THE

VOYAGE OF H.M.S. CHALLENGER.

ZOOLOGY—VOL. XXX.

PLATES.
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
THE LATE
Sir C. WYVILLE THOMSON, Knt., F.R.S., &c.
REGIUS PROFESSOR OF NATURAL HISTORY IN THE UNIVERSITY OF EDINBURGH
DIRECTOR OF THE CIVILIAN SCIENTIFIC STAFF ON BOARD
AND NOW OF
JOHN MURRAY, LL.D., PH.D., &c.
ONE OF THE NATURALISTS OF THE EXPEDITION

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PLATES

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Report on the Asteroidea collected by H.M.S. Challenger during the years 1873-1876.

By W. Percy Sladen, F.L.S., &c.

(The Manuscript was received in Instalments between 15th March 1886 and 21st January 1889.)
EDITORIAL NOTE.

The collection of *Asteroidea* is one of the most important made during the voyage of the Challenger. The late Sir C. Wyville Thomson paid considerable attention to these organisms, and at one time had the intention of describing the new species discovered during the Expedition; with this end in view, indeed, he had a few of the specimens figured and lithographed.

Eventually, however, the whole collections were handed over to Mr. W. Percy Sladen for examination and description. The result of Mr. Sladen's work, extending over many years, is now presented in this magnificent Report, which forms Part LI. and Volume XXX. of the Zoological series of Reports, the text and plates being bound up in separate parts.

Not only on account of the large number of forms, but also on account of their representative character, the Challenger collection is unquestionably the most important contribution to this group of animals that has ever been made.

In the Report, supplementary to the treatment of the Challenger material, a compact account of the whole group has been aimed at. Thus (1) under each family an account of all the genera included therein, whether Challenger or not, has been given, and where necessary the grounds on which the classification has been adopted are discussed; (2) under each genus there is a statement of all the known species which are recognised as belonging to that genus, with an account of their geographical distribution: this presents a compact idea of the composition and distribution of each genus; (3) a complete list of all the known species of
recent Asteroidea, with their geographical and bathymetrical distribution, and a full account of all synonyms and changes of name are given; every known starfish is believed to be included, and the recognition of "good species" and "synonyms" is based on personal observation (except in the case of some American types and a few recently described from the French dredgings).

The Report may be considered a monograph on the group, though of course it need hardly be said that previously described and recognised species are not re-described. An entirely new classification of the Asteroidea has been given—it was very unsatisfactory and quite unworkable previously.

All naturalists who appreciate careful and accurate work will join with me in congratulating Mr. Sladen on the completion of his valuable memoir, which extends to 935 pages, and is illustrated by 118 lithographic plates and a map.

John Murray.

Challenger Office, 32 Queen Street,
Edinburgh, January 23, 1889.
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[These figures appear to have been drawn from a dried or shrunken example. The plate was prepared under the direction of Sir Wyville Thomson, and I was unfortunately not aware of its existence until the greater part of the text and nearly all the plates had been printed off.]
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Fig. 5. Abactinal aspect; magnified 2 diameters.
Fig. 6. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. XXXVIII. figs. 7-9.]
I-2 ASTROPECTEN ACANTHIFER n sp.
3-4 ASTROPECTEN IMBELLIS n sp.
5-6 ASTROPECTEN MESACTUS n sp.
PLATE XXXV.
PLATE XXXV.

Figs. 1, 2. Astropecten pontoporeus, n. sp. . . . 210

Fig. 1. Abactinal aspect; magnified 1\(\frac{1}{2}\) diameters.

Fig. 2. Actinal aspect; magnified 1\(\frac{1}{2}\) diameters.

[For magnified details of this species see Pl. XXXVIII. figs. 10–12.]

Figs. 3, 4. Astropecten granulatus, Müller and Troschel, . . . 215

Fig. 3. Abactinal aspect; magnified 3 diameters.

Fig. 4. Actinal aspect; magnified 3 diameters.

[For magnified details of this species see Pl. XXXIX. figs. 4–6.]

Figs. 5, 6. Astropecten cingulatus, n. sp. . . . 218

Fig. 5. Abactinal aspect; magnified 2 diameters.

Fig. 6. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. XXXIX. figs. 1–3.]
1-2 ASTROPECTEN PONTOPORÆUS, n sp
3-4 ASTROPECTEN GRANULATUS, Müller & Troschel
5-6 ASTROPECTEN GINGULATUS, n sp
PLATE XXXVI.
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<td>1, 2</td>
<td>Bathybiaster loripes, n. sp.</td>
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<td>3</td>
<td>Abactinal aspect</td>
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<td>Actinal aspect</td>
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<td>5, 6</td>
<td>Dytaster equivocus, n. sp.</td>
<td>4 diameters</td>
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Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. XLII. figs. 1, 2.]

Fig. 3. Abactinal aspect; magnified 2 diameters.

Fig. 4. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. XXXIX. figs. 7-9.]

Fig. 5. Abactinal aspect; magnified 4 diameters.

Fig. 6. Actinal aspect; magnified 4 diameters.

[For magnified details of this species see Pl. XXXIX. figs. 10-12.]
1-2 BATHYBIASTER LORIPES, n.sp.
3-4 ASTROPECTEN ZEBRA, n.sp
5-6 DYTASTER EQUIVOCUS, n.sp.
PLATE XXXVII.

Figs. 1–3. Astropecten brevispinus, n. sp. . . . 198

Fig. 1. A portion of the abactinal surface; magnified 20 diameters.

Fig. 2. Mouth-plates; magnified 12 diameters.

Fig. 3. Adambulacral and infero-marginal plates; magnified 15 diameters.

[For macroscopic figures of this species see Pl. XXXIII. figs. 1, 2.]

Figs. 4–6. Astropecten pectinatus, n. sp. . . . 202

Fig. 4. A portion of the abactinal surface; magnified 15 diameters.

Fig. 5. Mouth-plates; magnified 10 diameters.

Fig. 6. Adambulacral and infero-marginal plates; magnified 8 diameters.

[For macroscopic figures of this species see Pl. XXXIII. figs. 3, 4.]

Figs. 7–9. Astropecten hermatophilus, n. sp. . . . 207

Fig. 7. A portion of the abactinal surface; magnified 25 diameters.

Fig. 8. Mouth-plates; magnified 10 diameters.

Fig. 9. Adambulacral and infero-marginal plates; magnified 12 diameters.

[For macroscopic figures of this species see Pl. XXXIII. figs. 5, 6.]

Figs. 10–12. Astropecten monacanthus, n. sp. . . . 216

Fig. 10. A portion of the abactinal surface; magnified 25 diameters.

Fig. 11. Mouth-plates; magnified 20 diameters.

Fig. 12. Adambulacral and infero-marginal plates; magnified 20 diameters.

[For macroscopic figures of this species see Pl. XXXIII. figs. 7, 8.]
PLATE XXXVIII.
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<td><strong>Astropecten acanthifer</strong>, n. sp.</td>
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Fig. 1. A portion of the abactinal surface; magnified 15 diameters.

Fig. 2. Mouth-plates; magnified 6 diameters.

Fig. 3. Adambulacral and infero-marginal plates; magnified 7 diameters.

[For macroscopic figures of this species see Pl. XXXIV. figs. 1, 2.]

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<td><strong>Astropecten imbellis</strong>, n. sp.</td>
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Fig. 4. A portion of the abactinal surface; magnified 25 diameters.

Fig. 5. Mouth-plates; magnified 15 diameters.

Fig. 6. Adambulacral and infero-marginal plates; magnified 17 diameters.

[For macroscopic figures of this species see Pl. XXXIV. figs. 3, 4.]

