CATALOGUE

OF THE

RECENT ECHINIDA,

OR

SEA EGGS,

IN THE COLLECTION

OF

THE BRITISH MUSEUM.

PART I.—ECHINIDA IRREGULARIA.

LONDON:
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PREFACE.

The chief object in preparing this Synopsis has been to give, at one view, a complete Catalogue of all the Specimens of Sea Eggs (*Echinida*) at present in the British Museum Collection, and an account of the species known to exist in other Collections, but which are desiderata in the British Museum, so as to enable travellers, collectors, and others, to assist in completing the National Collection.

After the short description of the Genera and Species, a detailed list of the synonyma referring to the different authors who have described and figured the species, there is added an enumeration stating the condition, country, origin of, by whom presented, and other peculiarities of each specimen of the kind in the Museum Collection.

The Second Part is in forwardness, and will be printed as soon as completed.

JOHN EDWARD GRAY.

British Museum,
16th March, 1855.

CATALOGUE

OF

ECHINIDA.

Subdivision II.—The Irregularia.

Vent lateral, dorsal, or inferior (not in the middle of the back); body not globular, variously shaped; jaws horizontal, separate or wanting; anus and mouth covered with small scales; ambulacra short, often confined to the vertex, and generally interrupted on the margin, sometimes appearing again near the mouth; shell covered with numerous generally equal-sized bristle-like spines, rarely scattered with thicker and more elongated ones.

Echinida, the annectant group, *Gray, Ann. Phil.* 1825, 5.
Echinides, Sect. 2, part. and sect. 1. *Lamk. Hist.* iii. 267.
Irregularia, *Latr. Fam. Nat. R. A.* 533, 1825.
Catocystos and Pleurocystos, *Klein Echin.* 13; *Leske*, 97–153.

Section 1. Mesostoma, *mouth subcentral, round, or pentagular.*

Mesostoma, *Latr. Fam. R. A.* 533, 1825.
Les Clypeastres, *Agassiz, Prod.*
Les Echinides paracentrostome, *Blainv. Dict. Sc. Nat.*
Clypeasteroidea, *Agassiz; Bronn, Gesch d. Nat.* 193, 1846.
Catocystos, part., *Klein*, 12.
Emmesostomi, part., *Klein*, 37.
Catocysti emmesostomi, part., *Van Phelsum.*
Pleurocysti Emmesostomi, *Van Phelsum.*

a. Jaws distinct.

Echinides paracentrosomes dentes, *Blainv. D. S. N.*

Fam. 3. SCUTELLIDÆ.

Shell thick, pentagonal, elliptical, or circular, covered with small uniform bristles, supported by very close, very small, very uniform tubercles on all parts of the shell; mouth five sided; vent posterior, marginal, or infra-marginal; jaws composed of five horizontal plates, pivoted on two pillars, which fit into two pits in their lower surface; teeth simple, obliquely truncated, and inserted in a groove in the middle of the jaws; internal cavity of the shell simple, or divided into compartments by perpendicular septa, or pillars; ambulacra formed of single series of double pores, forming dorsal petals, and straight or anastomosary lines on the lower surface; genital plates five, forming a circle round the madreporiform plate; ocellar plates five, interposed between the genital plates and the apex of the ambulacra.

Scutellidæ, *Gray, Ann. Phil.* x. 1825, 5; *Synop. Brit. Mus.* 1840; 1842, 115.
Clypeastres, *Agassiz, Prod.—Ann. Nat. Hist.* i. 302; *Deslong in Lamk. Hist.* iii. 273.
Les Echinides paracentrostomes dentes, *Blainv. Dict. Sc. Nat.* lx. 195; *Deslong in Lamk. Hist.* ed. 2, iii. 271.
Clypeasteroidea, γ Scutellæ, *Agassiz; Bronn, Gesch. d. Nat.* 196.
Clypeasteroidea, β Clypeastritæ, *Agassiz; Bronn, Gesch d. Nat.* 195.
Mesostoma, part., *Latr. Fam. N. R. A.* 533, 1825.
Clypeaster, *Lamk. Syst.* 349.
Des Clypeasteroides, *Agassiz & Desor, Ann. Sci. Nat.* 1847, 129.

The crustaceous covering of the body is usually thickened internally by an additional coat, and is strengthened by internal columns, which enable them to resist the action of the sea for a length of time.

The shells are formed of twenty bands of pieces, but the continuation of the ambulacral bands are often very much dilated and perforated.

This family is allied to the *Echinadæ*, by the nearly equal-sized spines, and having jaws, &c.; to the annectant families of the order *Stelleridæ*, by their jaws being only used for pressing the food, and by the radiated lobed form of some of the species.

Synopsis of the Genera.

I. *Pores of each ambulacral band united by a cross groove.*

A. *Infra-ambulacral grooves, simple, straight, not branched.*

a. Ambulacral petals broad, closed at end.

1. CLYPEASTER, under-side concave.

b. Ambulacral petals narrow, open at end.

2. LAGANUM, vent inferior ; body pentagonal.

3. ARACHNOIDES, vent supra-marginal ; body circular.

B. *Infra-ambulacral grooves branched near end, or waved ; vent inferior.*

c. Ambulacral petal narrow, open at the end.

4. ECHINARACHNIUS, discoidal entire ; vent sub-marginal ; oral grooves just branched at the end.

5. DENDRASTER, discoidal entire; vent sub-marginal; oral grooves much branched.

6. ROTULA, discoidal pierced, and lobed ; vent sub-oral.

7. LEODIA, discoidal pierced ; edge entire ; vent sub-oral.

d. Ambulacral petals broad, closed at the end.

8. ECHINODISCUS, discoidal pierced; vent sub-marginal; oral grooves round or slightly branched.

9. MELLITA, discoidal pierced; vent sub-oral ; oral grooves waved.

10. ECHINOGLYCUS, discoidal pierced ; vent sub-oral ; oral grooves much branched.

II. *Pores of each ambulacral band not united by a cross groove.*

11. MOULINSIA, discorded, edge festooned.

12. ECHINOCYAMUS, oblong, edge rounded.

13. FIBULARIA, sub-spherical.

I. *Pores of each ambulacral band united in pairs by a cross groove; cavity of the shell strengthened internally, at least on the margin.*

A. *Infra-ambulacral groove, simple, straight, not branched.*

a. Ambulacral petals broad, closed at the end.

1. CLYPEASTER.

Shell pentagonal, truncated behind, beaked in front, swollen, sometimes conic, or sub-conic ; beneath flat ; ambulacral petals very broad, sometimes costulated, arched, and circumscribed by very broad periferous zones, corresponding with five narrow

straight grooves on the lower side, continued to the mouth; vent small, infra-marginal; mouth pentagonal, deeply sunk in; jaws very strong, with two high wings; teeth vertical; cavity of the shell with many vertical septa; genital pores five, at top of ambulacra, and not continuous with the madreporiform plate.

Clypeaster, §*, *Lamk. Syst.* 349, 1801.
Clypeaster, *Lamk. Hist.* ed. 2, iii.; *Desmoulin, Etudes*, ii. 212; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 129.
Clypeasteroidea β Clypeastritæ, *Agassiz; Bronn, Gesch. d. Nat.* 195.
Echinanthus, sp. *Leske; Breynus.*
Echinanthus, *Gray, Ann. Phil.* 1825, 5.
Echinorodum, *Van Phelsum*, 38.
Scutum angulare, *Klein.*

* *Vent in margin; margin very thick, rounded; base concave.*

† *Back convex.*

1. ECHINANTHUS ROSACEUS.

Ambulacral petal very broad and strongly rounded; back regularly rounded; anus in the margin; jaws higher than broad, ambulacra close at the end.

Echinus rosaceus, *Linn. S. N.*, 3186.
Erizo estrellado, *Parva Descrip.* 139, t. 52, f. 1–10.
Scutum angulare humile, *a*, *Klein Gall.* 84, t. 9, f. 13.
Echinanthus humilis, *Leske ap. Klein*, 185, t. 17, f. A. t. 18, f. 13; *Ency. Meth.* t. 145, f. 56; *Seba*, iii. t. 11, f. 2, 3, & 13, 14; *Knorr Delc.* D, 1, f. 12; *Gray, Ann. Phil.* 1825, 5.
Echinorhodum, *Van Phelsum*, 38, 44.
Clypeaster rosaceus, *Lamk. Hist.* iii.; *Eth.* t. 144, f. 78, t. 145, f. 1, 2, 5, 6; *Deslong, Ency. Meth.* ii. 299; *Blainv. D. S. N.* ix. 448; lx. 197; *Zooph.* 216; *Desmoul. Tab. Syn.* 212; *Agass. Prod.* 187; *Agassiz & Desor*, l. c. 130.
Clypeaster incurvatus, *Desmoul. Tab. Syn.* 212. (*Ency. Meth.* t. 145, f. 56.)
Monstrosities, ambulacra four, and ambulacra six-rayed, *Mus. Paris.*

Hab. West Indies.

a. Adult. St. Vincent's, W. Indies. Mr. Guilding's Collection.
b. Half grown, cut across, showing the column inside. St. Vincent's, West Indies. Mr. Guilding's Collection.
c, d. Half grown, without spines.
e, f. Adult and young, covered with spines.

g. Without spine, rather more convex, and very thick and heavy.
h & j. Without spines.
k. Without spines.
l. Young.

†† *Back flat.*

2. ECHINANTHUS SCUTIFORMIS.

Shell very thick, ovate, sub-pentagonal, flat, elongate, the edge much swollen ; the middle of the back, as far as the end of the ambulacra, sunken ; base slightly concave ; ambulacra closed at the end ; vent near the margin.
Echinus planus scutiformis, *Seba Mus.* iii. t. 15, f. 23, 24 ; *Ency Meth.* t. 147, f. 3, 4.
Clypeaster scutiformis, *Lamk. Hist.* iii. 291. (*Ency. Meth.* t. 147. f. 3, 4.) *Deslong. Ency. Meth.* ii. 199 ; *Blainv. D. S. N.* lx. 197 ; *Zooph.* 216 ; *Agassiz, Prod.* 287 ; *Agassiz & Desor*, l. c. 130.
C. sentiformis (misprint) *Blainv. D. S. N.* ix. 449.
Scutella clypeastri formis, *Blainv. D. S. N.* xlviii. 228 ; *Desmoul. Syn. Echin.* 230.
Lagana scutiformis, *Gray, Ann. Phil.* 1825, 6.
Var. Minor, *Agassiz & Desor*, l. c. 130.
Clypeaster reticulatus, *Desmoul. Tab. Syn.* 214.
Echinoglycus pentagonus, *Van Phelsum*, 34.
Echinodiscus, *Gault*, t. 110, f. D.
Echinodiscus reticulatus, *Leske*, 207, t. 45, f. 8, 9 ; *Ency. Meth.* t. 144, f. 5, 6.
Echinus reticulatus, *α, β, Gmelin, S. N.* 3191.
Scutella reticulata, *Blainv. D. S. N.* xlviii. 228.
Lagana ovalis, *Blainv. Zuph.* 196.
Scutella ovalis, *Agass. Prod.* 21.
Hab. Persian Gulph. Red Sea.
a. Red Sea. Presented by Major Macdonald.

** *Vent beneath the margin ; beneath concave ; middle of back convex ; sides rather flat.*

3. ECHINANTHUS AUSTRALASIA.

Vent beneath, a little distance from the edge ; back very convex in the middle ; upper margin rather flattened, with a slight concavity at the end of the ambulacra ; under side flat near the margin, deeply concave in the middle ; spines of the under side near mouth very fine.

Echinanthus australasia, *Gray, Proc. Zool. Soc.* 1851.
Hab. Australia.
a. With a few spines ; adult. N. S. W. Brisbane Water.

4. ECHINANTHUS TESTUDINARIUS.

Vent beneath, a little within the edge ; depressed, back slightly raised, evenly convex ; under surface rather concave from the edge.

Echinanthus testudinarius, *Gray, Proc. Zool. Soc.* 1851.
Hab. Indian Ocean. Borneo.
a, b, c. Adult and half grown ; varying rather in the convexity of the back. Borneo ? Presented by Capt. Sir Edward Belcher, K.C.B., R.N.
d, e. Young, covered with spines. Borneo. Presented by the Admiralty.

5. ECHINANTHUS OBLONGUS.

Ovate, oblong, elongate, rounded at the end ; sides thick, rounded ; back depressed round the end of the ambulacra ; crown rather convex ; ambulacra ovate, lanceolate, broad, and closed at the end ; underside concave nearly to the edge ; ambulacra grooves indistinct ; vent near the margin.

Echinanthus oblongus, *Gray, Proc. Zool. Soc.* 1851.
Hab. Philippines. Siquigor.
a. Young (?) with only a few spines. Siquigor. Mr. Cuming's Collection.

6. ECHINANTHUS PRODUCTUS.

Shell ovate, elongate, the hinder end produced and flattened, the edge rather thick, thinner behind ; the ambulacra petals broad, the bands not quite united at the end ; under side concave to the margin ; vent near the margin.

Echinanthus productus, *Gray, Proc. Zool. Soc.*
Hab. ——— ?
a. Young ? Above pink ; under surface greenish, with narrow pink lines over the suture between the tessera.

7. ECHINANTHUS COLEÆ.

Shell ovate, sub-pentagonal, depressed ; margin thick, rounded ; back depressed, as far as the end of the ambulacra, and then rather convex in the middle ; the under side concave nearly to the edge ; ambulacral petals ovate, lanceolate, closed at the end ; vent near the margin.

Echinanthus Coleæ, *Gray, Proc. Zool. Soc.* 1851.
Hab. Mauritius.
a, b. Without spines. Mauritius. Presented by Lady Mary Cole.

