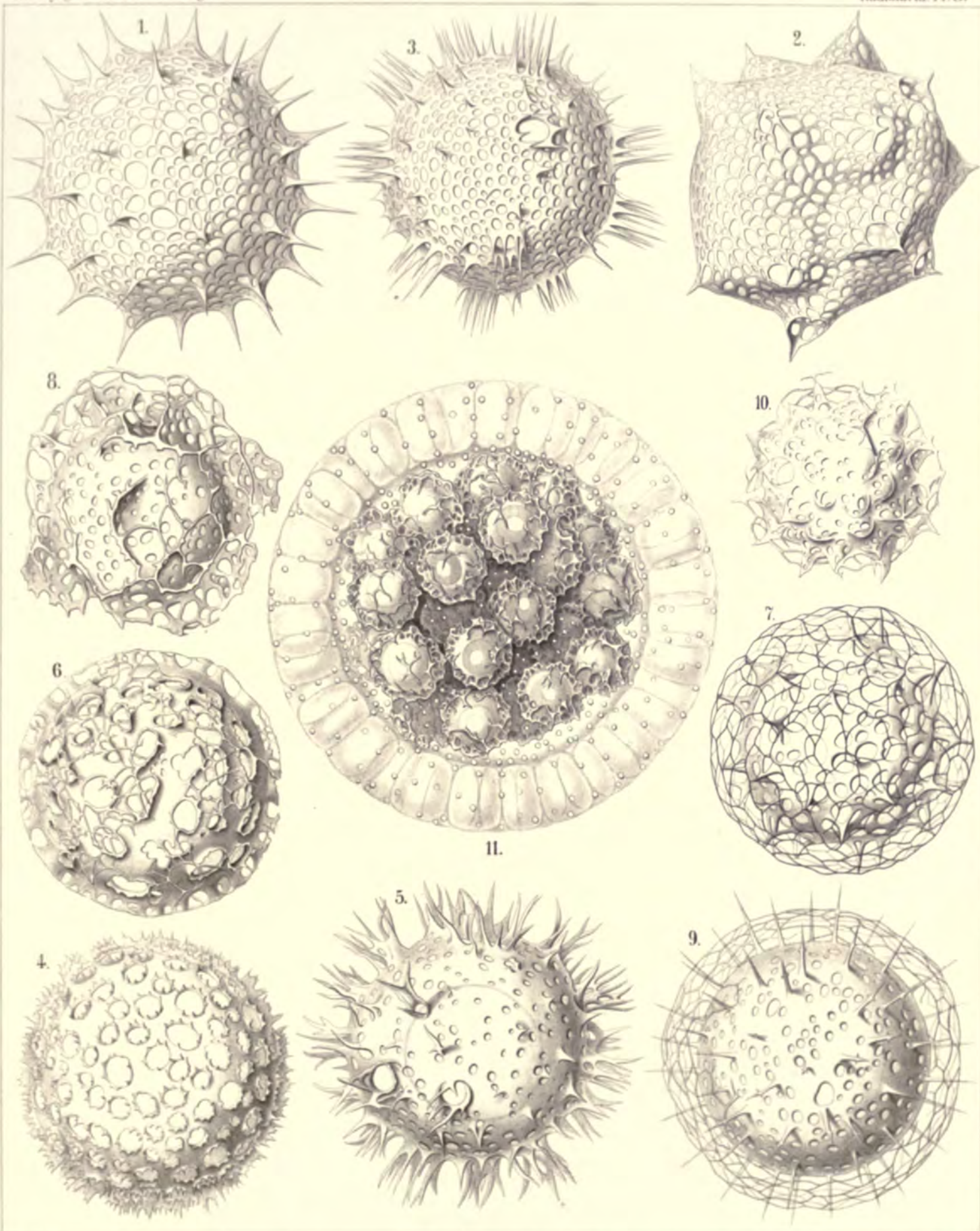
Family COLLOSPHÆRIDA.

PLATE 8.

COLLOSPHÆRIDA.

					Diam.	Page
Fig. 1.	<i>Acrosphæra echinoides</i> , n. sp.,	.	.	.	× 400	100
Fig. 2.	<i>Acrosphæra collina</i> , n. sp.,	.	.	.	× 300	101
Fig. 3.	<i>Chænicosphæra nassiterna</i> , n. sp.,	.	.	.	× 400	103
Fig. 4.	<i>Chænicosphæra murrayana</i> , n. sp.,	.	.	.	× 300	102
Fig. 5.	<i>Chænicosphæra flammabunda</i> , n. sp.,	.	.	.	× 300	103
Fig. 6.	<i>Clathrosphæra circumtexta</i> , n. sp.,	.	.	.	× 400	118
Fig. 7.	<i>Clathrosphæra arachnoides</i> , n. sp.,	.	.	.	× 300	119
Fig. 8.	<i>Clathrosphæra lamellosa</i> , n. sp.,	.	.	.	× 300	119
Fig. 9.	<i>Xanthiosphæra erinacea</i> , n. sp.,	.	.	.	× 400	120
Fig. 10.	<i>Xanthiosphæra lappacea</i> , n. sp.,	.	.	.	× 300	120
Fig. 11.	<i>Xanthiosphæra lappacea</i> , n. sp.,	.	.	.	× 100	120

A complete spherical cœnobium. The associated central capsules (each with a double shell) are densely crowded in the central part of the calymma, whilst its peripheral part is occupied by a layer of large alveoles. Numerous xanthellæ or yellow cells are scattered in the calymma.



1. 2. ACROSPHAERA, 3-5. CHOENICOSPHAERA, 6-8. CLATHROSPHAERA,
9-11. XANTHIOSPHAERA.

PLATE 9.

Legion SPUMELLARIA.

Order LARCOIDEA.

Family PYLONIDA.

PLATE 9.

PYLONIDA.

		Diam.	Page
Fig. 1.	<i>Monozonium alatum</i> , n. sp., Dorsal view. Fig. 1a. Apical view.	× 300	633
Fig. 2.	<i>Dizonium pleuracanthum</i> , n. sp.,	× 400	636
Fig. 3.	<i>Dizonium stauracanthum</i> , n. sp.,	× 300	636
Fig. 4.	<i>Trizonium tricinctum</i> , n. sp., Dorsal view. Fig. 4a. Lateral view. Fig. 4b. Apical view.	× 300	637
Fig. 5.	<i>Amphipyle tetraceros</i> , n. sp., Dorsal view.	× 400	642
Fig. 6.	<i>Amphipyle callizona</i> , n. sp., Dorsal view.	× 300	644
Fig. 7.	<i>Amphipyle amphiptera</i> , n. sp., Dorsal view. Fig. 7a. Lateral view.	× 300	642
Fig. 8.	<i>Tetrapyle circularis</i> , n. sp., Dorsal view.	× 300	645
Fig. 9.	<i>Tetrapyle pleuracantha</i> , n. sp., Dorsal view. The lentelliptical central capsule is visible between medullary and cortical shell.	× 400	646
Fig. 10.	<i>Tetrapyle turrita</i> , n. sp., Oblique view, half dorsal, half lateral.	× 400	649
Fig. 11.	<i>Octopyle stenozone</i> , n. sp., Dorsal view.	× 400	652
Fig. 12.	<i>Octopyle sexangulata</i> , n. sp., Dorsal view.	× 300	653
Fig. 13.	<i>Octopyle decastyle</i> , n. sp., Dorsal view. Fig. 13a. Lateral view.	× 300	654
Fig. 14.	<i>Pylonium quadricorne</i> , n. sp., Dorsal view.	× 400	655
Fig. 15.	<i>Tetrapylonium quadrangulare</i> , n. sp., Dorsal view.	× 300	658
Fig. 16.	<i>Pylozonium octacanthum</i> , n. sp., Dorsal view.	× 300	660

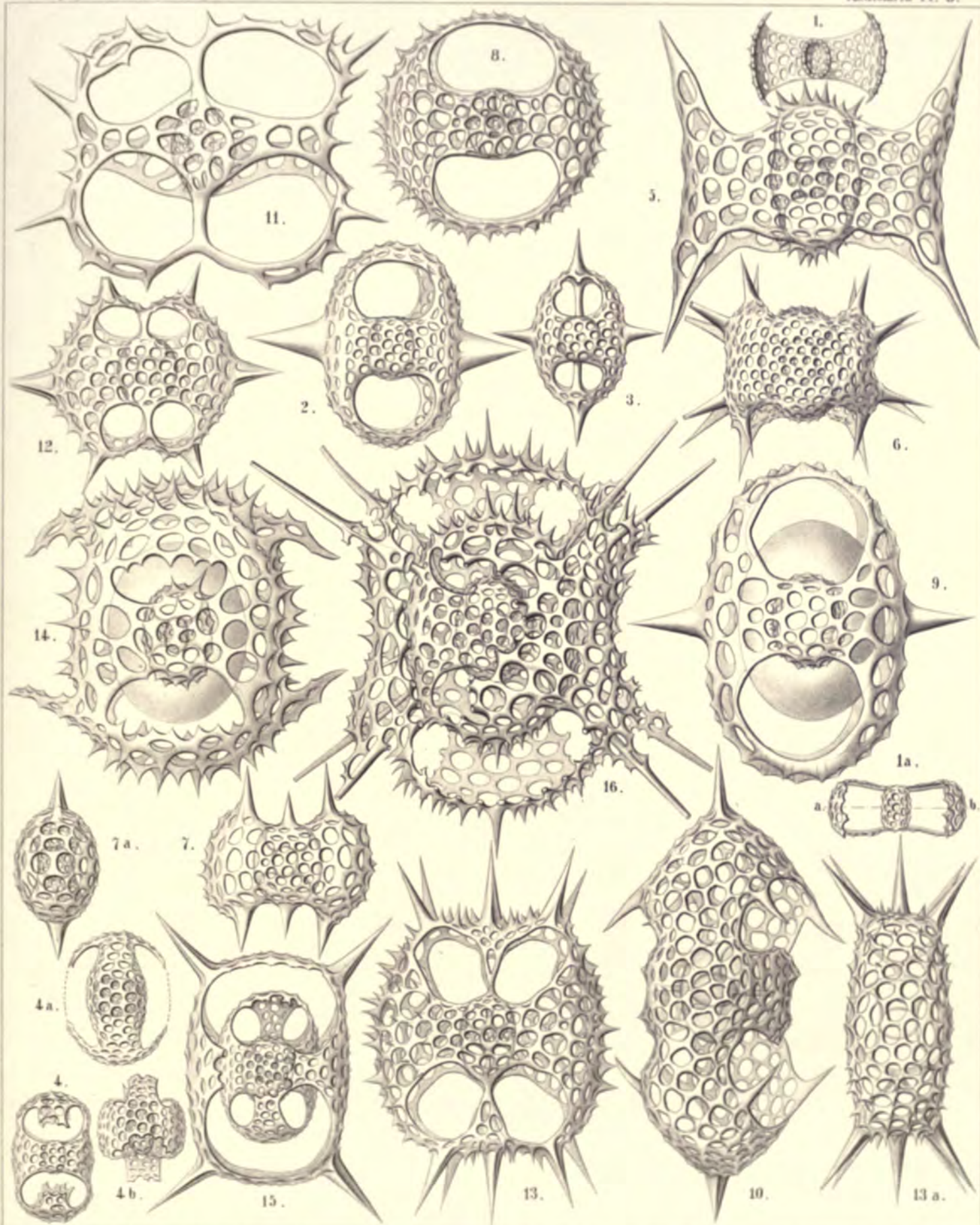


PLATE 10.

Legion SPUMELLARIA.

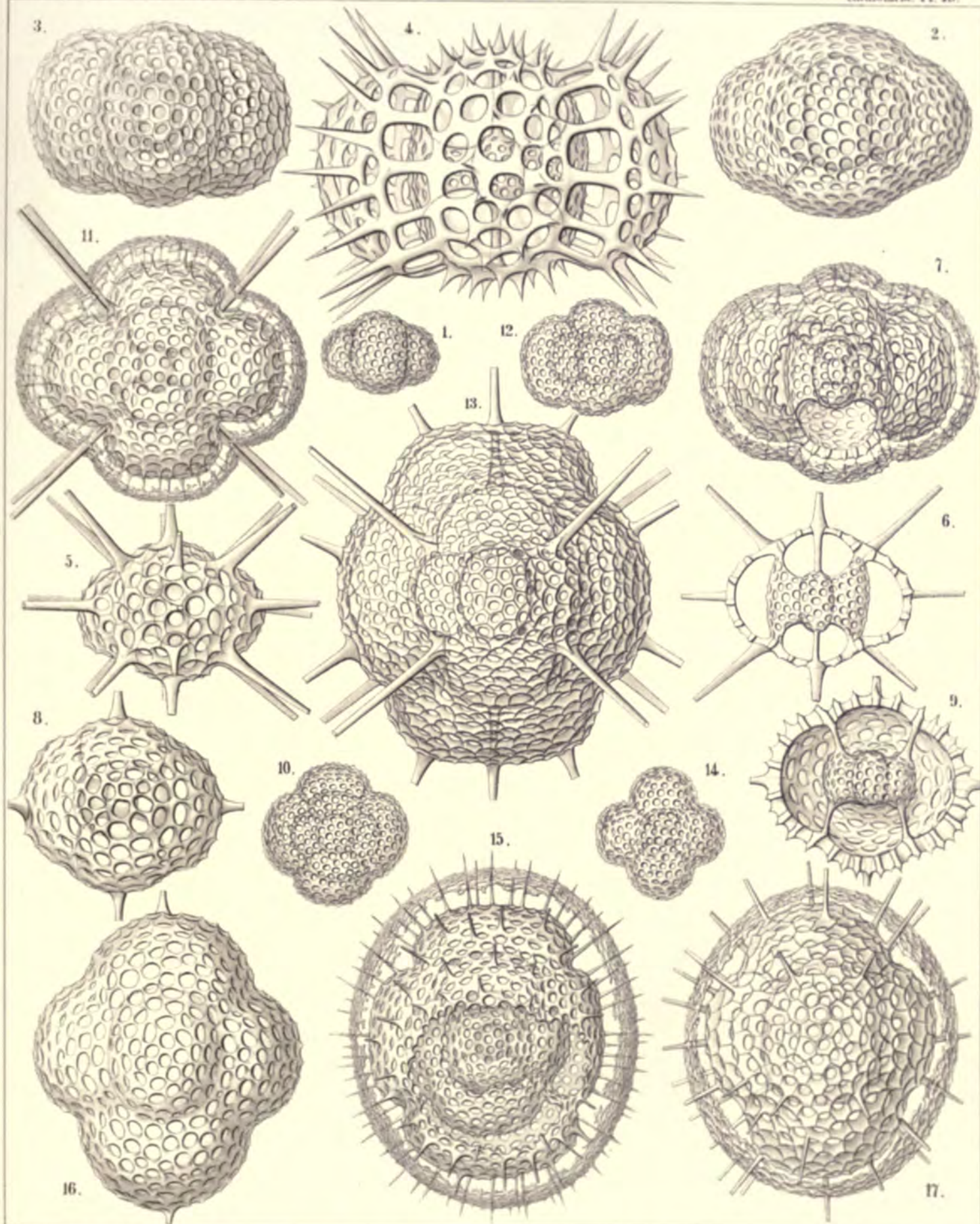
Order LARCOIDEA.

Family THOLONIDA.

PLATE 10.

THOLONIDA.

					Diam.	Page
Fig. 1.	<i>Tholartus tricolus</i> , n. sp.,	.	.	.	× 200	664
Fig. 2.	<i>Tholodes cupula</i> , n. sp.,	.	.	.	× 500	665
Fig. 3.	<i>Amphitholus artiscus</i> , n. sp.,	.	.	.	× 400	666
Fig. 4.	<i>Amphitholus panicium</i> , n. sp.,	.	.	.	× 500	668
Fig. 5.	<i>Amphitholus acanthometra</i> , n. sp.,	.	.	.	× 300	667
Fig. 6.	<i>Amphitholus acanthometra</i> , n. sp.,	.	.	.	× 300	667
	Frontal section of the shell.					
Fig. 7.	<i>Amphitholonium tricolonium</i> , n. sp.,	.	.	.	× 300	669
Fig. 8.	<i>Staurotholus tetrastylus</i> , n. sp.,	.	.	.	× 300	673
Fig. 9.	<i>Staurotholus dodecastylus</i> , n. sp.,	.	.	.	× 400	674
Fig. 10.	<i>Tholoma quadrigeminum</i> , n. sp.,	.	.	.	× 200	672
Fig. 11.	<i>Staurotholonium octodoronium</i> , n. sp.,	.	.	.	× 300	676
Fig. 12.	<i>Tholocubus tessellatus</i> , n. sp.,	.	.	.	× 200	677
Fig. 13.	<i>Tholoma metallasson</i> , n. sp.,	.	.	.	× 300	672
Fig. 14.	<i>Cubotholus regularis</i> , n. sp.,	.	.	.	× 200	680
Fig. 15.	<i>Cubotholonium ellipsoides</i> , n. sp.,	.	.	.	× 300	682
Fig. 16.	<i>Tholocubus tesseralis</i> , n. sp.,	.	.	.	× 400	678
Fig. 17.	<i>Tholonium hexonium</i> ,	.	.	.	× 400	679



E. Haeckel and A. Gieseler

K. Schmidt, Lithogr.

1. 2. THOLARTUS, 3-7. AMPHITHOLUS, 8-10. STAUROTHOLUS,
11 13. THOLOMA, 14. 15. CUBOTHOLUS, 16. 17. THOLONIUM.

PLATE 11.

Legion SPUMELLARIA.

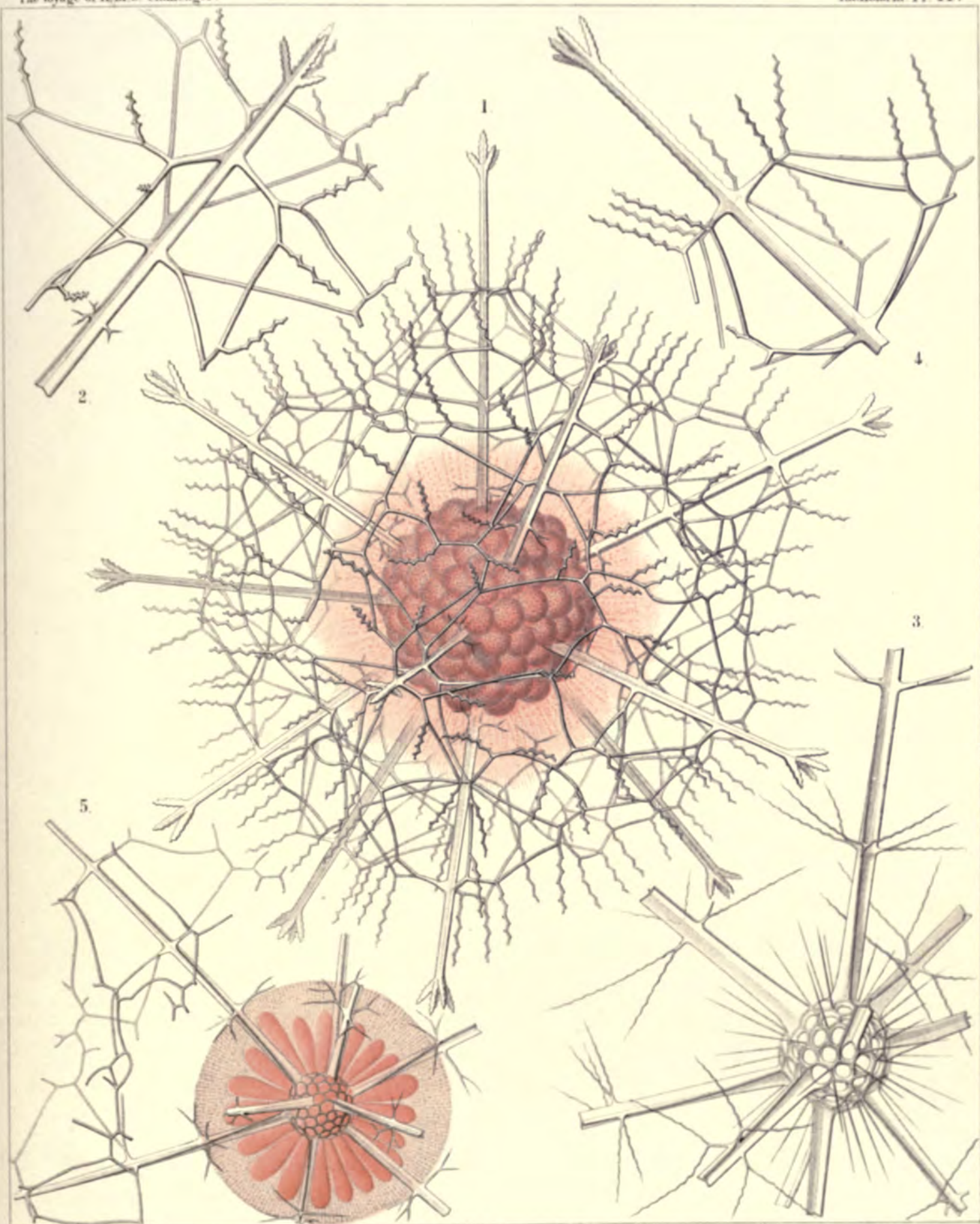
Order SPHÆROIDEA.

Family ASTROSPHÆRIDA.

PLATE 11.

ASTROSPHÆRIDA.

	Diam.	Page
Fig. 1. <i>Lychnosphæra regina</i> , n. sp.,	× 200	277
The entire shell and the central capsule. Numerous club-shaped radial apophyses or cœcal sacs arise from the pink central capsule and are protruded through the pores of the medullary shell, which is completely hidden by them. The sarcomatrix in the calymma, surrounding the central capsule, exhibits a fine radial striation. Numerous retracted pseudopodia, bearing red granules, arise from the sarcomatrix and pierce the calymma radially. The interval between the two concentric shells is filled up by the hyaline calymma.		
Fig. 2. <i>Lychnosphæra regina</i> , n. sp.,	× 400	277
A part of the cortical shell, with a radial spine.		
Fig. 3. <i>Lychnosphæra regina</i> , n. sp.,	× 400	277
The medullary shell and the basal parts of the radial spines arising from it.		
Fig. 4. <i>Lychnosphæra regina</i> , n. sp.,	× 400	277
Distal end of a radial spine.		
Fig. 5. <i>Rhizoplegma lychnosphæra</i> , n. sp.,	× 200	276
The central capsule and the enclosed parts of the skeleton. The protoplasm is radially striped. The central nucleus (red) sends out numerous radial apophyses, which are protruded through the pores of the medullary shell.		



E. Haeckel and A. G. S. Del.

K. G. S. Jena, Lithogr.

LYCHNOSPHERA.

PLATE 12.

Legion SPUMELLARIA.

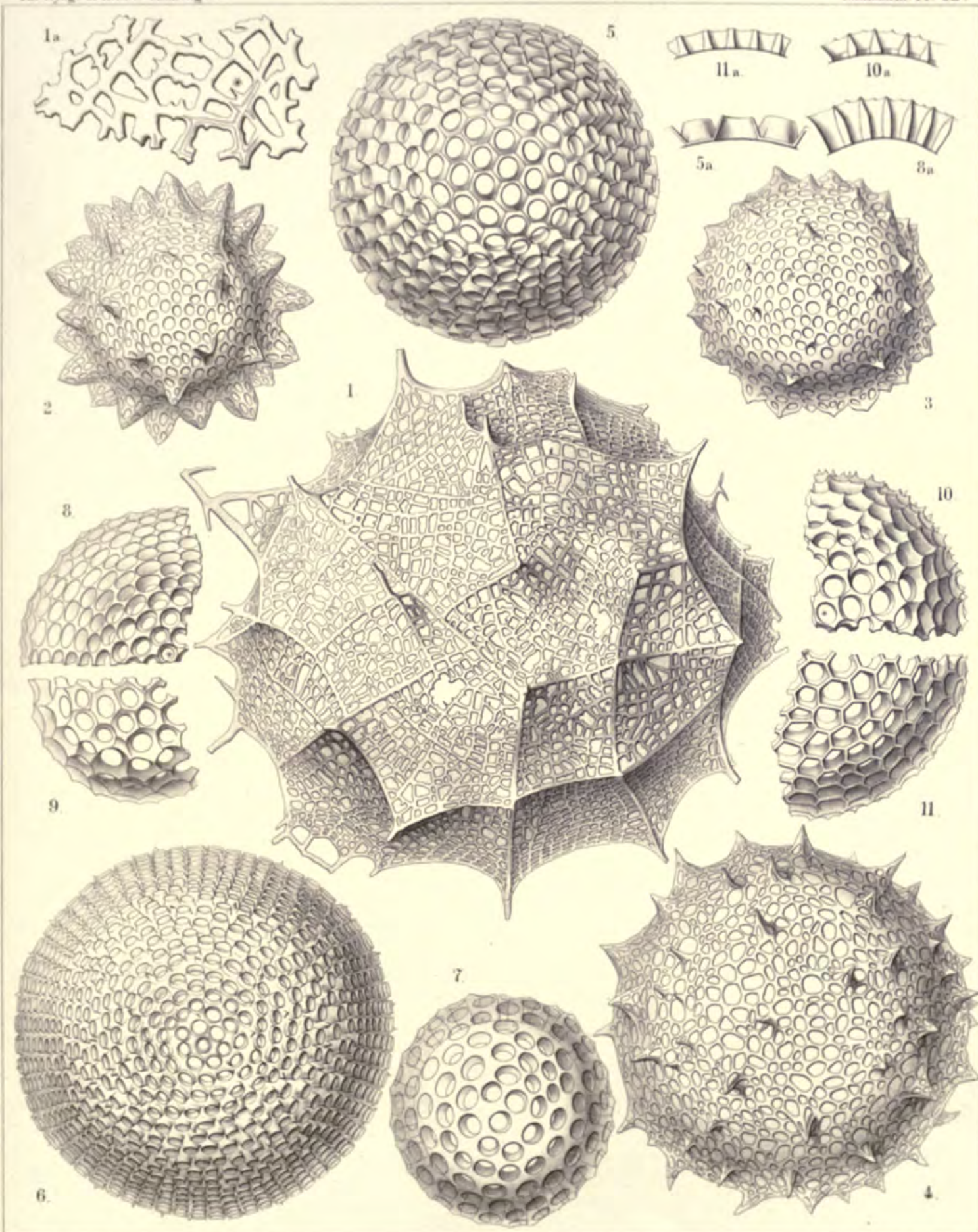
Orders PHÆOSPHERIA ET SPHÆROIDEA.

Families OROSPHERIDA, ASTROSPHERIDA et LIOSPHERIDA.

PLATE 12.

OROSPHERIDA, ASTROSPHERIDA et LIOSPHERIDA.

			Diam.	Page
Fig. 1.	<i>Orosphæra huxleyi</i> , n. sp. (vel <i>Oroscena huxleyi</i>), . . .	×	50	1599
	Fig. 1a. A piece of the network, the bars of which contain partly an axial canal,	×	200	1599
Fig. 2.	<i>Conosphæra orthoconus</i> , n. sp.,	×	200	221
Fig. 3.	<i>Conosphæra platyconus</i> , n. sp.,	×	300	221
Fig. 4.	<i>Conosphæra plagioconus</i> , n. sp.,	×	300	222
Fig. 5.	<i>Ethmosphæra conosiphonia</i> , n. sp.,	×	400	69
	Fig. 5a. Vertical section through the wall.			
Fig. 6.	<i>Ethmosphæra polysiphonia</i> , n. sp.,	×	400	70
Fig. 7.	<i>Cenosphæra compacta</i> , n. sp.,	×	300	65
Fig. 8.	<i>Cenosphæra elysia</i> , n. sp.,	×	300	64
	Fig. 8a. Vertical section through the wall.			
Fig. 9.	<i>Cenosphæra mellifica</i> , n. sp.,	×	300	62
Fig. 10.	<i>Cenosphæra favosa</i> , n. sp.,	×	300	62
	Fig. 10a. Vertical section through the wall.			
Fig. 11.	<i>Cenosphæra vesparia</i> , n. sp.,	×	300	62
	Fig. 11a. Vertical section through the wall.			