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<td><strong>Astropecten mesactus</strong>, n. sp.</td>
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Fig. 7. A portion of the abactinal surface; magnified 20 diameters.

Fig. 8. Mouth-plates; magnified 12 diameters.

Fig. 9. Adambulacral and infero-marginal plates; magnified 10 diameters.

[For macroscopic figures of this species see Pl. XXXIV. figs. 5, 6.]

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<td><strong>Astropecten pontopor-eus</strong>, n. sp.</td>
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Fig. 10. A portion of the abactinal surface; magnified 15 diameters.

Fig. 11. Mouth-plates; magnified 6 diameters.

Fig. 12. Adambulacral and infero-marginal plates; magnified 8 diameters.

[For macroscopic figures of this species see Pl. XXXV. figs. 1, 2.]
1-3. ASTROPECTEN ACANTHIFER, n. sp.
7-9. ASTROPECTEN MESACTUS, n. sp.
4-6. ASTROPECTEN IMPELLIS, n. sp.
10-12. ASTROPECTEN PONTOPORAÆUS, n. sp.
PLATE XXXIX.

Figs. 1–3. Astropecten cingulatus, n. sp. ... 218

Fig. 1. A portion of the abactinal surface; magnified 20 diameters.

Fig. 2. Mouth-plates; magnified 15 diameters.

Fig. 3. Adambulacral and infero-marginal plates; magnified 12 diameters.

[For macroscopic figures of this species see Pl. XXXV. figs. 5, 6.]

Figs. 4–6. Astropecten granulatus, Müller and Troschel, ... 215

Fig. 4. A portion of the abactinal surface; magnified 30 diameters.

Fig. 5. Mouth-plates; magnified 15 diameters.

Fig. 6. Adambulacral and infero-marginal plates; magnified 18 diameters.

[For macroscopic figures of this species see Pl. XXXV. figs. 3, 4.]

Figs. 7–9. Astropecten zebra, n. sp. ... 212

Fig. 7. A portion of the abactinal surface; magnified 20 diameters.

Fig. 8. Mouth-plates; magnified 12 diameters.

Fig. 9. Adambulacral and infero-marginal plates; magnified 12 diameters.

[For macroscopic figures of this species see Pl. XXXVI. figs. 3, 4.]

Figs. 10–12. Dytaster æquivocus, n. sp. ... 75

Fig. 10. A portion of the abactinal surface; magnified 30 diameters.

Fig. 11. Mouth-plates; magnified 15 diameters.

Fig. 12. Adambulacral and infero-marginal plates; magnified 30 diameters.

[For macroscopic figures of this species see Pl. XXXVI. figs. 5, 6.]
1-3. ASTROPECTEN CINGULATUS, n. sp.
4-6. ASTROPECTEN GRANULATUS, Muller & Troschel
7-9. ASTROPECTEN ZEBRA, n. sp.
10-12. DYTASTER AQUIVOCUS, n. sp.
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Figs. 1, 2. Psilaster acuminatus, n. sp. . . . 225

Fig. 1. Abactinal aspect; magnified 2 diameters.

Fig. 2. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. XLII. figs. 7, 8.]

Figs. 3-6. Phoxaster pumilus, n. sp. . . . 236

Fig. 3. Abactinal aspect; magnified 3 diameters.

Fig. 4. Actinal aspect; magnified 3 diameters.

Fig. 5. Abactinal aspect of a young example; magnified 3 diameters.

Fig. 6. Actinal aspect of a young example; magnified 3 diameters.

[For magnified details of this species see Pl. XV. figs. 7-11.]
1-2. PSILASTER ACUMINATUS, n. sp. 3-6. PHOXASTER PUMILUS, n. sp.
PLATE XLI.

Figs. 1, 2. *Psilaster cassiope*, n. sp. . . . . . 223

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. VII. figs. 9, 10.]

Figs. 3, 4. *Psilaster patagiatus*, n. sp. . . . . 232

Fig. 3. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 4. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. VII. figs. 11, 12.]

Figs. 5, 6. *Psilaster gracilis*, n. sp. . . . . . 230

Fig. 5. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 6. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. XLII. figs. 9-11.]
1-2. Psilaster Cassiope, n. sp. 3-4. Psilaster Patagiatus, n. sp.
5-6. Psilaster Gracilis, n. sp.
PLATE XLII.

Figs. 1, 2. Bathybiaster loripes, n. sp. Page 240.

Fig. 1. A portion of the abactinal surface; magnified 20 diameters.

Fig. 2. Adambulacral and infero-marginal plates; magnified 12 diameters.

[For macroscopic figures of this species see Pl. XXXVI. figs. 1, 2.]

Figs. 3, 4. Pseudarchaster discus, n. sp. Page 110.

Fig. 3. A portion of the abactinal surface; magnified 20 diameters.

Fig. 4. Adambulacral and infero-marginal plates; magnified 12 diameters.

[For macroscopic figures of this species see Pl. XIX. figs. 1, 2.]

Figs. 5, 6. Pseudarchaster intermedius, n. sp. Page 115.

Fig. 5. A portion of the abactinal surface; magnified 18 diameters.

Fig. 6. Adambulacral and infero-marginal plates; magnified 15 diameters.

[For macroscopic figures of this species see Pl. XIX. figs. 3, 4.]

Figs. 7, 8. Psilaster acuminatus, n. sp. Page 225.

Fig. 7. A portion of the abactinal surface; magnified 18 diameters.

Fig. 8. Adambulacral and infero-marginal plates; magnified 15 diameters.

[For macroscopic figures of this species see Pl. XL. figs. 1, 2.]


Fig. 9. A portion of the abactinal surface; magnified 25 diameters.

Fig. 10. Adambulacral and infero-marginal plates; magnified 15 diameters.

Fig. 11. Mouth-plates; magnified 7 diameters.

[For macroscopic figures of this species see Pl. XLI. figs. 5, 6.]
1-2. BATHYBIASTER LORIPES, n sp.
3-4. PSEUDARCHASTER DISCUS, n sp.
5-6. PSEUDARCHASTER INTERMEDIUS, n sp.
7-8. PSILASTER ACUMINATUS, n sp.
9-11. PSILASTER GRACILIS, n sp.
PLATE XLIII.
PLATE XLIII.

Figs. 1, 2. Luidia aspera, n. sp. 248

Fig. 1. Abactinal aspect; magnified 1\(\frac{1}{2}\) diameters.

Fig. 2. Actinal aspect; magnified 1\(\frac{1}{2}\) diameters.

[For magnified details of this species see Pl. XLV. figs. 9, 10.]

Figs. 3, 4. Luidia longispina, n. sp. 254

Fig. 3. Abactinal aspect; magnified 2 diameters.

Fig. 4. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. XLV. figs. 3, 4.]
1-2. Luidia aspera, n.sp.
3-4. Luidia longispina, n.sp.
PLATE XLIV.
Fig. 1. Abactinal aspect; natural size.

Fig. 2. Actinal aspect; natural size.

[For magnified details of this species see Pl. XLV. figs. 1, 2.]

Fig. 3. Abactinal aspect; magnified 1 1/2 diameters.

Fig. 4. Actinal aspect; magnified 1 1/2 diameters.

[For magnified details of this species see Pl. XLV. figs. 7, 8.]

Fig. 5. Abactinal aspect; magnified 2 diameters.

Fig. 6. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. XLV. figs. 5, 6.]
1-2. LUIDIA AFRICANA, n.sp.
3-4. LUIDIA LIMBATA, n.sp.
5-6. LUIDIA FORFICIFER, n.sp.
PLATE XLV.

Figs. 1, 2. **Luidia africana**, n. sp. . . . . 256

Fig. 1. A portion of the abactinal surface; magnified 15 diameters.
Fig. 2. Adambulaeral and infero-marginal plates; magnified 6 diameters.