** *Vent beneath the margin; shell flat beneath, except just near the mouth.*

8. ECHINANTHUS SUB-DEPRESSUS.

Back depressed, rather raised in the centre, petal moderate, nearly two-thirds the length of the space from the vertex to the side edges; jaws depressed, not so high as broad. Cavity on the broad septa on the edge.

Echinanthus ovalis, *Gault*, t. 110, f. *a*.
Echinanthus humilis, *β*, *Leske ap. Klein*, t. 19, f. A. B.
Scutum angulare humile, *β*, *Klein Gall.* 86 t. 10. f. 13.
Echinus rosaceus, *β*, *Gmelin, S. N.* 3186.
Echinanthus sub-depressus, *Gray, Ann. Phil.* 1825, 5.
Clypeaster rosaceus, *β*, *Lamk. Hist.* iii. 289.
Clypeaster rangianus, *Desmoul. Etud. Echin.* i. 62, t. 1; *Tab. Syn.* 214; *Agassiz & Desor*, l. c. 130.
Echinorhodum, n. 5; *Van Philsum*, 38.

Hab. East coast of Africa, *Rang*.

a. Without spines, showing the internal cavity and jaws.
b. Without spines.

9. ECHINANTHUS EXPLANATUS.

Depressed, much expanded; centre of the back rather convex; ambulacra occupying rather more than half the space between the vertex and margin; the lines of pores of the anterior pair and posterior odd one far apart at the end; cavity with thin concentric lines of short compressed columns near the margin; jaws depressed.

Echinanthus explanatus, *Gray, Proc. Zool. Soc.* 1851.

Hab. Mauritius.

a. Without spines, showing the internal cavity and jaws.

10. ECHINANTHUS PLACUNARIUS.

Back depressed; ambulacral petals short, only half as long as from the summit to the edge; under surface flat, except just close to the mouth; margin thin; cavity with concentric ridges near edge; the ambulacral lines close together at the outer end.

Capitis mortui, *Seba Thes.* iii. t, 13, f. 11, 12, not good.
Echinanthus humilis, *Leske ap. Klein*, 188, t. 19, f. C. D.
Scutella ambigua, *Lamk. Expl. Ency. Meth.* t. 145, f. 3, 4.
Scutella ambigena, *Lamk. Hist.* iii. 286; *Deslong, Ency. Meth.* ii. 678.
Scutum angulare, *γ*, *Klein, Gall.* 86, t. 10, f. *c*.
Clypeaster ambigenus, *Blainv. Dict. S. N.* xlviii. 299, lx. 197;

Zooph. 299 ; *Desmoul. Echin*, 214 ; *Agassiz, Prod.* 20; *Mem. Soc. Neufch.* 187.
Echinanthus ambigena, *Gray, Ann. Phil.* 1825, 5.
Clypeaster placunarius, *Lamk. Hist.* iii. 12, Ed. 2, iii.; *Agassiz & Desor*, l. c. 11.
Echinarachnius placunarius, *Agassiz, Prod.*
Echinodiscus placunaria, *Blainv. D. S. N.* lx. 199 ; *Zooph.* 218.
Scutella placunarius, *Lamk. Hist.* 12, Ed. 2, iii. 285 ; *Deslong, Eth.* ii. 678 ; *Desmoul. Tab.* 228.

Hab. Red sea. *Ruppell.*

a. Not good state, without spines. Red Sea. Presented by J. Burton, Esq.
b. Covered with spines; edge thick ; shell heavy. Red Sea.
c. Not good state. Red Sea.
d. With a few spines ; ambulacral petal rather narrow. Red Sea ?

Var. 1. Crown rather higher; space between petal of ambulacra very convex.

e, f. Without spines ; the space within the petal of the ambulacra very convex. Red Sea ?
g. Without spines ; the middle of the back rather high ; the space between the petal very convex. Muscat.

Var. 2. Edge rather rounded.

h. With some of the spines. Red Sea.

11. ECHINANTHUS PARVUS.

Small (smallest known).

Clypeaster parvus, *Duchassaigne ; Bull., Tran. Soc. Geol.* 1847 ; *Agassiz & Desor*, l. c. 130.

Hab. Guadaloupe, in white tufa.

See also *Rumph.*, t. 14, f. *c.*; Placenta, *Van Phelsum*, 25; Echinanthus humilis, *Leske*, 187, n. 47 ; Clypeaster Rumphii, *Desmoul. Tab. Syn.* 216.

b. Ambulacral petals narrow, open at the end.

2. LAGANUM.

Shell depressed, pentagonal, sub-pentagonal, or ovoide, truncated behind, rostrated in front ; ambulacral petals elongate, narrow, and only slightly rounded at the end ; ovavial pores four or five, contiguous to the madreporiform plate ; cavity simple, except near the margin ; mouth small, open to the level of the shell ; jaws large, rather flat ; vent below.

Placenta lagena, *Klein, Echin.*

Echinodiscus, sp., *Van Phel.*, not *Breyn; Gray, Ann. Phil.* 1825–6.
Laganum, *Klein. Agassiz, Mon. Echin.* ii. 105, 149; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 132.
Lagana, *Gray, Ann. Phil.* 1825, 5; *Blainv. D. S. N.* lx. 196.

* *Genital pores* 4 (*hinder wanting*), *on the sides of the central madreporiform plates between the apices of the ambulacra: vent small, circular.*

1. Laganum rostratum.

Body oblong, elongate, produced behind; vertical star rather large.

Laganum rostratum, *Agassiz, Mon. Scutelle,* 118, t. 25; *Agassiz & Desor,* l. c. 132.
Hab. New Zealand.
a. Under surface imperfect. New Zealand.

2. Laganum Lesueurii.

Vent near margin, rather ten-sided, nearly as broad as long, depressed, thin; edge thin; ambulacra linear, lanceolate; bands very narrow.

Laganum tonganense, *Valen. Mss.*
Laganum Lesueurii, *Valen. Mss.; Agassiz, Mon. Scut.* ii. 116, t. 24, f. 3, 6, 150; *Agassiz & Desor*, l. c. 132.
Hab. Chinese Seas.
a, b, c, d. China.
e, f. Smaller, covered with spine; one rather more elongated, nearly approaching L. elegatum. *Agassiz.* Australia. Presented by J. B. Jukes, Esq.
g, h. Small, young; ambulacral petals rather wider? China. Presented by J. Reeve, Esq.

Var. 1. Very like former, but ambulacra broader, shorter, ovate, lanceolate.
a. China, without spine. Mr. Argent's Collection.

Var. 2. Body rather elongate.
Laganum elongatum, *Agassiz, Mon. Scutelle,* ii. 117, t. 24, f. 1, 2, 150; *Agassiz & Desor*, l. c. 132.
Hab.—Mus. Stokes.

3. Laganum stellatum.

Ambulacra rather wide, ovate, lanceolate, rather far apart at the crown.

Laganum stellatum, *Agassiz, Mon. Echin.* ii. 122, t. 22, f. 7, 10, 150.

Hab. Australia.

a, *b*. Without spine. Australia.

c, *d*, *e*. Covered with spines.

** *Genital pores* 5, *on the sides of the central madreporiform plate, between the apices of the ambulacra.*

† *Vent transverse.*

4. LAGANUM DEPRESSUM.

Body oblong, sub-decagonal; front edges high, rounded; hinder side depressed, obliquely flattened, and with a thinner edge; ambulacral bands often ending in two or three additional pores; ovarial pores five.

Lagana depressa, *Lesson, Mus. Paris.*

Laganum depressum, *Agassiz, Mon. Scutelle*, ii. 110, t. 23, f. 1-7, 149; *Agassiz & Desor*, l. c. 132.

L. reflexum, *Agassiz, Mon. Scut.* t. 26, f. 1–3 ?

L. tenuissimum, *Agassiz, Mon. Scut.* t. 26, f. 46 ?

Hab. Indian Ocean.

a. Large, covered with spines. Australia, Darnley Island? Presented by J. B. Jukes, Esq.

b, *c*. Large and small. Darnley Island. Presented by the Earl of Derby.

d. Large, without spines.

e, *f*, *g*. Smaller, covered spines.

h. Without spines, more depressed, ambulacral petals rather narrower. Siquigor. Mr. Cuming's Collection.

i. Without spines.

Var. 1. ? Under-side of shell depressed, flattened; vent large, transverse; ambulacra rather wider, ovate, lanceolate.

a. Without spines.

b. Without spines. Mauritius. Presented by Lady Frances Cole.

Var. 2. Middle of back more elevated.

Lagana tonganensis, *Quoy & Gaimard, Mus. Paris.*

Laganum tonganense, *Agassiz, Mon. Scutelle*, 114, f. 26, f. 7–19, 150; *Agassiz & Desor*, l. c. 132.

Hab. Tonga.

5. LAGANUM ATTENUATUM.

Nearly allied to *L. tonganense*, but depressed round the ambulacra; differs from L. ellipticum in the more angular form, and circular vent; hinder edge bevelled; mouth small.

Laganum attenuatum, *Agassiz & Desor*, l. c. 132.

Hab. Red Sea. Semifossil.

a, *b*, *c*. Semifossil? Red Sea. Presented by Sir J. G. Wilkinson.

†† *Anus sub-medial, large, longitudinal; shell thick, edge rounded.*

6. Laganum orbiculare. *Boccon, Obs.* 269, f. 2–3.

Body sub-orbicular; edge inflated; vent posterior.

Echinodiscus circinnatus, *Breyn, Sched.* 64, t. 7, f. 1–2; *Gualt.* t. 210, f. B.
Laganum Sihynvoetii, *Klein*, 25.
Echinus planus, *Rumph.* 37.
Echinus orbiculus, δ, *Linn. S. N.* 1105.
Echinus orbicularis, *Gmelin, S. N.* 3191.
Echinodiscus, *Gmalt.* t. 110, f. B.
Laganum orbiculare, *Agassiz, Mon. Scutelle*, 120, t. 22, f. 16–20, 150; *Agassiz & Desor*, l. c. 132.
Echinodiscus orbicularis, *Leske ap. Klein*, 208, t. 45, f. 6–7; *Gray, Ann. Phil.* 1825–6; *Blainv. D. S. N.* lx. 199; *Zooph.* 199.
Scutella orbicularis, *Lamk. Hist.* n. 10; *Deslong. E. M.* ii. 677; *Ency. Meth.* t. 147, f. 1–2; *Blainv. D. S. N.* xlvii. 228; *Agassiz, Prod.* 21; *Desmoul. Tab. Syn.* 232.
Lagana orbicularis, *Blainv. Zooph.* 196.

Var. *Agassiz & Desor*, l. c. 132.
Laganum marginale, *Agassiz, Monog. Scutelle*, ii. 121, 150, t. 22, f. 11–15.
Hab. ——— ?

7. Laganinum latissimum.

Very large; edge thin, not swollen.

Scutella latissima, *Lamk. Hist.* iii. 12, Ed. 2, iii. 206; *Deslong. E. M.* ii. 678; *Desmoul. Echin.* 228.
Echinodiscus latissimus, *Blainv. D. S. N.* lx. 199; *Zooph.* 218.
Echinarachnius latissimus, *Agassiz, Prod.* 118.
? Scutella integra, *Brug. Ency. Meth.* t. 146, f. 4–5; *Blainv. D. S. N.* lx. 201.
Laganum latissimum, *Agassiz & Desor*, l. c. 13.
Scutella truncata, *Lamk. Expl. pl. Ency. Meth.* t. 146, f. 4–5.
Hab. Indian Ocean. Mus. Paris.
De Blainv. refers to *Ency. Meth.* t. 146, f. 4–5, for Scutella integra; but the figures represent the under-side with branched grooves, like an Encope.

8. Laganum cingulatum.

Small, circular or elliptical, flat; edge thick, swollen; ambulacral star very small.

Laganum cingulatum, *Agassiz & Desor*, l. c. 132.
Hab. Isle Salerno.

9. Laganus decagonum.

Body orbicular, slightly ten sided; edge very thin; ovarial pores 5; oral grooves keeled near the mouth; vent posterior.

Lagana decagona, *Lesson, Voy. Uran. fide Blainv. D. S. N.* lx. 196.
Laganum decagonum, *Agassiz, Mon. Scutelle*, ii. 112, 150, t. 23, f. 16–20; *Agassiz & Desor*, l. c. 132.
Scutella decagonalis, *Blainv. D. S. N.* xlviii. 229; *Desmoul. Tab. Syn.* 230.
Hab. Isle Waigron.

10. Laganum ellipticum.

Body ovate, depressed; edge turned; vent transverse; some pores on back.

Laganum ellipticum, *Agassiz, Monog. Echin.* ii. 111, t. 23, f. 13–15, 149; *Agassiz & Desor*, l. c. 132.

Hab. Mus. Stokes.

11. Laganum Bonani.

Body sub-pentangular, depressed; edge inflated; madreporiform tubercles with a small groove in the centre of the ovarial pores.

Laganum Bonani, *Klein & Leske*, 25, t. 22, f. *a. b.*; *Agassiz, Mon. Scutelle*, 108, t. 23, f. 8–12, t. 22, f. 25–29, 150; *Agassiz & Desor*, l. c. 132.
Laganum minus Bonani, *Klein*, 25, t. 22, f. *c.*
Lagana minor, *Gray, Ann. Phil.* 1825–6.
Clypeaster Laganum, *Lamk. Hist.* iii. 291; *Delong. E. M.* ii. 199.
Scutella laganum, *Blainv. D. S. N.* xlviii. 228; *Desmoul. Tab. Syn.* 230.
Lagana laganum, *Blainv. D. S. N.* lx. 196.
Echinodiscus laganum, *Leske ap. Klein*, 214, t. 22, f. *c.*
Echinus laganum, *Gmelin S. N.* 3190.
Echinus planus, *Rumph.* 36–37, t. 14, f. E.
Echinodiscus, *Gualt. Test.* t. 110, f. E.
Echinus planus, *Seba Thes.* t. 15, f. 25–26.