H. Hensel and A. Schuch, del.

E. Schuch, Jena, lithogr.

1. OROSPHAERA, 2-4. CONOSPHAERA, 5, 6. ETHMOSPHAERA, 7-11. CERIOSPHAERA.

PLATE 13.

Legion SPUMELLARIA.

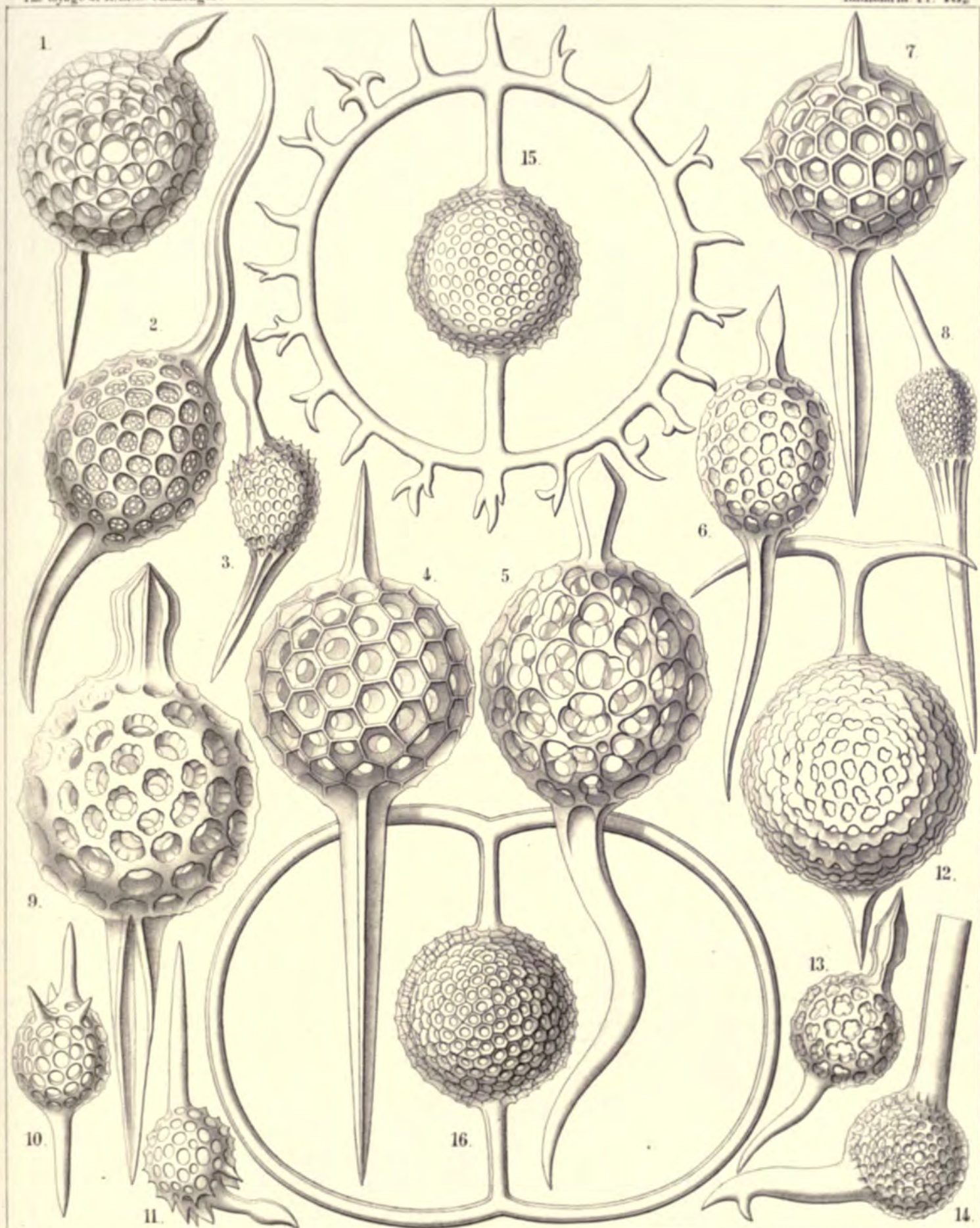
Orders SPHÆROIDEA ET PRUNOIDEA.

Families STYLOSPHÆRIDA et ELLIPSIDA.

PLATE 13.

STYLOSPHÆRIDA et ELLIPSIDA.

					Diam.	Page
Fig. 1.	<i>Ellipsostylus aquila</i> , n. sp.,	.	.	.	× 300	300
Fig. 2.	<i>Ellipsostylus hirundo</i> , n. sp.,	.	.	.	× 300	301
Fig. 3.	<i>Ellipsostylus columba</i> , n. sp.,	.	.	.	× 300	300
Fig. 4.	<i>Xiphostylus alcedo</i> , n. sp.,	.	.	.	× 400	127
Fig. 5.	<i>Xiphostylus edolius</i> , n. sp.,	.	.	.	× 400	130
Fig. 6.	<i>Ellipsostylus psittacus</i> , n. sp.,	.	.	.	× 400	300
Fig. 7.	<i>Stylostaurus caudatus</i> , n. sp.,	.	.	.	× 400	157
Fig. 8.	<i>Ellipsostylus ciconia</i> , n. sp.,	.	.	.	× 300	300
Fig. 9.	<i>Xiphostylus phasianus</i> , n. sp.,	.	.	.	× 400	127
Fig. 10.	<i>Xiphostylus trochilus</i> , n. sp.,	.	.	.	× 300	129
Fig. 11.	<i>Xiphostylus emberiza</i> , n. sp.,	.	.	.	× 300	131
Fig. 12.	<i>Saturnalis circoideus</i> , n. sp.,	.	.	.	× 400	132
	Not fully developed.					
Fig. 13.	<i>Xiphostylus alca</i> , n. sp.,	.	.	.	× 300	130
Fig. 14.	<i>Xiphostylus falco</i> , n. sp.,	.	.	.	× 300	130
Fig. 15.	<i>Saturnalis rotula</i> , n. sp.,	.	.	.	× 400	133
Fig. 16.	<i>Saturnalis annularis</i> , n. sp.,	.	.	.	× 400	132



K. Schmidt and A. Schmidt, Del.

K. Schmidt, Jena, Lithogr.

1-14. XIPHOSTYLUS, 15, 16. SATURNALIS.

PLATE 14.

Legion SPUMELLARIA.

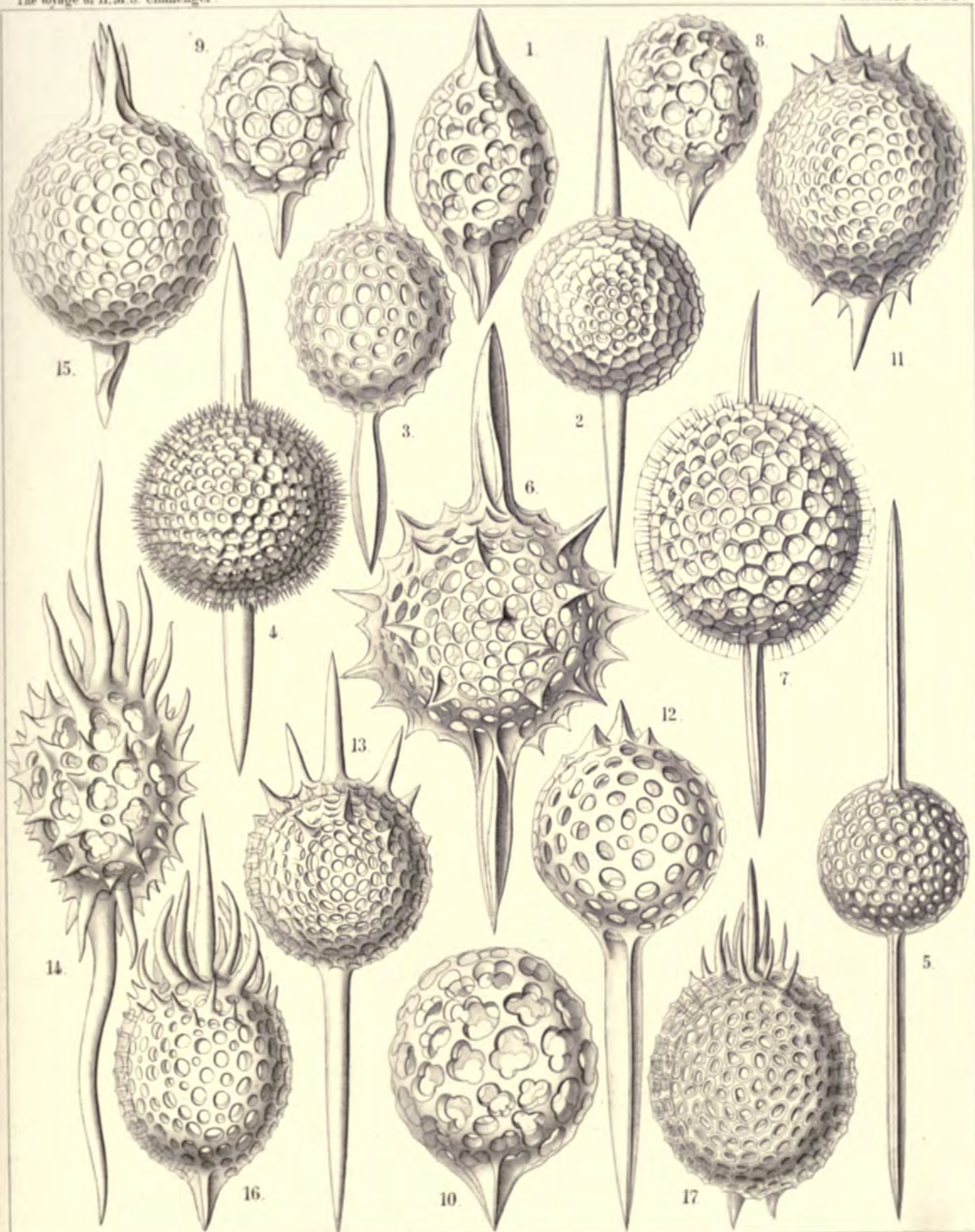
Orders SPHÆROIDEA ET PRUNOIDEA.

Families STYLOSPHÆRIDA et ELLIPSIDA.

PLATE 14.

STYLOSPHÆRIDA et ELLIPSIDA.

					Diam.	Page
Fig. 1.	<i>Ellipsoxiphus atractus</i> , n. sp.,	.	.	.	× 300	298
Fig. 2.	<i>Xiphosphæra venus</i> , n. sp.,	.	.	.	× 300	123
Fig. 3.	<i>Ellipsoxiphus claviger</i> , n. sp.,	.	.	.	× 300	297
Fig. 4.	<i>Xiphosphæra pallas</i> , n. sp.,	.	.	.	× 400	124
Fig. 5.	<i>Xiphosphæra gæa</i> , n. sp.,	.	.	.	× 400	123
Fig. 6.	<i>Xiphosphæra vesta</i> , n. sp.,	.	.	.	× 300	126
Fig. 7.	<i>Ellipsoxiphus elegans</i> , n. sp., var. <i>palliatus</i> ,	.	.	.	× 400	296
Fig. 8.	<i>Lithapium halicapsa</i> , n. sp.,	.	.	.	× 300	303
Fig. 9.	<i>Lithapium pyriforme</i> , n. sp.,	.	.	.	× 300	303
Fig. 10.	<i>Lithapium monocyrtes</i> , n. sp.,	.	.	.	× 300	304
Fig. 11.	<i>Ellipsoxiphus bipolaris</i> , n. sp.,	.	.	.	× 600	297
Fig. 12.	<i>Xiphostylus trogon</i> , n. sp.,	.	.	.	× 400	129
Fig. 13.	<i>Xiphostylus picus</i> , n. sp.,	.	.	.	× 300	129
Fig. 14.	<i>Lithomespilus flammabundus</i> , n. sp.,	.	.	.	× 400	303
Fig. 15.	<i>Xiphostylus alauda</i> , n. sp.,	.	.	.	× 400	128
Fig. 16.	<i>Lithomespilus phloginus</i> , n. sp.,	.	.	.	× 600	302
Fig. 17.	<i>Lithomespilus phlogoides</i> , n. sp.,	.	.	.	× 600	302



H. Burchell and J. G. Smith, Del.

J. G. Smith, Lithogr.

1 - 11. XIPHOSPHAERA, 12-17. LITHOMESPILOTUS.

PLATE 15.

Legion SPUMELLARIA.

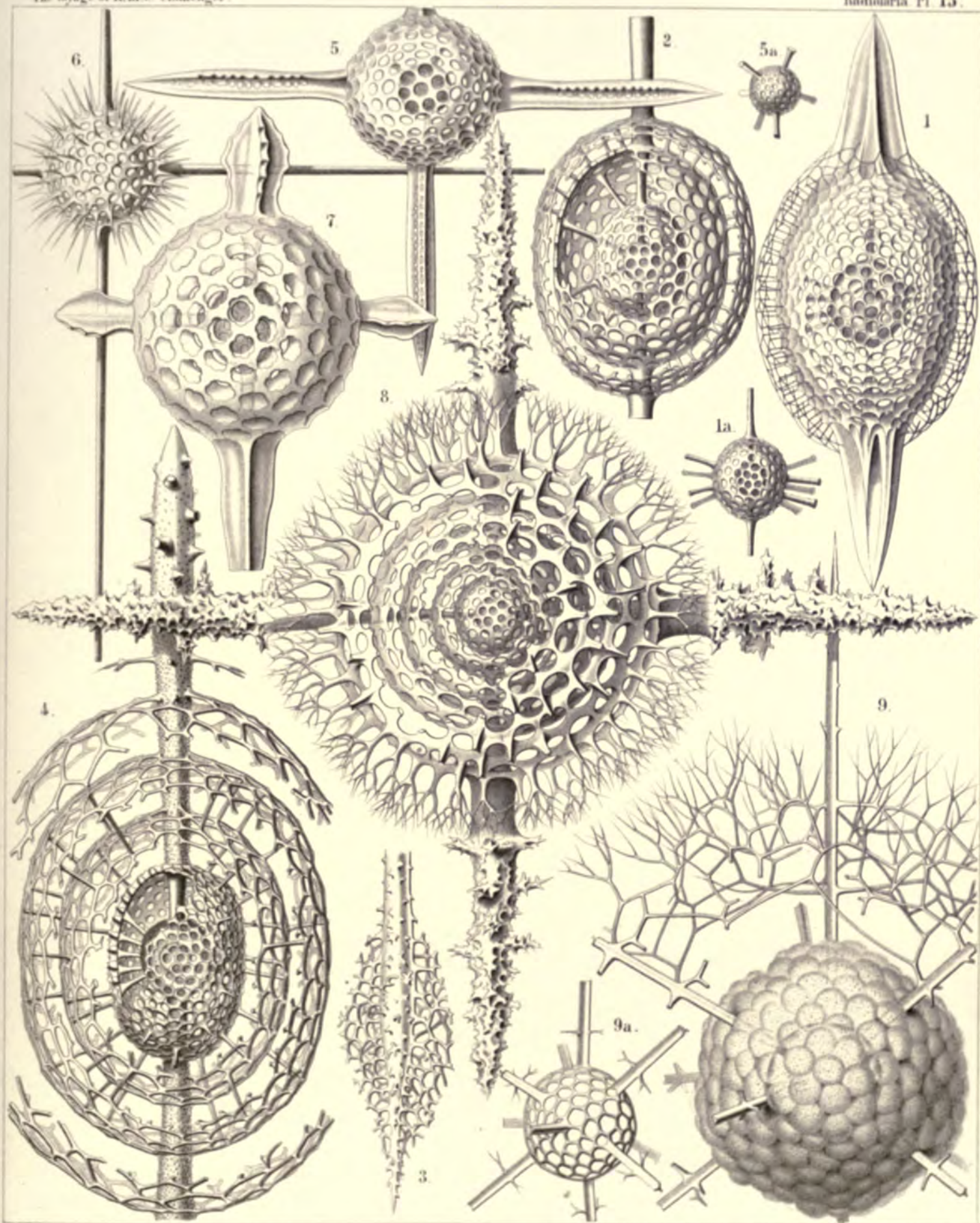
Orders SPHÆROIDEA ET PRUNOIDEA.

Families STAUROSPHÆRIDA et DRUPPULIDA.

PLATE 15.

STAUROSPHÆRIDA et DRUPPULIDA.

			Diam.	Page
Fig. 1.	<i>Cromyatractus tetracelyphus</i> , n. sp.,	×	300	335
	Fig. 1a. The two inner medullary shells.			
Fig. 2.	<i>Cromyatractus tetraphractus</i> , n. sp.,	×	300	335
Fig. 3.	<i>Cromyatractus cepicius</i> , n. sp.,	×	300	336
	The spongy distal part of a polar spine.			
Fig. 4.	<i>Cromyatractus ceparius</i> , n. sp. (vel <i>Caryostylus ceparius</i>),	×	300	336
Fig. 5.	<i>Staurolonche pertusa</i> , n. sp.,	×	300	159
	Fig. 5a. Its medullary shell.			
Fig. 6.	<i>Staurosphæra philippi</i> , n. sp.,	×	300	154
Fig. 7.	<i>Stauroxiphus gladius</i> , n. sp.,	×	400	163
Fig. 8.	<i>Staurocaryum arborescens</i> , n. sp.,	×	300	167
Fig. 9.	<i>Rhizoplegma radiculatum</i> , n. sp.,	×	200	276
	Fig. 9a. The medullary shell, which is completely hidden in fig. 9 by the numerous club-shaped apophyses of the central capsule.			



1 2 STYLOCROMYUM, 3 4 CARYOSTYLOS, 5-7 STAUROLONCHE,
8 STAUROCARYUM, 9 RHIZOPLEGMA.

PLATE 16.

Legion SPUMELLARIA.

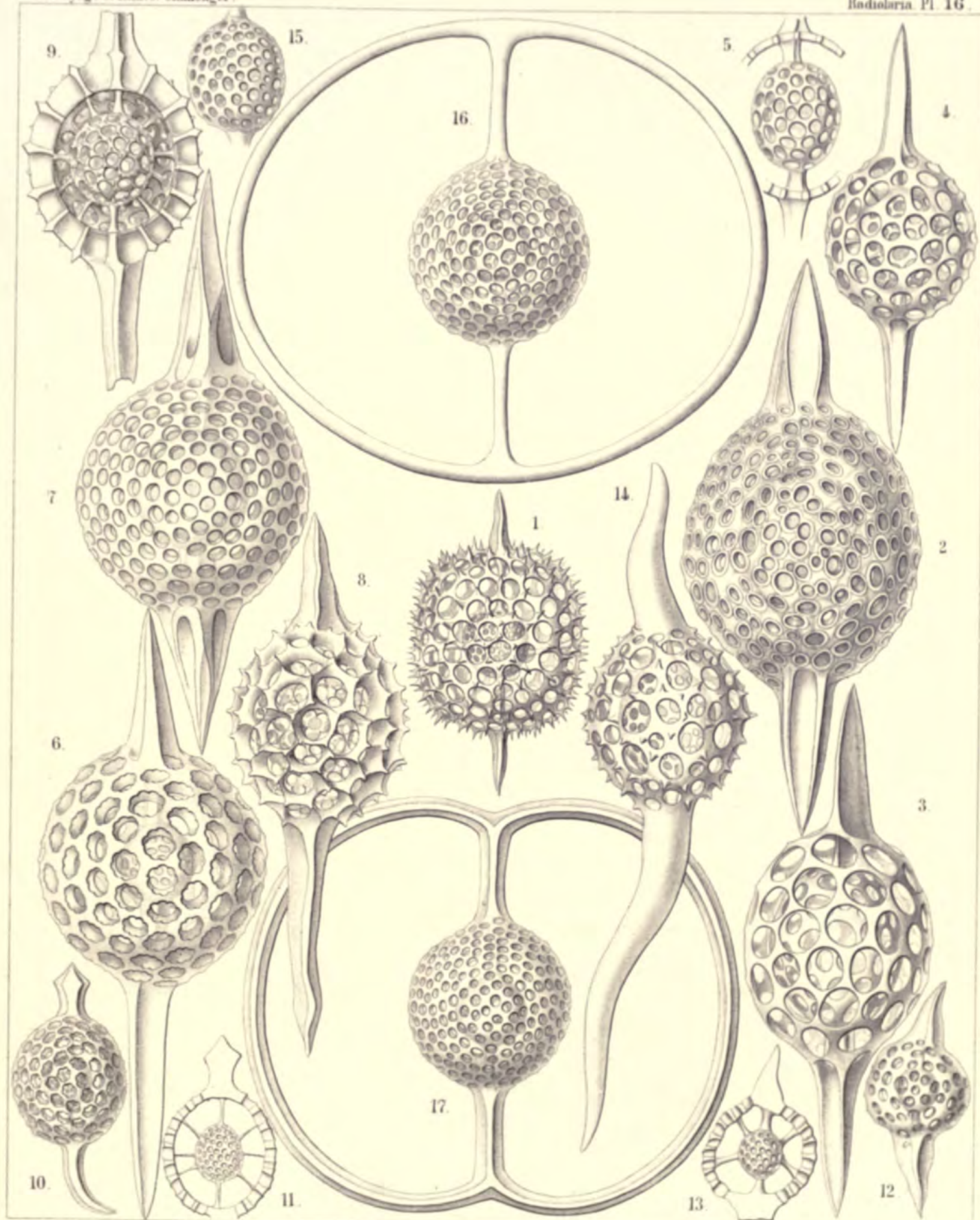
Orders SPHÆROIDEA ET PRUNOIDEA.

Families STYLOSPHÆRIDA et DRUPPULIDA.

PLATE 16.

STYLOSPHÆRIDA et DRUPPULIDA.

	Diam.	Page
Fig. 1. <i>Stylosphæra melpomene</i> , n. sp.,	× 300	135
Fig. 2. <i>Lithatractus jugatus</i> , n. sp. (vel <i>Stylosphæra jugata</i>),	× 400	323
Fig. 3. <i>Lithatractus fragilis</i> , n. sp. (vel <i>Stylosphæra fragilis</i>),	× 400	319
Fig. 4. <i>Stylosphæra lithatractus</i> , n. sp.,	× 300	
The entire shell.		
Fig. 5. <i>Stylosphæra lithatractus</i> , n. sp.,	× 300	
The greater part of the cortical shell and the two spines taken off. The description of <i>Stylosphæra lithatractus</i> (intermediate between <i>Stylosphæra jugata</i> and <i>Stylosphæra terpsichore</i> , p. 137) is by mistake not given in the text.		
Fig. 6. <i>Stylosphæra calliope</i> , n. sp.,	× 400	134
Fig. 7. <i>Stylosphæra clio</i> , n. sp.,	× 400	134
Fig. 8. <i>Druppatractus ostracion</i> , n. sp.,	× 300	326
The entire shell.		
Fig. 9. <i>Druppatractus ostracion</i> , n. sp.,	× 300	326
The anterior half of the cortical shell has been removed.		
Fig. 10. <i>Druppatractus hippocampus</i> , n. sp.,	× 300	324
The entire shell.		
Fig. 11. <i>Druppatractus hippocampus</i> , n. sp.,	× 300	324
The greater part of the cortical shell has been removed.		
Fig. 12. <i>Stylosphæra nana</i> , n. sp.,	× 300	136
The entire shell.		
Fig. 13. <i>Stylosphæra nana</i> , n. sp.,	× 300	136
The greater part of the cortical shell taken off.		
Fig. 14. <i>Sphærostylus ophidium</i> , n. sp.,	× 300	140
The entire shell.		
Fig. 15. <i>Sphærostylus ophidium</i> , n. sp.,	× 300	140
The medullary shell alone.		
Fig. 16. <i>Saturnulus ellipticus</i> , n. sp.,	× 400	141
Fig. 17. <i>Saturnulus planetes</i> , n. sp.,	× 400	142



1-15. STYLOSPHAERA. 16. 17. SATURNULUS.

PLATE 17.

Legion SPUMELLARIA.

Orders SPHÆROIDEA ET PRUNOIDEA.

Families STYLOSPHÆRIDA, DRUPPULIDA et SPONGURIDA.

PLATE 17.

STYLOSPHÆRIDA, DRUPPULIDA et SPONGURIDA.

	Diam.	Page
Fig. 1. <i>Stylatractus giganteus</i> , n. sp. (vel <i>Amphistylus giganteus</i>),	× 300	329
Fig. 2. <i>Stylatractus sethoporos</i> , n. sp.	× 400	330
The greater part of the cortical shell taken off.		
Fig. 3. <i>Stylatractus sethoporos</i> , n. sp.,	× 400	330
The entire cortical shell.		
Fig. 4. <i>Stylatractus compactus</i> , n. sp.,	× 400	329
Fig. 5. <i>Amphisphæra cronos</i> , n. sp. (vel <i>Amphistylus cronos</i>),	× 400	144
Fig. 6. <i>Stylatractus neptunus</i> , n. sp. (vel <i>Amphisphæra neptunus</i>),	× 300	328
Fig. 7. <i>Amphisphæra pluto</i> , n. sp.,	× 300	144
The entire cortical shell.		
Fig. 8. <i>Amphisphæra pluto</i> , n. sp.,	× 300	144
Meridional section through the three concentric shells.		
Fig. 9. <i>Xiphatractus glyptodon</i> , n. sp.,	× 400	334
The entire cortical shell.		
Fig. 10. <i>Xiphatractus glyptodon</i> , n. sp.,	× 400	334
The greater part of the cortical shell taken off.		
Fig. 11. <i>Xiphatractus armadillo</i> , n. sp.	× 400	332
Fig. 12. <i>Spongoxiphus prunococcus</i> , n. sp.,	× 300	354
The spongy cortical shell.		
Fig. 13. <i>Spongoxiphus prunococcus</i> , n. sp.,	× 600	354
The two concentric latticed medullary shells.		

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PLATE 18.

Legion SPUMELLARIA.

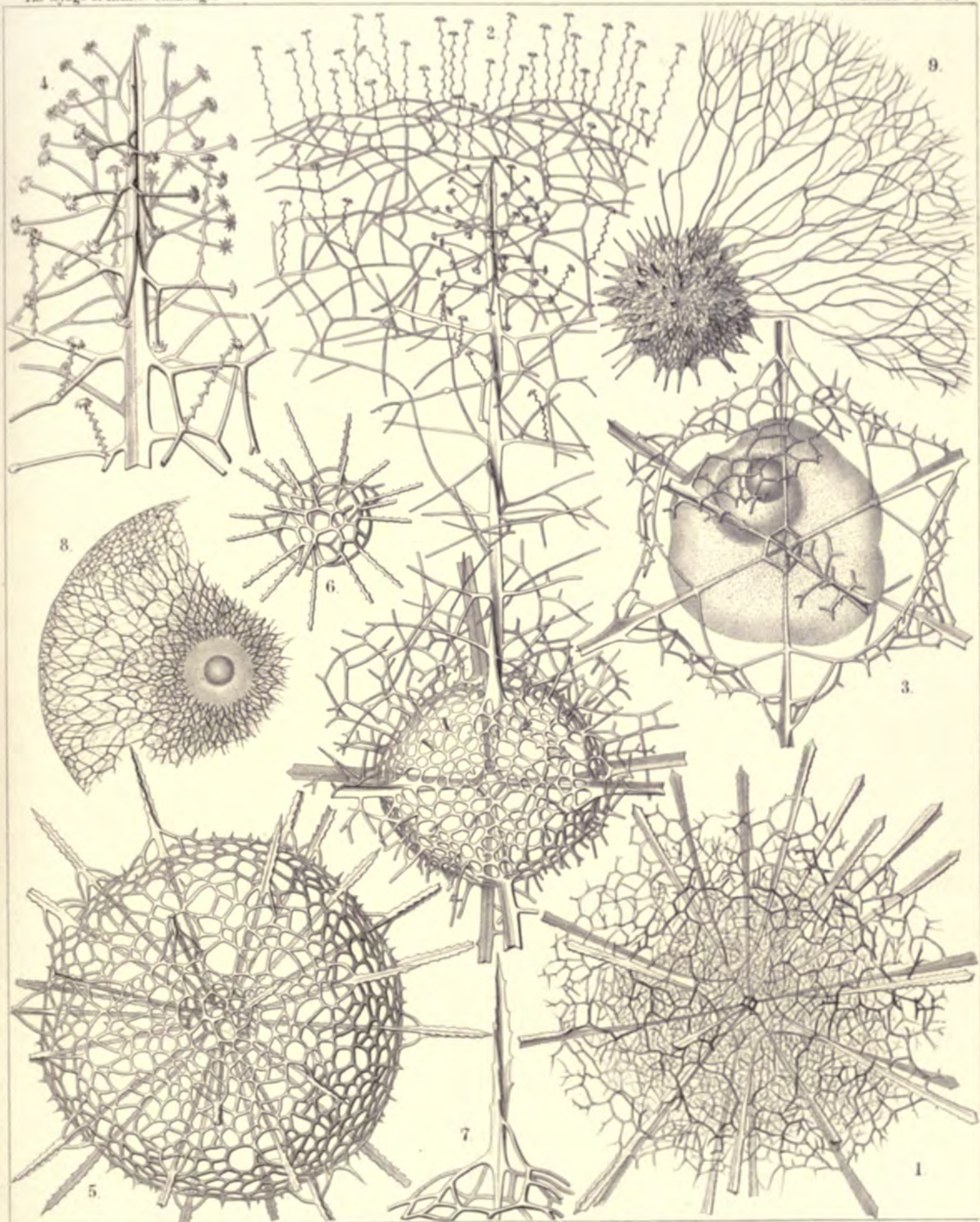
Order SPHÆROIDEA.