[For macroscopic figures of this species see Pl. XLIV. figs. 1, 2.]

Figs. 3, 4. **Luidia longispina**, n. sp. . . . . 254

Fig. 3. A portion of the abactinal surface; magnified 20 diameters.
Fig. 4. Adambulaeral and infero-marginal plates; magnified 10 diameters.

[For macroscopic figures of this species see Pl. XLIII. figs. 3, 4.]

Figs. 5, 6. **Luidia forficifer**, n. sp. . . . . 258

Fig. 5. A portion of the abactinal surface; magnified 15 diameters.
Fig. 6. Adambulaeral and infero-marginal plates; magnified 15 diameters.

[For macroscopic figures of this species see Pl. XLIV. figs. 5, 6.]

Figs. 7, 8. **Luidia limbata**, n. sp. . . . . 251

Fig. 7. A portion of the abactinal surface; magnified 15 diameters.
Fig. 8. Adambulaeral and infero-marginal plates; magnified 10 diameters.

[For macroscopic figures of this species see Pl. XLIV. figs. 3, 4.]

Figs. 9, 10. **Luidia aspera**, n. sp. . . . . 248

Fig. 9. A portion of the abactinal surface; magnified 10 diameters.
Fig. 10. Adambulaeral and infero-marginal plates; magnified 8 diameters.

[For macroscopic figures of this species see Pl. XLIII. figs. 1, 2.]
1-2. LUIDIA AFRICANA, n. sp.
3-4. LUIDIA LONGISPINA, n. sp.
5-6. LUIDIA FORIFICIFER, n. sp.
7-8. LUIDIA LIMBATA, n. sp.
9-10. LUIDIA ASPERA, n. sp.
PLATE XLVI.
Fig. 1. Abactinal aspect; natural size.

Fig. 2. Actinal aspect; natural size.

[For magnified details of this species see Pl. XLIX. figs. 1, 2.]

Fig. 3. Abactinal aspect; natural size.

Fig. 4. Actinal aspect; natural size.

[For magnified details of this species see Pl. XLIX. figs. 3, 4.]
PLATE XLVII.
PLATE XLVII.

Figs. 1, 2. Gnathaster meridionalis, Smith, sp. . . . 287

Fig. 1. Abactinal aspect; magnified 1\(\frac{1}{2}\) diameters.

Fig. 2. Actinal aspect; magnified 1\(\frac{1}{2}\) diameters.

[For macroscopic figures of a young example see Pl. XLVIII. figs. 5, 6; for magnified details of the same see Pl. XLIX. figs. 11, 12.]

Figs. 3, 4. Mmaster cognatus, n. sp. . . . . . 336

Fig. 3. Abactinal aspect; magnified 1\(\frac{1}{2}\) diameters.

Fig. 4. Actinal aspect; magnified 1\(\frac{1}{2}\) diameters.

[For magnified details of this species see Pl. LXII. figs. 4, 5.]

Error in the legend of the Plate:

_for “n. sp.” after Gnathaster meridionalis read “Smith, sp.”_
PLATE XLVIII.

Figs 1, 2. Gnathaster elongatus, n. sp. . . . 288

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. XLIX. figs. 5–8; for macroscopic figures of a young example see Pl. XIX. figs. 5, 6.]

Figs. 3, 4. Gnathaster elongatus, n. sp. (Variety), . . . 288

Fig. 3. Abactinal aspect of an attenuate variety; magnified $1\frac{1}{2}$ diameters.

Fig. 4. Actinal aspect of an attenuate variety; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this variety see Pl. XLIX. figs. 9, 10.]

Figs. 5, 6. Gnathaster meridionalis, Smith, sp. . . . 287

Fig. 5. Abactinal aspect of a young example; magnified 3 diameters.

Fig. 6. Actinal aspect of a young example; magnified 3 diameters.

[For magnified details of this example see Pl. XLIX. figs. 11, 12; for macroscopic figures of an adult example see Pl. XLVII. figs. 1, 2.]
1-2. **GNATHASTER ELONGATUS**, n.sp.

3-4. **GNATHASTER ELONGATUS**, n.sp. (Var)

5-6. **GNATHASTER MERIDIONALIS**, Smith, sp. (Juv.)
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Figs. 1, 2. Pentagonaster japonicus, n. sp. . . . 272

Fig. 1. A portion of the abactinal surface; magnified 8 diameters.
Fig. 2. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.

[For macroscopic figures of this species see Pl. XLVI. figs. 1, 2.]

Figs. 3, 4. Pentagonaster patagonicus, n. sp. . . . 269

Fig. 3. A portion of the abactinal surface; magnified 10 diameters.
Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.

[For macroscopic figures of this species see Pl. XLVI. figs. 3, 4.]

Figs. 5, 6. Gnathaster elongatus, n. sp. . . . 288

Fig. 5. A portion of the abactinal surface of a young example; magnified 20 diameters.
Fig. 6. Adambulacral plates and adjacent portion of the actinal surface of a young example; magnified 15 diameters.

[For macroscopic figures of this example see Pl. XIX. figs. 5, 6.]

Figs. 7, 8. Gnathaster elongatus, n. sp. . . . 288

Fig. 7. A portion of the abactinal surface; magnified 12 diameters.
Fig. 8. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.

[For macroscopic figures of this species see Pl. XLVIII. figs. 1, 2.]

Figs. 9, 10. Gnathaster elongatus, n. sp. (Variety). . . . 288

Fig. 9. A portion of the abactinal surface; magnified 20 diameters.
Fig. 10. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.

[For macroscopic figures of this variety see Pl. XLVIII. figs. 3, 4.]

Figs. 11, 12. Gnathaster meridionalis, Smith, sp. . . . 287

Fig. 11. A portion of the abactinal surface of a young example; magnified 20 diameters.
Fig. 12. Adambulacral plates and adjacent portion of the actinal surface of a young example; magnified 30 diameters.

[For macroscopic figures of this example see Pl. XLVIII. figs. 5, 6; for those of an adult example see Pl. XLVII. figs. 1, 2.]
The Voyage of H.M.S "Challenger"

1-2. PENTAGONASTER JAPONICUS, n. sp.
5-6. GNATHASTER ELONGATUS, n. sp. (juv.)
9-10. GNATHASTER ELONGATUS, n. sp. (var.)

3-4. PENTAGONASTER PATAGONICUS, n. sp.
7-8. GNATHASTER ELONGATUS, n. sp.
11-12. GNATHASTER MERIDIONALIS, Smith, sp. (juv.)
PLATE L.

Figs. 1, 2. *Nymphaster symbolicus*, n. sp. 297

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. LIII. figs. 7, 8.]

Figs. 3, 4. *Nymphaster protentus*, n. sp. 303

Fig. 3. Abactinal aspect; magnified $1\frac{1}{2}$ diameters. *

Fig. 4. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. LIII. figs. 9, 10.]
PLATE LI.

Figs. 1, 2. Nymphaster albidus, n. sp. . . . 306

Fig. 1. Abactinal aspect; magnified 2 diameters.

Fig. 2. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. LI. figs. 5, 6.]

Figs. 3, 4. Paragonaster cylindratus, n. sp. . . . 314

Fig. 3. Abactinal aspect; magnified 2 diameters.

Fig. 4. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. LI. figs. 3, 4.]

Figs. 5, 6. Paragonaster ctenipes, n. sp. . . . 311

Fig. 5. Abactinal aspect; magnified 2 diameters.

Fig. 6. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. LI. figs. 1, 2.]
1-2. NYMPHASTER ALBIDUS, n.sp.
3-4. PARAGONASTER CYLINDRATUS, n.sp.
5-6. PARAGONASTER CTENIPES, n.sp.
PLATE LII.
PLATE LII.