Hab. New Guinea. *Quoy.*
a, b, c, d, e. Without spines. Presented by J. E. Gray.
d. Without spines.
e, f, g. Without spines.
h, i, j, k, l, m, n. Without spines, pale yellowish brown, spotted. Siquigor. Mr. Cuming's Collection.

*** *Genital pores* 4, *large*, (*posterior wanting*,) *far apart and between the upper part of the ambulacra.* Peronella.

12. Laganum Peronii.

Ovarial pores 4, outside the apex of the ambulacra; under surface concave; vent some distance in margin.

Laganum Peronii, *Agassiz, Mon. Scutelle*, 123, t. 22, f. 21–42, 150; *Agassiz & Desor*, l. c. 132.
Scutella orbicularis, *Lamk. Hist.* iii. 282; *Delong. E. M.* ii. 677; *Blainv. D. S. N.* xlviii. 288; *Desmoul. Tab. Syn.* 232.
Lagana orbicularis, *Blainv. D. S. N.* lx. 197; *Zooph.* 196.
Hab. South Seas.
a, b, c, d. Dark red, brown, some varied with some spines. New South Wales, Brisbane Water.
e, f, g, h, i. Bleached, without spines. Australia, Flinders Island. Presented by Joseph Milligen, Esq.

3. Arachnoides.

Shell circular; discoidal thin; edge narrow; ambulacral area gradually wider from the top; the inter-ambulacral area narrow, and sunk below the level of the rest of the shell; ambulacral petals triangular, series of pores gradually diverging from each other, and wide open at the end; tubercles of the ambulacral area in oblique parallel series, of inter-ambular area sporadic; inferior ambulacral grooves straight, not branched; jaw very flat; anus dorsal just above the lower margin.

Scutella, sp., *Lamk. Hist. A. S. V.* iii. 283; *Desmoulin, Tab. Syn.* 228.
Arachnoides, *Agassiz, Monog. Scutelle*, ii. 94, 149; *& Desor, Ann. Sci. Nat.* 1847, 134.
Echinarachnius, *Leske ap. Klein*, 218.
Echinarachnius, sp., *Fleming, B. A.* 479; *Forbes, Brit. Starfish*, 178.
Echinodiscus, sp., *Blainv. D. S. N.* lx. 199.
Echinarachnius (type), *Gray, Ann. Phil.* 1825; *Agassiz, Prod.*

1. Arachnoides placenta.

The outer ambulacral bands are only half as wide as the inter-ambulacral ones; the space on the under side covered with the oblique series of pores only separated from each other by a narrow band.

Arachnoides, *Klein ed. Leske*, 26, t. 20, f. *a, b*; *Klein Gall.* 98, t. 11, f. *a*; *Dan. Cat.* i. 424.
Scutella placenta, *Lamk. Hist.* iii. 283; *E. M.* t. 143, f. 11–12;

Deslong. E. M. ii. 677; *Blainv. D. S. N.* xlviii. 225; *Desmoul. Tab. Syn.* 228.

Echinarachnius placenta, *Gray, Ann. Phil.* 1825, 6; *Cat. Brit. Rad. B. M.*; *Fleming, B. A.* 479; *Agassiz, Prod. Echin.* 188; *Forbes, Brit. Starf.* f. 178, 181.

Echinodiscus placenta, *Blainv. D. S. N.* lx. 199; *Zooph.* 199.

Echinus placenta, *Linn. S. M.* 1105; *Blainv. D. S. N.* xxiv. 281.

Echinodiscus maximus, &c., *Breyn. Sched.* 64, f. 7, f. 7–8.

Echinarachnius, *Leske ap. Klein*, 218, t. 20, f. *a*, *b*; *Van Phelsum*, 38; *Gualt, Test.* t. 110, f. 9.

Arachnoides placenta, *Agassiz, Mon. Echin.* 94, t. 22, f. 35–42, 149.

Very young.

Scutella porpita, *Lamk. Ency. Meth.* t. 152, f. 3–4; *Agassiz, Prod. Echin.* 188.

Hab. Amboyna.

a, *b*, *c*, *d*. With and without spines. Australia, Cape Upstart. J. B. Jukes, Esq.

e, *f*, *g*. With spines. Australia, Cape York. Presented by the Earl of Derby.

h. Australia, Flinders Island. Presented by J. Millingen, Esq.

2. Arachnoides Zelandiæ.

Ambulacral area as wide as the inter-ambulacral area; the space on the under side covered with the oblique series of pores nearly as wide as the space covered with scattered pores between them.

Echinarachnius Zelandiæ, *Gray, Deiffenbach, Voy.* ii. 265.

Hab. New Zealand.

a. Without spines. New Zealand. Presented by Dr. Deiffenbach. The specimen described by Mr. Gray.

b. Large, without spines. New Zealand.

c. Large, the inter-ambulacral area raised and very convex. New Zealand.

B. *Infra-ambulacral grooves branched near end, or waved; vent inferior.*

c. Ambulacral petals narrow, open at the end.

4. Echinarachnius.

Shell discoidal, depressed, circular, beneath flat; ambulacral petals open; ambulacral groove of the lower surface straight, with one or two straight diverging branches near the margin, marked by a plain band; mouth small, circular, on a level

with the shell; ambulacral area of the shell narrow, rapidly widening at the end of the ambulacra towards the margin; jaws high; teeth horizontal; vent very small, marginal; ovarial pores four, between the apices of the ambulacra, the hinder wanting.

Echinarachnius, *Van Phelsum; Leske, Klein, Echid.; Fleming, Brit. An.* 479; *Gray, Ann. Phil.* x. 1825, 6; *Agassiz, Prod. Echin.* 88, 148; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 133; *Ann. N. H.* i. 304.
Scutella, sp., *Lamk. Hist.* ii. 11, 1816.
Echinodiscus, sp., *Blainv. Dict. Sci. Nat.* lx. 199.
Lagena, sp., *Blainv. Dict. Sci. Nat.* lx. 199.

1. Echinarachnius parma.

Vent in the margin; ambulacra petal rather narrow; the series of pores broad, broader towards the end.

Echinarachnius parma, *Gray, Ann. Phil.* 1825, 6; *Agassiz, Prod.* 188; *Mon. Scutelle,* 89, 148, t. 20, f. 9, 18; *Agassiz & Desor,* l. c. 133.
Echinodiscus parma, *Blainv. D. S. N.* lx. 199.
Scutella parma, *Lamk. Hist.* iii. 284; *E. Deslong. Ency. Meth.* ii. 677; *Blainv. D. S. N.* xlviii. 226; *Desmoul. Tab. Syn.* 230.
E. atlanticus, "*Gray*" *in Agassiz, Mon. Scutelle,* 92–148, t. 21, f. 32–34.
Hab. Atlantic Ocean, Kamtschatka.
a, b, c, d. Some with spines. Labrador. Presented by Lady K. Douglas.
e, f. With spines. North America.
g, h, i, k. With and without spines. Newfoundland. Presented by Mr. G. Shaw.
l, m, n, o. With spines. Newfoundland. Presented by Mr. G. Shaw. Specimens described as Echinarachnius atlanticus, *Agassiz, Scutelle,* ii. 92, 148, t. 21, f. 32–34.

Var. 1. The oral grooves near the mouth with an obscure central keel.
a. ——— with spines.

2. Echinarachnius Rumphii.

Vent just above the margin; ambulacral petal rather broad; series of pores narrow, scarcely converging together at the end.

Echinarachnius Rumphii, *Agassiz, Prod. Echin.* 188; *Mon. Scutelle,* ii. 91, t. 20, f. 1–6, 148; *Agassiz & Desor,* l. c. 133.
Echinodiscus Rumphii, *Blainv. D. S. N.* lx. 199; *Zooph.* 199.
Scutella Rumphii, *Blainv. D. S. N.* xlviii. 226.

Echinus planus, *Rumph.* t. 14, f. 9.
Scutella parma, part., *Desmoul. Tab. Syn.* 230.
Hab. Amboyna. *Rumph.*
a. Without spines. Indian Ocean.
b. India? Presented by Mr. Petit.

5. DENDRASTER.

Shell depressed; subcircular, entire, depressed; ambulacral star excentric, posterior, petals oblong, rounded, unequal, the odd one longer than the anterior pair, the hinder pair very short; the branches converging, and nearly closed at the end; inferior ambulacral grooves much branched, and imprinted even on the dorsal surface of the shell; anus inferior, just within the margin; genital pores four, rather far apart.

Dendraster, *Agassiz & Desor, Ann. Sci. Nat.* 1847, 135.

1. DENDRASTER EXCENTRICUS.

Scutella excentrica, *Eschscholtz, Zool. Atlas*, 19, t. 20, f. 2, 1829.
Echinarachnius excentricus, *Valen. Voy. Venus, Zool.* t. 10.
Dendraster excentricus, *Agassiz & Desor*, l. c. 135.

Hab. Kamtschatcka, Unalasch, *Esch.*; California, *Neboux.*
a, b, c. Bleached. California. Presented by Lady Katherine Douglas.
d, e, f, g. Purple, some with spines. California. Presented by Lady Katherine Douglas.

6. ROTULA.

Shell circular, strongly pierced, and digitated on the edge; ambulacral petals large, even at the end; inferior ambulacral groove ramified, but not waved; anus inferior, nearer the mouth than the hinder edge; ovarial pores four, contiguous to the madreporiform plate.

Scutella, § 1. *Desmoul. Tab. Syn.* 220.
Rotula, *Rumphius, Klein; Davilla, Cat.* 425; *Agassiz, Monog. Echin.* ii. 23; *Agassiz & Desor*, l. c. 138.
Placenta, sp., *Klein.*
Echinodiscus, sp., *Breyn, Leske.*
Echinotrochus, sp., *Van Phelsum.*
Scutella, § E. F., *De Blainv. D. S. N.* lx. 201.
Echinodiscus, §, *Gray, Ann. Phil.* 1825, 6.

* *Hinder edge divided into simple rays.*

Scutella, § F., *Blainv. D. S. N.* lx. 201.

1. ROTULA RUMPHII.

Hinder edge divided into many simple rays; digitation short and broad.

Rotula Rumphii, *Klein, N. D. Echin. ed. Leske*, 26, t. 22, f. E. F.; *Agassiz & Desor*, l. c. 138.
Placenta Rotula, sp. 2, *Klein, Gall.* § 91, 196, t. 12, f. C.
Echinodiscus dimidia perifera, &c., *Breyn, Dissert. Polyth.* 64, t. 7, f. 3–4.
Echinotrochus decem dentatus, *Van Phelsum*, 32.
Rotula, *Davilla, Cat.* 425.
Echinus solaris, *Rumph.* 37, *note*, t. 14, f. 1.
Echinus orbiculus, *α* & *β*, *Gmelin S. N.* f. 3192.
Oursin dente, *Bosc. Detervill. Dict. H. N.* xxiv. 281.
Oursin solaire (Rotula), *Davilla, Cat.* i. 424, n. 959.
Oursin disque, *D'Argenv. Zoomorph.* t. 7, f. D.
Echinus planias singularis, *Seba, Thes.* iii. 35, t. 15, f. 15, 16.
Tertia Echinodisci, sp., *Seba, Thes.* iii. 35, t. 15, f. 19, 20.
Echinodiscus dentatus, *Leske*, 212, t. 22, f. E. F.; *Gray, Ann. Phil.* 1825, 6; var. minor, *Leske*, 212, t. 49, f. 6, 7.
Scutella dentata, *Blainv. Dict. Sci. Nat.* xlviii. 226, lx. 201; *Zooph.* 201; *Agassiz, Prod. Ech.* 188; *E. Deslong. Ency. Meth.* ii. 675; *Ency. Meth.* t. 151, f. 1–4; *Lamk. Hist.* iii. 277; *Desmoul. Tab. Syn.* 220, n. l.
Les Scutelles semisoleils, *Blainv. D. S. N.* xlviii. 226; lx. 201.
Scutella semisol, *Desmoul. Tab. Syn.* 220.
Scutella radiata, *De Blainv. D. S. N.* lx. 201; *Zooph.* 201; *Seba*, iii. t. 15, f. 3, 9, 20; *Agassiz, Prod. Echin.* 188; *Lamk. Hist.* iii. 278.
Boccon, Observ. 273. *Favan. Zooph.* t. 74, f. 6. *Gualt. Test.* t. 110, f. 11. *Valent. Mus.* iii. 177, f. 2.

Var. 1. Digitations narrow, elongate.
Rotula digitata, *Agassiz & Desor*, l. c. 138.
Rotula Rumphii, *Agassiz, Monog. Scutelle*, 25, t. 1.
Hab. Senegal.

** *Body with five slits, the edge of the hinder portion lobed.*

Scutella, E., *Blainv. D. S. N.* lx. 201.

2. ROTULA AUGUSTI.

The anterior part of the body depressed, with two elongated slits; vent intermediate, between the mouth and the bottom of the posterior slit.