Families LIOSPHERIDA et ASTROSPHERIDA.

PLATE 18.

LIOSPHERIDA et ASTROSPHERIDA.

	Diam.	Page
Fig. 1. <i>Centrocubus cladostylus</i> , n. sp.,	× 100	278
Fig. 2. <i>Octodendron spathillatum</i> , n. sp.,	× 300	280
The entire inner shell, but a small part only of the outer shell is represented.		
Fig. 3. <i>Octodendron cubocentron</i> , n. sp.,	× 400	279
The central capsule (somewhat irregular by compression?) exhibits a large excentric nucleus (probably dislocated artificially?).		
Fig. 4. <i>Octodendron spathillatum</i> , n. sp.,	× 800	280
Free distal end of a radial spine, with the spathillæ on the end of the branches.		
Fig. 5. <i>Rhizosphæra serrata</i> , n. sp.,	× 300	284
Fig. 6. <i>Rhizosphæra serrata</i> , n. sp.,	× 300	284
Medullary shell.		
Fig. 7. <i>Rhizosphæra serrata</i> , n. sp.,	× 600	284
A single radial spine.		
Fig. 8. <i>Plegmosphæra exodictyon</i> , n. sp.,	× 200	89
The central shell-cavity encloses the spherical central capsule and the concentric nucleus.		
Fig. 9. <i>Spongodymus elaphococcus</i> , n. sp.,	× 150	272
The entire inner shell, but only a small part of the outer spongy envelope is represented.		



H. Heckel and J. G. Schuch. Del.

K. Schuch. Jena. Lithogr.

1-4. CENTROCUBUS, 5-7. RHIZOSPHAERA, 8. PLEGMOSPHAERA,
9. SPONGODRYMUS.

PLATE 19.

Legion SPUMELLARIA.

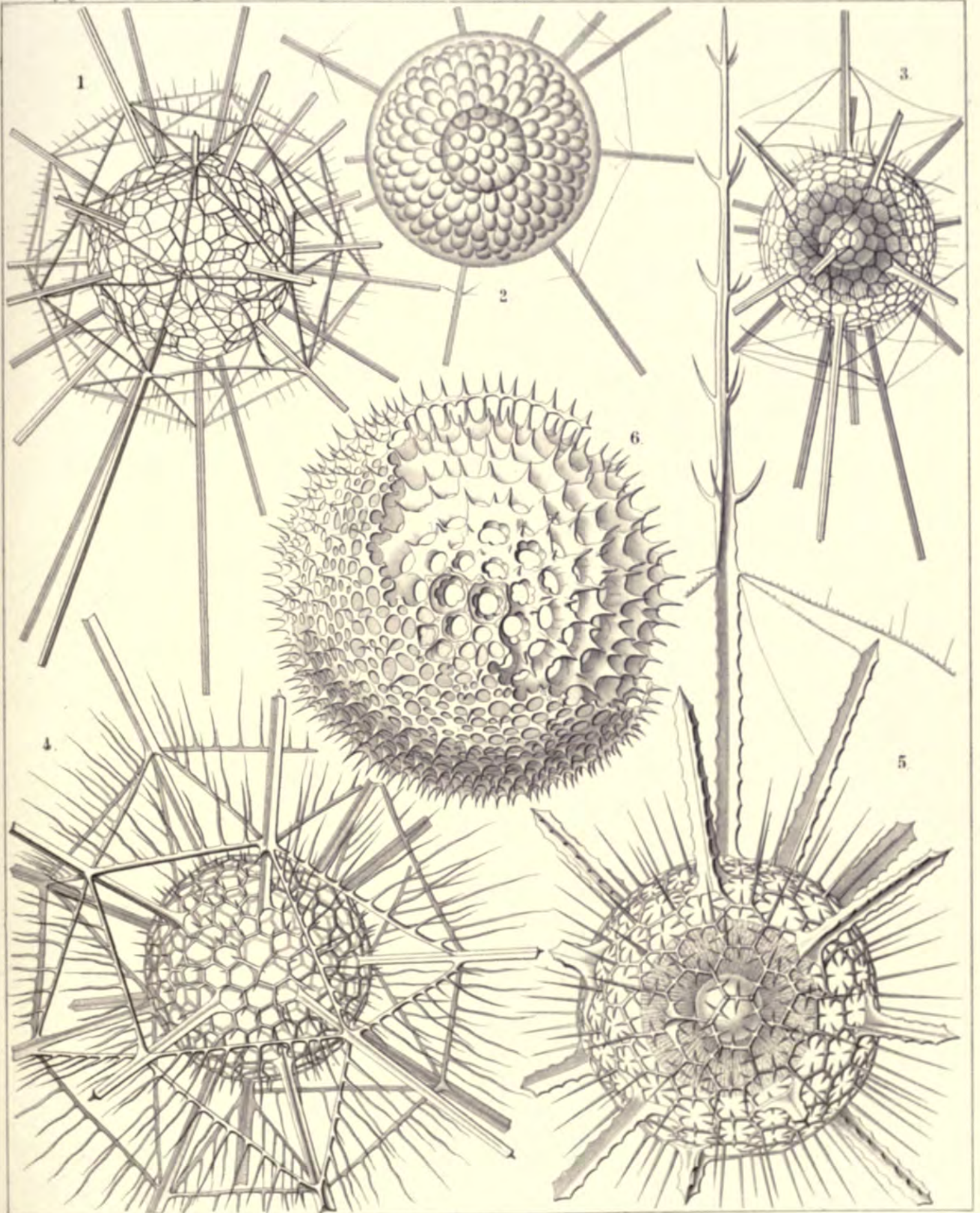
Order SPHÆROIDEA.

Family ASTROSPHÆRIDA.

PLATE 19.

ASTROSPHÆRIDA.

			Diam.	Page
Fig. 1.	<i>Drymosphæra polygonalis</i> , n. sp.,		× 200	249
Fig. 2.	<i>Leptosphæra hexagonalis</i> , n. sp.,		× 200	244
	Showing the central capsule (forming numerous club-shaped protuberances) and the simple spherical nucleus in its centre. The skeleton is nearly the same as in <i>Diplosphæra hexagonalis</i> (fig. 3).			
Fig. 3.	<i>Diplosphæra hexagonalis</i> , n. sp.,		× 200	246
	The spherical central capsule, with radially striped protoplasm, is enclosed in the inner shell, and exhibits in its centre the clear spherical nucleus.			
Fig. 4.	<i>Astrosphæra hexagonalis</i> , n. sp.,		× 300	250
Fig. 5.	<i>Astrosphæra stellata</i> , n. sp.,		× 300	251
	The central capsule, enclosed in the inner shell, exhibits a distinct radial striation of the protoplasm, and in the centre a clear spherical nucleus.			
Fig. 6.	<i>Haliomma rhodococcus</i> , n. sp. (vel <i>Sethosphæra rhodococcus</i>),		× 400	237
	The greater part of the outer shell is removed.			



H. Haeckel and J. G. Thomsen del.

V. G. Sinner, Jena, lithogr.

1-5 DIPLOSPHAERA, 6. SETHOSPHAERA.

PLATE 20.

Legion SPUMELLARIA.

Order SPHÆROIDEA.

Families LIOSPHERIDA et ASTROSPHERIDA.

PLATE 20.

LIOSPHERIDA et ASTROSPHERIDA.

	Diam.	Page
Fig. 1. <i>Drymosphæra dendrophora</i> , n. sp.,	× 300	249
Fig. 1a. Meridional section through the central capsule. In the centre the large spherical nucleus is visible. The protoplasm around it is distinctly radiate. From the central capsule arise numerous club-shaped apophyses or cæcal sacs, which are protruded through the meshes of the inner shell,		
	× 300	
Fig. 1b. Basal part of a single radial spine, and its connection with the network of the two shells,	× 400	
Fig. 2. <i>Liosphæra polypora</i> , n. sp.,	× 300	78
The greater part of the outer shell is removed.		
Fig. 3. <i>Liosphæra hexagonia</i> , n. sp.,	× 400	76
Fig. 4. <i>Carposphæra melitomma</i> , n. sp. (vel <i>Melitomma melittosphæra</i>),	× 400	73

PLATE 21.

Legion SPUMELLARIA.

Order SPHÆROIDEA.

Family CUBOSPHERIDA.

PLATE 21.

CUBOSPHERIDA.

			Diam.	Page
Fig. 1.	<i>Hexastylus cochleatus</i> , n. sp.,	×	400	174
	From the central capsule, enclosed in the shell, numerous delicate radial pseudopodia arise, which are protruded through the pores of the shell.			
Fig. 2.	<i>Hexastylus triaxonius</i> , n. sp.,	×	400	175
Fig. 3.	<i>Hexastylus phænaaxonius</i> , n. sp.,	×	300	171
Fig. 4.	<i>Hexastylus thaletis</i> , n. sp.,	×	400	172
Fig. 5.	<i>Hexastylus minimus</i> , n. sp.,	×	400	172
Fig. 6.	<i>Hexastylus dimensivus</i> , n. sp.,	×	400	175
Fig. 7.	<i>Hexastylus spiralis</i> , n. sp.,	×	400	177
Fig. 8.	<i>Hexastylus dictyotus</i> , n. sp.,	×	400	176
Fig. 9.	<i>Hexastylus dictyotus</i> , n. sp.,	×	400	176
	Central capsule with concentric nucleus and nucleolus; the protoplasm is radially striped.			
Fig. 10.	<i>Hexastylus marginatus</i> , n. sp.,	×	400	176
	Fig. 10a. Radial section through the shell-wall.			
Fig. 11.	<i>Hexastylus solonis</i> , n. sp.,	×	400	173
Fig. 12.	<i>Hexastylus contortus</i> , n. sp.,	×	300	177

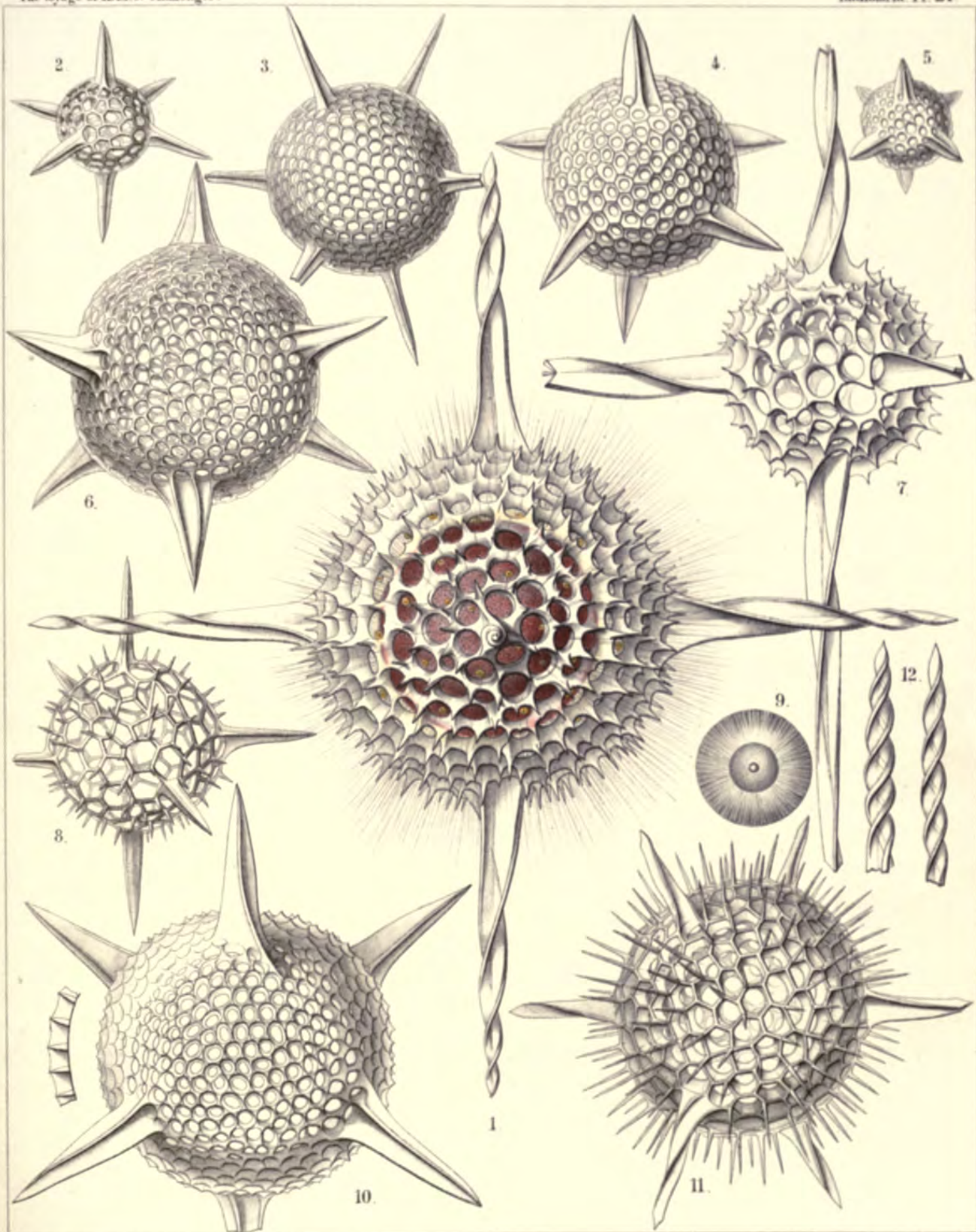


PLATE 22.

Legion SPUMELLARIA.

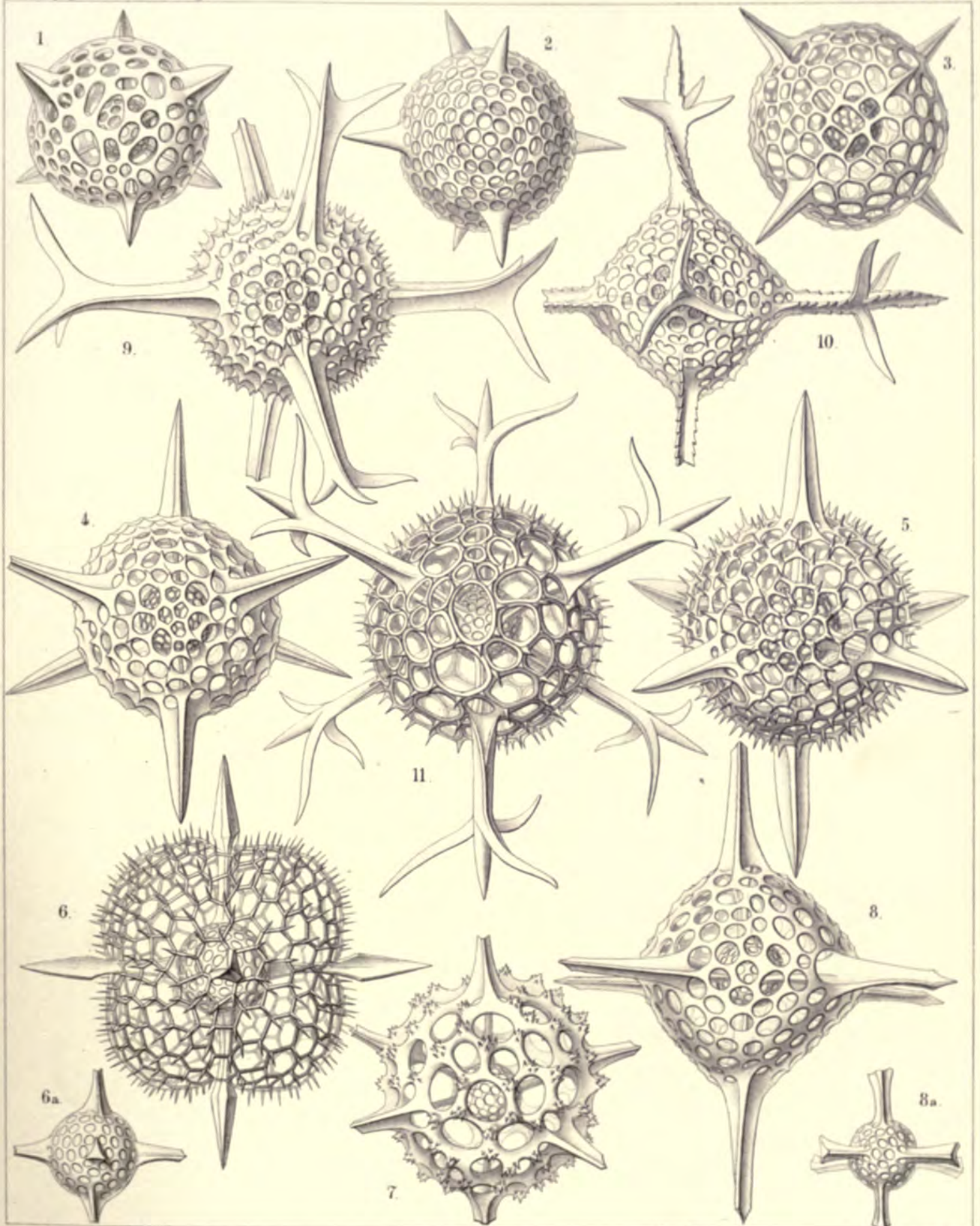
Order SPHÆROIDEA.

Family CUBOSPHERIDA.

PLATE 22.

CUBOSPHERIDA.

					Diam.	Page
Fig. 1.	<i>Hexalonche pythagoræa</i> , n. sp.,	.	.	.	× 300	185
Fig. 2.	<i>Hexalonche conicornis</i> , n. sp.,	.	.	.	× 300	181
Fig. 3.	<i>Hexalonche aristarchi</i> , n. sp.,	.	.	.	× 400	185
Fig. 4.	<i>Hexalonche philosophica</i> , n. sp.,	.	.	.	× 400	186
Fig. 5.	<i>Hexalonche anaximandri</i> , n. sp.,	.	.	.	× 400	182
Fig. 6.	<i>Hexalonche octocolpa</i> , n. sp.,	.	.	.	× 300	183
	Fig. 6a. The inner shell alone.					
Fig. 7.	<i>Hexalonche heracliti</i> , n. sp.,	.	.	.	× 300	187
Fig. 8.	<i>Hexalonche octahedra</i> , n. sp.,	.	.	.	× 400	181
	Fig. 8a. The inner shell alone.					
Fig. 9.	<i>Hexancistra tricuspis</i> , n. sp.,	.	.	.	× 300	188
Fig. 10.	<i>Hexancistra triserrata</i> , n. sp.,	.	.	.	× 300	188
Fig. 11.	<i>Hexancistra quadricuspsis</i> , n. sp.,	.	.	.	× 300	189



H. Haeckel and A. Götsch, Del.

A. Götsch, Jena, Lithogr.

1-8. HEXALONCHE, 9-12. HEXANCISTRA.

PLATE 23.

Legion SPUMELLARIA.

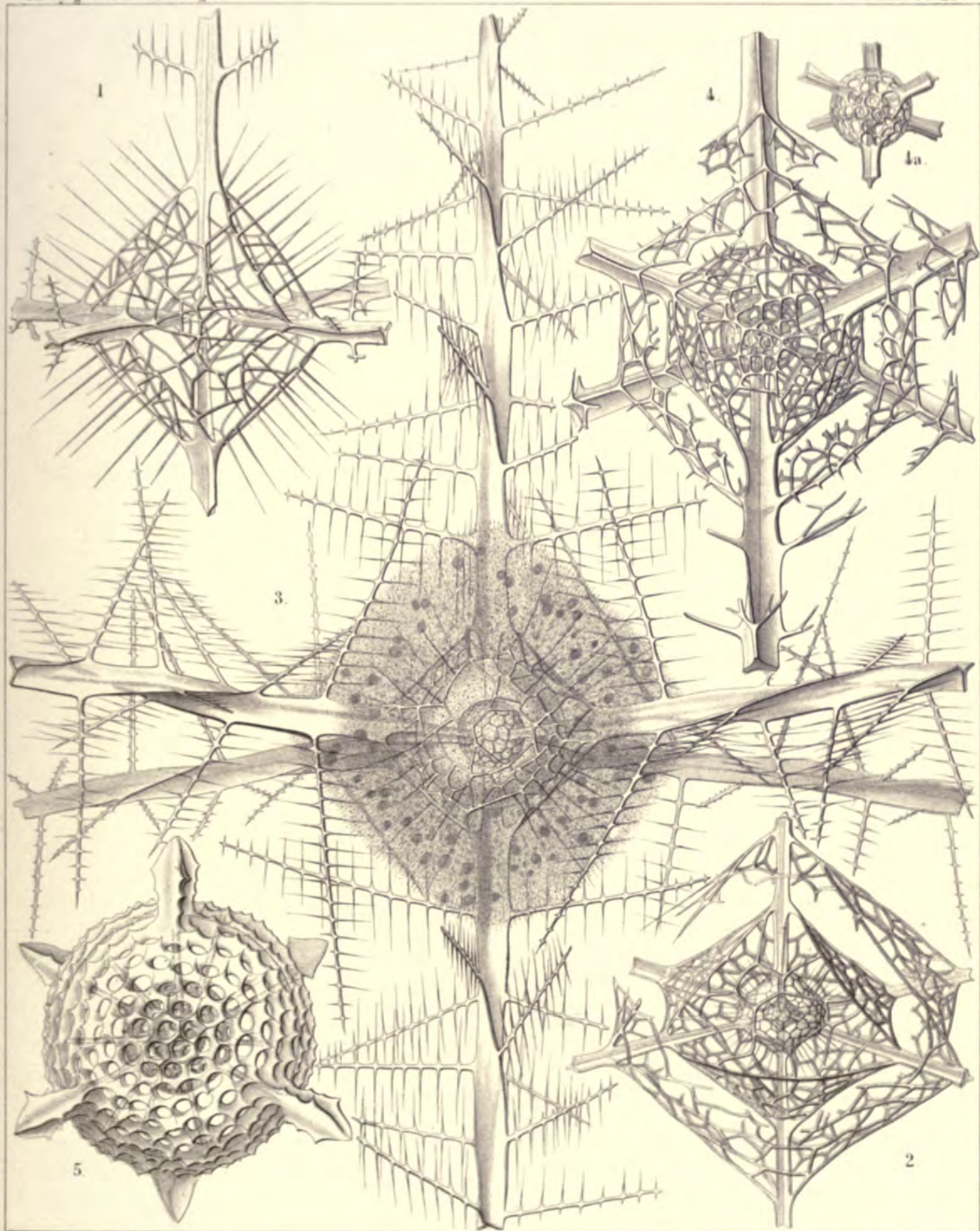
Order SPHÆROIDEA

Family CUBOSPHERIDA.

PLATE 23.

CUBOSPHERIDA.

			Diam.	Page
Fig. 1.	<i>Hexadendron bipinnatum</i> , n. sp.,		× 400	200
Fig. 2.	<i>Hexacromyum octahedrum</i> , n. sp.,		× 400	202
Fig. 3.	<i>Hexancistra mirabilis</i> , n. sp. (= <i>Hexapitys mirabilis</i>),		× 400	189
The spherical central capsule encloses the concentric spherical inner shell (which is filled up by the nucleus), and is surrounded by the octahedral outer shell. The latter is enveloped by the octahedral calymma, which is radially striated and contains numerous xanthellæ.				
Fig. 4.	<i>Hexacaryum arborescens</i> , n. sp.,		× 400	203
Fig. 5.	<i>Hexacontium clavigerum</i> , n. sp.,		× 300	19



H. Burchell and J. S. Burchell, Del.

E. G. Litzsch, Jena, Lithogr.

1 2 HEXADENDRUM, 3 HEXAPYTIS, 4 HEXACARYUM,
5 HEXACANTHIUM.

PLATE 24.

Legion SPUMELLARIA.

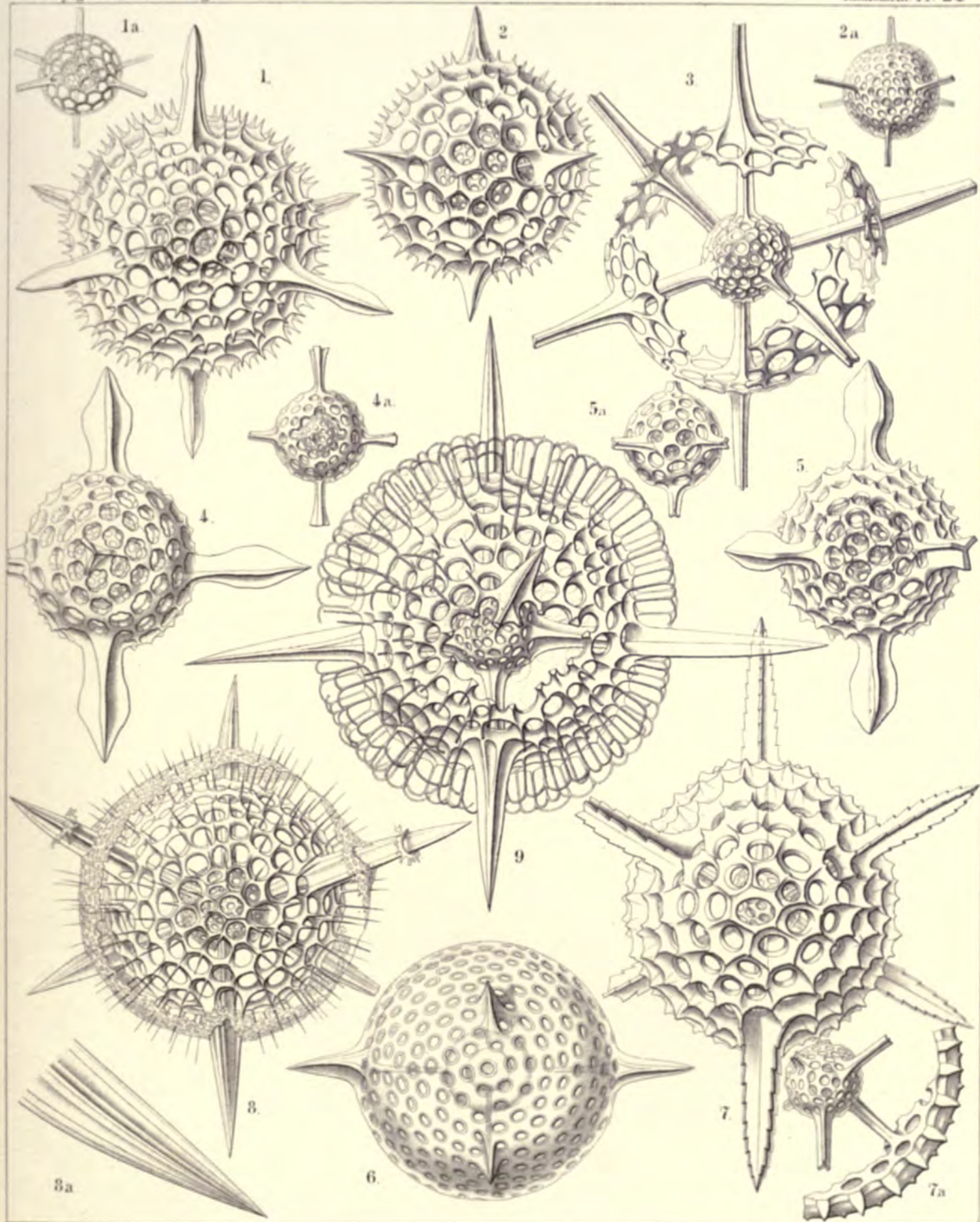
Order SPHÆROIDEA.