Figs. 1, 2. Pentagonaster arcuatus, n. sp. . . . 277

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. XVIII. figs. 5, 6.]

Figs. 3, 4. Nymphaster bipunctus, n. sp. . . . 301

Fig. 3. Abactinal aspect; magnified 2 diameters.

Fig. 4. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. LIII. figs. 11, 12.]

Figs. 5–8. Gymnasteria carinifera (Lamarck), von Martens, . 357

Fig. 5. Abactinal aspect of a young example; magnified 2 diameters.

Fig. 6. Actinal aspect of a young example; magnified 2 diameters.

Fig. 7. Adambulacral plates and adjacent portion of the actinal surface of the same example; magnified 10 diameters.

Fig. 8. A portion of the abactinal surface of the same; magnified 10 diameters.
1-2. PENTAGONASTER ARGUATUS, n sp
3-4. NYMPHASTER BIPUNCTUS, n sp
5-8. GYMNASTERIA CARINIFERA (Lamarck), V Martens (juv)
PLATE LIII.

Figs. 1, 2. Paragonaster ctenipes, n. sp. 311

Fig. 1. A portion of the abactinal surface; magnified 15 diameters.
Fig. 2. Adambulacral and infero-marginal plates; magnified 15 diameters.

[For macroscopic figures of this species see Pl. LI. figs. 5, 6.]

Figs. 3, 4. Paragonaster cylindratus, n. sp. 314

Fig. 3. A portion of the abactinal surface; magnified 12 diameters.
Fig. 4. Adambulacral and infero-marginal plates; magnified 15 diameters.

[For macroscopic figures of this species see Pl. LI. figs. 3, 4.]

Figs. 5, 6. Nymphaster albidus, n. sp. 306

Fig. 5. A portion of the abactinal surface; magnified 20 diameters.
Fig. 6. Adambulacral and infero-marginal plates; magnified 15 diameters.

[For macroscopic figures of this species see Pl. L. figs. 1, 2.]

Figs. 7, 8. Nymphaster symbolicus, n. sp. 297

Fig. 7. A portion of the abactinal surface; magnified 10 diameters.
Fig. 8. Adambulacral and infero-marginal plates; magnified 15 diameters.

[For macroscopic figures of this species see Pl. L. figs. 1, 2.]

Figs. 9, 10. Nymphaster protentus, n. sp. 303

Fig. 9. A portion of the abactinal surface; magnified 12 diameters.
Fig. 10. Adambulacral and infero-marginal plates; magnified 12 diameters.

[For macroscopic figures of this species see Pl. L. figs. 3, 4.]

Figs. 11, 12. Nymphaster bifunctus, n. sp. 301

Fig. 11. A portion of the abactinal surface; magnified 15 diameters.
Fig. 12. Adambulacral and infero-marginal plates; magnified 20 diameters.

[For macroscopic figures of this species see Pl. LIII. figs. 3, 4.]
1-2. **PARAGONASTER CTENIPES**, *n.* sp.
3-4. **PARAGONASTER CYLINDRATUS**, *n.* sp.
9-10. **NYMPHASTER PROTENTUS**, *n.* sp.
5 & **NYMPHASTER ALBIDUS**, *n.* sp.
7-8. **NYMPHASTER SYMBOLICUS**, *n.* sp.
11-12. **NYMPHASTER BIPUNCTUS**, *n.* sp.
PLATE LIV.

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Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 3. A portion of the abactinal surface; magnified 15 diameters.

Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.

Fig. 5. The extremity of a ray; magnified.

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T.Michael

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PLATE LXXVIII.

Figs. 1, 2. CALYPTASTER COA, n. sp. 489

Fig. 1. Abactinal aspect; magnified 3 diameters.

Fig. 2. Actinal aspect; magnified 3 diameters.

[For magnified details of this species see Pl. LXXIX. figs. 1-3.]

Figs. 3, 4. MARSIPASTER HIRSUTUS, n. sp. 487

Fig. 3. Abactinal aspect; magnified 2 diameters.

Fig. 4. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. LXXIX. figs. 4-6.]

Figs. 5, 6. MARSIPASTER SPINOSISSimus, n. sp. 485

Fig. 5. Abactinal aspect; magnified 3 diameters.

Fig. 6. Actinal aspect; magnified 3 diameters.

[For magnified details of this species see Pl. LXXIX. figs. 7-9.]
1-2. CALYPTRASTER COA, n sp.  3-4. MARSIPASTER HIRSUTUS, n sp.
5-6. MARSIPASTER SPINOSISSIMUS, n sp.
FIGS. 1–3. **Calyptraster coa**, n. sp. 489

Fig. 1. A portion of the supradorsal membrane; magnified 20 diameters.

Fig. 2. Mouth-plates; magnified.

Fig. 3. Adambulacral plates and adjacent portion of the actinal surface; magnified 20 diameters.

[For macroscopic figures of this species see Pl. LXXVIII. figs. 1, 2.]

FIGS. 4–6. **Marsipaster hirsutus**, n. sp. 487

Fig. 4. A portion of the supradorsal membrane; magnified 20 diameters.

Fig. 5. Mouth-plates; magnified.

Fig. 6. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.

[For macroscopic figures of this species see Pl. LXXVIII. figs. 3, 4.]

FIGS. 7–9. **Marsipaster spinosissimus**, n. sp. 485

Fig. 7. A portion of the supradorsal membrane; magnified 20 diameters.

Fig. 8. Mouth-plates; magnified.

Fig. 9. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.

[For macroscopic figures of this species see Pl. LXXVIII. figs. 5, 6.]
1-3. Calyptraster coa, n. sp.
4-6. Marsipaster hirsutus, n. sp.
7-9. Marsipaster spinosissimus, n. sp.
PLATE LXXX.

(ZOOL. CHALL. EXP.—PART LI.—1888.)—2 S
PLATE LXXX.

Figs. 1-5. Hymenaster pellucidus, Wyville Thomson, . . . 508

Fig. 1. Abactinal aspect; magnified 3 diameters.
Fig. 2. Actinal aspect; magnified 3 diameters.
Fig. 3. A portion of the supradorsal membrane; magnified 20 diameters.
Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 18 diameters.
Fig. 5. Mouth-plates; magnified.

Figs. 6-9. Korethraster hispidus, Wyville Thomson, . . . 464

Fig. 6. Abactinal aspect; magnified 4 diameters.
Fig. 7. Actinal aspect; magnified 4 diameters.
Fig. 8. A portion of the abactinal surface; magnified 24 diameters.
Fig. 9. Adambulacral plates and adjacent portion of the actinal surface; magnified 35 diameters.
PLATE LXXXI.
PLATE LXXXI.

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1-2. Hymenaster Pergamentaceus, n.sp.
3-4. Hymenaster Formosus, n.sp.
PLATE LXXXII.
PLATE LXXXII.

Figs. 1, 2. Hymenaster echinulatus, n. sp. . . . 502

Fig. 1. Abactinal aspect; magnified 3 diameters.

Fig. 2. Actinal aspect; magnified 3 diameters.

[For magnified details of this species see Pl. LXXXIII. figs. 7-9.]

Figs. 3, 4. Hymenaster porosissimus, n. sp. . . . 515

Fig. 3. Abactinal aspect; magnified 1 ½ diameters.

Fig. 4. Actinal aspect; magnified 1 ½ diameters.

[For magnified details of this species see Pl. LXXXIII. figs. 10-12.]
1-2. HYMENASTER ECHINULATUS, n.sp.
3-4. HYMENASTER POROSISSIMUS, n.sp.
PLATE LXXXIII.
PLATE LXXXIII.