Rotula augusti, *Klein, edit. Leske*, 26, § 90, t. 22, f. A. B. C. D.;

Agassiz, Mon. Scutelle, 145, t. 2, f. 1–10, t. 4, f. 1–6 ; *Agassiz & Desor,* l. c. 138.
Echinodiscus dimidia, &c., *Breyn,* 64, t. 7, f. 56.
Placenta rotula, sp. 1, *Klein, Gall.* 94, t. 12, f. A. B.
Echinodiscus decies digitatus, *Leske ap. Klein,* 209, t. 22, f. A. B.
Echinodiscus octies digitatus, *Leske ap. Klein,* 211, t. 22, f. C. D.
Oursin à dix doigts, *Bosc. Deterv. D. H. N.* xxiv. 281.
Echinodiscus, *Gualt. Test.* t. 110, f. H.
Echinus octodactylos, *Gmelin, S. N.* f. 3191.
Echinus alterplanus, *Seba, Thes.* iii. t. 15, f. 17, 18.
Echinotrochus octodigitatus, *Van Phels.* 33, sp. 6.
Scutella decadactyla, *Blainv. Dict. Sci. Nat.* xlviii. 227, lx. 201 ; *Zooph.* 201 ; *Desmoul. Tab. Syn.* 222, n. 3.
Scutella digitata, *Lamk. Hist.* iii. 278 ; *Deslong. Ency. Meth.* ii. 675 ; *Ency. Meth.* t. 150, f. 3, 6 ; *Agassiz, Prod. Echin.* 188.
Echinodiscus digitatus, *Gray, Ann. Phil.* 1825, 6.
Echinodiscus octodactylus, *Gray, Ann. Phil.* 1825, 6.
Scutella octodactyla, *Blainv. D. S. N.* xlviii. 227, lx. 201 ; *Zooph.* 201 ; *Lamk. Hist.* iii. 279 ; *Agass. Prod. Echin.* 188 ; *Desmoulin, Tab.* 222.
Davilla, Cat. f. 425, n. 960. *Ency. Meth.* t. 59, f. 7. *Favanne,* t. 58, f. c. 2, c. 4.
Hab. East coast of Africa.

Var. 1. Hinder part of lateral lobes entire. (E. M. t. 150, f. 3, 4.)
a. Without spines.

Var. 2. Hinder part of lateral lobes notched. *Seba, Thes.* iii. t. 15, f. 17, 18. E. M. t. 50, f. 5, 6.

3. ROTULA GAULTIERI.

The anterior part of the back convex, with two deep interambulacral notches in the margin, the crown shelving towards the hinder edge ; the hinder part of the side lobes notched near the slits ; the vent much nearer the end of the posterior slit than to the mouth.

Gault, t. 110, f. F. bad.
Scutella digitata, *β, Lamk. Hist.*
Echinus octodactylus, *Gmelin, S. N.* 476.

Hab. ———
a. Bleached, without spines.

7. Leodia.

Body depressed, with a posterior, and five perforations between the end of the ambulacra and edge; the marginal ambulacral tesseræ square, like the inter-ambulacral ones; ambulacra lanceolate, acute at the tip, the anterior one most narrow and longest; pores united by a groove; ovarial plate pentangular; ovarial pores three; oral grooves slightly impressed, converging towards the margin, in front of the ambulacral perforations, simply forked at the end; vent near the mouth, in front of the anal perforations, with a group of three or four larger spines between it and the mouth.

Leodia, *Gray, Pro. Zool. Soc.* 1851.

1. Leodia Richardsonii.

Body sub-orbicular, depressed, slightly five-lobed, hinder edge transverse; ambulacra lanceolate, not reaching to the discal perforations; discal perforation ovate, small, the anterior smallest, the posterior longest, with two pair of rather large tesseræ between the ends of the ambulacra and the foramens, the upper pair sub-trigonal.

Leodia Richardsonii, *Gray, Pro. Zool. Soc.* 1851.

Hab. West Indies.

a. Small, very flat, rather deformed; the right side various, with the perforations of that side nearly obliterated. West Indies. Presented by Sir John Richardson, M.D.

a. Ambulacral petals broad, closed at the end.

8. Echinodiscus.

Shell flat, subcircular, with a slit or holes in the hinder part of the two hinder ambulacral areas; ambulacral petals closed; inferior ambulacral grooves waved, or slightly branched; mouth small; jaws flat; vent inferior, more or less far from the edge; ovarial pores four, contiguous to the madreporiform body.

The recent species have two linear holes, the fossils (Amphiope, *Agassiz*) have two round ones, and another fossil (Monophora) a single elongate slit.

Lobophora. *Agassiz, Mon. Echin.* ii. 62, 147; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 136.
Scutella, § 1, B., *Eschsch. Zool. Atlas*, 19.
Mellita, sp., *Klein ap. Leske*, 25.
Placenta, sp., *Klein.*
Echinodiscus, sp., *Leske ap. Klein*, 196; *Knorr—Müller.*
Echinodiscus, § 3; *Gray, Ann. Phil.* 1825, 6.
Echinoglycus, *Van Phelsum*, 34.

a. With two posterior perforations.

1. ECHINODISCUS BIFORA.

The hinder slits linear, elongate, very diverging; the straight part of the hinder end wider than the middle of the front edge.

Scutella bifora, *Lamk. Hist.* iii. 281; *Agass. Prod.* 388.
Echinus biforis, *Gmelin, S. N.* 3188, part.
Echinoglycus irregularis, *Van Phelsum*, 35, part.
Echinodiscus, *Knorr. Delic. Nat.* i. 92, t. D. 1, f. 1.
Scutella bilinearifora, *Desmoulin, Tab. Syn.* 226.
Echinodiscus bifora, *Gray, Ann. Phil.* 1825, 6.
Lobophora bifora, *Agassiz, Mon. Scutelles*, ii. 64, 147, t. 12; *Agassiz & Desor*, l. c. 136.
Hab. Madagascar, Red Sea.
a, b. Adult. Red Sea. Presented by Major Macdonald.
c. Half grown.
d. Red sea. Presented by J. E. Gray, Esq.
e, f. Red Sea. Presented by Sir J. Gardner Wilkinson.
g, h. Indian Ocean.

2. ECHINODISCUS TRUNCATA.

The hinder slits diverging; the straight part of the hinder end not so wide as the middle of the front.

Scutella bifora, var. 2, *Lamk. Hist.* iii. 281; *E. M.* t. 147, f. 7, 8; *Deslong. E. M.* ii. 676; *Blainv. D. S. N.* xlviii. 222.
Scutella bifora, *Desmoul. Tab. Syn.* 226.
Scutella biforis, *Blainv. D. S. N.* lx. 200; *Zooph.* 200.
Echinus biforis, part, *Gmelin, S. N.* 3188.
Placenta (Mellita) lævis, *Klein edit. Leske*, 25, t. 21, f. A. B.; *Klein, Gall.* § 81, 90, t. 11, f. B.
Echinodiscus biperforatus, *Leske ap. Klein*, 296.
Echinodiscus, *Muller, Del. Nat.* i. 92, t. D. 1, f. 15.
Pain d'épice à deux fentes, *Davilla, Cat.* i. 423, n. 955.
Lobophora truncata, *Agassiz, Mon. Scutelles*, 66, t. 11, f. 11, 16, 147; *Agassiz & Desor*, l. c. 136.
Hab. ——— ?
a. Broken.

3. ECHINODISCUS TENUISSIMA.

Shell very flat, with two very small lunules, corresponding to the hinder pair of ambulacra.

Lobophora tenuissima, *Agassiz & Desor*, l. c. 136.
Hab. Waigron, *Lesson.* Mus. Paris.

* *Hinder end with two linear notches.*

4. ECHINODISCUS INAURITA.

Echinoglycus inauritus, *Van Phelsum*, 34.
Echinodiscus inauritus, *Leske ap. Klein*, 202 ; *Gray, Ann. Phil.* 1825, 6.
Echinus planus, *Rumph.* 37, t. 14, f. F.
Placenta laganum magus, *Klein, Gall.* § 85, 92.
Oursin double entaille, *Bosc. Dict. H. N.* xxiv. 281.
Echionanthus, *Seba, Thes.* iii. t. 15, f. 3, 4 ; *Cap. Eth.* t. 152, f. 1, 2.
Scutella bifissa, *Lamk. Hist.* iii. 281 ; *Eth.* t. 152, f. 1, 2 ; *Deslong. E. M.* ii. 676 ; *Blainv. D. S. N.* xlviii. 224.
Scutella bifissa, *a*, *Desmoul. Tab. Syn.* 226, No. 12, *var. a.*
Scutella inaurita, *Blainv. D. S. N.* lx. 201 ; *Zooph.* 200 ; *Agass. Prod.* 188.
Echinus inauritus, *a*, *Gmelin, S. N.* 3199.
Lobophora bifissa, *Agassiz, Mon. Scutelles*, ii. 67, 147, t. 13, f. 2–6, t. 14, f. 1, 2 ; *Agassiz & Desor*, l. c. 136.

Hab. Zanzibar, *Rousseau.* Red Sea, *Savigny.*
a, *b*. One with spines.
c, *d*, *e*, *f*. Various sized, without spines. Mauritius. Presented by Lady Frances Cole.

Var. 1.
Scutella aurita, *Blainv. D. S. N.* lx. 201 ; *Zooph.* 200 ; *Agassiz, Prod. Echin.* 188.
Echinoglycus auritus, *Van Phel.* 34.
Echinus auritus, *Gmelin, S. N.* 3189.
Echinodiscus auritus, *Leske ap. Klein*, 202 ; *Gray, Ann. Phil.* 1825, 6.
Echinus acoritus, *Expl. Ency. Meth.* t. 151, f. 5, 6.
Echionanthus maximus, *Seba, Thes.* iii. t. 15, f. 1, 2.
Scutella bifissa, var. 2, *Lamk. Hist.* iii. 282 ; *Eth.* t. 151, f. 56.
Scutella bifissa, γ, *Desmoul. Tab. Syn.* 228, var. c.
Lobophora aurita, *Agassiz, Mon. Scutelles*, ii. 70, t. 13, f. 1, t. 14, f. 3, 7, 147 (*Favanne*, t. 58, f. c. 1) ; *Agassiz & Desor*, l. c. 136.

Hab. Red Sea.
a. Young, broken. Red Sea. Presented by M. Petit.
b. Adult, broken.

9. MELLITA.

Body subcircular, very flat, truncated behind, with five or six elongated perforations or lunules, the hinder corresponding with the odd inter-ambulacral area; ambulacral petals closed; inferior ambulacral grooves much waved; larger spines of the back capitate; vent very near the mouth; ovarial pores four.

Mellita, *Klein*; *Agassiz, Mon. Echin.* ii. 34, 143; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 138, not *Tab.*
Clypeaster, § **, *Lamk. Syst.* 344.
Scutella, § 1, *Blainv. D. S. N.* lx. 200.
Echinodiscus, sp., *Leske ap. Klein*, 204.

* *Pores five; no anterior slit.*

1. MELLITA TESTUDINEA.

Anterior side of the back convex, raised; ambulacra short, broad.

Placenta (Mellita) testudinea, *Klein ed. Leske*, 25, t. 21, f. c. D., 36, t. 33, f. *r. s. jaws; Klein, Gall.* § 82, 92, t. 11, f. c.
Mellita testudinea, *Agassiz, Mon. Scutelles*, ii. 40, 143, t. 40, f. 7, 9; *Agassiz & Desor*, l. c. 138.
Echinodiscus quinquies perforatus, *Leske ap. Klein*, 197.
Echinus orbiculus, γ, *Linn. S. N., ed.* 12, 1105.
Echinus pentaforus, *Gmelin, S. N.* i. 3189.
Echinoglycus quinque perforatus, *Van-Phelsum Brief.* 35, n. 11.
Pain d'épice, &c., *Davilla, Cat.* i. 423.
Echinus laganoides, &c., *Seba, Thes.* iii. t. 15, f. 9, 10.
Scutella quinquefora, *Ency. Meth.* t. 149, f. 3, 4.
Echinodiscus, *Gualt. Test.* t. 110, f. *e.*; *Muller, Delic. Nat.* i. 93, t. D. 1, f. 16.
Hab. Vera Crux.

Var. 1. Anterior side moderate; back flattish.
Mellita quinquefora, *Agassiz, Mon. Scutelles*, ii. 36, 145, t. 3; *Agassiz & Desor*, l. c. 138.
Scutella quinquefora, *Lamk. Hist.*, iii. 280; *Eth.* t. 149, f. 3, 4; *Deslong. Ency. Meth.* ii. 676; *Blainv. Dict. S. N.* xlviii. 223; *Desmoul. Tab. Syn.* 224.
Clypeaster pentaporus, *Lamk. Syst.* 349.
Scutella pentapora, *Blainv. D. S. N.* lx. 200; *Zooph.* 220; *Agassiz, Prod. Echin.* 188.
Hab. Porto Rico.

Var. 2. Anterior side short; back convex, raised; ambulacra broad, short.

M. testudinea, *Agassiz*, l. c. t. 40, f. 7, 9.
a. Without spine; back very convex behind.
b. Small; back less convex. Brazils.

Var. 2. Anterior sides rather short; ambulacra elongate, ovate.
c. Small, without spines.
d. Without spines.
e. Without spines. Dr. Goodall's Collection.
f. Without spines; showing the dorsal part of the jaws.
g, h. Without spines.
i, j. One covered with spines.

*** Pores six; anterior slit distinct.*

2. Mellita hexapora.

Small dorsal spines with round head at the top; the band of larger spine and tubercle between the inferior veins narrow, linear; grooves much branched, and very sinuous.

Echinotrochus perforatus, *Van Phelsum*, 33.
Echinodiscus sexies perforatus, *Leske ap. Klein*, 199, t. 50, f. 3, 4.
Echionanthus, *Seba, Thes.* iii. t. 15, f. 7, 8.
Oursin de mer-étoile, *Klein, Gall. Supp.* 230, 231, t. 24, f. *a, b*, 1, 2.
Pain d'épice, &c., *Davilla, Cat.* n. 955, f. 423.
Echinus hexaporus, *Gmelin, S. N.* 3189; *Favanne*, t. 58, f. c. 2.
Scutella hexapora, *Blainv. D. S. N.* lx. 200; *Zooph.* 200; *Agassiz, Prod. Ech.* 188.
Scutella sex foris, *Lamk. Hist.* iii. 279; *Deslong, E. M.* ii. 676; *Ency. Meth.* t. 149, f. 1, 2; *Desmoul. Tab. Syn.* 224.
Mellita hexapora, *Agassiz & Desor*, l. c. 138; *Agassiz, Mon. Scutelles*, ii. 41, t. 4, f. 4–7, t. 44, 146, f. 11, 12; *Muller, Delic.* i. 93, t. D. 1, f. 17; *Ency. Meth.* t. 59, f. 6; *Knorr, Delic.* t. D. 1, f. 17.
Hab. Martinique, Mexico.
c, d, e. f, g. West Indies.
h, i, j, k, l, m. St. Vincent's. Mr. Guilding's Collection.
n, o, p, q, r. St. Vincent's. Mr. Guilding's Collection.