Family CUBOSPHERIDA.

PLATE 24.

CUBOSPHERIDA.

	Diam.	Page
Fig. 1. <i>Hexacontium sceptrum</i> , n. sp.,	× 400	194
Fig. 1a. The two medullary shells.		
Fig. 2. <i>Hexacontium favosum</i> , n. sp.,	× 400	194
Fig. 2a. The two medullary shells.		
Fig. 3. <i>Hexacontium axotrias</i> , n. sp.,	× 300	192
The six lattice-plates, which form the cortical shell, are not yet fully developed.		
Fig. 4. <i>Hexacontium floridum</i> , n. sp.,	× 300	195
Fig. 4a. The two medullary shells.		
Fig. 5. <i>Hexacontium papillosum</i> , n. sp.,	× 400	197
Fig. 5a. The two medullary shells.		
Fig. 6. <i>Hexacontium lævigatum</i> , n. sp.,	× 400	193
The contours of the two medullary shells are visible in the centre.		
Fig. 7. <i>Hexacontium prionacanthum</i> , n. sp.	× 400	195
Fig. 7a. The two medullary shells, connected with a fragment of the cortical shell.		
Fig. 8. <i>Cubosphæra cubaxonia</i> , n. sp.,	× 400	203
Fig. 8a. A single radial spine.		
Fig. 9. <i>Hexacromyum elegans</i> , n. sp.,	× 400	201
A part of the two cortical shells is broken off.		



H. Schmidt and J. Schmidt del.

J. Schmidt, Jena, Lithogr.

1-7. HEXACANTHIUM, 8, 9. HEXACROMYUM.

PLATE 25.

Legion SPUMELLARIA.

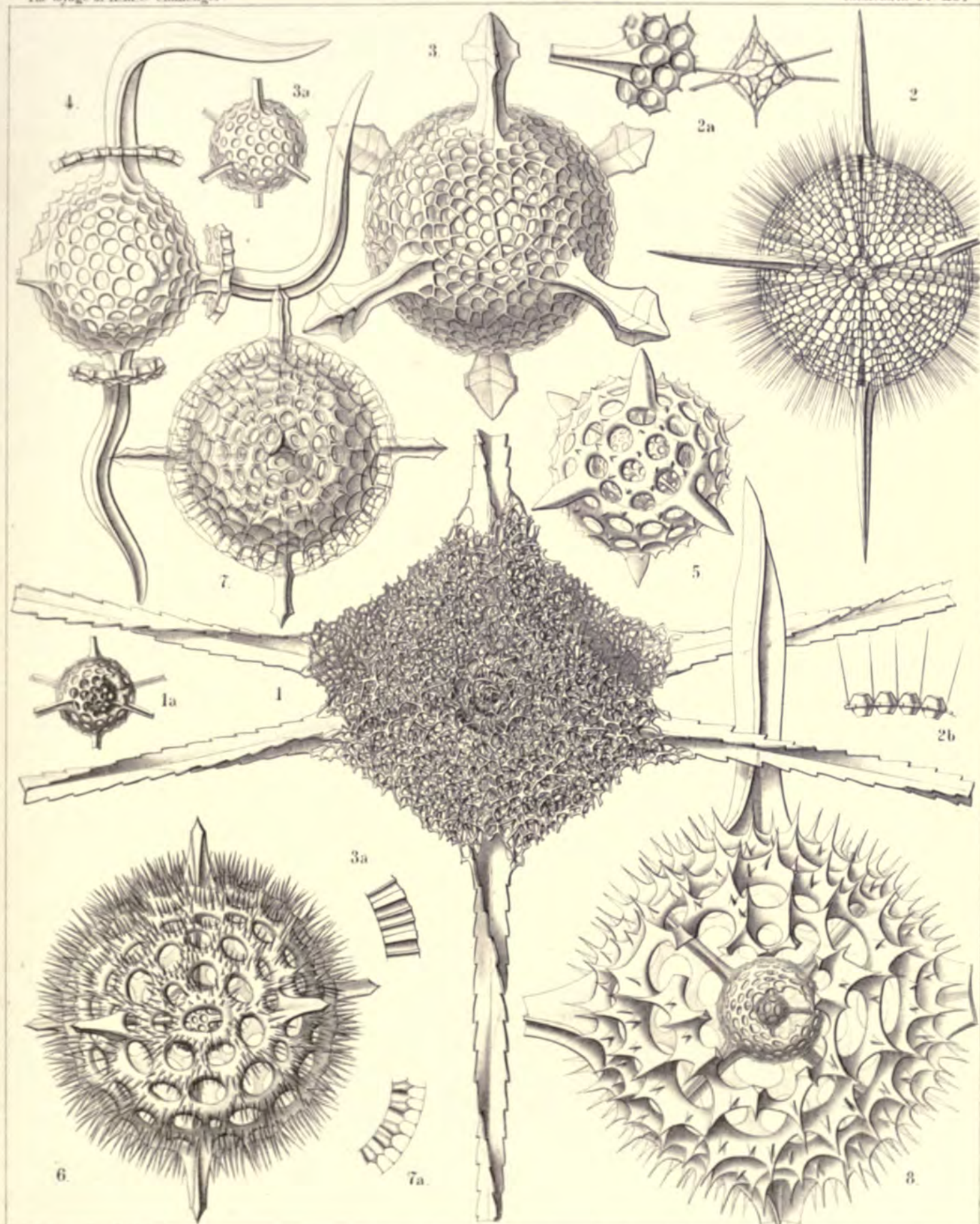
Order SPHÆROIDEA.

Family CUBOSPHERIDA.

PLATE 25.

CUBOSPHERIDA.

		Diam.	Page
Fig. 1. <i>Hexadoridium streptacanthum</i> , n. sp.,	x	400	206
Fig. 1a. The two concentric medullary shells.			
Fig. 2. <i>Hexalonche amphisiphon</i> , n. sp.,	x	300	182
Fig. 2a. Medullary shell connected with a fragment of the cortical shell.			
Fig. 2b. Vertical section through the wall of the cortical shell. (Below the centre of the Plate, also lettered 3a by mistake.)			
Fig. 3. <i>Hexalonche rosetta</i> , n. sp.,	x	400	180
Fig. 3a. Medullary shell.			
Fig. 3b. Vertical section through the wall of the cortical shell.			
Fig. 4. <i>Hexalonche curvicornis</i> , n. sp.,	x	300	181
Outer shell not yet complete, or partly broken off (!).			
Fig. 5. <i>Hexalonche anaximenis</i> , n. sp.,	x	400	183
Fig. 6. <i>Hexalonche hystericina</i> , n. sp.,	x	300	187
Fig. 7. <i>Hexacontium circumtextum</i> , n. sp.,	x	400	193
Fig 7a. Vertical section through the double wall of the cortical shell.			
Fig. 8. <i>Hexacontium gladiatum</i> , n. sp.,	x	400	198
A part of the two outer shells and of the radial spines is broken off.			



1 HEXADORAS, 2-6 HEXALANCHE, 7 & 8 HEXACANTUM.

PLATE 26.

Legion SPUMELLARIA.

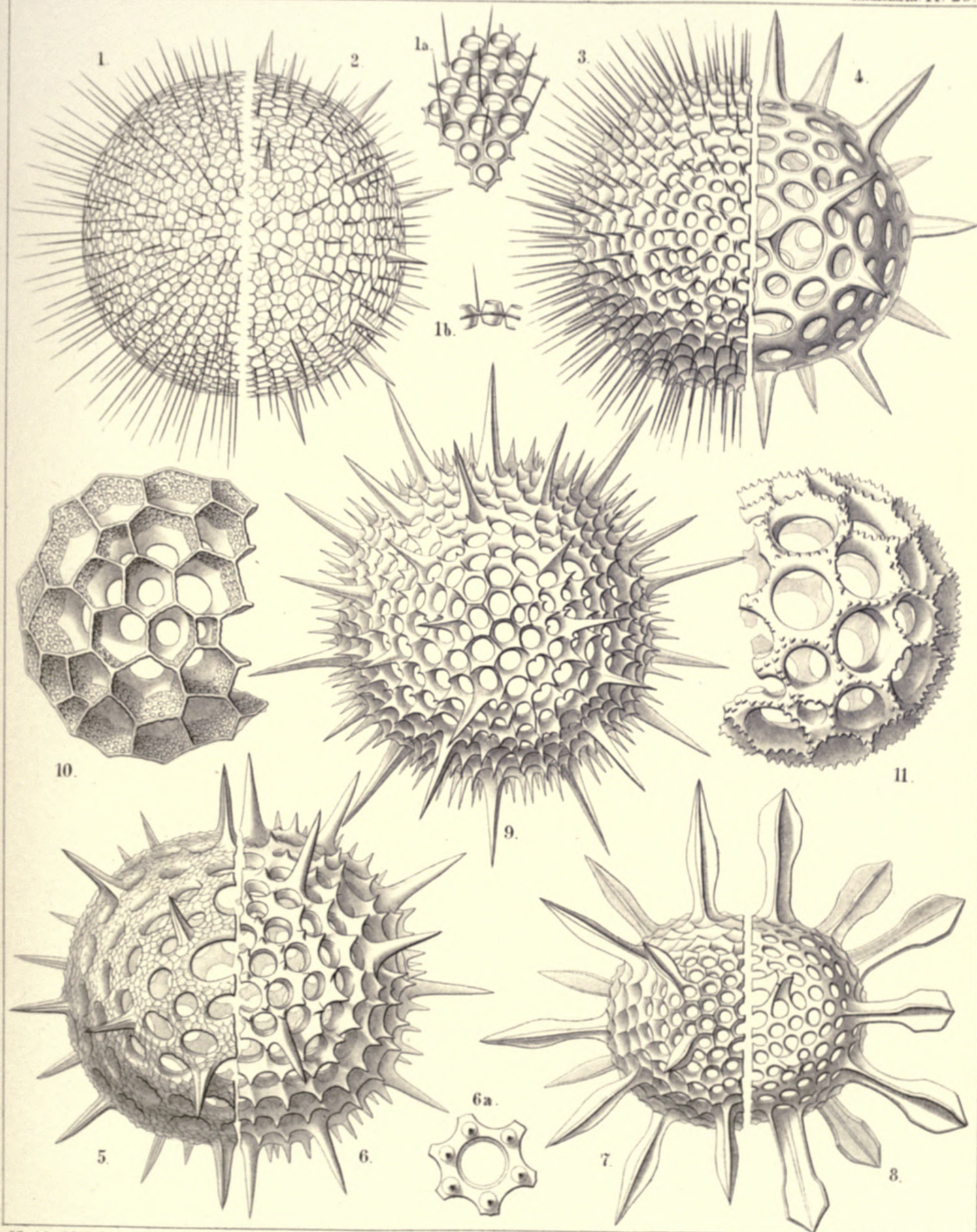
Order SPHÆROIDEA.

Families LIOSPHERIDA et ASTROSPHERIDA.

PLATE 26.

LIOSPHÆRIDA et ASTROSPHÆRIDA.

				Diam.	Page	
Fig. 1.	<i>Coscinomma amphisiphon</i> , n. sp.,	.	.	×	300	222
	Fig. 1a. A piece of the lattice-shell,	.	.	×	600	
	Fig. 1b. Vertical section through the shell-wall,	.	.	×	600	
Fig. 2.	<i>Heliosphæra hexagonaria</i> , n. sp.,	.	.	×	300	217
Fig. 3.	<i>Acanthosphæra castanea</i> , n. sp.,	.	.	×	400	211
Fig. 4.	<i>Acanthosphæra angulata</i> , n. sp.,	.	.	×	300	216
Fig. 5.	<i>Acanthosphæra reticulata</i> , n. sp.,	.	.	×	300	217
Fig. 6.	<i>Heliosphæra coronata</i> , n. sp.,	.	.	×	400	219
	Fig. 6a. A single pore with its coronal,	.	.	×	300	
Fig. 7.	<i>Acanthosphæra mucronata</i> , n. sp.,	.	.	×	400	212
Fig. 8.	<i>Acanthosphæra clavata</i> , n. sp.,	.	.	×	400	212
Fig. 9.	<i>Heliosphæra pectinata</i> , n. sp.,	.	.	×	400	218
Fig. 10.	<i>Cenosphæra perforata</i> , n. sp.,	.	.	×	400	66
Fig. 11.	<i>Cenosphæra coronata</i> , n. sp.,	.	.	×	400	67



H. Heckel and A. G. S. Del.

K. Giltach, Jena, Lithogr.

1 2 HELIOSPHAERA, 3 - 9. ACANTHOSPHAERA, 10. 11. CERIOSPHAERA.

PLATE 27.

Legion SPUMELLARIA

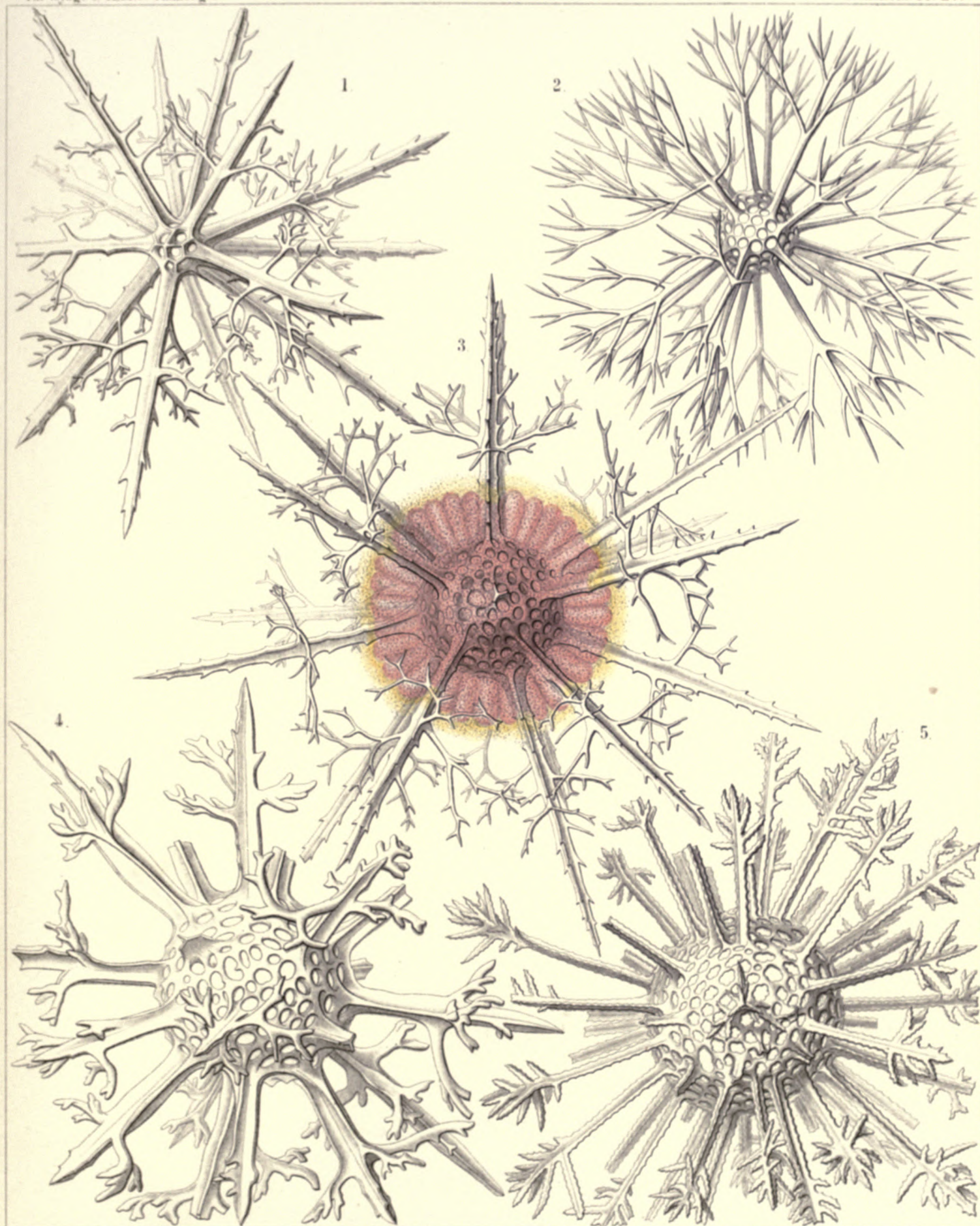
Order SPHÆROIDEA.

Family ASTROSPHÆRIDA.

PLATE 27.

ASTROSPHÆRIDA.

						Diam.	Page
Fig. 1.	<i>Cladococcus pinetum</i> , n. sp.,	.	.	.	.	× 300	226
Fig. 2.	<i>Cladococcus scoparius</i> , n. sp.,	.	.	.	.	× 300	225
Fig. 3.	<i>Cladococcus abietinus</i> , n. sp.,	.	.	.	.	× 300	226
The central capsule, enclosed originally in the shell, sends out numerous club-shaped apophyses through the pores of the lattice-sphere. The central spherical nucleus fills up half the shell-cavity.							
Fig. 4.	<i>Cladococcus stalactites</i> , n. sp.,	.	.	.	.	× 300	227
Fig. 5.	<i>Cladococcus dendrites</i> , n. sp.,	.	.	.	.	× 200	227



H. Haeckel and J. G. Rees del.

J. G. Rees, Jena, lithogr.

CLADOCOCCUS.

PLATE 28.

Legion SPUMELLARIA.

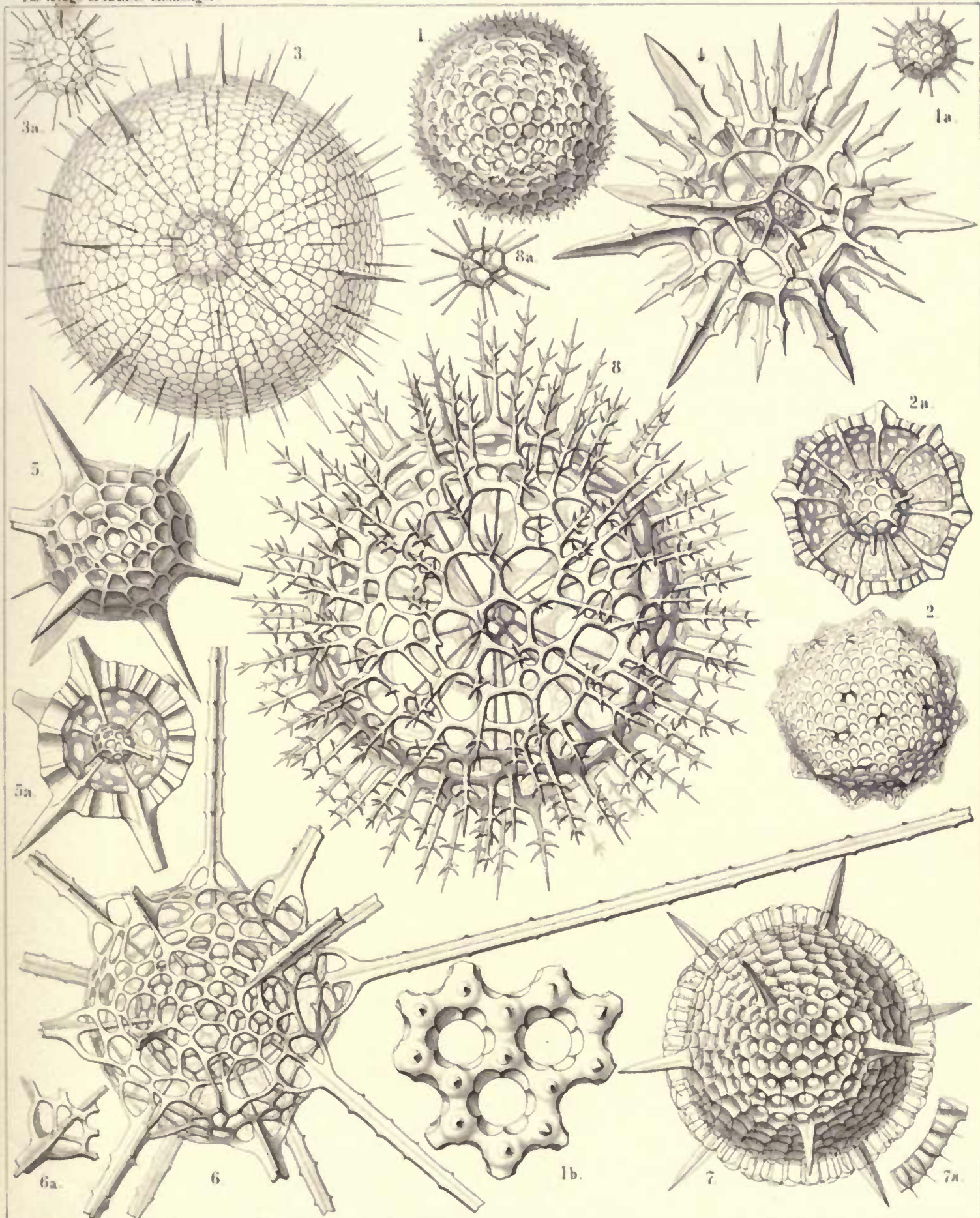
Order SPHÆROIDEA.

Families LIOSPHERIDA et ASTROSPHERIDA.

PLATE 28.

LIOSPHERIDA et ASTROSPHERIDA.

		Diam.	Page
Fig. 1.	<i>Haliomma liranthus</i> , n. sp.,	× 300	232
	Fig. 1a. Medullary shell,	× 300	
	Fig. 1b. Three pores of the cortical shell,	× 900	
Fig. 2.	<i>Carposphæra nodosa</i> , n. sp.,	× 300	76
	Fig. 2a. The medullary shell is visible, the upper half of the cortical shell being taken off,	× 300	
Fig. 3.	<i>Heliosoma radians</i> , n. sp.,	× 300	240
	Fig. 3a. Medullary shell,	× 300	
Fig. 4.	<i>Heliosoma hastatum</i> , n. sp.,	× 400	241
Fig. 5.	<i>Haliomma compactum</i> , n. sp.,	× 400	239
	Fig. 5a. The upper half of the cortical shell is removed,	× 300	
Fig. 6.	<i>Haliomma macrodoras</i> , n. sp.,	× 400	238
Fig. 7.	<i>Haliomma circumtextum</i> , n. sp.,	× 400	233
Fig. 8.	<i>Elatomma juniperinum</i> , n. sp.,	× 400	243
	Fig. 8a. Medullary shell,	× 400	



1 2 ANTHOMMA. 3 HELIOSOMA. 4 - 7 HALIOMMA.
8 ELATOMMA.

PLATE 29.

PLATE 29.

Legion SPUMELLARIA.

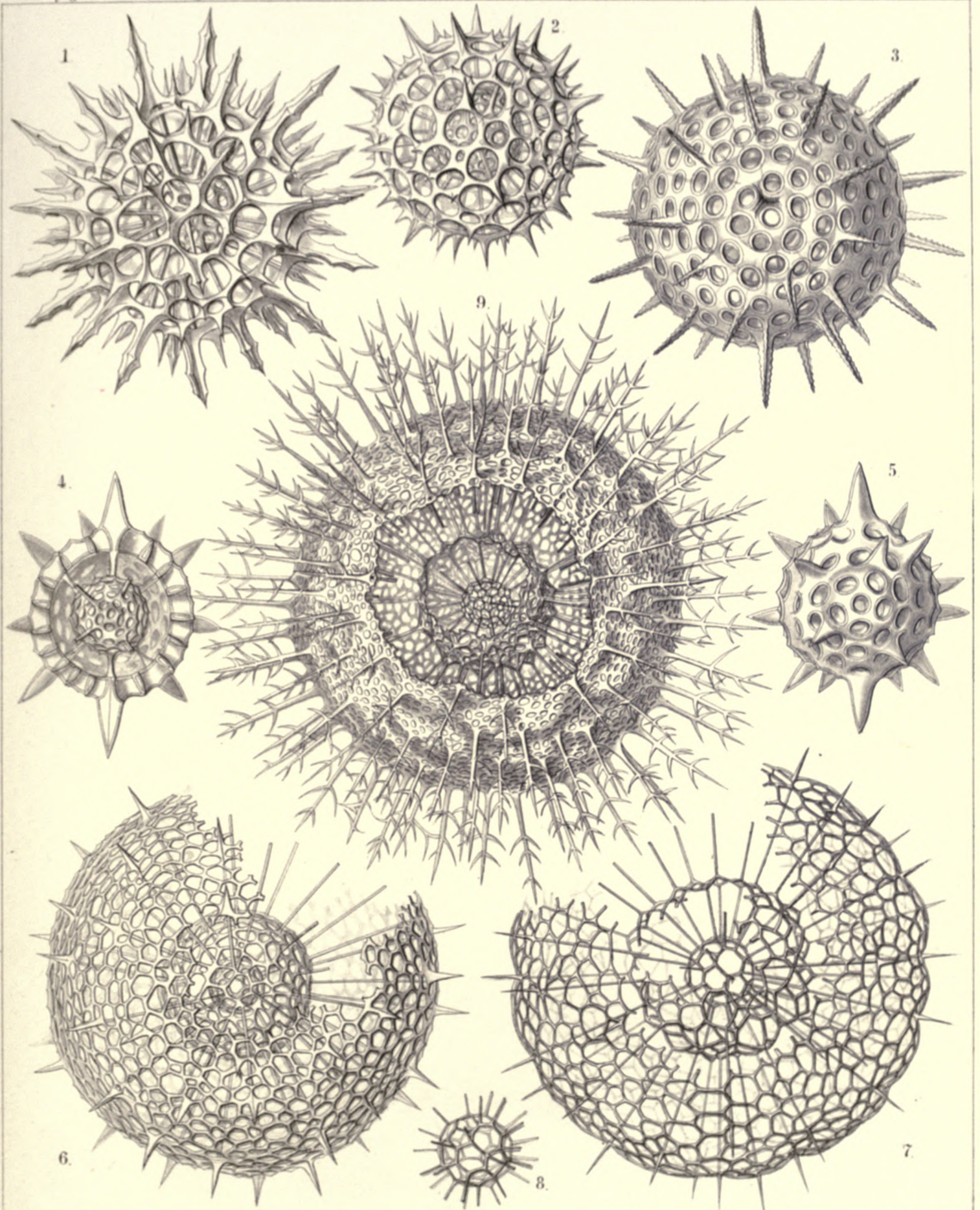
Order SPHÆROIDEA.

Family ASTROSPHÆRIDA.

PLATE 29.

ASTROSPHÆRIDA.

					Diam.	Page
Fig. 1.	<i>Echinomma toxopneustes</i> , n. sp.,	.	.	.	× 400	259
Fig. 2.	<i>Echinomma sphærechinus</i> , n. sp.,	.	.	.	× 400	258
Fig. 3.	<i>Actinomma denticulatum</i> , n. sp.,	.	.	.	× 400	254
Fig. 4.	<i>Actinomma pachyderma</i> , n. sp.,	.	.	.	× 400	254
	The half of the cortical shell is removed.					
Fig. 5.	<i>Actinomma pachyderma</i> , n. sp.,	.	.	.	× 400	254
Fig. 6.	<i>Actinomma capillaceum</i> , n. sp.,	.	.	.	× 300	255
Fig. 7.	<i>Actinomma arcadophorum</i> , n. sp.,	.	.	.	× 400	255
	A part of the two outer shells is removed.					
Fig. 8.	<i>Actinomma arcadophorum</i> , n. sp.,	.	.	.	× 400	255
	Inner medullary shell.					
Fig. 9.	<i>Pityomma drymodes</i> , n. sp.,	.	.	.	× 300	260
	A part of the two outer shells is removed.					



H. Haeckel and J. G. Süsser, Del.

F. Süsser, Jena, Lithogr.

1-8. ACTINOMMA. 9. PITYOMMA.

PLATE 30.

Legion SPUMELLARIA.