Figs. 1–3. Hymenaster pergamentaceus, n. sp. . . . 499

Fig. 1. A portion of the supradorsal membrane; magnified 10 diameters.
Fig. 2. Mouth-plates; magnified.
Fig. 3. Adambulacral plates and adjacent portion of the actinal surface; magnified 7 diameters.

[For macroscopic figures of this species see Pl. LXXXI. figs. 1, 2.]

Figs. 4–6. Hymenaster formosus, n. sp. . . . 497

Fig. 4. A portion of the supradorsal membrane; magnified 16 diameters.
Fig. 5. Mouth-plates; magnified.
Fig. 6. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.

[For macroscopic figures of this species see Pl. LXXXI. figs. 3, 4.]

Figs. 7–9. Hymenaster echinulatus, n. sp. . . . 502

Fig. 7. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 8. Mouth-plates; magnified.
Fig. 9. Adambulacral plates and adjacent portion of the actinal surface; magnified 16 diameters.

[For macroscopic figures of this species see Pl. LXXXII. figs. 1, 2.]

Figs. 10–12. Hymenaster porosissimus, n. sp. . . . 515

Fig. 10. A portion of the supradorsal membrane; magnified 10 diameters.
Fig. 11. Mouth-plates; magnified.
Fig. 12. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.

[For macroscopic figures of this species see Pl. LXXXII. figs. 3, 4.]
1-3. HYMENASTER Pergamentaceus, n. sp.
4-6. HYMENASTER Formosus, n. sp.
7-9. HYMENASTER Echinulatus, n. sp.
10-12. HYMENASTER Porosissimus, n. sp.
PLATE LXXXIV.

(Zool. Chal. Exp.—Part II.—1888.)—2 U
PLATE LXXXIV.

Figs. 1, 2. *Hymenaster glaucus*, n. sp. . . . 505

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. LXXXVI. figs. 4–6.]

Figs. 3, 4. *Hymenaster vicarius*, n. sp. . . . 507

Fig. 3. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 4. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. LXXXVI. figs. 1–3.]
1-2. HYMENASTER GLAUCUS, n. sp.
3-4. HYMENASTER VICARIUS, n. sp.
PLATE LXXXV.
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<td>Fig. 5. Profile view of the same; magnified 2 diameters.</td>
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1-3 HYMENASTER SACculatus, n sp

4-5 HYMENASTER Cælatus, n sp
PLATE LXXXVI.

(ZOOL. CHALL. EXP.—PART LI.—1888.)—2 X
Figs. 1–3. Hymenaster vicarius, n. sp. . . . 507

Fig. 1. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 2. Mouth-plates; magnified.
Fig. 3. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.
[For macroscopic figures of this species see Pl. LXXXIV. figs. 3, 4.]

Figs. 4–6. Hymenaster glaucus, n. sp. . . . 505

Fig. 4. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 5. Mouth-plates; magnified.
Fig. 6. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.
[For macroscopic figures of this species see Pl. LXXXIV. figs. 1, 2.]

Figs. 7–9. Hymenaster sacculatus, n. sp. . . . 501

Fig. 7. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 8. Mouth-plates; magnified.
Fig. 9. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.
[For macroscopic figures of this species see Pl. LXXXV. figs. 1–3.]

Figs. 10–12. Hymenaster cælatus, n. sp. . . . 509

Fig. 10. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 11. Mouth-plates; magnified.
Fig. 12. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.
[For macroscopic figures of this species see Pl. LXXXV. figs. 4, 5.]
1. Hymenaster Vicarius, n.sp.  4-6. Hymenaster Glaucus, n.sp.  7-9. Hymenaster Sacculatus, n.sp.
10-12. Hymenaster Cælatus, n.sp.
PLATE LXXXVII.
Figs. 1–3. Hymenaster nobilis, Wyville Thomson, 495

Fig. 1. Abactinal aspect; natural size.

Fig. 2. Actinal aspect; natural size.

Fig. 3. Adambulacral plates and adjacent portion of the actinal surface; magnified 3 diameters.

Figs. 4–7. Hymenaster infernalis, n. sp. 508

Fig. 4. Abactinal aspect; natural size.

Fig. 5. A portion of the supradorsal membrane; magnified 15 diameters.

Fig. 6. Mouth-plates; magnified.

Fig. 7. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.
4-7. HYMENASTER INFERNALIS, n. sp.
The Voyage of H.M.S. Challenger.

1-3. HYMENASTER NOBILIS, Wyville Thomson.

4-7. HYMENASTER INFERNALIS, n. sp.
PLATE LXXXVIII.
PLATE LXXXVIII.

Figs. 1–5. Hymenaster carnosus, n. sp. 504

Page

Fig. 1. Abactinal aspect; natural size.

Fig. 2. Actinal aspect; natural size.

Fig. 3. A portion of the supradorsal membrane; magnified 8 diameters.

Fig. 4. Mouth-plates; magnified.

Fig. 5. Adambulacral plates and adjacent portion of the actinal surface; magnified 4 diameters.
HYMENASTER CARNOSUS, n. sp.
Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{4}$ diameters.

[For magnified details of this species see Pl. XCI. figs. 1–3.]

Fig. 3. Abactinal aspect; magnified 3 diameters.

Fig. 4. Actinal aspect; magnified 3 diameters.

[For magnified details of this species see Pl. XCI. figs. 4–6.]
1-2. HYMENASTER CRUCIFER, n. sp.

3-4. HYMENASTER ANOMALUS, n. sp.
PLATE XC.

(Zool. Chall. Exp.—Part LI.—1888.)—2 Z
PLATE XC.

Figs. 1, 2. *Hymenaster graniferus*, n. sp. . . . 517

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. XCl. figs. 7–9.]

Figs. 3, 4. *Hymenaster coccinatus*, n. sp. . . . 522

Fig. 3. Abactinal aspect; magnified 3 diameters.

Fig. 4. Actinal aspect; magnified 3 diameters.

[For magnified details of this species see Pl. XCl. figs. 10–12.]

Figs. 5, 6. *Hymenaster præcoquis*, n. sp. . . . 524

Fig. 5. Abactinal aspect; magnified 4 diameters.

Fig. 6. Actinal aspect; magnified 4 diameters.

(The young contained in the nidamental cavity may be seen through the membrane, and are exposed at the rent in one of the interradial areas.)

[For magnified details of this species see Pl. XCl. figs. 13–15.]
1-2. HYMENASTER GRANIFERUS, n.sp.
3-4. HYMENASTER COCCINATUS, n.sp.
5-6. HYMENASTER PRÆCOQUIS, n.sp.
PLATE XCI.

Figs. 1–3. Hymenaster crucifer, n. sp. Page 511
Fig. 1. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 2. Mouth-plates; magnified.
Fig. 3. Adambulacral plates and adjacent portion of the actinal surface; magnified 5 diameters.
[For macroscopic figures of this species see Pl. LXXXIX. figs. 1, 2.]

Figs. 4–6. Hymenaster anomalus, n. sp. Page 512
Fig. 4. A portion of the supradorsal membrane; magnified 30 diameters.
Fig. 5. Mouth-plates; magnified.
Fig. 6. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.
[For macroscopic figures of this species see Pl. LXXXIX. figs. 3, 4.]

Figs. 7–9. Hymenaster graniferus, n. sp. Page 517
Fig. 7. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 8. Mouth-plates; magnified.
Fig. 9. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.
[For macroscopic figures of this species see Pl. XC. figs. 1, 2.]

Figs. 10–12. Hymenaster coccinatus, n. sp. Page 522
Fig. 10. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 11. Mouth-plates; magnified.
Fig. 12. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.
[For macroscopic figures of this species see Pl. XC. figs. 3, 4.]