Var. 1. Body elongate, *Agassiz & Desor*, l. c. 138.
Mellita similis, *Agassiz, Mon. Scutelles*, 43, t. 4, f. 1–3, 146.
a, b. West Indies.
Hab. Porto Rico. Mus. Mechelin.

Var. 2. Irregular; the hinder lateral slit confluent with the edge, forming notches.
Mellita lobata, *Agassiz, Mon. Scutelles*, 44, 146, t. 4, *a*, f. 13, t. 16, f. 4–7.
s. Back edge irregularly sinuous.
t. Back broken, the hinder lateral sinuous.

3. Mellita nummularia.

Small, very flat; lunules rounded.

Mellita nummularia, *Agassiz & Desor*, l. c. 139.
Hab. Mus. Paris.

10. Echinoglycus.

Shell nearly circular, truncated behind, with six lunules, or slits, on the edge, one at the end of each ambulacra, and one on the odd posterior inter-ambulacral area; ambulacral petals closed; the marginal tesseræ of the ambulacral bands short, broad, transverse, band-like; larger dorsal spines with ovate heads; inferior ambulacral grooves much branched; mouth central, round; jaws flat; anus inferior, nearer the mouth than the hinder edge, covered with large flat plates behind, and the aperture in front covered with small imbricate scales; ovarial pores five, at the end of the rays of the large star-shaped central madreporiform body.

Encope, *Agassiz, Mon. Scutelles*, 45, 146; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 137.
Scutella, § 1, *Desmoul. Tab. Syn.* 222.
Scutella, § 1, *a*, *Eschsch. Zool. Atlas*, 19.
Echinodiscus, sp., *Leske ap. Klein*, 244.
Echinoglycus, sp., *Van Phelsum*, 34.

* *Posterior central perforation elongate between the hinder ambulacra.*

† *Margin of shell thin.*

1. Echinoglycus frondosus.

Madreporiform body large, with long tapering rays; central hinder slit large, elongate; slit elongate, often converted into perforations by the union of the converging outer margins.

Echinodiscus emarginatus, *Leske*, n. 53, 200, t. 50, f. 5, 6.
Echinus emarginatus, *Gmelin, S. N.* 3189.
Grand Oursin de mer-étoile, *Klein, Gall. Supp.* 231, 232, t. 25, f. A. t. 26, f. B.
Echinoglycus frondosus, *Van Phelsum*, 34.
Scutella emarginata, *Lamk. H.* iii. 279; *E. M.* t. 150, f. 1, 2; *Deslong. Ency. Meth.* ii. 675; *Blainv. D. S. N.* xlviii. 224, lx. 201; *Zooph.* 201; *Agass. Prod. Echin.* 188; *Desmoul. Tab. Syn.* 222.

Var. 1. Outer edge of slits nearly all united.
Encope emarginatus, *Agassiz, Mon. Scutelles*, ii. 47, 146, t. 10, 146; *Agassiz & Desor*, l. c. 137.

Hab. Brazils.
a, b, c, d, e, f, g. Adult. Nicaragua. Mr. Eling's Collection.
h, i, j, k, l, m. Young. Nicaragua. Mr. Eling's Collection.

Var. 2. Slits all open.

Scutella quinque loba, *Eschscholtz, Zool. Atlas*, 19, t. 20, f. 1, 1829.
Encope Valenciennesii, *Agassiz, Monag. Scutelles*, 54, 146, t. 7–8; *Agassiz & Desor*, l. c. 137.
Hab. Rio Janeiro, *Eschscholtz.* Martinique.
a, b. Covered with spines; all the holes open to the margin.

Var. 3. The anterior lateral holes closed on the edge.

Encope subclausa, *Agassiz, Monag. Scutelles*, 56, 146; *Agassiz & Desor*, l. c. 137.
E. tretrapora, *Agassiz, Monag. Scutelles*, t. 5.
Hab. Brazils.
a. Partly covered with spines.

Var. 4. Posterior slits closed at the edge.

Encope oblonga, *Agassiz, Monag. Scutelles*, ii. 53, t. 9, 146; *Agassiz & Desor*, l. c. 137.
Hab. Brazils. Rio.
a. Without spines. West Indies. Mr. Scrivener's Collection.

Var. 5. Hinder part of the back high behind, the short central posterior slit.

Encope Michelini, *Agassiz, Mon. Scutelles*, ii. 58, 146, t. 6, *a.* f. 9–10; *Agassiz & Desor*, l. c. 137.
Hab. Yutata.

Var. 6. Slits small, all closed at the edges.

Encope micropora, *Agassiz, Mon. Scutelles*, iii. 51, t. 10, *a.* f. 4–8, tab. 19, *a.* f. 4, 146; *Agassiz & Desor*, l. c. 137.
Hab. West Indies. Mus. Neuchatel.

†† *Margin of shell high, rounded.*

2. ECHINOGLYCUS GRANDIS.

Edge of body thick, high, rounded; madreporiform body small.

Encope grandis, *Agassiz, Monag. Scutelles*, 57, 147, t. 6; *Agassiz & Desor*, l. c. 137.
Hab. West Indies.
a, *b*. One with spines. West Indies. Mr. Scrivener's Collection.

3. ECHINOGLYCUS PERSPECTIVA.

Perforations sub-orbicular; central hinder perforation roundish, broad between the ends of the hinder ambulacra.

Encope perspectiva, *Valenc. Mss.; Agassiz, Mon. Scutelles*, ii. 51, t. 10, *b*. f. 15, 146; *Agassiz & Desor*, l. c. 137.
Hab. Mus. Paris.
a. Semifossil (?) or fossil; roundish, posterior hole oblong, larger than the others. Dalmatia.

4. ECHINOGLYCUS TETRAPORA.

Sub-orbicular; hinder central slit small, narrow; the marginal perforations elongate; anterior ovate; hinder rather larger.

Echinus tetrapora, *Gmelin, S. N.* 3190.
Scutella tetrapora, *Blainv. D. S. N.* lx. 200; *Zooph.* 20; *Agass. Prod. Ech.* 188.
Scutella quadrifora, *Lamk. Hist.* iii. 280; *E. M.* t. 148, f. 1, 2; *Deslong, E. M.* ii. 676; *Blainv. D. S. N.* xlviii. 224; *Desmoul. Tab. Syn.* 224.
Echinodiscus quatuor perforatus, *Leske*, 204.
Echinoglycus oblique, &c., *Van Phelsum*, 34.
Echionanthus, sp. 3, *Seba, Thes.* t. 15, f. 5, 6.
Encope tetrapora, *Agassiz, Mon. Scutelles*, ii. 49, 146, t. 10, *a*. f. 1–3; *Agassiz & Desor*, l. c. 137.
Hab. East Coast of Africa, *Rang*. Galapagos.

5. ECHINOGLYCUS CYCLOPORA.

Hinder perforation near the margin, oblong, on a level with the end of the hinder ambulacra.

Encope cyclopora, *Agassiz, Mon. Scutelles*, ii. 52, 146, t. 10, *b*. f. 6–9; *Agassiz & Desor*, l. c. 137.
Hab. ——— ? Mus. Michelin.
a. ? Oral posterior hole small, oblong. West Indies. Mr. Scrivener's Collection.

** *Posterior central perforation round, near the margin, beyond the end of hinder ambulacra.*

6. Encope Stokesii.

Sub-circular; the posterior central slit oblong, or roundish, broad; the slits all open, broad, and rounded at the inner end.

Encope Stokesii, *Agassiz, Mon. Scutelles*, 59, 147, t. 6, *a.* f. 1–8; *Agassiz & Desor*, l. c. 137.

Hab. Guayaquil.

a, b, c, d, e. Without spines. Guayaquil. Presented by R. B. Hinds, Esq.

d. Without spine; posterior perforation small, narrow.

II. *Ambulacral pores not united by a cross groove, round, and quite isolated.*—Fistularina.

11. Moulinsia.

Shell thin, depressed, oval; edge thin, festooned; surface covered with very apparent tubercles; ambulacral petals even at the ends; the pores not conjugated by a transverse groove; vent inferior; internal cavity ——— ?

Moulinsia, *Agassiz, Mon. Echin.* ii. 139, 151; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 139.

1. Moulinsia cassidulina.

Scutella cassidulina, *Desmoul. Tab. Syn.* 232.

Moulinsia cassidulina, *Agassiz, Mon. Scutelles*, ii. 139, t. 22, f. 1–6, 151; *Agassiz & Desor*, l. c. 139.

Hab. Martinique, *Rang.* Mus. Paris.

12. Echinocyamus.

Shell thick, flat, sub-circular, elliptical, or somewhat five-sided; edge rounded; cavity with radiating internal septa; ambulacral petals elongate, open at the ends; pores not conjugated; mouth round; jaws high; vent inferior, small, circular, just intermedial between the mouth and the hinder edge; genital pores four; tubercles rather large; spines elongate, subulate.

Echinocyamus, *Van Phelsum; Leske; Klein, Echid.; Gray, Ann. Phil.* 1825, 6; *Fleming, Brit. An.* 481, 1828; *Blainv. Dict. S. N.* lx. 194.

Fibularia, *Lamk. Hist.* 1816; *Agassiz, Prod. Ann. N. H.* i. 303; *Mon. Scutelles*, i. 125, 150; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 140.

Echinoneus, sp. *Goldfuss.*
Fibularia, sp. *Blainv. D. S. N.* lx. 193.
Spatangus, sp. *Müller, Zool. Dan.*

1. ECHINOCYAMUS PUSILLUS.

Spatangus pusillus, *Müller, Zool. Dan.* 18, t. 91, figs. 5, 6.
Echinocyamus pusillus, *Flem. Brit. An.* 481; *Forbes, Brit. Starf.* 175, fig.; *Gray, Ann. Phil.* x. 1825, 6; *Agassiz, Monog. Scut.* 128, t. 27, fig. 1–8, 151; *Philippi Erichson, Arch.* 1845, 356.
Echinus ovalis depressus, *Walker, Test. M. R.* 25, t. 3, fig. 88.
Ovulum marinum, *Borlase, Cornw.* t. 28, fig. 26.
Echinus perexiguus, *Pet. Gaz.* t. 31, fig. 10.
Echinus minutus, *Gmelin, S. N.* 3194.
Echinocyamus minutus, *Blainv. M. Act.* 214, 194; *D. S. N.* lx. 195.
Echinocyamus minus, *Blainv. Zooph.* 195.
Echinocyamus angulosus, *Van Phel.* 134, t. 2, f. 11–15; *Leske ap. Klein,* 215; *Agassiz, Mon. Echin.* ii. 150, t. 27, f. 14–18, 151; *Agassiz & Desor,* l. c. 140.
Fibularia angulosa, *De Blainv. D. Sci. Nat.* xvi. 515; *E. Deslong. Ency. Meth.* ii. 390; *Desmoul. Tab. Syn.* 236; *Lamk. Hist.* iii. 301.
Echinocyamus equinus, *Leske,* 215, n. 70; *Van Phelsum,* 134, t. 2, f. 6–10.
Echinus equinus, *Gmelin, S. N.* 3194.
Fibularia tarentina, *Lamk. Hist.* iii. 300; *Deslong. E. M.* ii. 389; *Blainv. D. S. N.* lx. 193; *Zooph.* 211; *Risso. Eur. Merid.* v. 283; *Desmoul. Echin.* 236.
Echinocyamus tarentina, *Agassiz & Desor,* l. c. 140.
Hab. Atlantic Ocean, Mediterranean.
a, b, c, d. A series. Kent.
e, f. "*Fibularia pusilla.*" Berwick on Tweed. Presented by G. Johnston, M.D.
g, h. With spine, green. Arran. Rev. D. Landsborough.
i, j, k. Coast of Barbary.
l, m, n. Mediterranean. Presented by Capt. W. H. Smythe, R.N.
o, p, q. Mediterranean. Presented by M. Brousonet.

13. FIBULARIA.

Shell rather thin, sub-spherical or ovoid; internal cavity simple, without any radiating septa; ambulacral petals open at the end; pores not conjugate; vent inferior, near the mouth; jaws high.

Fibularia, *Lamk. Hist.* ed. 2, iii; *Blainv. D. S. N.* lx. 192; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 142.
Echinocyamus, sp. *Gray, Ann. Phil.* 1825, 6.
Clypeasteroidea δ Fibulariæ, part., *Bronn, Gesch. de Nat.* 197.

* *Vent circular.*

1. Fibularia craniolaris.

Ovate, sub-globose, rather variable in shape; vent moderate, circular.