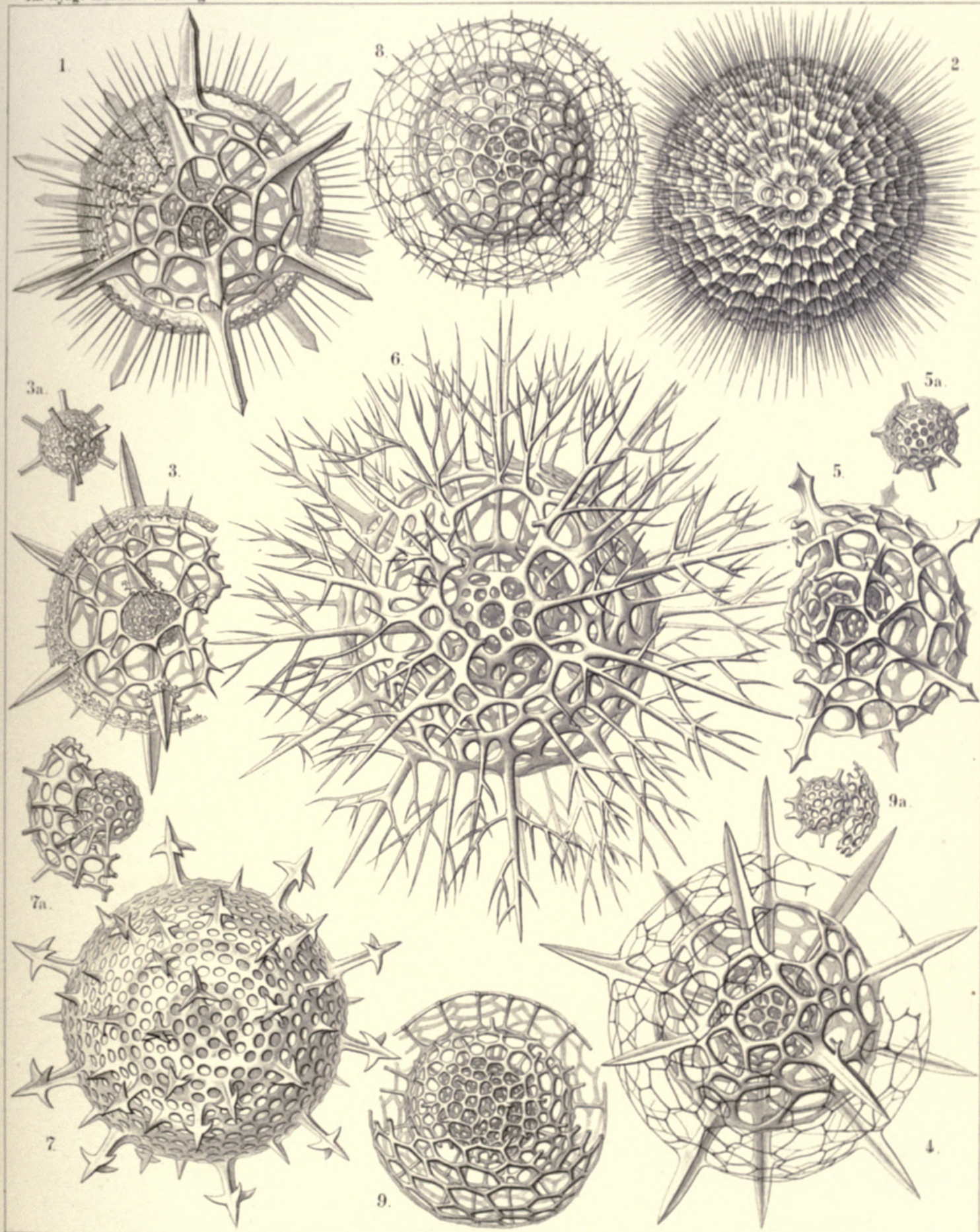
Order SPHÆROIDEA.

Families LIOSPHERIDA et ASTROSPHERIDA.

PLATE 30.

LIOSPHERIDA et ASTROSPHERIDA.

		Diam.	Page
Fig. 1.	<i>Cromyechinus icosacanthus</i> , n. sp.,	× 300	263
Fig. 2.	<i>Cromyomma villosum</i> , n. sp.,	× 300	261
Fig. 3.	<i>Cromyechinus dodecacanthus</i> , n. sp.,	× 400	264
	Fig. 3a. The innermost shells.		
Fig. 4.	<i>Cromyomma circumtextum</i> , n. sp.,	× 300	262
Fig. 5.	<i>Cromyomma mucronatum</i> , n. sp.,	× 200	263
	Fig. 5a. The innermost shells.		
Fig. 6.	<i>Cromyodrymus abietinus</i> , n. sp.,	× 300	265
Fig. 7.	<i>Cromyodrymus quadricuspis</i> , n. sp.,	× 400	264
	Fig. 7a. The inner concentric shells.		
Fig. 8.	<i>Cromyomma perspicuum</i> , n. sp.,	× 300	262
Fig. 9.	<i>Cromyosphæra quadruplex</i> , n. sp.,	× 300	84
	Fig. 9a. The innermost shells.		



H. Haeckel and J. G. Rees, Del.

J. G. Rees, Lithogr.

1-5. CROMYOMMA, 6, 7. CROMYODRYMUS, 8, 9. CROMYOSPHAERA.

PLATE 31.

Legion SPUMELLARIA.

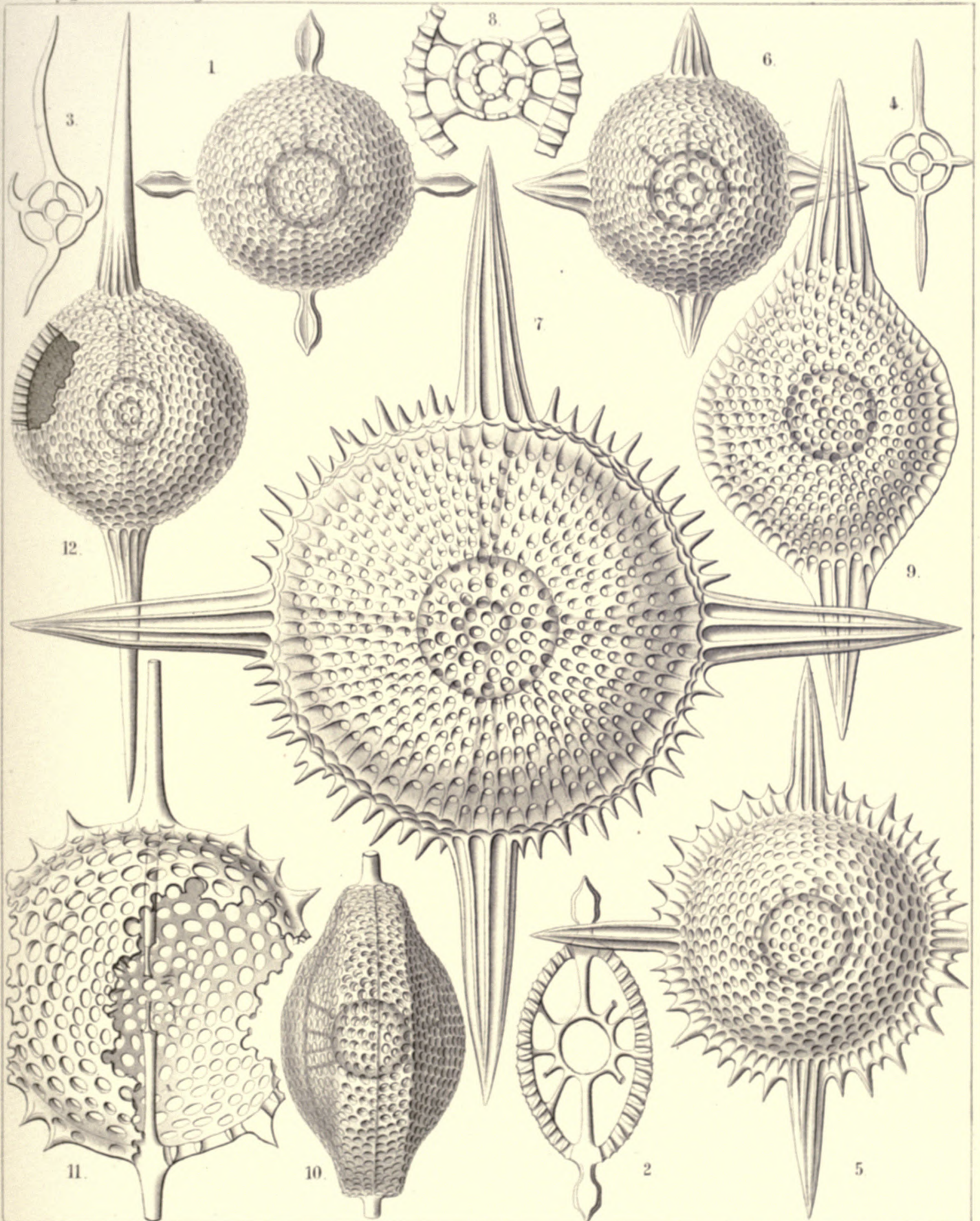
Order DISCOIDEA.

Families CENODISCIDA et PHACODISCIDA.

PLATE 31.

CENODISCIDA et PHACODISCIDA.

				Diam.	Page
Fig. 1.	<i>Sethostaurus orthostaurus</i> , n. sp.,	.	.	× 300	433
Fig. 2.	<i>Sethostaurus orthostaurus</i> , n. sp.,	.	.	× 300	433
	Vertical section through the centrum.				
Fig. 3.	<i>Sethostaurus recurvatus</i> , n. sp.,	.	.	× 100	434
	Optical section through the equatorial plane.				
Fig. 4.	<i>Sethostaurus rhombostaurus</i> , n. sp.,	.	.	× 100	434
	Optical section through the equatorial plane.				
Fig. 5.	<i>Sethostaurus cruciatus</i> , n. sp. (vel <i>Heliosaurus cruciatus</i>),	.	.	× 300	434
Fig. 6.	<i>Phacostaurus oceanidum</i> , n. sp.,	.	.	× 300	435
Fig. 7.	<i>Phacostaurus magnificus</i> , n. sp.,	.	.	× 400	436
Fig. 8.	<i>Phacostaurus magnificus</i> , n. sp.,	.	.	× 200	436
	Vertical section through the centrum.				
Fig. 9.	<i>Sethostylus dictyliscus</i> , n. sp.,	.	.	× 400	428
Fig. 10.	<i>Sethostylus dicylindrus</i> , n. sp.,	.	.	× 300	428
	Marginal view.				
Fig. 11.	<i>Stylodiscus endostylus</i> , n. sp. (vel <i>Sethostylus endostylus</i>),	.	.	× 300	413
Fig. 12.	<i>Phacostylus amphistylus</i> , n. sp.,	.	.	× 300	430



H. Haeckel and A. Götsch Del.

K. Götsch, Jena, Lithogr.

1-4. SETHOSTAURUS, 5 HELIOSTAUROS, 6 PHACOSTAUROS,
7 8. ASTROSTAUROS, 9-11. SETHOSTYLUS, 12 PHACOSTYLUS.

PLATE 32.

Legion SPUMELLARIA.

Order DISCOIDEA.

Family PHACODISCIDA.

PLATE 32.

PHACODISCIDA.

	Diam.	Page
Fig. 1. <i>Astrophacus solaris</i> , n. sp.,	x 300	453
Fig. 2. <i>Astrophacus apollinis</i> , n. sp.,	x 300	455
Fig. 3. <i>Astrophacus phacodiscus</i> , n. sp.,	x 300	454
Vertical section through the centrum.		
Fig. 4. <i>Astrosestrum ephyra</i> , n. sp.,	x 300	442
Fig. 4a. Transverse section through the double medullary shell, .	x 300	442
Fig. 5. <i>Astrosestrum nauphanta</i> , n. sp.,	x 300	442
Fig. 6. <i>Phacostylus caudatus</i> , n. sp. (vel <i>Astrosestrum caudatum</i>), .	x 200	431
Fig. 7. <i>Perizona scutella</i> , n. sp.,	x 400	427
Fig. 8. <i>Perizona pterygota</i> , n. sp.,	x 400	427
Fig. 8a. Medullary shells and radial beams connecting them with the disk, .	x 300	427

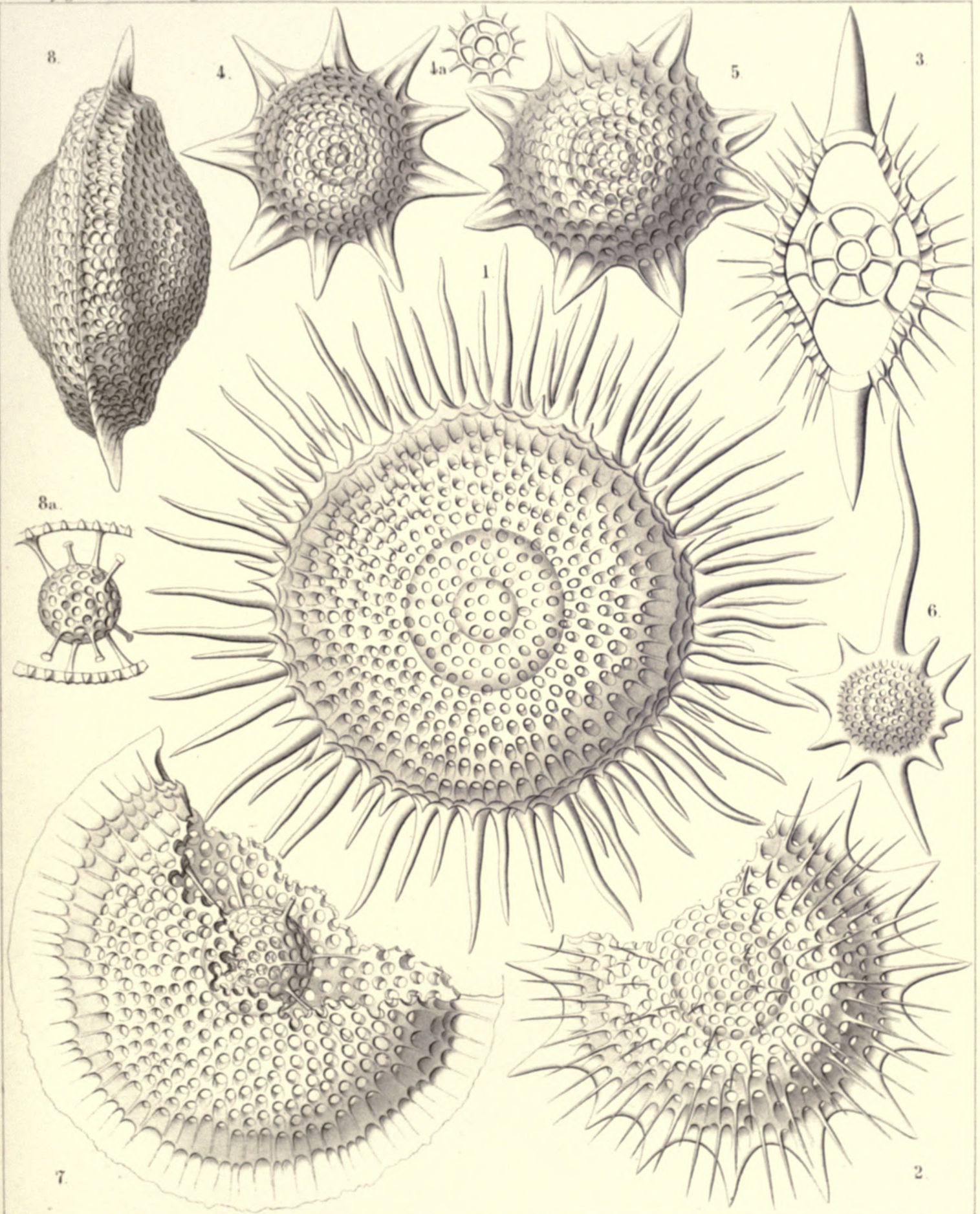


PLATE 33.

Legion SPUMELLARIA.

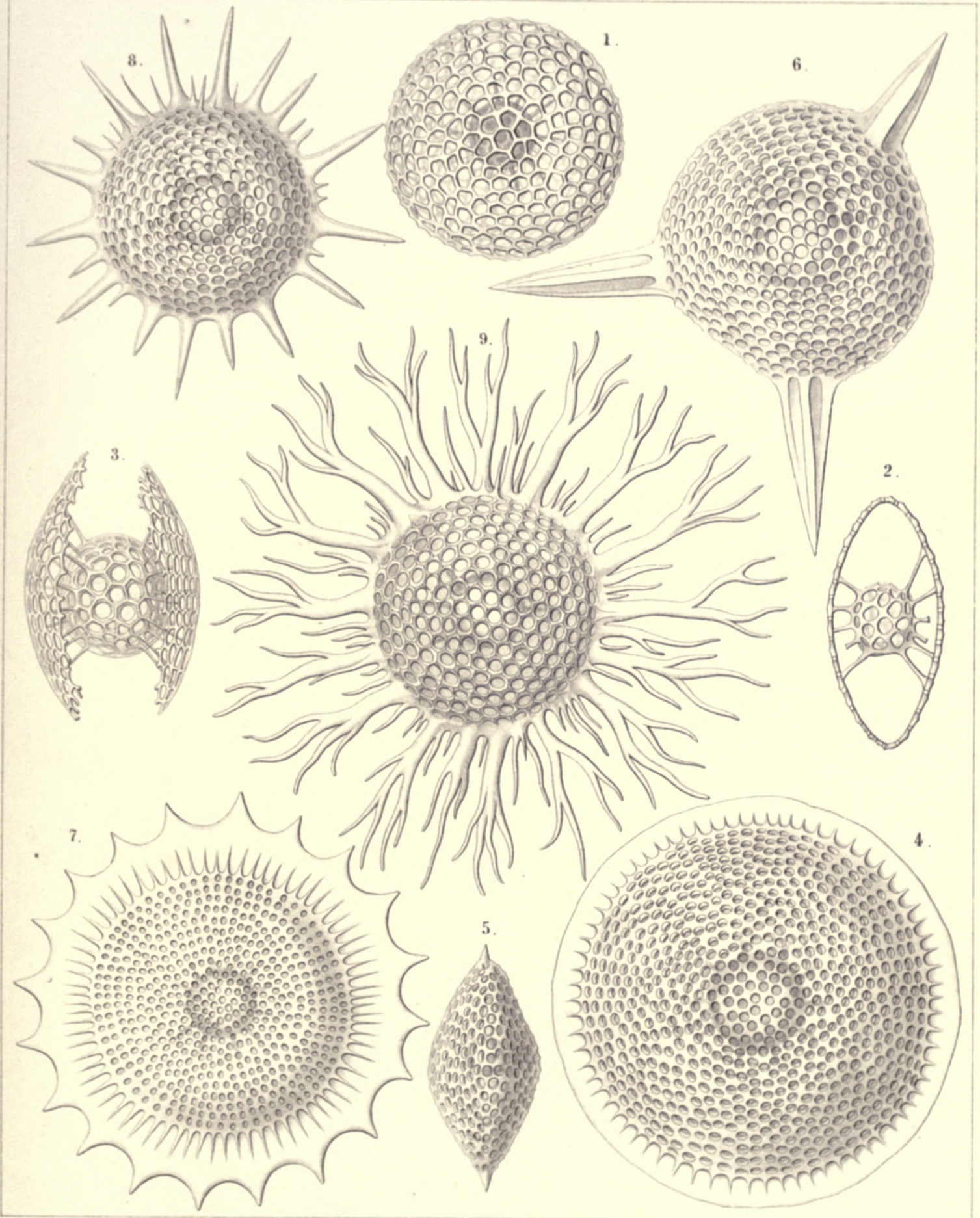
Order DISCOIDEA.

Family PHACODISCIDA.

PLATE 33.

PHACODISCIDA.

					Diam.	Page
Fig. 1.	<i>Sethodiscus lenticula</i> , n. sp.,	.	.	.	× 300	423
Fig. 2.	<i>Sethodiscus lenticula</i> , n. sp.,	.	.	.	× 300	423
	Vertical section.					
Fig. 3.	<i>Sethodiscus macrococcus</i> , n. sp.,	.	.	.	× 300	423
	Young shell, not yet closed, seen from the margin.					
Fig. 4.	<i>Periphæna cincta</i> , n. sp.,	.	.	.	× 400	426
Fig. 5.	<i>Triactiscus tricuspis</i> , n. sp.,	.	.	.	× 300	432
	Marginal view.					
Fig. 6.	<i>Triactiscus tripyramis</i> , n. sp.,	.	.	.	× 400	432
Fig. 7.	<i>Heliodiscus cingillum</i> , n. sp.,	.	.	.	× 300	448
Fig. 8.	<i>Heliodiscus asteriscus</i> , n. sp.,	.	.	.	× 300	445
Fig. 9.	<i>Heliodrymus dendrocyclus</i> , n. sp. (vel <i>Heliocladus dendrocyclus</i>),				× 300	451



K. Hancock and A. G. S. Del.

F. G. S. S. Lithogr.

1-3. SETHODISCUS, 4. PERIPHAENA, 5. 6. TRIACTIS,
7. 8. HELIODISCUS, 9. HELIOCLADUS.

PLATE 34.

Legion SPUMELLARIA.

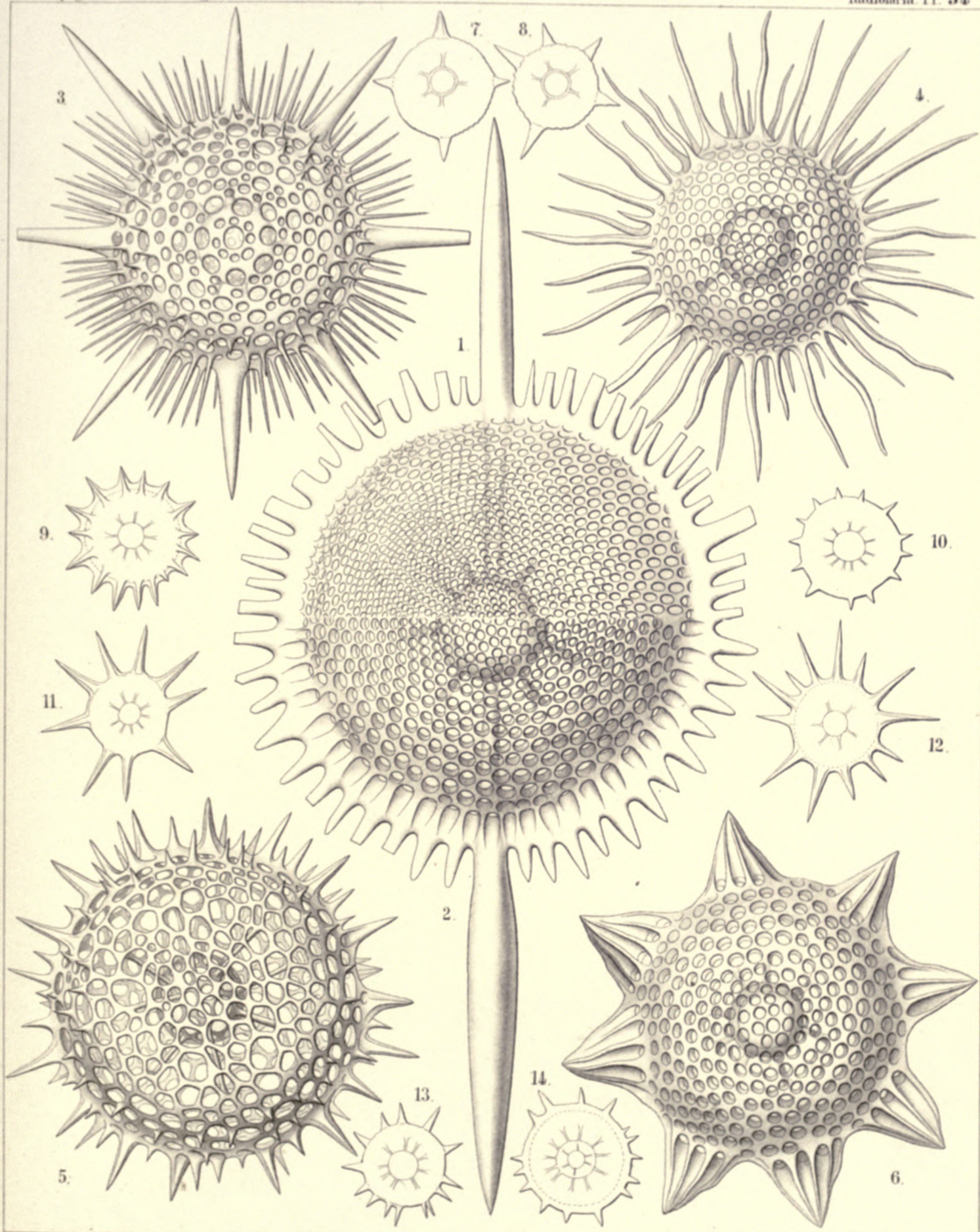
Order DISCOIDEA.

Family PHACODISCIDA.

PLATE 34.

PHACODISCIDA.

			Diam.	Page
Fig. 1.	<i>Sethostylus dentatus</i> , n. sp. (vel <i>Heliostylus dentatus</i>), Upper half of the disk.	.	× 300	429
Fig. 2.	<i>Sethostylus serratus</i> , n. sp. (vel <i>Heliostylus serratus</i>), Lower half of the disk.	.	× 300	429
Fig. 3.	<i>Heliosestrum octonum</i> , n. sp.,	.	× 300	440
Fig. 4.	<i>Heliodiscus solaster</i> , n. sp.,	.	× 300	447
Fig. 5.	<i>Heliodiscus echiniscus</i> , n. sp.,	.	× 400	448
Fig. 6.	<i>Heliosestrum medusinum</i> , n. sp.,	.	× 300	438
Fig. 7.	<i>Sethostaurus conostaurus</i> , n. sp., Normal form with four regular spines.	.	× 100	433
Fig. 8.	<i>Sethostaurus conostaurus</i> , n. sp., Abnormal form with five spines.	.	× 100	433
Fig. 9.	<i>Heliodiscus marginatus</i> , n. sp.,	.	× 100	449
Fig. 10.	<i>Heliodiscus trochiscus</i> , n. sp.,	.	× 100	445
Fig. 11.	<i>Heliodiscus polymorphus</i> , n. sp.,	.	× 100	447
Fig. 12.	<i>Heliodiscus polymorphus</i> , n. sp.,	.	× 100	447
Fig. 13.	<i>Heliodiscus trochiscus</i> , n. sp.,	.	× 100	445
Fig. 14.	<i>Astrophacus trochiscus</i> , n. sp.,	.	× 100	453



E. Haeckel and A. G. G. Del.

E. G. G. Jena, Lithogr.

1 2. HELIOSTYLUS, 3-14. HELIODISCUS.

PLATE 35.

Legion SPUMELLARIA.