Figs. 13–15. Hymenaster praecoquis, n. sp. Page 524
Fig. 13. A portion of the supradorsal membrane; magnified 15 diameters.
Fig. 14. Mouth-plates; magnified.
Fig. 15. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.
[For macroscopic figures of this species see Pl. XC. figs. 5, 6.]
I-3. HYMENASTER CRUCIFER, n.sp. 4-6. HYMENASTER ANOMALUS, n.sp. 7-9. HYMENASTER GRANIFERUS, n.sp. 10-12. HYMENASTER COCCINATUS, n.sp. 13-15. HYMENASTER PRÆCOQUIS, n.sp.
PLATE XCII.

(Zool. Chall. Exp.—Part II.—1888.)—3 A
PLATE XCII.

Fig. 1. Hymenaster pullatus, n. sp. . . . 519

Fig. 1. Abactinal aspect; magnified 1½ diameters.

[For magnified details of this species see Pl. XCIII. figs. 1–3.]

Figs. 2, 3. Hymenaster geometricus, n. sp. . . . 518

Fig. 2. Abactinal aspect; magnified 1½ diameters.

Fig. 3. Profile view, showing the actinal interradial area (partly diagrammatic); magnified 1½ diameters.

[For magnified details of this species see Pl. XCIII. figs. 4–6.]

Figs. 4, 5. Hymenaster latebrosus, n. sp. . . . 514

Fig. 4. Abactinal aspect; magnified 2 diameters.

Fig. 5. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. XCIII. figs. 7–9.]

Figs. 6, 7. Hymenaster membranaceus, Wyville Thomson, . . 521

Fig. 6. Abactinal aspect; magnified 1½ diameters.

Fig. 7. Actinal aspect; magnified 1½ diameters.

[For magnified details of this species see Pl. XCIII. figs. 10–12.]
1. HYMENASTER PULLATUS, n sp.
2-3. HYMENASTER GEOMETRICUS, n sp.
4-5. HYMENASTER LATEBROSUS, n sp.
6-7. HYMENASTER MEMBRANACEUS, Wyville Thomson
PLATE XCIII.

Figs. 1–3. *Hymenaster pullatus*, n. sp. . . . . 519

Fig. 1. A portion of the supradorsal membrane; magnified 15 diameters.

Fig. 2. Mouth-plates; magnified.

Fig. 3. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.

[For a macroscopic figure of this species see Pl. XCII. fig. 1.]

Figs. 4–6. *Hymenaster geometricus*, n. sp. . . . . 518

Fig. 4. A portion of the supradorsal membrane; magnified 15 diameters.

Fig. 5. Mouth-plates; magnified.

Fig. 6. Adambulacral plates and adjacent portion of the actinal surface; magnified 5 diameters.

[For macroscopic figures of this species see Pl. XCII. figs. 2, 3.]

Figs. 7–9. *Hymenaster latebrosus*, n. sp. . . . . 514

Fig. 7. A portion of the supradorsal membrane; magnified 15 diameters.

Fig. 8. Mouth-plates; magnified.

Fig. 9. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.

[For macroscopic figures of this species see Pl. XCII. figs. 4, 5.]

Figs. 10–12. *Hymenaster membranaceus*, Wyville Thomson, 521

Fig. 10. A portion of the supradorsal membrane; magnified 15 diameters.

Fig. 11. Mouth-plates; magnified.

Fig. 12. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.

[For macroscopic figures of this species see Pl. XCII. figs. 6, 7.]
1-3. HYMENASTER PULLATUS, n.sp.  
4-6. HYMENASTER GEOMETRICUS, n.sp.  
7-9. HYMENASTER LATEBROSUS, n.sp.  
10-12. HYMENASTER MEMBRANACEUS, Wyville Thomson.
PLATE XCIV.
PLATE XCIV.

Figs. 1–5. Benthaster wyville-thomsoni, n. sp. . . . 527

Fig. 1. Abactinal aspect; magnified 2 diameters.

Fig. 2. Actinal aspect; magnified 2 diameters.

Fig. 3. Adambulacral plates and adjacent portion of the actinal surface; magnified 18 diameters.

Fig. 4. Diagrammatic view of the abactinal paxillae and rudimentary supradorsal membrane, seen in profile; magnified.

Fig. 5. Diagram of the plates on the outer part of a ray; magnified.

Figs. 6–9. Benthaster penicillatus, n. sp. . . . 529

Fig. 6. Abactinal aspect; magnified 2 diameters.

Fig. 7. Actinal aspect; magnified 2 diameters.

Fig. 8. Adambulacral plates and adjacent portion of the actinal surface; magnified.

Fig. 9. Diagram of the plates on the outer part of a ray; magnified.
1-5 Benthaster Wyville-Thomsoni, n. sp.
6-8 Benthaster Penicillus, n. sp.
PLATE XCV.
Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 3. Adambulacral plates and adjacent portion of the actinal surface; magnified 9 diameters.

Fig. 4. A portion of the abactinal surface; magnified 9 diameters.

Fig. 5. Mouth-plates; magnified 5 diameters.
PYTHONASTER MURRAYI, n sp
Figs. 1, 2. Cribrella compacta, n. sp. 543

Fig. 1. Abactinal aspect; magnified 4 diameters.

Fig. 2. Actinal aspect; magnified 4 diameters.

[For magnified details of this species see Pl. XCVIII. figs. 3, 4.]

Figs. 3, 4. Cribrella obesa, n. sp. 544

Fig. 3. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 4. Profile view of a ray; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. XCVIII. figs. 5, 6.]

Figs. 5, 6. Cribrella sufflata, n. sp. 549

Fig. 5. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 6. Profile view of a ray; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. XCVIII. figs. 7, 8.]

Fig. 7. Cribrella præstans, n. sp. 545

Fig. 7. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. XCVIII. figs. 7, 8.]
1-2. CRIBRELLA COMPACTA, n. sp.
5-6. CRIBRELLA SUFLATA, n. sp.
3-4. CRIBRELLA OBESA, n. sp.
7. CRIBRELLA PRÆSTANS, n. sp.
PLATE XCVII.
PLATE XCVII.

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[For magnified details of this species see Pl. XCVIII. figs. 11, 12.]

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[For magnified details of this species see Pl. LXII. fig. 1.]

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[For magnified details of this species see Pl. XCVIII. figs. 9, 10.]
1-2. PERKNASTER DENSUS, n.sp
3-4. PERKNASTER FUSCUS, n.sp
5-6. CRIBRELLA SIMPLEX, n.sp.
PLATE XCVIII.
PLATE XCVIII.

Figs. 1, 2. Cribrella sufflata, n. sp. 549

Fig. 1. A portion of the abactinal surface; magnified 12 diameters.

Fig. 2. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.

[For macroscopic figures of this species see Pl. XCVI. figs. 5, 6.]

Figs. 3, 4. Cribrella compacta, n. sp. 543

Fig. 3. A portion of the abactinal surface; magnified 35 diameters.

Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 35 diameters.

[For macroscopic figures of this species see Pl. XCVI. figs. 1, 2.]

Figs. 5, 6. Cribrella obesa, n. sp. 544

Fig. 5. A portion of the abactinal surface; magnified 15 diameters.

Fig. 6. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.

[For macroscopic figures of this species see Pl. XCVI. figs. 3, 4.]

Figs. 7, 8. Cribrella praestans, n. sp. 545

Fig. 7. A portion of the abactinal surface; magnified 16 diameters.

Fig. 8. Adambulacral plates and adjacent portion of the actinal surface; magnified 18 diameters.

[For a macroscopic figure of this species see Pl. XCVI. fig. 7.]