Echinocyamus, 1 to 35, *Van Phelsum*, t. 1, f. 1–35, t. 2, f. 1–35.
Echinocyamus craniolaris, *Leske ap. Klein*, 214.
Echinus craniolaris, *Gmelin, S. N.* 3193.
Fibularia craniolaris, *Lamk. Hist.* iii. 17, ed. 2, 301; *Ency. Meth.* t. 154, f. 1–5; *Deslong. E. M.* ii. 389; *Blainv. D. S. N.* xvi. 512, lx. 193; *Agassiz, Prod.* 186; *Desmoul. Echin.* 238.
Echinocyamus turcicus, *Leske ap. Klein*, 214.
Echinus turcicus, *Gmelin, S. N.* 3143; (*Phelsum*, t. 1, f. 21–25.)
Echinus equinus, *Gmelin, S. N.* 3194; (*Van Phelsum*, 134, t. 2, f. 6–10.)
Echinocyamus equinus, *Leske ap. Klein*, 215, n. 70.
Echinocyamus vicea, *Leske.*
Echinus vicea, *Gmelin, S. N.* 3143.
Echinus minutus, &c., *Pallas, Spic. Zool.* ix. t. 1, f. 24?
Echinocyamus nucleo cerasi, *Leske ap. Klein*, 65; *Van Phelsum*, 131, t. 1, f. 1, 5.
Echinus nucleus, *Gmelin, S. N.* 3193.
Fibularia nucleus, *Lamk. H.* iii. 302; *E. M.* t. 153, f. 24, 28; *Blainv. D. S. N.* xvi. 511; *Desmoul. Echin.* 240.
Fibularia nucleola, *Deslong. E. M.* ii. 389.
Echinocyamus vertice centralis, *Leske ap. Klein.*
Echinus centralis, *Gmelin, S. N.* 3193.
Echinocyamus ervum, *Leske.*
Echinus ervum, *Gmelin, S. N.* 3193.
Echinocyamus ovalis, *Leske ap. Klein*, 216, t. 37, f. 6, n. 72; *Van Phelsum*, t. 2, f. 16–22.
Echinus faba, *Gmelin, S. N.* 3194.
Echinometra setosa, *Müller.*
Fibularia trigona, *Lamk. Hist.* iii. 17, ed. 2, iii.; *Blainv. D. S. N.* lx. 193; *Deslong. E. M.* 389; *Blainv. Zool.* 211; *Lamk. Hist.* iii. 299.
Fibularia ovalis, *Deslong. E. M.* 390.
Echinocyamus trigonus, *Gray, Ann. Phil.* 1825, 6.
Echinocyamus Lathyrus, *Leske ap. Klein*, 215, t. 28, f. 1; *Van Phelsum*, 153, t. 2, f. 1–5.
Echinus Lathyrus, *Gmelin, S. N.* 3194.
Fibularia Lathyrus, *Lamk. H.* iii. 302; *E. M.* t. 154, f. 6–10; *Blainv. D. S. N.* xvi. 512; *Deslong. E. M.* ii. 390; *Desmoul. Echin.* 240.
Echinocyamus inequalis, *Leske*, 216, n. 73; *Van Phelsum*, t. 2, f. 21–25.

Echinus inequalis, *Gmelin, S. N.* 3191.
Fibularia inequalis, *Blainv. D. S. N.* xvi. 512; *Lamk. Hist.* iii. 301; *Deslong. E. M.* ii. 390; *Desmoul. Echin.* 236.
? Echinus raninus, *Gmelin, S. N.* 3191.
? Echinus bufonius, *Gmelin, S. N.* 3191.
Echinocyamus ovatus, *Leske; Van Phelsum*, 132–133, t. 1, f. 16–35.
Hab. Mediterranean.
a. g. Without spines. Mediterranean.

I believe that all these synonyma belong to the same species. It may be observed that f. 1–5 of tab. 154, which Lamarck refers to *F. craniolaris*, f. 6–10, which he refers to *F. Lathyrus*, and f. 24–28, which he refers to *F. nucleus*, appear to be all copied from the same sea eggs.

** *Vent oblong, longitudinal.*

2. Fibularia oblonga.

Shell ovate, elongate, ventricose; vent oblong, longitudinal to the axis of the shell.

Fibularia oblonga, *Gray, Pro. Zool. Soc.* 1851.
Hab. North Australia.
a, d. Without spines. North Australia.

*** *Vent* ———— ?

3. Fibularia ovulum.

Ovoid, size of a pea.

Fibularia ovulum, *Lamk. Hist.* iii. 17, ed. 2; *Blainv. D. S. N.* lx. 193; *Agassiz & Desor*, l. c. 142.
Echinocyamus ovulum, *Gray, Ann. Phil.* 1825, 6.
Hab. ————? Mus. Paris.

4. Fibularia volva.

Elongate, acuminated at each end.

Fibularia volva, *Agassiz & Desor*, l. c. 142.
Hab. Red Sea.

Fam. 4. GALERITIDÆ.

Shell thin, elongate, or subcircular, or subconic, covered with uniform, very fine bristle-like spines on very close small tubercles; cavity simple; tubercle of recent species simple, of fossil, often perforated and crenulated; mouth central,

five or ten sides, with a thin simple edge; jaws none; vent posterior, inferior (in fossil, rarely dorsal; ambulacra in a single series of double pores; series parallel; ovarial plates five; ocellar plates five, intercolated with the former.

Galeritidæ, part., *Gray, Ann. Phil.* 1825, 6.
Fibula, *Klein.*
Clypeasteroidea (Galeritæ), *Agassiz; Desor, Monag. Galerites*, iii. 89.
Des Cassidulides (des Echinoneides), *Agassiz & Desor, Ann. Sci. Nat.* 1847, 148.
Echin. Centrostomes (part.), *Blainv. Dict. Sci. Nat.* lx.; *Deslong. in Lamk. Hist.* iii. 272.
Mesostoma, part., *Latr. Fam. R. A.* 533, 1825.
Clypeasteroidea *a* Galeritæ, *Agassiz; Bronn, Gesch. Nat.* 193.
E. Paracentrostomes edentes, *Blainv. D. S. N.* lx. 188.
Catocysti emmesostomi, part., *Van Phelsum.*

The body is formed, like the true *Echinidæ*, of twenty vertical bands, the ambulacral bands being the narrowest. The sutures are not so distinctly sinuous as in *Echinidæ*. *Gray, Ann. Phil.* 1825.

A. Tubercles mammillated, but not perforated or crenulated.— Echinoneina.

1. ECHINONEUS.

Shell thin, elongate, subcylindrical; tubercles very numerous placed in more or less regular series; mammillate but not crenulated or perforated, and intermixed with transparent glassy tubercles; mouth oblique, somewhat five-sided; vent very large, elongate, inferior between mouth, and hinder margin; closed by a number of small plates; ovarial pores four, very close, at the apex of the inter-ambulacral area; madreporiform plate central, irregular. Their intestines are filled with fragments of corals, or with foraminifera.

Echinoneus (Egelschuitje) *Van Phelsum; Leske ap. Klein; Lamarck, Syst.* 347, 1811; *Desmoul. Etud. Echin.* i. 41; *Desor, Monag. Galerites*, i. 40, 91; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 148.
Echinonæus, A.; *Blainv. D. S. N.* lx. 193.
Echinonaus, *Kœnig; Gray, Ann. Phil.* 1825, 7.
Echinoceni, part., *Breynius.*
Galerites, sp., *Desmoulin, Etud. Echin.* i. 25.

Agassiz divides the tubercles into three kinds; 1, prin-

cipal, or miliary, which are mammillonated and opaque; 2, transparent (or vitreous) tubercles, as large as the principal; 3, the minute and crowded.

1. ECHINONEUS CYCLOSTOMUS.

Inflated, ovate, dilated, rather depressed above; vitreous tubercles small, numerous; mouth oblique.

Seba Mus. iii. t. 15, f. 33–38; *Breyn, Sched.* 57, t. 2, f. 5, 6; *Boccone, Obs. Nat.* 219; *Rumph. Amb.* 6, t. 14, f. D; *Müller, Dell.* 90, t. D, f. 11; *Van Phelsum*, 32, n. 1, (Rendmond); *Baier, Oryct.* t. 3, f. 36.

Echinoneus cyclostomus, *Leske ap. Klein*, 173, t. 27, f. 3, 4; *Lamk. Syst.* 347, *Hist.* iii. 304; *E. M.* t. 153, f. 19, 20. *E. Deslong. Ency.* ii. 296; *De Blainv. Dict. Sci. Nat.* xiv. 196; *Agas. Prod. Mem. Neufch.* 187; *Desor, Monag. Galerites*, i. 43, 91, t. 6, f. 13, 15; *Agassiz.*

Echinonaus cyclostomus, *Gray, Ann. Phil.* 1825, 7.

Echinus cyclostomus, *Gmelin*, 3183.

Galerites echinonea, *Desmoul. Etud. Echin.* 29, *Tab. Syn.* 246.

Oursin cyclostome, *Bosc. Deterv.* xxiv. 280.

Echinoneus elegans, *Desor, Monag. Galerites*, 47, t. 6, f. 7, 9.

Echinoneus conformis, *Desor, Monag. Galerites*, 48, t. 6, f. 17, 21.

Hab. Lord Hood Islands. Guadaloupe.

a, b. Partly covered with spines; intestines were filled with a very large number of rather large foraminifera. Torres Straits. Presented by J. B. Jukes, Esq.

c, d, e. Partly covered with spines; intestines were filled with a large number of rather large foraminifera. Port Essington. Presented by J. B. Jukes, Esq.

Var. 1. Gibbosa, *Agassiz & Desor*, l. c. 148.

Echinoneus gibbosus; *Lamk. Hist.* iii. 305; *Desor, Monag. Galerites*, 46, 88, 91, t. 5, f. 4–6.

Hab. West Indies. Mus. Paris.

2. ECHINONEUS MINOR.

Inflated, ovate, cylindrical; rather convex above; vitreous tubercles few, small.

Seba, Thes. iii. t. 10, f. 7, *a, b*; *Van Phelsum*, 32, n. 2; *D'Argenville*, t. 57, f. B. 6, B. 7.

Echinoneus minor, *Leske ap. Klein*, 174, t. 49, f. 8, 9; *Desor, Monag. Galerites*, i. 45, t. 6, f. 16, 91; *Agassiz & Desor*, l. c. 143.

Echinoneus semilunaris, var. 2; *Lamk. Hist.* iii. 304; *E. Deslong.* ii. 296; *Agassiz, Prod. Mem. Neufch.* i. 187; *Desmoul.*

Tab. Syn. 340 ; *Lamour. Dict. Sci. Nat.* vi. 38 ; *De Blainv. Zooph.* 193.

Echinus ovalis, *Mus. Tesson*, 114, t. 6, f. 2.
Hab. West Indies.
a, b, c, d. Without spines ; intestines filled with large fragments of nullipora. West Indies. St. Vincent's. Mr. Guilding's Collection.
e, f, g, h. Covered with spines ; intestines filled with large fragments of nullipora. West Indies. St. Vincent's. Mr. Guilding's Collection.

Var. 2. Cruciata, *Agassiz & Desor*, l. c. 143.
Echinoneus cruciatus ; *Agassiz & Desor, Monag. Galerites*, i. 88, 91, t. 6, f. 1–3.
Hab. ———

3. ECHINONEUS SERIALES.

Inflated, ovate, rather depressed above, dilated behind ; larger tubercles in series in the ambulacral area ; vitreous tubercles small.

Echinoneus serialis ; *Desor, Monag. Galerites*, i. 48, t. 6, f. 10, 12, 91 ; *Agassiz & Desor*, l. c. 143.
Hab. ——— ? Mus. Desmoulin.

4. ECHINONEUS CRASSUS.

Shell thick, elongated ; vent large.

Echinoneus crassus ; *Agassiz & Desor*, l. c. 143.
Hab. Zanzibar, *Rousseau ;* Mus. Paris.
a. Indian Ocean ?

5. ECHINONEUS VENTRICOSUS.

Shell (large) elongate, swollen ; vent short.

Echinoneus ventricosus ; *Agassiz & Desor*, l. c. 144.
Hab. New Zealand. Mus. Paris.

6. ECHINONEUS ORBICULARIS.

Shell nearly circular, large.

Echinoneus orbicularis ; *Agassiz & Desor*, l. c. 144.
Hab. Cuba—semi-fossil. Mus. D'Orbigny.

Fam. 5. ECHINOLAMPASIDÆ.

Shell elongate, or subcircular ; covered with uniform very small bristles ; articulated to small tubercles, scattered, or placed in series ; the cavity is simple, and the edge of the shell is simply bent up round the mouth, so as to form a slight

ring, which rather resemble auricules; mouth central, or rather in front of the centre; jaws none; vent posterior, dorsal, or inferior; ambulacra formed of two series of double pores, petaloid; ovarial plates five; ocellar plates five, intercalated with the ovarial plate.

Echinolampus, *Gray, Ann. Phil.* 1825, x. 7.
Galeritidæ, part.; *Gray, Ann. Philos.* 1825, x. 7.
Les Echinides parocentrostomes edentes, part., *Blainv. Dict. Sci. Nat.* lx. 188, 1830; *Deslong. in Lamk. Hist.* iii. 271.
Mesostoma, part., *Latr. Fam. R. A.* 553, 1825.
Clypeasteroidea, δ, Fibulariæ; *Bronn, Gesch. Nat.* 197.
Des Cassidulides, § 2, des Nucleolides, *Agassiz & Desor, Ann. Sci. Nat. series* iii. 1847, 153.
Nucleolites, *Lamk. Syst.* 347, 1801.

A. *Mouth with stellate oral ambulacra.*—Cassidulina.

1. Cassidulus.

Shell elongate; mouth surrounded by a raised edge, and with a rosette of buccal pores; vent superior; ambulacra subpetaloid; the pairs of pores are not united by transverse grooves.

Cassidulus, *Lamk. Syst.* 348, 1801, *Hist.* iii. 338; *Blainv. Zooph.* 310, *D. S. N.* lx. 191; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 157.
Nucleolites, sp., *Desmoul. Syn.* 354; *Goldfuss, Petorf.*

1. Cassidulus caribæarum.

Cassidulus caribæarum, *Lamk. Syn.* 349, 1801 (*E. M.* t. 143, f. 8, 10); *Desmoul. Etud. Echin.* i. 24–46.
Cassidulus australis, *Lamk. Hist.* ii. 35, 1816, ed. 2, iii. 339; *E. M.* t. 143, f. 8, 10; *Blainv. Zooph.* 210; *M. Edw. Cuvier, Reg. Anim. Crochard. Rad.* t. 15, f. 3; *Agassiz & Desor*, l. c. 157.
Cassidulus Richardi, *Delong. E. M.* t. 2, f. 174.
Nucleolites Richardi, *Desmoul. Echin.* 354.