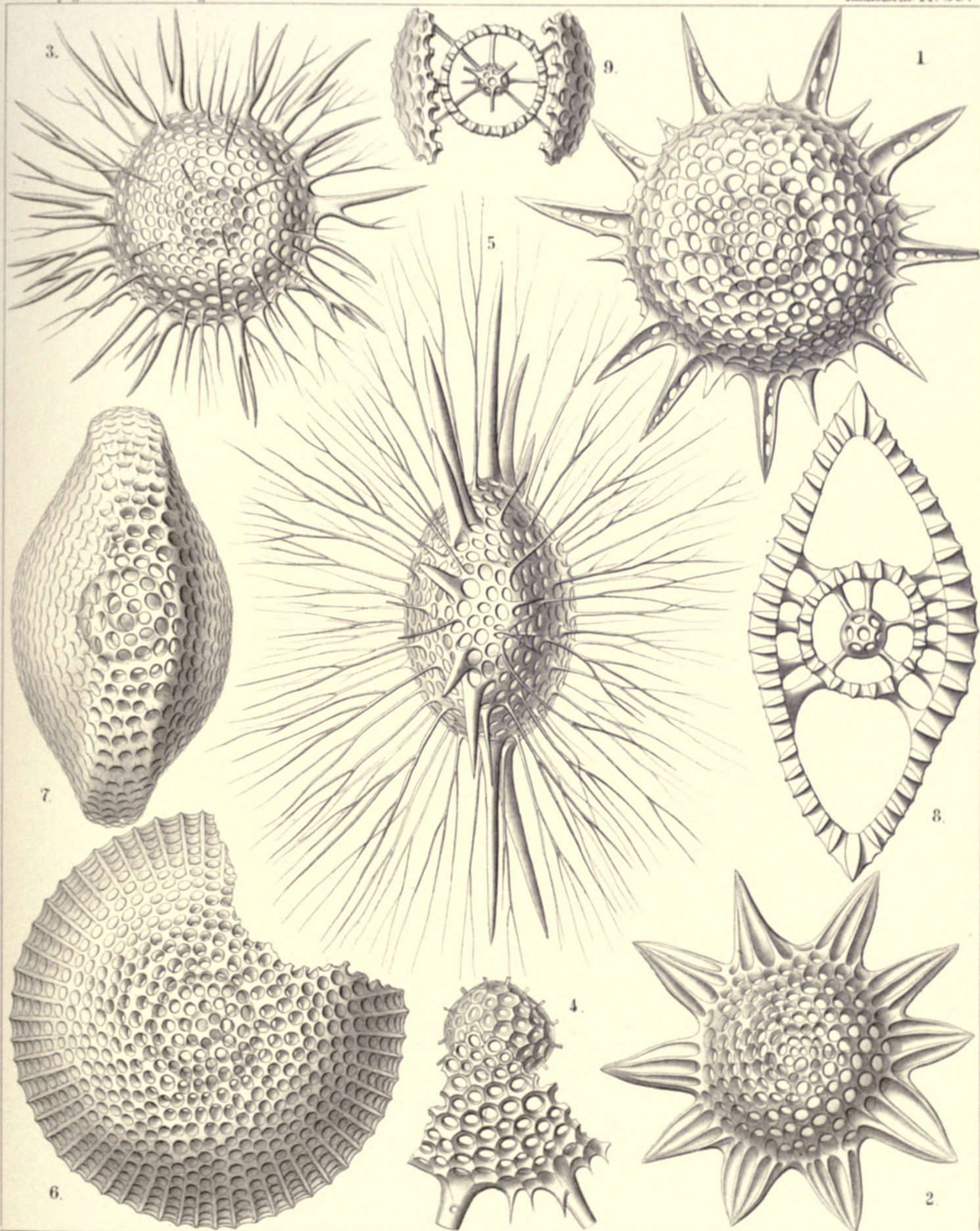
Order DISCOIDEA.

Family PHACODISCIDA.

PLATE 35.

PHACODISCIDA.

	Diam.	Page
Fig. 1. <i>Heliodiscus pertusus</i> , n. sp. (vel <i>Heliosestrum pertusum</i>), Irregular form with ten (instead of eight) larger latticed spines.	. x 400	448
Fig. 2. <i>Heliodiscus glyphodon</i> , n. sp. (vel <i>Heliosestrum glyphodon</i>),	. x 300	446
Fig. 3. <i>Heliodrymus ramosus</i> , n. sp.,	. x 300	452
Fig. 4. <i>Heliodrymus ramosus</i> , n. sp., Medullary shell and a segment of the disk.	. x 500	452
Fig. 5. <i>Heliodrymus viminalis</i> , n. sp., Marginal view.	. x 400	452
Fig. 6. <i>Phacodiscus clypeus</i> , n. sp.,	. x 400	425
Fig. 7. <i>Phacodiscus rotula</i> , n. sp., Marginal view.	. x 400	424
Fig. 8. <i>Phacodiscus lentiformis</i> , n. sp., Vertical section nearly through the centre.	. x 400	425
Fig. 9. <i>Phacodiscus clypeus</i> , n. sp., Vertical section nearly through the centre.	. x 400	425



H. Haeckel and A. Götzsch, Del.

E. Götzsch, Jena, Lithogr.

1 2 HELIOSESTRUM 3-5 HELIODRYMUS 6-9 PHACODISCUS

PLATE 36.

Chondrodiscus

Fig. 1. *Chondrodiscus* *sp.*
The left half of the figure represents a chondrodiscus, showing the
enlarged part, the other half a view of the entire

PLATE 36.

Legion SPUMELLARIA.

Order DISCOIDEA.

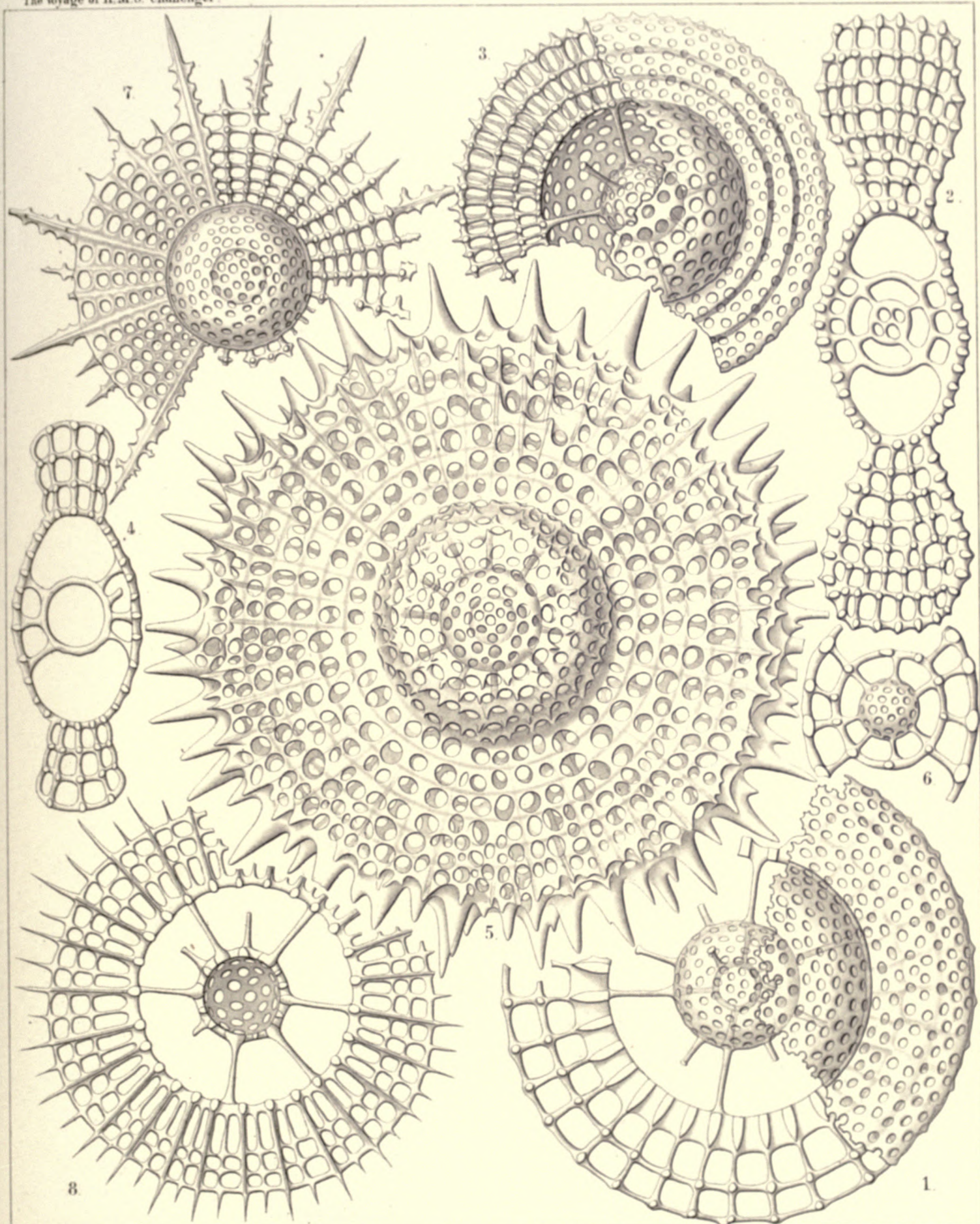
Family COCCODISCIDA.

Fig. 2. *Chondrodiscus* *sp.*
Fig. 3. *Chondrodiscus* *sp.*
Fig. 4. *Chondrodiscus* *sp.*
Fig. 5. *Chondrodiscus* *sp.*
Fig. 6. *Chondrodiscus* *sp.*
Fig. 7. *Chondrodiscus* *sp.*
Fig. 8. *Chondrodiscus* *sp.*
Fig. 9. *Chondrodiscus* *sp.*

PLATE 36.

COCCODISCIDA.

	Diam.	Page
Fig. 1. <i>Coccodiscus lamarchii</i> , n. sp.,	× 500	459
The left half of the figure represents a horizontal section through the peripheral shell, the right half a view of the surface.		
Fig. 2. <i>Coccodiscus gæthei</i> , n. sp.,	× 500	461
Vertical section nearly through the centre.		
Fig. 3. <i>Lithocyclia lenticula</i> , n. sp.,	× 400	459
Fig. 4. <i>Lithocyclia lenticula</i> , n. sp.,	× 400	459
Vertical section through the centre.		
Fig. 5. <i>Coccocyclia helianthus</i> , n. sp.,	× 400	468
Fig. 6. <i>Coccocyclia helianthus</i> , n. sp.,	× 500	468
Vertical section through the outer medullary shell, showing the inner.		
Fig. 7. <i>Astrocyclia solaster</i> , n. sp.,	× 300	466
Fig. 8. <i>Astrocyclia heterocycla</i> , n. sp.,	× 400	468
Horizontal section through the equatorial plane.		



H. Haeckel and A. Gültzsch, Del.

E. Sittich, Jena, Lithogr.

1 2 COCCODISCUS 3 4 LITHOCYCLIA 5 6 COCCOCYCLIA
7 8 ASTROCYCLIA

PLATE 37.

Legion SPUMELLARIA.

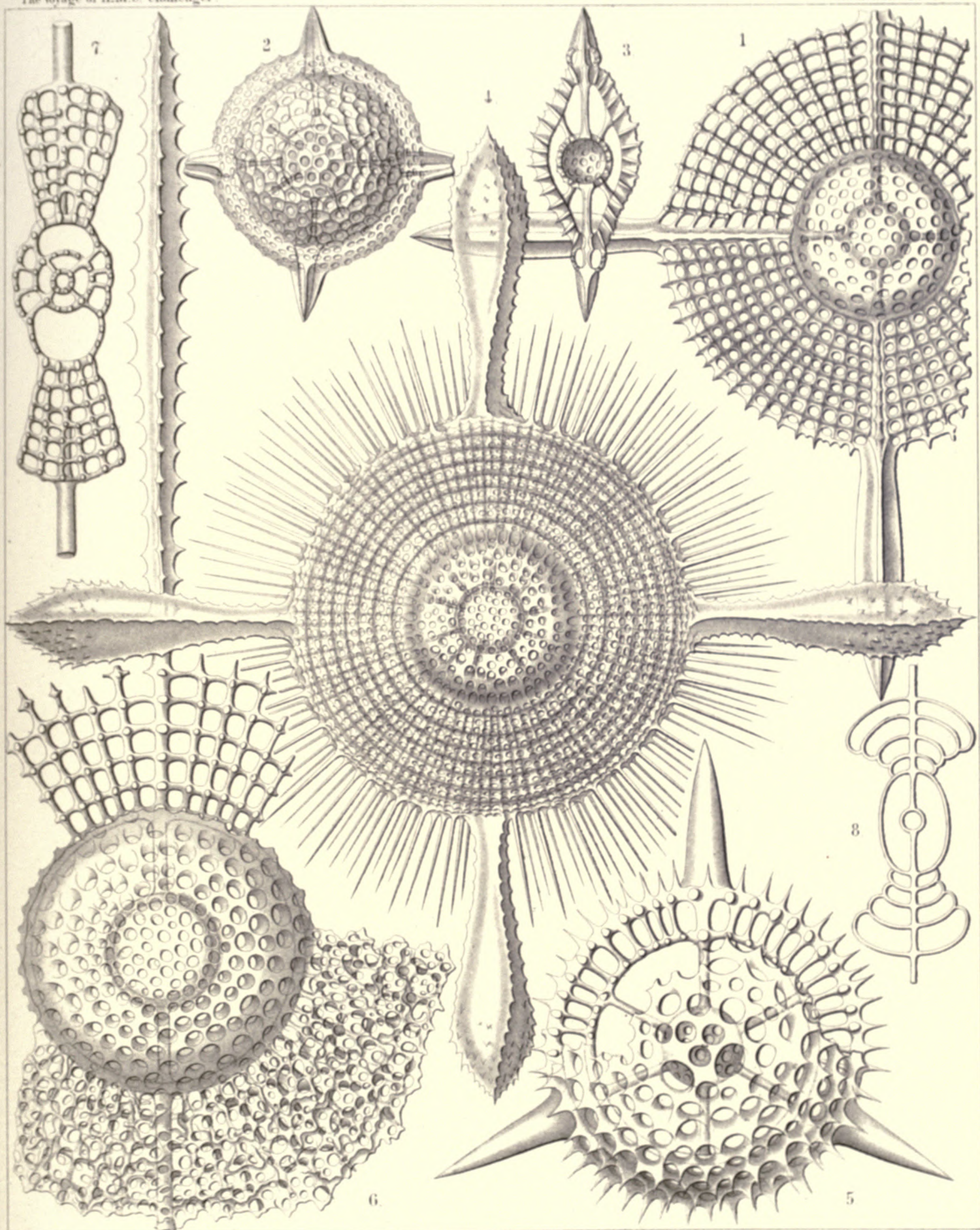
Order DISCOIDEA.

Family COCCODISCIDA.

PLATE 37.

COCCODISCIDA.

			Diam.	Page
Fig. 1.	<i>Staurocycilia cruciata</i> , n. sp.,	x	400	465
Fig. 2.	<i>Staurocycilia phacostaurus</i> , n. sp.,	x	300	465
Fig. 3.	<i>Staurocycilia phacostaurus</i> , n. sp.,	x	300	465
	Vertical section through the centre.			
Fig. 4.	<i>Staurocycilia magniducis</i> , n. sp. (<i>Coccostaurus magniducis</i>),	x	300	466
Fig. 5.	<i>Trigonocycilia triangularis</i> , n. sp.,	x	400	464
Fig. 6.	<i>Stylocycilia prionacantha</i> , n. sp.,	x	500	462
	A great part of the peripheral shell is removed.			
Fig. 7.	<i>Amphicyclia amphistyla</i> , n. sp.,	x	300	464
	Vertical section through the centre.			
Fig. 8.	<i>Stylocycilia excavata</i> , n. sp.,	x	200	463
	Vertical section through the centre.			



H. Haeckel and J. G. Sattler del.

L. Sattler lith.

1-3 STAUROCYCLIA, 4 COCCOSTAURUS, 5 TRIGONOCYCLIA,
6-8. STYLOCYCLIA.

PLATE 38.

Legion SPUMELLARIA.

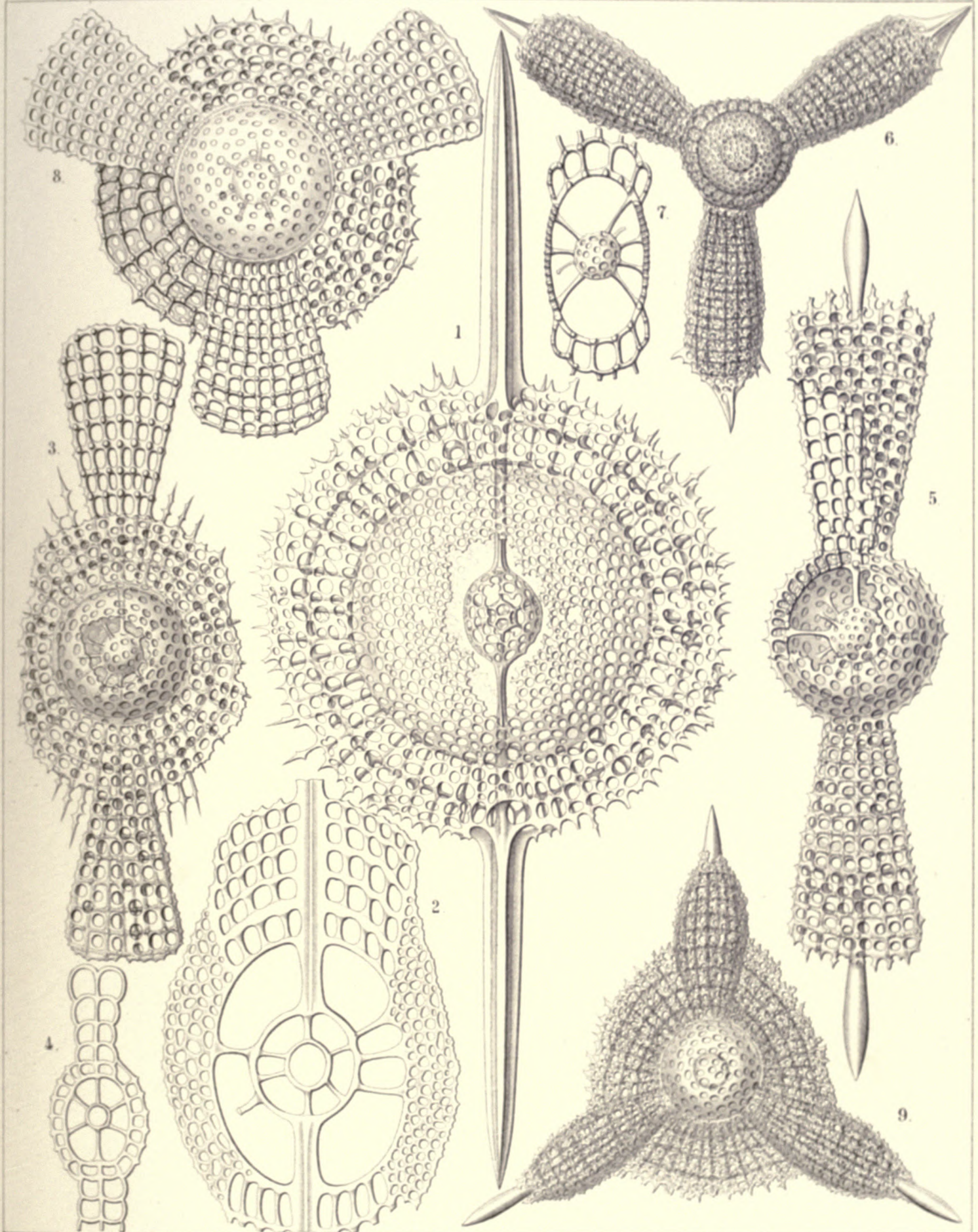
Order DISCOIDEA.

Family COCCODISCIDA.

PLATE 38.

COCCODISCIDA.

					Diam.	Page
Fig. 1.	<i>Amphicyclia chronometra</i> , n. sp.,	.	.	.	× 400	463
Fig. 2.	<i>Amphicyclia pachydiscus</i> , n. sp.,	.	.	.	× 500	464
	Vertical section through the centre.					
Fig. 3.	<i>Amphiactura amphibrachia</i> , n. sp.,	.	.	.	× 300	470
Fig. 4.	<i>Amphiactura amphibrachia</i> , n. sp.,	.	.	.	× 150	470
	Vertical section through the centre.					
Fig. 5.	<i>Diplactura diploconus</i> , n. sp.,	.	.	.	× 300	470
Fig. 6.	<i>Trigonactura triacantha</i> , n. sp.,	.	.	.	× 200	472
Fig. 7.	<i>Trigonactura triacantha</i> , n. sp.,	.	.	.	× 400	472
	Vertical section nearly through the centre.					
Fig. 8.	<i>Hymenactura archimedis</i> , n. sp.,	.	.	.	× 300	473
Fig. 9.	<i>Hymenactura copernici</i> , n. sp.,	.	.	.	× 200	475



H. Haeckel and A. S. S. Del.

K. G. S. Jena, Lithogr.

1 2 AMPHICYCLIA, 3-5 AMPHIACTURA, 6 7 TRIGONACTURA,
8 9. HYMENACTURA.

PLATE 39.

Legion SPUMELLARIA.

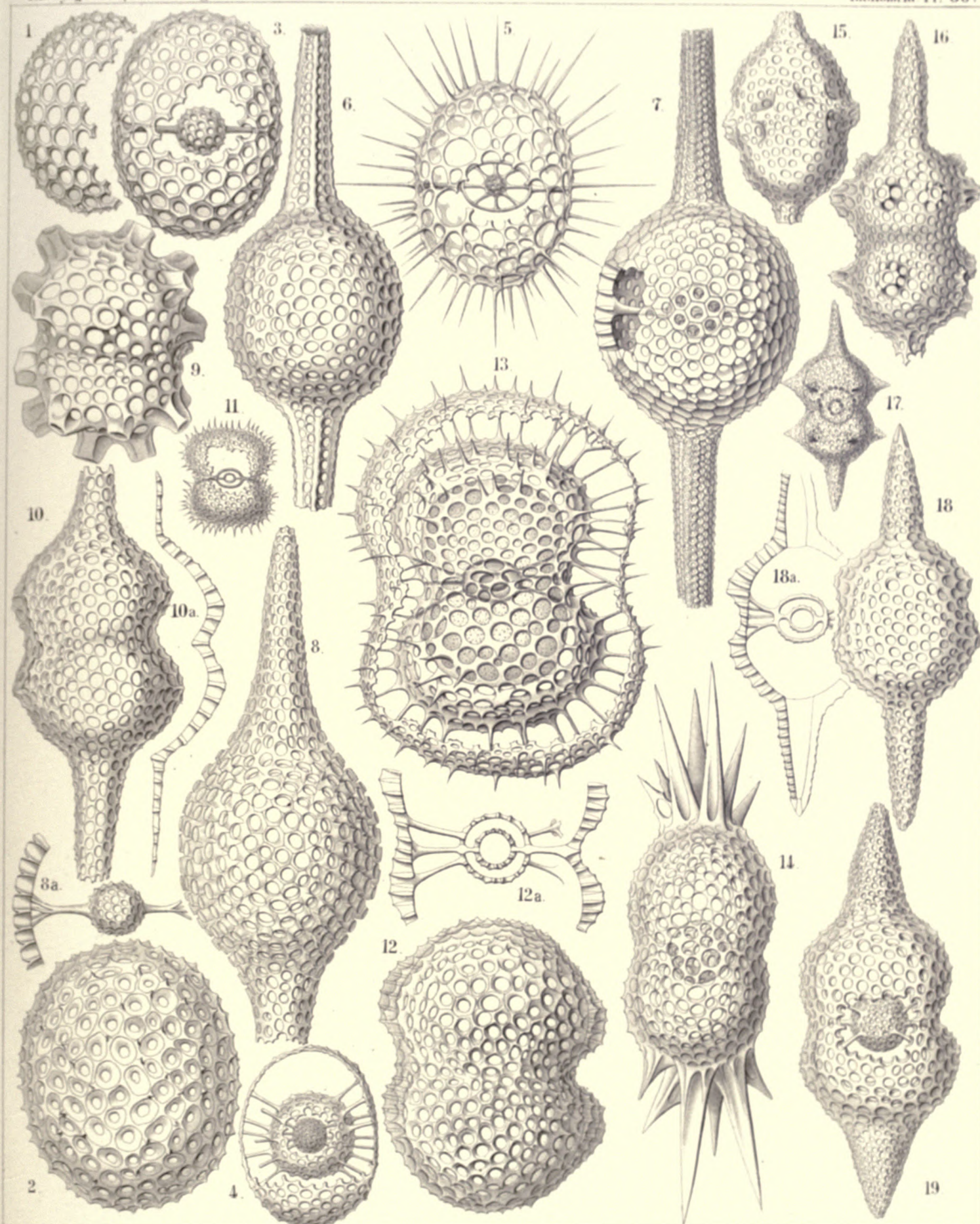
Order PRUNOIDEA.

Families ELLIPSIDA, DRUPPULIDA, ARTISCIDA et CYPHINIDA.

PLATE 39.

ELLIPSIDA, DRUPPULIDA, ARTISCIDA et CYPHINIDA.

	Diam.	Page
Fig. 1. <i>Cenellipsis faceta</i> , n. sp. (vel <i>Ellipsis faceta</i>),	x 300	291
Fig. 2. <i>Cenellipsis infundibulum</i> , n. sp. (vel <i>Ellipsis infundibulum</i>),	x 300	292
Fig. 3. <i>Druppula pandanus</i> , n. sp. (vel <i>Coccymelium pandanus</i>),	x 300	308
Fig. 4. <i>Prunulum coccymelium</i> , n. sp. (vel <i>Coccymelium prunulum</i>),	x 300	313
Fig. 5. <i>Prunocarpus artocarpium</i> , n. sp. (vel <i>Artocarpium indicum</i>),	x 300	316
Fig. 6. <i>Pipettella prismatica</i> , n. sp.,	x 300	305
Fig. 7. <i>Pipetta tuba</i> , n. sp.,	x 300	337
Fig. 8. <i>Pipetta fusus</i> , n. sp.,	x 300	337
Fig. 8a. The enclosed medullary shell.		
Fig. 9. <i>Artiscus nodosus</i> , n. sp. (vel <i>Artidium nodosum</i>),	x 400	356
Fig. 10. <i>Cannartus violina</i> , n. sp.,	x 300	358
Fig. 11. <i>Cyphonium cribellum</i> , n. sp.,	x 200	365
Fig. 12. <i>Cyphonium virgineum</i> , n. sp. (vel <i>Ommatospyris virginea</i>),	x 400	363
Fig. 12a. Vertical section through the double medullary shell.		
Fig. 13. <i>Cypassis puella</i> , n. sp. (vel <i>Didymospyris puella</i>),	x 400	367
The enclosed central capsule is visible.		
Fig. 14. <i>Cyphinus amphilophus</i> , n. sp.,	x 300	370
Fig. 15. <i>Pipettaria tubaria</i> , n. sp.,	x 300	339
Fig. 16. <i>Cannartidium mammiferum</i> , n. sp.,	x 300	375
Fig. 17. <i>Cannartidium mastophorum</i> , n. sp.,	x 150	375
Fig. 18. <i>Cannartidium bicinctum</i> , n. sp.,	x 300	374
Fig. 18a. Vertical section through the main axis.		
Fig. 19. <i>Cannartiscus amphiconiscus</i> , n. sp.,	x 300	372



H. Haeckel and J. G. Stead, Del.

K. G. Stead, Jena, Lithogr.

1 2 ELLIPSIS, 3 4 COCCYMELIUM, 5 ARTOCARPIUM, 6 PIPETTELLA,
7 8. PIPETTA, 9. ARTIDIUM, 10 CANNARTUS, 11 12 OMMATOSPYRIS,
13 DIDYMOSPYRIS, 14 CYPHINIDIUM, 15-19 CANNARTIDIUM.

PLATE 40.

Legion SPUMELLARIA.