Figs. 9, 10. Cribrella simplex, n. sp. 547

Fig. 9. A portion of the abactinal surface; magnified 16 diameters.

Fig. 10. Adambulacral plates and adjacent portion of the actinal surface; magnified 20 diameters.

[For macroscopic figures of this species see Pl. XCVII. figs. 5, 6.]

Figs. 11, 12. Perknaster densus, n. sp. 552

Fig. 11. A portion of the abactinal surface; magnified 15 diameters.

Fig. 12. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.

[For macroscopic figures of this species see Pl. XCVII. figs. 1, 2.]
1-2. CRIBRELLA SUFFLATA, n sp
5-6. CRIBRELLA OBESA, n sp
9-10. CRIBRELLA SIMPLEX, n sp
3-4. CRIBRELLA COMPACTA, n sp
7-8. CRIBRELLA PRIESTANS, n sp
11-12. PERKNASTER DENSUS, n sp
PLATE XCIX.
PLATE XCIX.

Figs. 1, 2. *Asterias vesiculosa*, n. sp. . . . . 568

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. CIII. figs. 9, 10.]

Figs. 3, 4. *Asterias* (*Hydrasterias*) *ophidion*, n. sp. . . . 581

Fig. 3. Abactinal aspect; magnified 2 diameters.

Fig. 4. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. CIII. figs. 3, 4.]
1-2. ASTERIAS VESICULOSA, n. sp.
3-4. ASTERIAS (HYDRASTERIAS) OPHIDION, n. sp.
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PLATE C.

Figs. 1–3. *Stichaster polygrammus*, n. sp. . . . 434

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 3. Profile view of a ray; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. CIII. figs. 5, 6.]

Figs. 4–6. *Asterias (Smilasterias) scalprifera*, n. sp. . . . 578

Fig. 4. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 5. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 6. Profile view of a ray; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. CIII. figs. 1, 2.]
1-3. STICHASTER POLYGRAMMUS m sp
4-6. ASTERIAS (SMILASTERIAS) SCALPRIFERA m sp
PLATE CI.

Figs. 1, 2. Stichaster felipes, n. sp. . . . 433

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. CIII. figs. 7, 8.]

Figs. 3, 4. Calvasterias stolidota, n. sp. . . . 590

Fig. 3. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 4. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

[For magnified details of this species see Pl. CIII. figs. 11, 12.]

Figs. 5, 6. Asterias (Smilasterias) triremis, n. sp. . . 579

Fig. 5. Abactinal aspect; magnified 2 diameters.

Fig. 6. Actinal aspect; magnified 2 diameters.

[For magnified details of this species see Pl. CII. figs. 5, 6.]
1-2. *STICHAster FelipEs*, n. sp.
3-4. *Calvasterias Stolidota*, n. sp.
5-6. *Asterias (Smilasterias) Triremis*, n. sp.
PLATE CII.
PLATE CII.

Figs. 1–4. Asterias torquata, n. sp. ........................................ 570

Fig. 1. Abactinal aspect; magnified 1 1/2 diameters.

Fig. 2. Actinal aspect; magnified 1 1/2 diameters.

Fig. 3. A portion of the abactinal surface; magnified 12 diameters.

Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.

Figs. 5, 6. Asterias (Smilasterias) triremis, n. sp. ...................... 579

Fig. 5. A portion of the abactinal surface; magnified 20 diameters.

Fig. 6. Adambulacral plates and adjacent portion of the actinal surface; magnified 20 diameters.

[For macroscopic figures of this species see Pl. CI. figs. 5, 6.]
1-4. ASTERIAS TORQUATA (5 spp.

5-6. ASTERIAS (SMILASTERIAS) TRIREMIS (5 spp.)
PLATE CIII.
Figs. 1, 2. *Asterias (Smilasterias) scalprifera*, n. sp. 578
Fig. 1. A portion of the abactinal surface; magnified 15 diameters.
Fig. 2. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.

[For macroscopic figures of this species see Pl. C. figs. 4–6.]

Figs. 3, 4. *Asterias (Hydrasterias) ophidion*, n. sp. 581
Fig. 3. A portion of the abactinal surface; magnified 12 diameters.
Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 14 diameters.

[For macroscopic figures of this species see Pl. XCIX. figs. 3, 4.]

Figs. 5, 6. *Stichaster polygrammus*, n. sp. 434
Fig. 5. A portion of the abactinal surface; magnified 12 diameters.
Fig. 6. Adambulacral plates and adjacent portion of the actinal surface; magnified 10 diameters.

[For macroscopic figures of this species see Pl. C. figs. 1–3.]

Figs. 7, 8. *Stichaster felipes*, n. sp. 433
Fig. 7. A portion of the abactinal surface; magnified 10 diameters.
Fig. 8. Adambulacral plates and adjacent portion of the actinal surface; magnified 9 diameters.

[For macroscopic figures of this species see Pl. CI. figs. 1, 2.]

Figs. 9, 10. *Asterias vesiculosa*, n. sp. 568
Fig. 9. A portion of the abactinal surface; magnified 13 diameters.
Fig. 10. Adambulacral plates and adjacent portion of the actinal surface; magnified 13 diameters.

[For macroscopic figures of this species see Pl. XCIX. figs. 1, 2.]

Figs. 11, 12. *Calvasterias stolidota*, n. sp. 590
Fig. 11. A portion of the abactinal surface; magnified 14 diameters.
Fig. 12. Adambulacral plates and adjacent portion of the actinal surface; magnified 14 diameters.

[For macroscopic figures of this species see Pl. Cl. figs. 3, 4.]
1-2. ASTERIAS (SMILASTERIAS) SCALPRIFERA, n. sp.
5-6. STICHASTER POLYGRAMMUS, n. sp.
9-10. ASTERIAS VESICULOSA, n. sp.
3-4. ASTERIAS (HYDASTERIAS) OPHIDION, n. sp.
7-8. STICHASTER FELIPES, n. sp.
11-12. CALVASTERIAS STOLIDOTA, n. sp.
PLATE CIV.

Figs. 1-4. Asterias versicolor, n. sp. Page 573

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 3. A portion of the abactinal surface; magnified 7 diameters.

Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.

Figs. 5-8. Tarsaster stoichodes, n. sp. Page 440

Fig. 5. Abactinal aspect; magnified 2 diameters.

Fig. 6. Actinal aspect; magnified 2 diameters.

Fig. 7. A portion of the abactinal surface; magnified 10 diameters.

Fig. 8. Adambulacral plates and adjacent portion of the actinal surface; magnified 13 diameters.
1-4. ASTERIAS VERSICOLOR, n. sp. 5-8. TARSASTER STOICHOIDES, n. sp.
Figs. 1–4. *Asterias clomerata*, n. sp. 571

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 3. A portion of the abactinal surface; magnified 8 diameters.

Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.

Figs. 5–7. *Pedicellaster hypernotius*, n. sp. 558

Fig. 5. Abactinal aspect; magnified 3 diameters.

Fig. 6. A portion of the abactinal surface; magnified 20 diameters.

Fig. 7. Adambulacral plates and adjacent portion of the actinal surface; magnified 18 diameters.

Figs. 8–10. *Asterias (Cosmasterias) tomidata*, n. sp. 576

Fig. 8. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 9. Adambulacral plates and adjacent portion of the actinal surface; magnified 8 diameters.

Fig. 10. A portion of the abactinal surface; magnified 8 diameters.
1-4. ASTERIAS GLOMERATA, n.sp.
5-7. PEDICELLAster HYPERNOTIUS, n.sp.
8-10. ASTERIAS (COSMASTERIAS) TOMIDATA, n.sp.
PLATE CVI.
PLATE CVI.