Var. 1. Cassidulus Guadaloupensis, *Duchaissaigne; Bull, Soc. Geol. Trans.* 1847; *Agassiz & Desor*, l. c. 157.
Hab. West Indies, Spanish Town. Mus. Paris.

2. Echinolampas.

Shells elongate or subdiscoidal, concave beneath; summit generally excentric; ambulacra broad, often produced at the end; mouth medial; oral membrane quite naked; vent trans-

verse, ovate, triangular on the lower surface, just with the margin covered with three very thin shelly valves covered with minute tubercles; the lateral valves triangular, larger, the central one linear, erect; ovarial pores four; hinder pair largest, far apart; posterior absent; madreporiform plate central, small.

Echinolampas, *Gray, Ann. Phil.* 1825, 7; *Blainv. D. Sci. Nat.* lx. 190, 1830; *Desmoul. Etud. Echin.* i. 41, 1835; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 163.
Nucleolites (sp.), *Lamk. Syst.* 347, 1801.
Echinanthus, *Leske.*
Echinanthus, sp. ? *Van Phelsum.*
Clypeaster, sp., *Lamk. Hist.*
Scutum ovatum, *Klein.*

Desmoulin gives this genus to De Blainville, who specially quotes my paper for it, and says he never saw the *Echinus*.

* *Porous band of the anterior and other pairs of ambulacra equal, lower side flattish; mouth oblong, transverse, with a tubercle between each of the oral ambulacra.*

1. Echinolampas oviformis.

Shell swollen, ovoide; ambulacra narrow; vertex subconical, high; ambulacra linear, lanceolate.

Seba, iii. t. 10, f. 23.
Clypeaster oviformis, *Lamk. Hist.* iii. 292 (*E. M.* t. 144, f. 1–2); *Deslong, E. M.* ii. 200; *Blainv. Zool.* 209; *Gratel, Mem. Foss.*
Echinus oviformis, *Gmelin, S. N.* 3187.
Echinanthus ovatus, *Leske a Klein*, 191, t. 20, f. *c*, *d*; *Breyn, Echin.* 59, t. 4, f. 1–2.
Echinus sulcatus, *Rumph.* 36, t. 14, f. 3.
Echinorhodum ovatum, *Van Phelsum*, 38.
Nucleolites oviformis, *Lamk. Syst.* 347, 1801.
Echinolampas * * oviformis, *Gray, Ann. Phil.* 1825; *Blainv. Zooph.* 216; *Desmoul. Echin.* 342; *Agassiz & Desor*, l. c. 163.
? Clypeaster Cuvierii, *Gratel. Mem. sur Foss.* 46, t. 2, f. 22.
Hab. South Sea, *Peron.* Mus. Paris.

a. Not good state. Back subconic, vertex rather anterior, hinder dorsal side shelving.
b. Broken. Back regular, rounded, rather high.

Var. 1. Back not so high, regularly rounded; vertex rather anterior; ambulacra narrow.

c, d, e. With spines.

f. Without spines; ambulacra rather wider.

Var. 2. Back regular, rounded; ambulacra rather broad.

Seba, iii. t. 10, f. 23–24.

" Echinolampas orientalis, *Gray*," *Blainv. D. S. N.* lx. 190, 1830; *Agassiz & Desor*, l. c. 163.

Hab. Red Sea. Mus. Paris.

a. Without spines.

2. Echinolampas Richardii.

Violet; shell large, ovoid; ambulacra broad.

Echinolampas Richardii, *Desmoul. Tab. Syn.* 340; *Agassiz & Desor*, l. c. 163.

Hab. Senegal. Mus. Paris.

a. Without spines, in spirits; ambulacral lines purple. Senegal. Presented by M. Petit.

** *The anterior porous band of the anterior pair of ambulacra shortest; under side rounded, convex; mouth oblong, transverse, large, marked with no tubercles, and only very rudimentary oral ambulacra.*

3. Echinolampas depressus.

Ovate, depressed, subpentangular; back regularly convex.

Echinolampas depressus, *Gray, Ann. & Mag. N. H.* 1851.

Hab. ——— ?

a. Without spines.

3. Mortonia.

Shell ovate, thin, rather produced in front, rounded behind, covered with small tubercles; vertex central, convex; internal cavity quite simple; ambulacra petaloid, narrow, open at the end; bands rather diverging; pores rather crowded, united by an oblong groove; beneath concave, especially near the mouth and vent; mouth rather large, roundish oblong, transverse, without any ambulacral star; vent large, transverse, oblong, in the middle of the space between the mouth and hinder edge; ovarial pores four; madreporiform plate small, central.

? Echinocyamus, sp., *Agassiz & Desor*, 140.

Mortonia, *Gray, Ann. & Mag. N. H.* 1851.

This genus differs from *Echinocyamus* in the thinness of the

shell, and especially in the ambulacra being larger, more perfect, and in the pores of the ambulacra being united in pairs by a cross groove. It differs from the fossil genus *Pygaulus* in the vent being inferior, intermediate between the mouth and edge, and transverse.

This genus is named after Dr. Morton, the historian of Northamptonshire, who first attempted to arrange the fossil *Echini* into generic groups.

1. Mortonia Australis.

Elliptical, depressed, rather acute in front, rounded behind, under side concave near the mouth and vent; vent large, oblong, transverse, in the centre between the mouth and hinder margin.

Fibularia Australis, *Desm. Tab. Syn.* 240.
Echinocyamus Australis, *Agassiz & Desor*, l. c. 140.
Mortonia Australis, *Gray, Ann. & Mag. N. H.* 1851.
Hab. South Sea.
a, b, c, d. Without spines; Australia.

B. *Mouth without any oral ambulacra, and not edged.*—Echinobrissina.

4. Echinobrissus.

Shell thin, angular, squarish, wider behind; anus superior, on the back of the shell, often lodged in a more or less deep posterior dorsal groove; mouth five-sided, without any raised edges or stellate oral ambulacra.

Echinobrissus, *Breynius; Gray, Ann. Phil.* 1825, x. 7.
Nucleolites, *Lamk. Hist.; Blainv. D. S. N.* lx. 168; *Agassiz & Desor, Ann. Sci. Nat.* 1847, 153.

1. Echinobrissus recens.

Shell squarish; dorsal groove distinct.

Nucleolites recens, *M. Edwards; Cuvier, Reg. Animal, Radiata*, t. 14, f. 3; *Agassiz & Desor*, l. c. 153.
Hab. N. Holland. *Quoy & Gaimard.* Mus. Paris.

Section 2. Apomesostomi, *mouth excentric; jaws none; shell thin, bilateral, with a posterior dorsal groove.*

Plagystoma, *Latr. Fam. R. A.* 553, 1825.
Echinides excentrostomes, *Blainv. D. S. N.* lx. 182, 1830.
Pleurocysti apomesostomi, *Van Phelsum.*
Apomesostomi, *Klein, Echin.* 38.

Spatangidæ, *Gray, Ann. Phil.* x. 1825, 8.
Spatangi, *Agassiz, Ann. Nat. Hist.* i. 300, 1838.
Spatangus and Anachitis, *Lamk. Syst.* i. 347.
Les Echinides excentrostomes, *Blainv. Dict. Sc. Nat.* lx. 185, 1830 ; *Deslong. in Lamk. Hist.* ed. 2, iii. 271.
Les Spatangues, *Agassiz, Prod. Echid.*; *Deslong. in Lamk. Hist.* ed. 2, iii. 272.
Spatangoidea, *Agassiz ; Bronn, Gesch. d' Nat.* 201.
Des Spatangoides, *Agassiz & Desor, Ann. Sci. Nat.* viii. 1847, 5.

Body elongate or subcircular, bilateral; jaws none ; mouth two-lipped or subangular; vent posterior; ambulacra five, separated or united at the summit; the front odd one generally placed in a groove, and usually more simple than the two other pair; shell generally thin, covered with slender hair-like spines, often scattered with longer spines carried on crenulated perforated tubercles, and ornamented with smoothish bands, covered with very fine bristles, similar to the *Pedicellaria* of other Echini; genital pores four, close or distant; ocellar spots five.

Fam. 6. SPATANGIDÆ.

Shell thin, elongate or subcircular, bilateral, with an anterior dorsal groove ; covered with crowded, uniform, hair-like spines, often armed with larger longer spines placed on perforated tubercles, and generally furnished with smoother band-like fascioles, which are covered with very short minute spines; cavity simple; ambulacra short, petaloid, converging at the summit; mouth two-lipped, transverse; mouth and vent covered with small unequal scales; anus posterior, marginal; ovarial pores four, often close; ocellar pores five.

Spatangidæ, *Gray, Ann. Phil.* 1825.
Spatangus, *Lamk. Hist.; Blainv. D. S. N.* lx. 182.
Des Spatangoides, première groupe, *Agassiz & Desor, Ann. Sci. Nat.* 1847, viii. 6.
Campana, *Van Phelsum.*

The species, like *Spatangus purpures*, which have very distinct larger spines, are allied to *Cidaridæ*, by the tubercles of the larger spines being perforated.

The whole family is allied to *Holothuridæ* by the thin texture of the crustaceous covering, and by the mouth being destitute of jaws and surrounded by branched appendages, *Gray, Ann. Phil.* 1825.

The crustaceous covering of the body of these animals is

thin, and formed of twenty bands of pieces, like all the other *Echinida*, but the interambulacral areæ are unequal: the posterior hinder ones are usually very broad, the widening of which is formed more especially by the extension of the pieces of the posterior bands of this area; the hinder middle area is rather irregular, the posterior series of each of the two hinder ambulacra being extended into it just below the anus, so as to form an isolated subpentagonal piece (the *subanal plate*), externally marked by a smooth groove; the ambulacra are thin, being extended beyond it, leaving a central ovate or lanceolate medial inferior area (called the *plastron*); round the mouth there are five grooves, the continuation of the ambulacra, which are more or less perforated with holes, through which pass out branched tentacula, somewhat like those of *Holothuria*. See *Leske*, t. 43, f. 5; *Gray, Ann. Phil.* 1825.

Van Phelsum, in 1774, used the *fasciole* (under the name of "*Margines multangula*") to characterize this genus *Nuces* (the *Brissus* of Klein).

Dr. Fleming used the band of minute spines on the surface as a character to separate the species into sections; thus:—*A subquadrangular space on the vertex*, containing the orifices of the oviduct inclosed by a narrow band; the pairs of pores in the avenue not connected by lines; compressions at the vent vertical. *S. cordatus* and *S. ovatus*. *B.* Destitute of a subquadrangular space on the vertex; the pairs of pores in the avenues connected by transverse lines; compression at the vent oblique. *S. purpureus*. British Animals, 1828, p. 480.

Desmoulin (*Etudes sur les Echinides*, 1835, p. 55) refers to the *fascioles* under the name of a *linear impression*, which he compared to the pallial impression in the shells of bivalves. He proposed to divide the *Spatangi* into three sections by them, thus:—*a*. Dorsal impression placed on the crown between the apex of the ambulacra, *S. arcuarius*. *b*. Dorsal impression surrounding the excavated part, or petaliform ambulacra, *S. ovatus*. *c*. Dorsal impression none, *S. purpureus*.

MM. Agassiz and Desor (*Ann. Sci. Nat.* 1847) have more extensively applied this character, and used it to define the generic characters.

The position of the *fascioles* or *bandelets* varies in the different genera; those which surround the ambulacral petals are called *peripetalous*, as in *Hemiaster* and *Schizaster*, &c.; when they surround the odd ambulacra, *internal*, as in *Amphidetus;* when they extend in front and behind on the sides, as in *Schigaster*, *lateral;* when limited to the base of the vent, *subanal*. The

peripetalous and *subanal* fascioles are often found in the same genus.

Synopsis of the Genera.

I. *Pore of the inner part of the lateral ambulacra obliterated.*

a. Ambulacra flat, elongated, star-like.

1. ECHINOCARDIUM; internal, subanal, and peripetalous fasciole distinct; back with small subanal tubercles.
2. LOVENIA; internal and subanal fasciole distinct; peripetalous fasciole none; back with large sunken tubercles.
3. BREYNIA; internal, subanal, and peripetalous fasciole distinct; back with large sunken tubercles.
4. SPATANGUS; internal fasciole and peripetalous fasciole none; subanal distinct; back with large sunken tubercles.

b. Ambulacra sunken, short, definite; internal fasciole none.

5. KLEINIA.

II. *Ambulacra complete to the vertex; peripetalous fasciole distinct; internal fasciole none.*

c. Lateral ambulacra petaloid, similar, generally sunken; lateral fasciole none.

* *Subanal fasciole ring-like.*

6. EUPATAGUS; back with larger scattered tubercles; subanal fasciole cordate; ambulacra broad, ovate, shallow.
7. PLAGIONOTUS; back with larger scattered tubercles; ambulacra elongate, deep; subanal fasciole cordate, radiately grooved.
8. BRISSUS; back with nearly equal small tubercles; subanal fasciole near vent.
9. BRISSIOPSIS; back with nearly equal small tubercles; subanal fasciole far below vent.

** *Subanal fasciole imperfect, crescent-like.*

10. MEOMA; back with nearly equal small tubercles.

*** *Subanal fasciole none.*

11. Faorina ; back nearly equal small tubercles.

d. Lateral ambulacra similar, sunken ; lateral fasciole extending under the vent ; subanal fasciole none.

12. Desoria ; vertex anterior.

13. Tripylus ; vertex central.

14. Schizaster ; vertex posterior.

e. Posterior lateral ambulacra petaloid, sunken ; anterior lateral, flat, elongate, like the anterior odd one, of only two rows of pores.