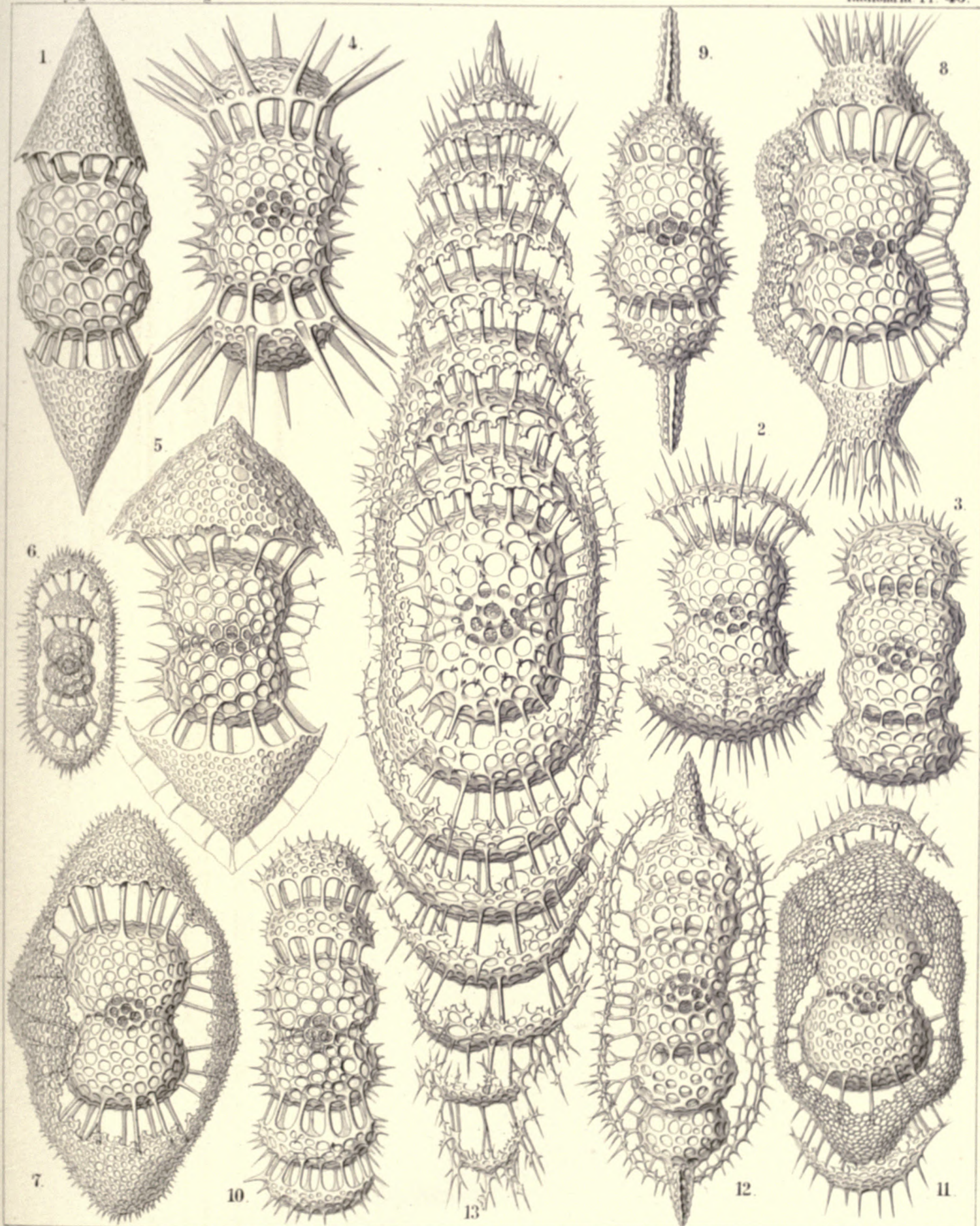
Order PRUNOIDEA.

Families PANARTIDA et ZYGARTIDA.

PLATE 40.

PANARTIDA et ZYGARTIDA.

		Diam.	Page
Fig. 1.	<i>Panartus diploconus</i> , n. sp.,	× 300	379
Fig. 2.	<i>Panartus pluteus</i> , n. sp.,	× 300	382
Fig. 3.	<i>Panartus tetrathalamus</i> , n. sp.,	× 300	378
Fig. 4.	<i>Panicium coronatum</i> , n. sp. (vel <i>Panartidium coronatum</i>),	× 300	386
Fig. 5.	<i>Peripanartus amphiconus</i> , n. sp.,	× 300	383
Fig. 6.	<i>Peripanartus cylindrus</i> , n. sp.,	× 150	384
Fig. 7.	<i>Peripanartus atractus</i> , n. sp.,	× 300	384
Fig. 8.	<i>Peripanicium amphicorona</i> , n. sp.,	× 300	387
Fig. 9.	<i>Panarium tubularium</i> , n. sp.,	× 300	390
Fig. 10.	<i>Ommatocampe nereides</i> , n. sp.,	× 300	394
Fig. 11.	<i>Cyphocolpus virginis</i> , n. sp. (vel <i>Zygartus virginis</i>),	× 300	369
Fig. 12.	<i>Desmartus larvalis</i> , n. sp. (vel <i>Zygartus larvalis</i>),	× 300	398
Fig. 13.	<i>Zygartus chrysalis</i> , n. sp. (vel <i>Zygocampe chrysalis</i>),	× 400	401



1-3. PANARTUS, 4. PANARTIDIUM, 5-8. PERIPANARTUS,
9. PANARIUM, 10. OMMATOCAMPE, 11-13. ZYGARTUS.

PLATE 41.

Legion SPUMELLARIA.

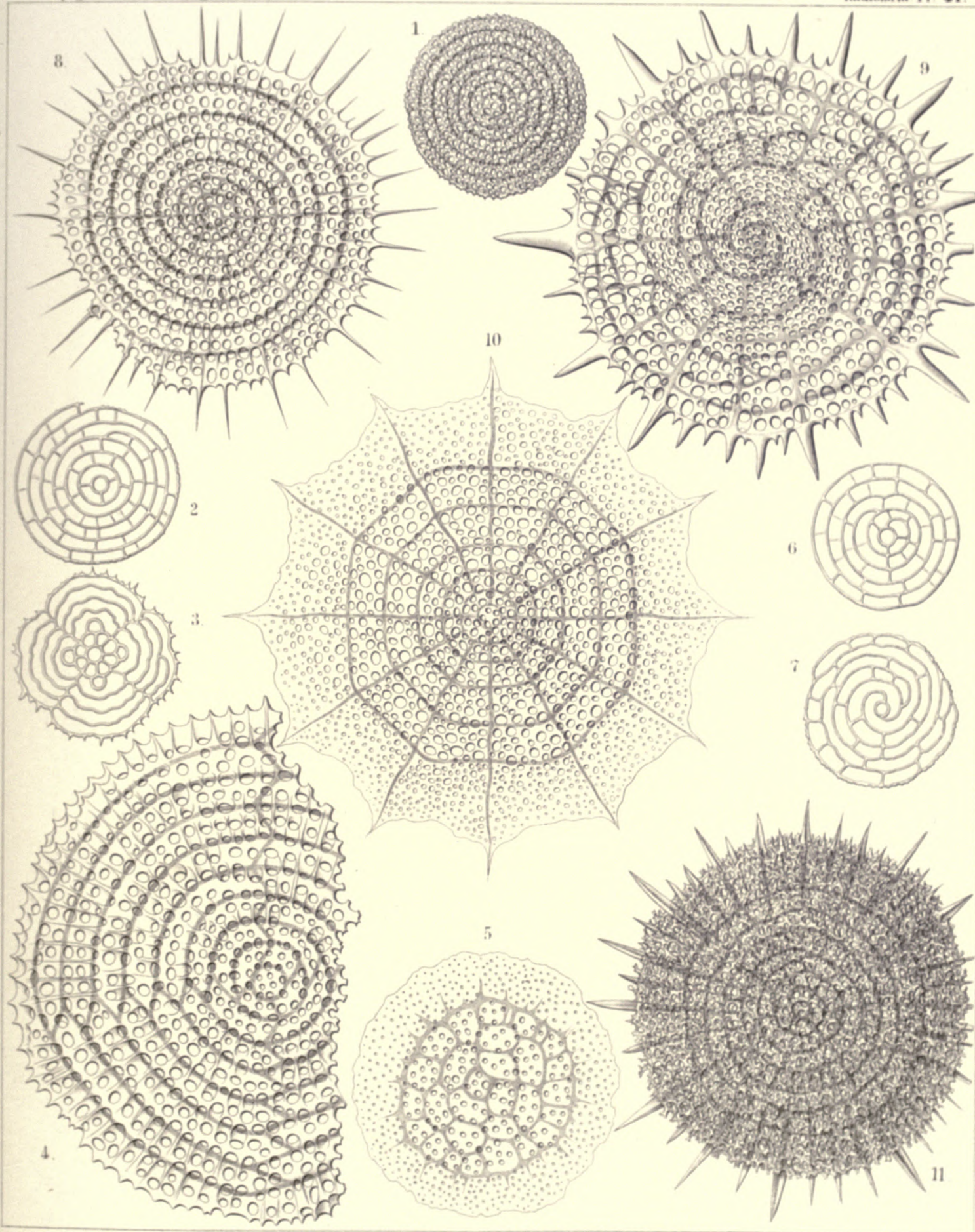
Order DISCOIDEA.

Families PORODISCIDA et SPONGODISCIDA.

PLATE 41.

PORODISCIDA et SPONGODISCIDA.

			Diam.	Page
Fig. 1.	<i>Porodiscus flustrella</i> , n. sp.,	x 300	493	
Fig. 2.	<i>Porodiscus perispira</i> , n. sp., The rings alone (equatorial section).	x 200	495	
Fig. 3.	<i>Porodiscus quadrigatus</i> , n. sp., The rings alone (equatorial section).	x 200	494	
Fig. 4.	<i>Porodiscus semispiralis</i> , n. sp.,	x 500	497	
Fig. 5.	<i>Perichlamydidium saturnus</i> , n. sp.,	x 300	499	
Fig. 6.	<i>Porodiscus centrospira</i> , n. sp. (vel <i>Perispongidium centrospira</i>), The rings alone (equatorial section).	x 200	495	
Fig. 7.	<i>Porodiscus irregularis</i> , n. sp. (vel <i>Perispongidium irregulare</i>), The rings alone (equatorial section).	x 200	498	
Fig. 8.	<i>Stylodictya heliospira</i> , n. sp.,	x 400	512	
Fig. 9.	<i>Stylodictya centrospira</i> , n. sp.,	x 400	512	
Fig. 10.	<i>Stylochlamydidium asteriscus</i> , n. sp.,	x 400	514	
Fig. 11.	<i>Stylotrochus geddesii</i> , n. sp.,	x 300	585	



H. MacNeil and A.G. Stutch, Del.

V. Stutch, Lithogr.

1-4. PORODISCUS, 5 PERICHLAMYDIUM, 6 7 PERISPONGIDIUM,
8, 9. STYLODICTYA, 10 STYLOCHLAMYDIUM, 11 STYLOSPONGIDIUM.

PLATE 42.

Legion SPUMELLARIA.

Order DISCOIDEA.

Family PORODISCIDA.

PLATE 42.

PORODISCIDA.

					Diam.	Page
Fig. 1.	<i>Staurodictya elegans</i> , n. sp.,	.	.	.	x 500	507
Fig. 2.	<i>Staurodictya ciliata</i> , n. sp.,	.	.	.	x 400	506
Fig. 3.	<i>Staurodictya medusa</i> , n. sp.,	.	.	.	x 400	506
Fig. 4.	<i>Staurodictya cruciata</i> , n. sp.,	.	.	.	x 300	507
Fig. 5.	<i>Staurodictya cruciata</i> , n. sp.,	.	.	.	x 300	507
	Vertical section through the disk.					
Fig. 6.	<i>Staurodictya grandis</i> , n. sp.,	.	.	.	x 300	508
	Vertical section through the disk.					
Fig. 7.	<i>Tripodictya triacantha</i> , n. sp.,	.	.	.	x 400	505
Fig. 8.	<i>Tripodictya trigonaria</i> , n. sp.,	.	.	.	x 400	505
Fig. 9.	<i>Tripodictya tribelonia</i> , n. sp.,	.	.	.	x 400	505
	Vertical section through the disk.					
Fig. 10.	<i>Xiphodictya amphibelonia</i> , n. sp.,	.	.	.	x 300	503
	Marginal view.					
Fig. 11.	<i>Xiphodictya amphirrhopalia</i> , n. sp.,	.	.	.	x 400	504
Fig. 12.	<i>Xiphodictya staurospira</i> , n. sp.,	.	.	.	x 500	504



1-6. STAURODICTYA, 7-9. TRIPODICTYA, 10-12 XIPHODICTYA.

PLATE 43.

Legion SPUMELLARIA.

Order DISCOIDEA.

Family PORODISCIDA.

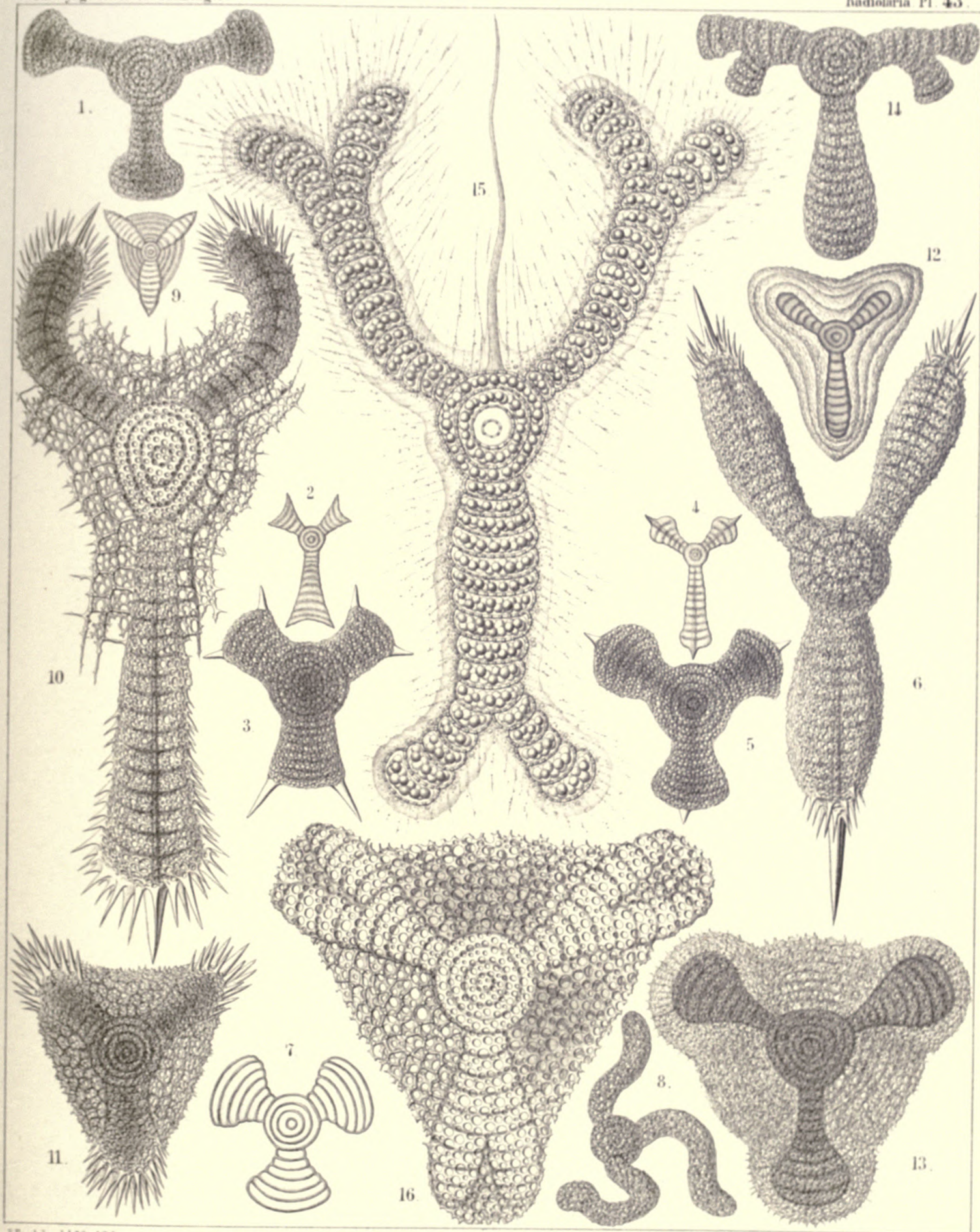
PLATE 43.

PORODISCIDA.

		Diam.	Page
Fig. 1.	<i>Rhopalastrum malleus</i> , n. sp.,	× 100	527
Fig. 2.	<i>Rhopalastrum ypsilinum</i> , n. sp.,	× 50	528
Fig. 3.	<i>Rhopalastrum hexaceros</i> , n. sp.,	× 100	529
Fig. 4.	<i>Rhopalastrum triceros</i> , n. sp.,	× 50	529
Fig. 5.	<i>Rhopalastrum trispinosum</i> , n. sp. (vel <i>Dictyastrum trispinosum</i>),	× 150	525
Fig. 6.	<i>Rhopalastrum arcticum</i> , n. sp.,	× 300	529
Fig. 7.	<i>Rhopalastrum hexagonum</i> , n. sp. (vel <i>Dictyastrum hexagonum</i>),	× 100	525
Fig. 8.	<i>Rhopalastrum irregulare</i> , n. sp.,	× 100	528
Fig. 9.	<i>Euchitonia lanceolata</i> , n. sp.,	× 80	534
Fig. 10.	<i>Euchitonia carcinus</i> , n. sp.,	× 300	535
Fig. 11.	<i>Euchitonia echinata</i> , n. sp.,	× 120	536
Fig. 12.	<i>Euchitonia stohrii</i> , n. sp.,	× 100	534
Fig. 13.	<i>Hymeniastrum euclidis</i> , n. sp.,	× 200	531
Fig. 14.	<i>Chitonastrum jugatum</i> , n. sp.,	× 200	537
Fig. 15.	<i>Chitonastrum lyra</i> , n. sp.,	× 500	538

A living specimen observed. The entire shell is enveloped by the calymma and surrounded by radiating pseudopodia (drawn much too short). Between the two paired arms arises a large "sarcode-flagellum." The central chamber and the first enveloping ring are filled by the clear nucleus; the other rings and all the chambers of the arms contain numerous pink oil-globules.

Fig. 16.	<i>Trigonastrum regulare</i> , n. sp. (vel <i>Chitonastrum regulare</i>),	× 200	539
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E. Reichenow and A. G. Stöckel, Del.

E. G. Stöckel, Jena Lithogr.

1-8. RHOPALASTRUM, 9-11 HYMENIASTRUM, 12 13 EUCHITONIA.
14 15 DICTYASTRUM, 16 CHITONASTRUM.

PLATE 44.

Legion SPUMELLARIA.

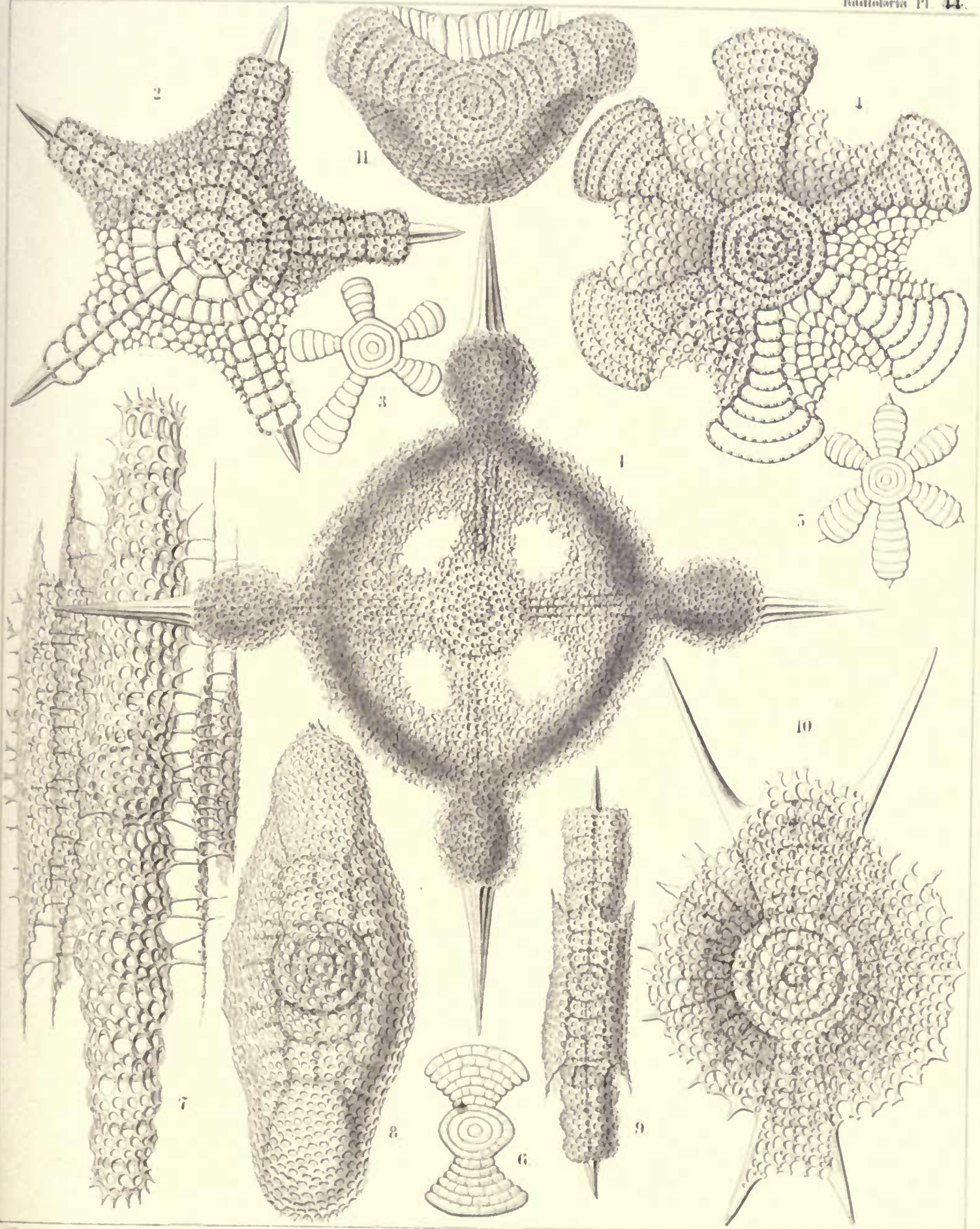
Order DISCOIDEA.

Family PORODISCIDA.

PLATE 44.

PORODISCIDA.

					Diam.	Page
Fig. 1.	<i>Stephanastrum capitatum</i> , n. sp.,	.	.	.	× 200	549
Fig. 2.	<i>Pentinastrum asteriscus</i> , n. sp.,	.	.	.	× 300	557
Fig. 3.	<i>Pentalastrum ophidiaster</i> , n. sp.,	.	.	.	× 100	557
Fig. 4.	<i>Hexinastrum geryonidum</i> , n. sp.,	.	.	.	× 300	560
Fig. 5.	<i>Hexalastrum orchidaceum</i> , n. sp.,	.	.	.	× 50	560
Fig. 6.	<i>Amphibrachium dilatatum</i> , n. sp.,	.	.	.	× 50	517
Fig. 7.	<i>Amphymenium zygartus</i> , n. sp.,	.	.	.	× 400	520
Fig. 8.	<i>Amphymenium pupula</i> , n. sp.,	.	.	.	× 300	519
Fig. 9.	<i>Amphymenium amphistylum</i> , n. sp.,	.	.	.	× 200	520
Fig. 10.	<i>Amphicraspedum murrayanum</i> , n. sp.,	.	.	.	× 300	523
Fig. 11.	<i>Amphymenium monstrosum</i> , n. sp.,	.	.	.	× 300	520



1 STEPHANASTRUM, 2, 3 PENTALASTRUM, 4, 5 HEXALASTRUM,
6 AMPHIBRACHIUM, 7-11 AMPHYMENIUM.

Edwards & Loring.

PLATE 45.

Legion SPUMELLARIA.

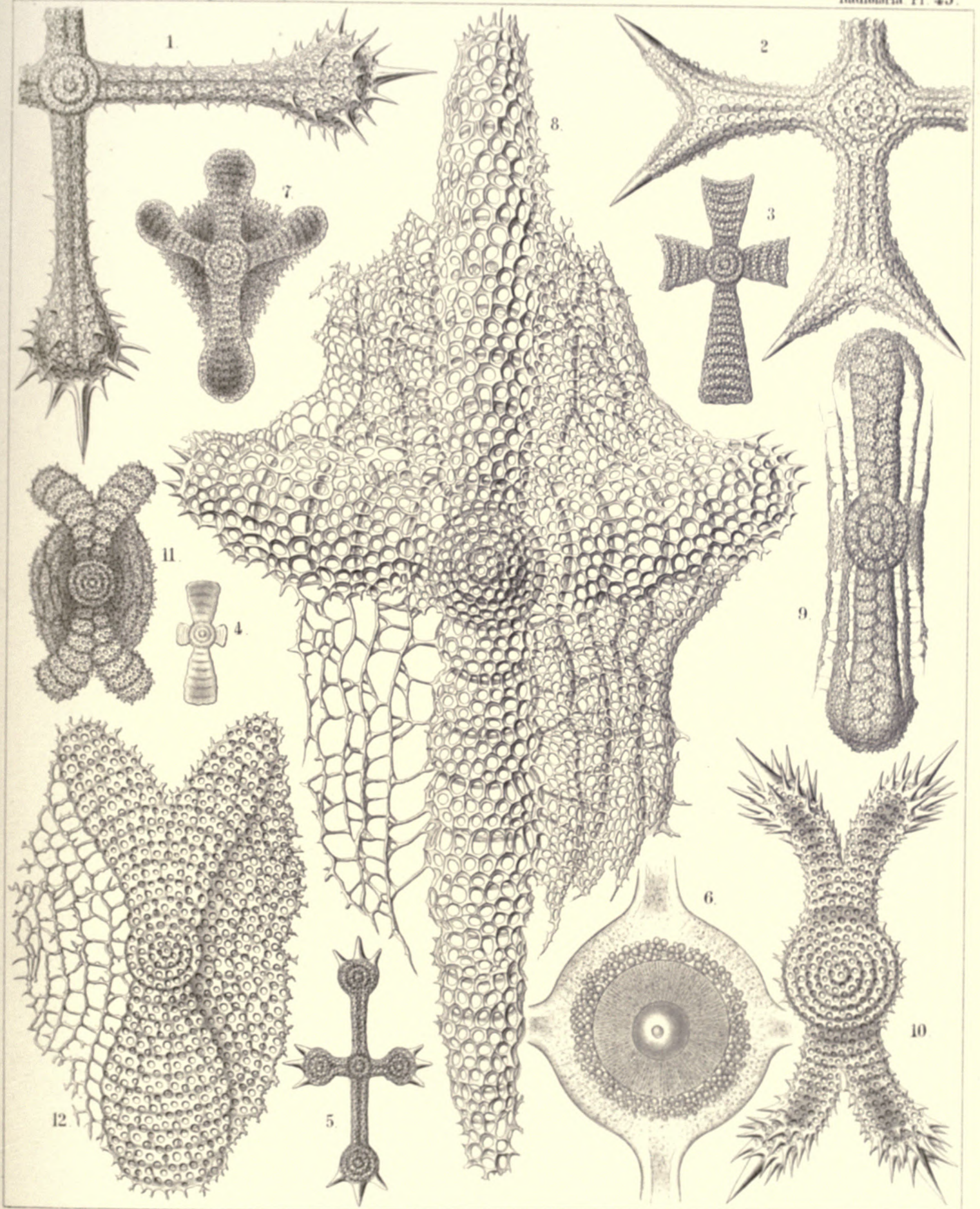
Order DISCOIDEA.

Family PORODISCIDA.

PLATE 45.

PORODISCIDA.

				Diam.	Page
Fig. 1.	<i>Stauralastrum rhopalophorum</i> , n. sp.,	.	.	× 200	541
Fig. 2.	<i>Dicranastrum cornutum</i> , n. sp.,	.	.	× 200	551
Fig. 3.	<i>Hagiastrum mosis</i> , n. sp.,	.	.	× 100	543
Fig. 4.	<i>Hagiastrum mosis</i> , n. sp.,	.	.	× 50	543
	Lateral view, from the edge.				
Fig. 5.	<i>Hagiastrum buddhae</i> , n. sp.,	.	.	× 50	542
Fig. 6.	<i>Stauralastrum cruciforme</i> , n. sp. (in glycerine),	.	.	× 500	540
	The central capsule contains a large central nucleus with nucleolus, and is surrounded by the jelly calymma and numerous small zooxanthellæ. The endoplasm is radially striped.				
Fig. 7.	<i>Tesserastrum democriti</i> , n. sp.,	.	.	× 100	548
Fig. 8.	<i>Tesserastrum straussii</i> , n. sp.,	.	.	× 500	547
Fig. 9.	<i>Tesserastrum brunonis</i> , n. sp.,	.	.	× 200	548
	Disk seen from the edge.				
Fig. 10.	<i>Amphirhopalum echinatum</i> , n. sp.,	.	.	× 300	522
Fig. 11.	<i>Amphicraspedum maclagganium</i> , n. sp.,	.	.	× 100	523
Fig. 12.	<i>Amphicraspedum wyvilleanum</i> , n. sp.,	.	.	× 300	523



W. Hensel and A. G. S. Del.

K. G. S. Jena Lithogr.

1-6. HAGIASTRUM, 7-9. HISTIASTRUM, 10. AMPHIRHOPALUM.
11, 12. AMPHICRASPEDUM.