Figs. 1–4. Asterias (Stolasterias) stichantha, n. sp.  . . 586

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 3. A portion of the abactinal surface; magnified 4 diameters.

Fig. 4. Adambulaeral plates and adjacent portion of the actinal surface; magnified 4 diameters.

Figs. 5–8. Asterias (Stolasterias) eustyla, n. sp.  . . 587

Fig. 5. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 6. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 7. A portion of the abactinal surface; magnified 4 diameters.

Fig. 8. Adambulaeral plates and adjacent portion of the actinal surface; magnified 4 diameters.
PLATE CVII.

Figs. 1-4. Asterias (Stolasterias) volsellata, n. sp.  584

Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 3. A portion of the abactinal surface; magnified 9 diameters.

Fig. 4. Adambulacral plates and adjacent portion of the actinal surface; magnified 15 diameters.
ASTERIAS (STOLASTERIAS) VOLSELLATA n sp.
PLATE CVIII.
PLATE CVIII.

Fig. 1. Labidiaster annulatus, n. sp.  . .  . 595

Fig. 1. Abactinal aspect; natural size.

Fig. 2. Labidiaster radiosus (Lovén), Lütken,  .  . 595

Fig. 2. Abactinal aspect; natural size.
1. LABIDIASTER ANNULATUS, n sp
2. LABIDIASTER RADIOSUS, (Lovén), Jütken
PLATE CIX.

Figs. 1–5. *Odinia pandina*, n. sp. 598

Fig. 1. Abactinal aspect of a ray; natural size.

Fig. 2. Abactinal aspect of the disk; natural size.

Fig. 3. A portion of a ray, lateral view; magnified 2 diameters.

Fig. 4. Part of the same more highly magnified, to show the papulae; magnified 4 diameters.

Fig. 5. Adambulacral plates; magnified 4 diameters.

Figs. 6–8. *Brisinga cricophora*, n. sp. 606

Fig. 6. Abactinal aspect of a ray and the disk; magnified 1 1/2 diameters.

Fig. 7. Adambulacral plates; magnified 4 diameters.

Fig. 8. An actinal spine from an adambulacral plate near the base of a ray; magnified.

Figs. 9–11. *Brisinga verticillata*, n. sp. 604

Fig. 9. Abactinal aspect of a ray and the disk; magnified 1 1/2 diameters.

Fig. 10. Actinal aspect of the disk; magnified 1 1/2 diameters.

Fig. 11. Adambulacral plates; magnified 12 diameters.

Figs. 12–17. *Freyella polycnema*, n. sp. 621

Fig. 12. Abactinal aspect of a ray; magnified 2 diameters.

Fig. 13. Abactinal aspect of the disk; magnified 2 diameters.

Fig. 14. Actinal aspect of the disk; magnified 2 diameters.

Fig. 15. Mouth-plates; magnified 6 diameters.

Fig. 16. A portion of the abactinal surface of a ray; magnified 12 diameters.

Fig. 17. Adambulacral plates; magnified 12 diameters.
1-5. ODINIA PANDINA, n.sp.
9-11. BRISINGA VERTICILLATA, n.sp.
6-8. BRISINGA CRICOPHORA, n.sp.
12-17. FREYELLA POLYCHNEMA, n.sp.
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PLATE CX.

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Fig. 2. Actinal aspect; magnified 1½ diameters.

Fig. 3. Adambulacral plates; magnified 5 diameters.

Figs. 4–7. Brisinga distincta, n. sp. . . . 613

Fig. 4. Abactinal aspect of a ray; magnified 1½ diameters.

Fig. 5. Actinal aspect of a portion of a ray; magnified 1½ diameters.

Fig. 6. Abactinal aspect of a portion of a ray; magnified 8 diameters.

Fig. 7. Adambulacral plates; magnified 8 diameters.

Figs. 8, 9. Brisinga membranacea, n. sp. . . . 611

Fig. 8. Abactinal aspect of a portion of a ray; magnified 1½ diameters.

Fig. 9. Abactinal aspect of a portion of a ray; magnified 8 diameters.
1-3. BRISINGA ARMILLATA, sp.  4-7. BRISINGA DISTINCTA.
8-9. BRISINGA MEMBRANACEA.
PLATE CXI.

Figs. 1–4. Freyella pennata, n. sp. . . . . 618

Fig. 1. Abactinal aspect; natural size.

Fig. 2. Actinal aspect; natural size.

Fig. 3. A portion of the abactinal surface of an ovarian region; magnified 10 diameters.

Fig. 4. Adambulacral plates; magnified 5 diameters.

Figs. 5–8. Freyella benthophila, n. sp. . . . . 641

Fig. 5. Abactinal aspect; magnified 2 diameters.

Fig. 6. Actinal aspect; magnified 2 diameters.

Fig. 7. A portion of the abactinal surface of an ovarian region; magnified 20 diameters.

Fig. 8. Adambulacral plates; magnified 6 diameters.
1-4 FREYELLA PENNATA, n sp.
5-8 FREYELLA BENTHOPHILA, n sp.
PLATE CXII.

(2001. CHALL. EXP.—PART II.—1888.)—3 L
Fig. 1. Abactinal aspect; magnified 1½ diameters.

Fig. 2. Actinal aspect; magnified 1½ diameters.

Fig. 3. A portion of the abactinal surface of the disk; magnified 15 diameters.

Fig. 4. A portion of the abactinal surface of an ovarian region; magnified 5 diameters.

Fig. 5. Adambulaeral plates; magnified 4 diameters.
FREYELLA ECHINATA, n sp.
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1-4 FREYELLA FRAGILISSIMA, n sp
5-7 FREYELLA ATTENUATA, n sp.
PLATE CXIV.

(zool. chall. exp.—part li.—1888.)—3 M
PLATE CXIV.

Figs. 1–4. Freyella bracteata, n. sp. . . 629

Fig. 1. Abactinal aspect; natural size.
Fig. 2. Actinal aspect; natural size.
Fig. 3. A portion of the abactinal surface of an ovarial region; magnified 10 diameters.
Fig. 4. Adambulacral plates; magnified 5 diameters.

Figs. 5–8. Freyella heroina, n. sp. . . 643

Fig. 5. Abactinal aspect; natural size.
Fig. 6. Actinal aspect; natural size.
Fig. 7. A portion of the abactinal surface of an ovarial region; magnified 12 diameters.
Fig. 8. Adambulacral plates; magnified 4 diameters.
1-4 FREYELLA BRACETEATA, n.sp.  5-8. FREYELLA HEROINA, n.sp.
Fig. 1. Abactinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 2. Actinal aspect; magnified $1\frac{1}{2}$ diameters.

Fig. 3. Profile view in outline; two-thirds of natural size.

Fig. 4. A portion of the abactinal surface of an ovarial region; magnified 10 diameters.

Fig. 5. Adambulaeral plates; magnified 3 diameters.
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PLATE CXVI.

Figs. 1–3. **Freyella remex**, n. sp. . . . 635

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Figs. 1–3. Freyella tuberculata, n. sp. . . . 638

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Fig. 2. Actinal aspect; magnified 1\frac{1}{2} diameters.

Fig. 3. A portion of the abactinal surface of an ovarial region; magnified 12 diameters.

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Fig. 4. Abactinal aspect of a portion of a ray and the disk; magnified 1\frac{1}{2} diameters.

Fig. 5. Actinal aspect of a portion of a ray and the disk; magnified 2 diameters.

Fig. 6. A portion of the abactinal surface of the disk; magnified 20 diameters.

Fig. 7. Adambulacral plates; magnified 10 diameters.
1-3. FREYELLA TUBERCULATA, n sp

4-7. COLPASTER SCUTIGERULA, n sp