PLATE 46.

Legion SPUMELLARIA.

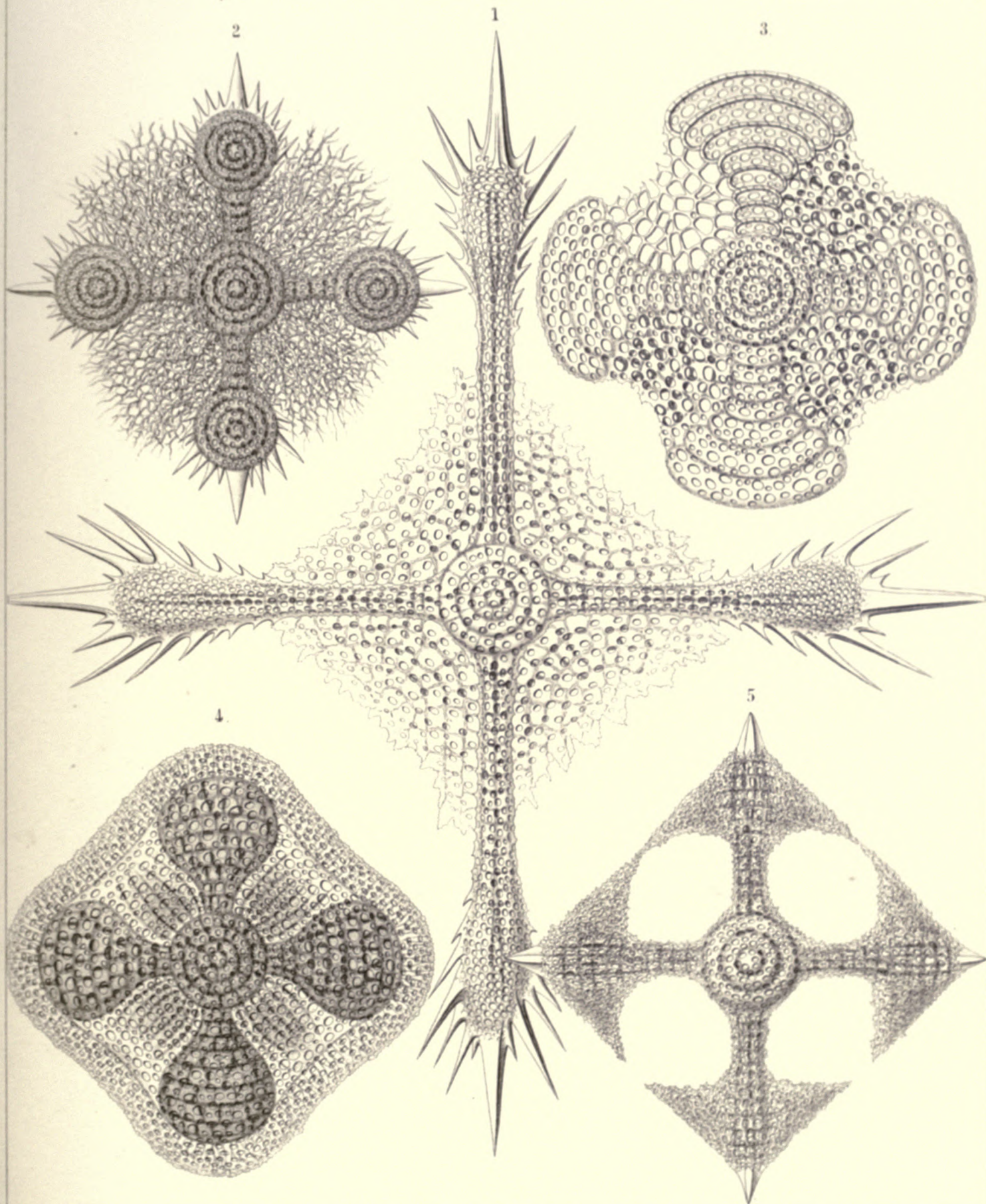
Order DISCOIDEA.

Family PORODISCIDA.

PLATE 46.

PORODISCIDA.

	Diam.	Page
Fig. 1. <i>Histiastrum boseanum</i> , n. sp.,	. x 400	546
Fig. 2. <i>Histiastrum pentadiscus</i> , n. sp.,	. x 200	546
Fig. 3. <i>Histiastrum quadrigatum</i> , n. sp.,	. x 300	544
Fig. 4. <i>Histiastrum velatum</i> , n. sp.,	. x 200	545
Fig. 5. <i>Stephanastrum quadratum</i> , n. sp.,	. x 200	549



H. Beckel and A. G. G. Del.

K. G. G. Lithogr.

1-3. HISTIASTRUM, 4. DICTYASTRUM, 5. STEPHANASTRUM.

PLATE 47.

Legion SPUMELLARIA.

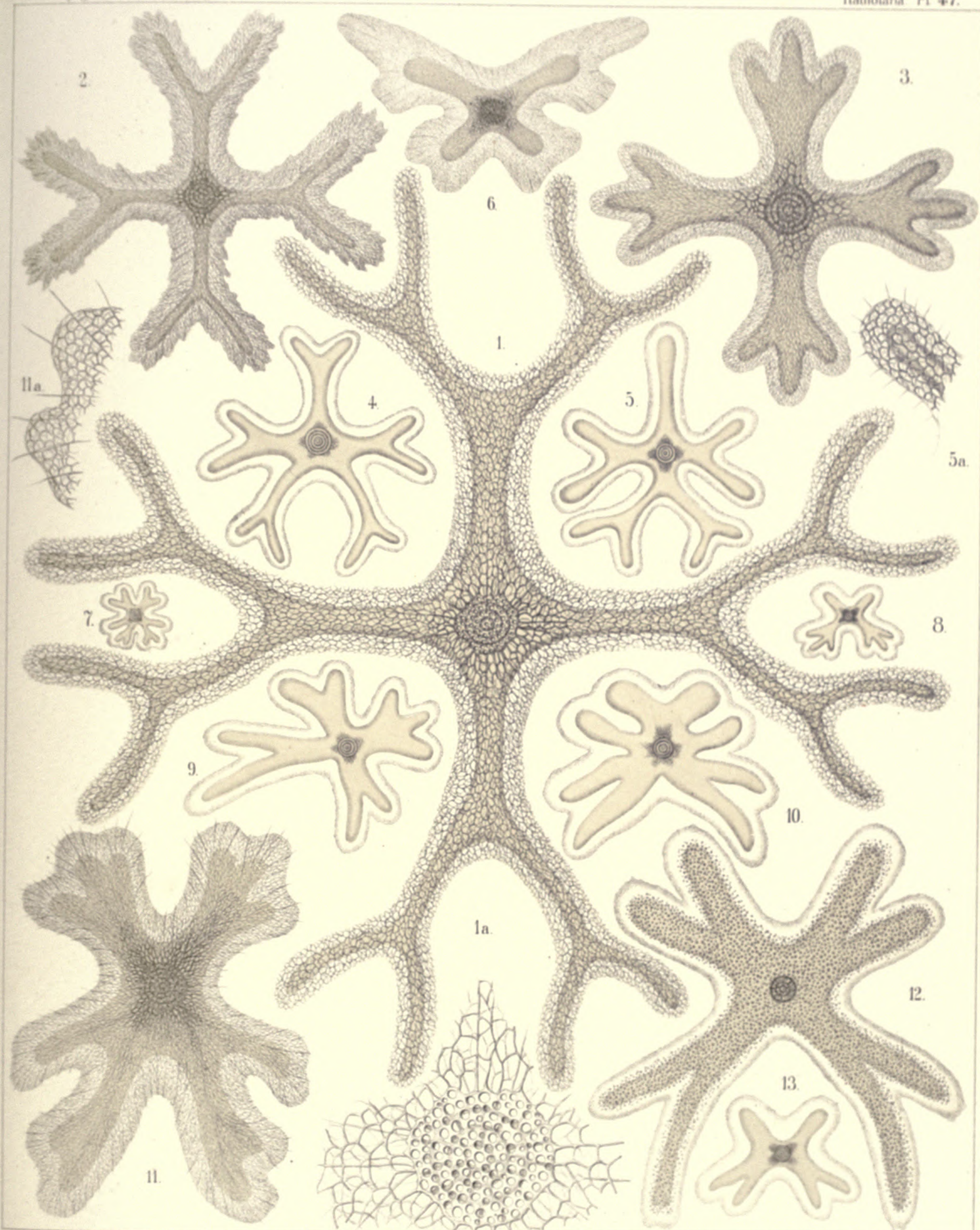
Order DISCOIDEA.

Family PORODISCIDA.

PLATE 47.

PORODISCIDA.

			Diam.	Page
Fig. 1.	<i>Dicranastrum bifurcatum</i> , n. sp.,	.	× 200	552
	Fig. 1a. Central disc of the same,	.	× 600	
Fig. 2.	<i>Dicranastrum furcatum</i> , n. sp.,	.	× 100	550
Fig. 3.	<i>Dicranastrum wyvillei</i> , n. sp.,	.	× 100	551
Fig. 4.	<i>Pentophastrum forcipatum</i> , n. sp.,	.	× 50	559
Fig. 5.	<i>Pentophastrum caudatum</i> , n. sp.,	.	× 50	559
Fig. 6.	<i>Myelastrum papilio</i> , n. sp.,	.	× 50	554
Fig. 7.	<i>Myelastrum decaceros</i> , n. sp.,	.	× 20	554
Fig. 8.	<i>Myelastrum heteropterum</i> , n. sp.,	.	× 20	553
Fig. 9.	<i>Myelastrum anomalum</i> , n. sp.,	.	× 50	556
Fig. 10.	<i>Myelastrum farfalla</i> , n. sp.,	.	× 50	554
Fig. 11.	<i>Myelastrum dodecaceros</i> , n. sp.,	.	× 100	554
Fig. 12.	<i>Myelastrum octocorne</i> , n. sp.,	.	× 90	553
Fig. 13.	<i>Myelastrum medullare</i> , n. sp.,	.	× 50	553



E. Haeckel and A. G. S. Col.

T. G. Smith, New York.

1. 2. DICRANASTRUM, 3. TRICANASTRUM, 4. 5. PENTALASTRUM,
6-13. MYELASTRUM.

PLATE 48.

Legion SPUMELLARIA.

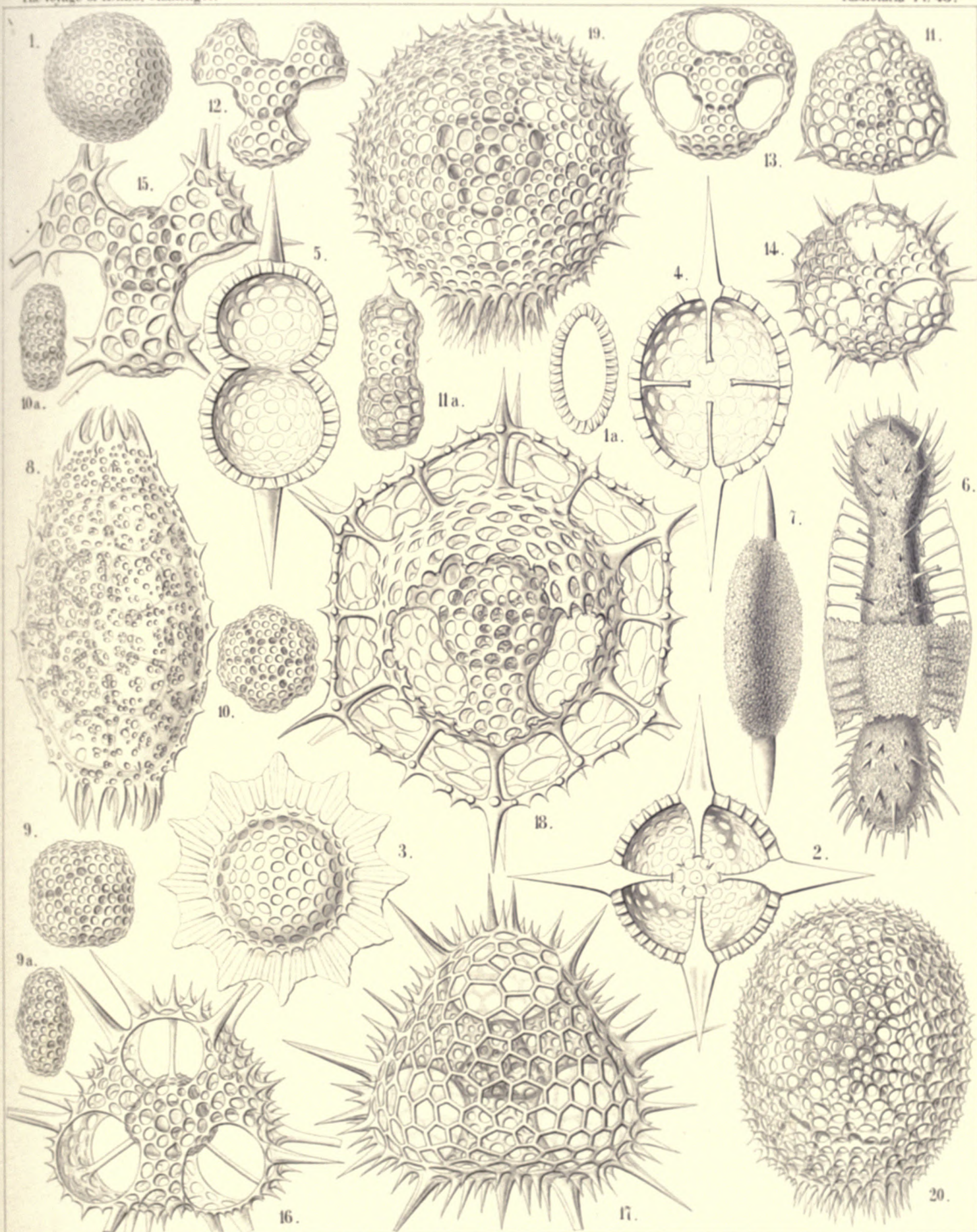
Orders PRUNOIDEA ET DISCOIDEA.

Families ELLIPSIDA, ARTISCIDA, SPONGURIDA, CENODISCIDA,
PORODISCIDA et PYLODISCIDA.

PLATE 48.

ELLIPSIDA, ARTISCIDA, SPONGURIDA, CENODISCIDA, PORODISCIDA, et PYLODISCIDA.

			Diam.	Page
Fig. 1.	<i>Cenodiscus phacoides</i> , n. sp.,	×	100	411
	Fig. 1a. Vertical section.			
Fig. 2.	<i>Crucidiscus endostaurus</i> , n. sp.,	×	200	416
	Equatorial section.			
Fig. 3.	<i>Trochodiscus stellaris</i> , n. sp.,	×	200	418
Fig. 4.	<i>Axoprunum stauraxonium</i> , n. sp.,	×	300	298
	Equatorial section.			
Fig. 5.	<i>Stylartus bipolaris</i> , n. sp.,	×	200	357
	Vertical section.			
Fig. 6.	<i>Spongocore puella</i> , n. sp.,	×	300	347
Fig. 7.	<i>Spongoprunum amphilonche</i> , n. sp.,	×	300	347
Fig. 8.	<i>Stomatodiscus osculatus</i> , n. sp.,	×	600	503
Fig. 9.	<i>Archidiscus stauroniscus</i> , n. sp.,	×	400	487
	Fig. 9a. Marginal view.			
Fig. 10.	<i>Archidiscus hexoniscus</i> , n. sp.,	×	400	488
	Fig. 10a. Marginal view.			
Fig. 11.	<i>Archidiscus pyloniscus</i> , n. sp.,	×	400	488
	Fig. 11a. Marginal view.			
Fig. 12.	<i>Triolena primordialis</i> , n. sp.,	×	800	564
Fig. 13.	<i>Triopyle hexagona</i> , n. sp.,	×	600	565
Fig. 14.	<i>Triodiscus spinosus</i> , n. sp.,	×	600	565
Fig. 15.	<i>Pyrolena armata</i> , n. sp.,	×	300	568
Fig. 16.	<i>Hexapyle dodecantha</i> , n. sp.,	×	300	569
Fig. 17.	<i>Pylodiscus triangularis</i> , n. sp.,	×	400	570
Fig. 18.	<i>Discozonium hexagonium</i> , n. sp.,	×	400	572
Fig. 19.	<i>Discopyle osculata</i> , n. sp.,	×	400	573
Fig. 20.	<i>Discopyle elliptica</i> , n. sp.,	×	400	573



R. Hasckel and A. G. J. DeL.

R. Hasckel, Jena, Lithogr.

1-3. GENODISCUS, 4. AXOPRUNUM, 5. STYLARTUS, 6. SPONGOCORE, 7. SPONGOPRUNUM, 8. STOMATODISCUS, 9-11. ARCHIDISCUS, 12-20. PYLODISCUS.

PLATE 49.

Legion SPUMELLARIA.

Order LARCOIDEA.

Families LITHELIDA, STREBLONIDA, PHORTICIDA et SOREUMIDA.

PLATE 49.

LITHELIDA, STREBLONIDA, PHORTICIDA et SOREUMIDA.

		Diam.	Page
Fig. 1.	<i>Spirema melonia</i> , n. sp.,	× 300	692
Fig. 2.	<i>Lithelius solaris</i> , n. sp. (the first central convolutions only), .	× 300	695
Fig. 3.	<i>Larcospira quadrangula</i> , n. sp.,	× 300	696
Fig. 4.	<i>Pylospira octopyle</i> , n. sp.,	× 300	698
Fig. 5.	<i>Tholospira cervicornis</i> , n. sp.,	× 300	700
Fig. 6.	<i>Tholospira dendrophora</i> , n. sp.,	× 300	700
Fig. 7.	<i>Spironium octonium</i> , n. sp.,	× 300	701
Fig. 8.	<i>Streblacantha siderolina</i> , n. sp.,	× 300	706
	Fig. 8a. Outlines of the chambers,	× 200	
Fig. 9.	<i>Streblapyle helicina</i> , n. sp.,	× 300	707
Fig. 10.	<i>Phorticium pylonium</i> , n. sp.,	× 300	709
Fig. 11.	<i>Spongophortis larnacilla</i> , n. sp.,	× 200	711
	Fig. 11a. The upper half of the cortical shell is removed.		
	Figs. 11b to 11d. The enclosed medullary <i>Larnacilla</i> -shell. b, Dorsal view; c, lateral view; d, basal view.		
Fig. 12.	<i>Soreuma irregulare</i> , n. sp.,	× 200	713
Fig. 13.	<i>Sorolarcus larnacillifer</i> , n. sp.,	× 300	715

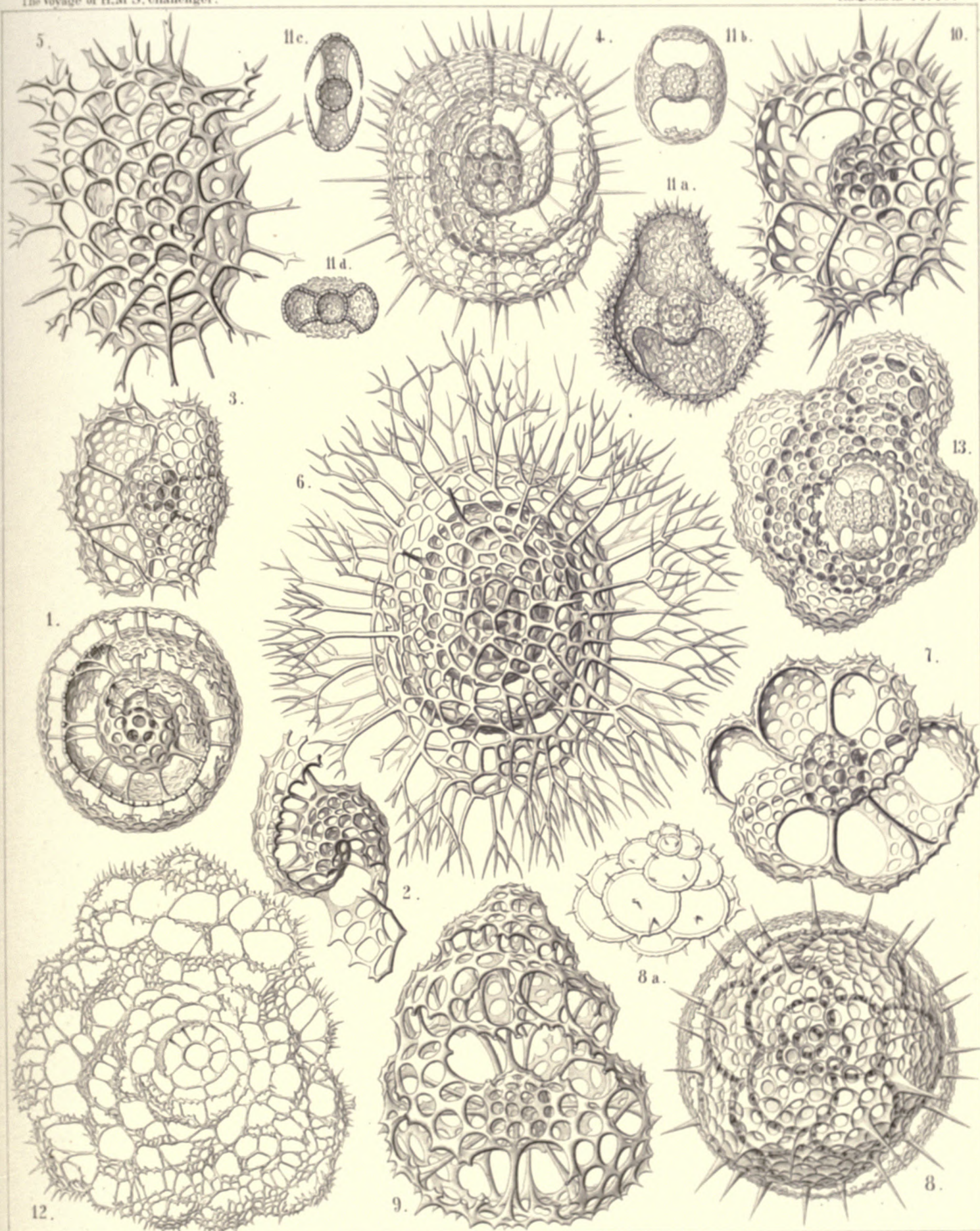


PLATE 50.

Legion SPUMELLARIA.

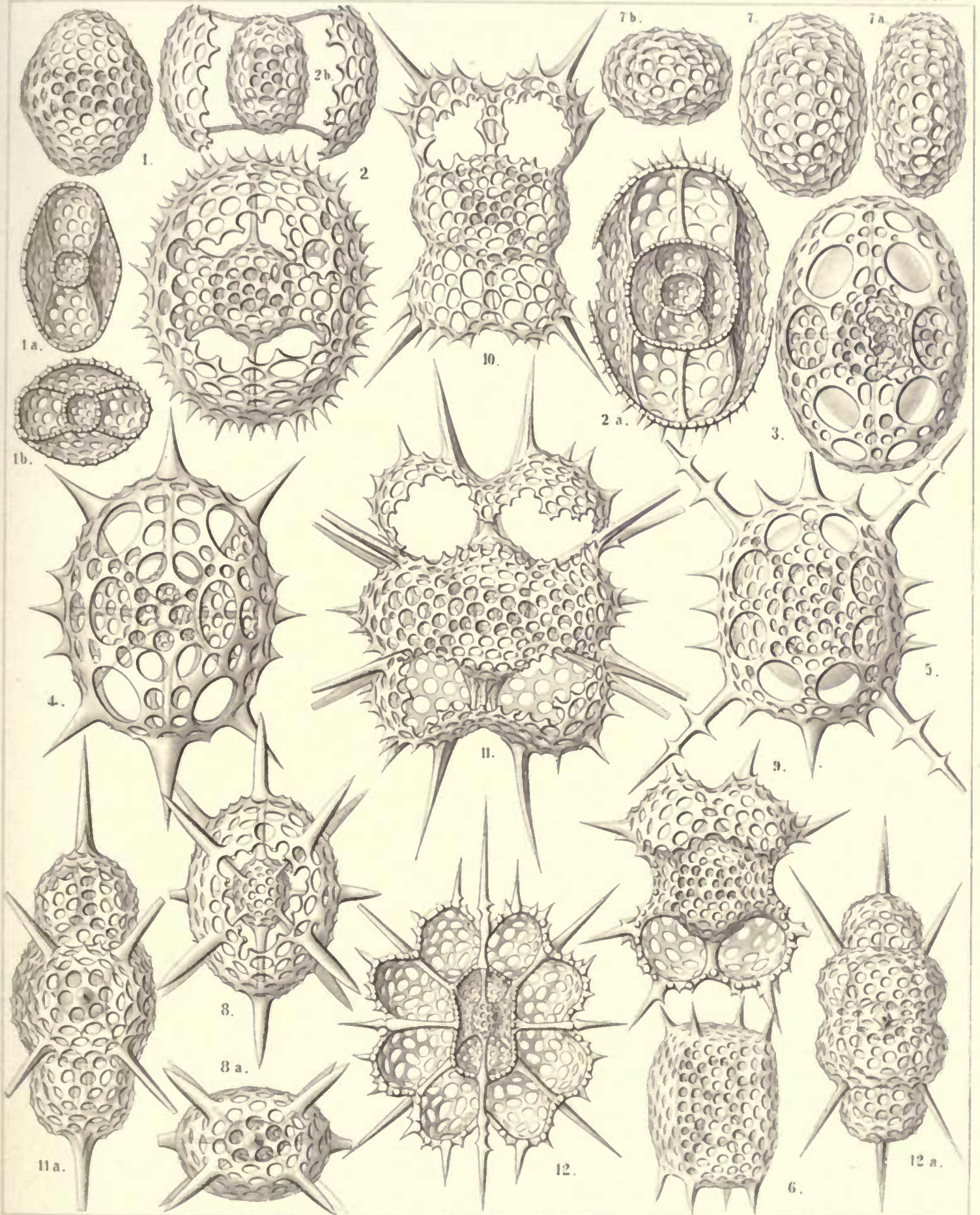
Order LARCOIDEA.

Families LARCARIDA, LARNACIDA et ZONARIDA.

PLATE 50.

LARCARIDA, LARNACIDA et ZONARIDA.

		Diam.	Page
Fig. 1.	<i>Larnacilla typus</i> , n. sp., From the sagittal pole (dorsal view). Fig. 1a. From the lateral pole (sagittal section). Fig. 1b. From the principal pole (equatorial section).	× 300	617
Fig. 2.	<i>Larnacalpis lentellipsis</i> , n. sp., From the sagittal pole (dorsal view). Fig. 2a. From the lateral pole (sagittal section). Fig. 2b. From the principal pole (equatorial section).	× 400	620
Fig. 3.	<i>Larnacalpis triaxonia</i> , n. sp., From the sagittal pole (dorsal view).	× 400	621
Fig. 4.	<i>Larnacantha hexacantha</i> , n. sp., From the sagittal pole (dorsal view).	× 400	622
Fig. 5.	<i>Larnacantha bicrucata</i> , n. sp., Frontal view.	× 300	623
Fig. 6.	<i>Larnacantha prismatica</i> , n. sp., Half frontal, half lateral view.	× 300	623
Fig. 7.	<i>Cenolarcus primordialis</i> , n. sp., From the sagittal pole. Fig. 7a. From the lateral pole. Fig. 7b. From the principal pole.	× 300	607
Fig. 8.	<i>Larcidium dodecanthum</i> , n. sp., From the sagittal pole. Fig. 8a. From the principal pole.	× 300	612
Fig. 9.	<i>Zonarium octangulum</i> , n. sp., Frontal view.	× 300	685
Fig. 10.	<i>Zoniscus tetracanthus</i> , n. sp., Frontal view.	× 300	687
Fig. 11.	<i>Zoniscus hexatholius</i> , n. sp., Dorsal view (from the sagittal pole). Fig. 11a. Lateral view (from the frontal pole).	× 400	687
Fig. 12.	<i>Zonidium octotholium</i> , n. sp., Frontal section (from the sagittal pole). Fig. 12a. Lateral view (from the frontal pole).	× 300	688



1. LARNACILLA. 2. LARNACALPIS. 7. CENOLARCUS.
8. LARCIDIUM. 9-12. ZONARIUM.