15. Agassizia.

Or the genera may be arranged and characterised thus :—

I. *Back with large, sunken, perforated tubercles.*

1. Lovenia ; peripetalous fasciole none, subanal and internal distinct.

2. Breynia ; peripetalous, subanal, and internal fasciole distinct.

3. Spatangus ; peripetalous fasciole none ; subanal fasciole distinct.

4. Kleinia ; internal fasciole none.

5. Eupatagus ; peripetalous and subanal fasciole distinct ; internal fasciole none ; ambulacra broad.

6. Plagiostomus, peripetalous and subanal fasciole distinct ; internal fasciole none ; ambulacra elongate.

II. *Back with nearly uniform small tubercles.*

* *Ambulacra cruciform.*

7. Echinocardium ; peripetalous, internal, and subanal fasciole distinct, lateral none.

** *Ambulacra stellate, sunken.*

8. Brissus ; peripetalous and subanal fasciole distinct, internal and lateral none ; subanal disk very distinct, near vent.

9. Brissiopsis ; peripetalous and subanal fasciole distinct, internal and lateral none ; subanal disk distant from vent.

10. Meoma ; peripetalous fasciole distinct, subanal fasciole incomplete.

11. Faorina ; peripetalous fasciole distinct ; subanal or lateral fasciole none.

12. Desoria ; peripetalous and lateral posterior fasciole distinct ; ambulacra ; vertex anterior.

13. Schizaster ; peripetalous and lateral posterior fasciole distinct ; ambulacra ; vertex posterior.

14. Tripylus ; peripetalous and posterior fasciole distinct ; vertex central.

*** *Ambulacra superficial.*

15. Agassizia ; peripetalous and lateral posterior fasciole very distinct.

1. *Ambulacral pores obliterated near the crown.*—Spatangina.

a. Ambulacra rather cruciform, flat ; series of pores elongated.

1. Echinocardium.

Shell cordiform, very thin ; lateral ambulacra very much arched ; pores few and distant ; anterior odd ambulacra in a more or less deep groove, with very small pores ; sides of the odd anterior ambulacral groove with rather larger spines and larger pierced tubercles ; mouth very excentric, anterior ; vent on the upper part of the hinder edge, supported by a heart-shaped very prominent shield ; an internal fasciole surrounds the anterior ambulacra, and is prolonged to the apex between the lateral posterior ambulacra, so as to interrupt their convergence ; a subanal fasciole surrounds the cordiform shield, sometimes furnished with two ascending branches to the vent ; peripetalous fasciole none ; ovarial pores four, very close ; ocellar holes very small, external to the ovarial ones ; lower surface with larger tubercles and larger bristles on perforated tubercles, with broad smooth bands, corresponding with the lateral ambulacra ; spines in front of plastron larger, dilated at the top ; lower ambulacral area very narrow.

Amphidetus, *Agassiz, Ann. Nat. Hist.* i. 301, 1838 ; *Agassiz & Desor, Ann. Sc. Nat.* vii. 1847, 11.
Amphidotus, *Forbes, Brit. Starf.* 190.
Echinocardium, *Van Phelsum ? ; Gray, Ann. Phil.* x. 1825, 8.
Spatangus *a*, *Fleming, Brit. An.* 480, 1829.
Spatangus *a*, *Blainv. Dict. Sc. Nat.* lx. 185.

* *Anterior odd ambulacral grooves deep; lower part of the hinder end perpendicular, blunt.*

1. ECHINOCARDIUM CORDATUM.

Echinus Spatangus, *Merret*, 192; *Borlase, Cornw.* 278, t. 28, fig. 28; *Lister, App.* t. 1, fig. 13.
Echinus cordatus, *Penn. Brit. Zool.* iv. 69, t. 34, fig. 75.
Spatangus cordatus, *Flem. Brit. An.* 480.
Amphidotus cordatus, *Forbes, Brit. Starf.* 190, fig.
Amphidetus cordatus, *Agassiz; Duben & Koren, Zool. Bidrag.* 285; *Agassiz & Desor, Ann. Sc. Nat.* 1847, viii. 11.
Spatangus pusillus, *Leske; Klein*, 230, t. 24, fig. *c*, *d*, *e*, t. 38, fig. 5 (not *Müller*); *Seba Mus.* iii. t. 10, f. 21, *a*, *b*.
Echinocardium pusillum, *Gray, Ann. Phil.* x. 1825.
Sp. lacunosus, *Müller, Zool. Dan.* i. 19, 20 (not *Linn.*).
Sp. flavescens, *Abildg. Zool. Dan.* t. 91 (not *Müller, Prod.*); *Oersd. Reg. Mar.* 81.
Sp. arcuarius, *Lamk, H.* iii. 31, edit. 2, iii. 328; *E. M.* t. 556, f. 7, 8; *Blainv. M. Act.* 201; *Desmoul. Echin.* 278; *Deslong. Em.* iii. 688; *Gold. Pet. Germ.* t. 48. fig. 1.
Amphidetus Goldfussii, *Agassiz.*
Echinus brissus, *Argenv. Conch.* t. 25, f. 1; *Knorr, Delic.* t. D. 1, f. 14.
Echinus pusillus, *Gmelin, S. N.* 3198.
Echinus lacunosus, var. *d. e.*, *Gmelin, S. N.* 3198.
Echinospatangus codiformis, *Breyn, Echin.* 61, f. 5.
Echinocardium Sebæ, *Gray, Ann. Phil.* 1825.
Amphidetus Sebæ, *Agassiz, Prod.* 184.

Hab. North Sea, Mediterranean.

a, *b*. Adult and young, with spines. Coast of England. Presented by Mrs. Mauger.

c, *d*, *e*. Adult, without spines. Melton sands. G. Montague, Esq.

f. Covered with spines. Adult. Sicily. Presented by J. E. Gray, Esq.

2. ECHINOCARDIUM OVATUM.

Spatangus ovatus, *Leske; Klein*, 252, t. 49, figs. 12, 13; *Fleming, Brit. An.* 480; *Blainv. Zooph.; Desmoul.; Agassiz* (not *Lamk.* nor *Blainv.*).
Amphidetus ovatus, *Agassiz; Duben & Koren, Zool. Bidrag.* 283, t. 10, fig. 50; *Agassiz & Desor, Ann. Sc. Nat.* 1847, 12.
Spatangus flavescens, *Müller, Prod.* 235; *Zool. Dan.* i. 19, 20, (not *Abildg. Zool. Dan.*); *Sars, Besk.* 40, 46.

Var. minor, *Agassiz & Desor*, l. c. viii. 12.
Amphidotus roseus, *Forbes, Brit. Starf.* 194, fig. 194, 196.

Amphidetus ovatus, var. minor, *Agassiz & Desor*, *Ann. Sc. Nat.* 1847, viii. 12 ; *Seba*, iii. t. 15, figs. 27, 29 ; cop. *E. M.* t. 159, figs. 5, 6.
Hab. North Sea.
a, *b*. Dry. Coast of Northumberland. Presented by A. G. Melville, M.D.

3. Echinocardium Mediterraneum.

Back rather convex, with a flattish depression; belly flat; tail prominent, pointed ; pectoral area lanceolate.

Amphidetus Mediterraneus, *Forbes*, *Ann. Nat. Hist.*
Hab. Egina Sea, *Forbes*.

4. Echinocardium Australe.

The hinder end erect, the lower edge rather acute.

Hab. Australia.
a. Small, with only a few spines in anterior groove. Australia, Port Jackson. Presented by J. B. Jukes, Esq.
b. Larger, without spines. Van Diemen's Land. Presented by Ronald Gunn, Esq.
c. Larger, with spines. Van Diemen's Land. Presented by Dr. A. Sinclair.
d. Without spines. Western Australia.

5. Echinocardium Zelandicum.

Shell ovate, rather elongate ; plastron lanceolate, elongate.

Hab. New Zealand.
a, *b*, *c*, *d*, *e*. Without spines. New Zealand. Presented by Dr. Andrew Sinclair.

** *Anterior odd ambulacral groove very shallow, lower part of hinder end produced, acute.*

6. Echinocardium gibbosum.

Without any anterior ambulacral groove ; front edge of the shell much elevated ; internal fasciole narrow at the summit.

Amphidetus gibbosus, *Agassiz & Desor*, l. c. viii. 11.
Var. *Minor*, Amphidetus pusillus, *Agassiz*, *Prod.?*
Echinocardium pusillum, *Gray*, *Ann. Phil.* 1825, 8.
Hab. French coast. Palermo.

2. Lovenia.

Shell elongate ; lateral ambulacral petals, forming a crescent, united by their convex sides, the anterior odd one sunk in a groove, and formed of very small pores ; back with large tubercles between the ambulacra, supported by large internal

purses on the interior of the shell, bearing elongated spines, arched at their base; an internal fasciole surrounds the odd anterior ambulacra, and advancing to the base between the hinder ambulacra; subanal fasciole surrounding the anal region, and penetrating the concave cornet, at the base of which the vent is situated; peripetalous fasciole none; ovarial pores four; ocellar pores in a pentagon round the four ovarial pores; the lower surface with elongated spines on large tubercles, with internal bags, like those of the back.

Lovenia, *Agassiz & Desor, Ann. Sci. Nat.* viii. 11.

1. Lovenia Hystrix.

Shell depressed, narrow behind; dorsal spines very long.

Spatangus, *Savigny, Descrip. Egypt Zooph.* t. 7, f. 4.
Lovenia Hystrix, *Agassiz & Desor, Ann. Sci. Nat.* viii. 1847, 11, vi. t. 16, f. 16.
Hab. Red Sea.
a, b. Red Sea. Presented by J. Burton, Esq.

2. Lovenia elongata.

Shell depressed, narrow; dorsal spines few.

Spatangus elongatus, *Gray in Eyre, Discov. Central Australia*, i. 436, t. 6, f. 2, 1845.
Hab. Western Australia. Port Essington.
a, b, c. Port Essington.

This species is very like *Lovenia Hystrix, Desor,* but is narrower and more elongate, and the sunken tubercles are much less numerous.

3. Lovenia subcarinata, t. 5, f. 3.

Shell elongate, narrow; the lower anterior edge keeled; the lower part of the anterior side, with a few large tubercles placed in two series on each side of the end of the anterior lateral ambulacra; the side of the under surface covered with numerous sunken large tubercles.
Hab. Philippines.
a, b, c. Different sizes, two covered with spines, third without. Isle of Luzon. Mr. Cuming's Collection.

3. Breynia.

Shell solid, thick; back with large tubercles between the ambulacra and peripetalous fasciole, the cups round, thin, not prominent into the cavity of the shell; an internal fasciole round the anterior ambulacra; subanal and peripetalous fas-

cioles distinct; subanal disk subtrigonal, distinct from the vent; ocellar pores five, surrounding the four ovarial pores.

Breynia, *Agassiz & Desor, Ann. Sci. Nat.* viii. 1847, 12.
Spatangus, sp., *Lamk. Hist.* iii.; *Leach, Zool. Misc.*

1. Breynia Australasiæ.

Spatangus Australasiæ, *Leach, Zool. Misc.* ii. 68, t. 82, 1815.
Spatangus Crux Andreæ, *Lamk. Hist.* iii. 326, 1816; *Deslong. E. M.* ii. 687; *Deslong. Echin.* 378.
Brissus Crux Andreæ, *Agassiz, Prod.* 184.
Breynia Crux Andreæ, *Agassiz & Desor, Ann. Sci. Nat.* viii. 12, 1847, vi. t. 16, f. 14.
Hab. Australia.
a. Without spines. Australia, Port Jackson? The specimen figured by Dr. Leach.

2. Breynia Desorii.

Sunken tubercles on the lateral and posterior interambulacral area numerous, about 30; central fasciole elongate, narrow, extended backward considerably behind the hinder line of the lateral ambulacra.

Breynia Desorii, *Gray, Ann. & Mag. N. H.* 1851.
Hab. Swan River.
a. Without spines. W. Australia.
b. Without spines. W. Australia.
c, d, e, f, g, h. Without spines. W. Australia.
i. Without spines.

The specimens of this species in the British Museum all differ from the true *Spatangus Australasiæ*, Leach, Zool. Mus. ii. 68, t. 82; the *B. Crux Andreæ* of Agassiz, well figured *Ann. Sci. Nat.* 1846, t. 16, f. 14, which is also in the British Museum,—in the dorsal tubercles being much more numerous.

4. Spatangus.

Shell thin, swollen; ambulacra broad, the upper edge of the lateral ambulacra obliterated near the summit, the odd anterior one in a broad deep groove; interambulacral area with scattered large, perforated, and crenulated tubercles; peripetalous fasciole none; subanal fasciole deeply notched above the vent; ovarial pores four, the two front closed; ocellar pores five, in a pentagon round the ovarial pores; upper lip of mouth composed of many small polygonal plates; a large vertical plate on the inner face of the shell on the left side of the mouth.

Spatangus, *Klein; Agassiz & Desor, Ann. Sc. Nat.* 1847; *Gray, Ann. Phil.* x. 1825, 8; *Agassiz, Ann. Nat. Hist.* i. 301 (1838); *Lamk. Syst.* 348, 1801.
Spatangus *b*, *Fleming, Brit. An.* 481.
Spatangus *c**, *Blainv. Dict. Sc. Nat.* lx. 185.
Echinospatagus, *Breyn.*

* *Ambulacral petals broad, plastron covered with spines and tubercles.* Spatangus.

Spatangus, premier type, *Agassiz & Desor*, l. c. 6, viii. 6.

1. Spatangus purpureus.

Depressed, blunt behind; interambulacral tubercles numerous.

Spatangus purpureus, *Müller, Prod.* ii. 2850, *Zool. Dan.* t. 6; *Leske, Klein*, 235, t. 43, figs. 3, 5, cop. *E. M.* t. 157, figs. 1, 4; *Lamk. H.* iii. 29, edit. 2, iii. 324; *Flem. Brit. Anim.* 489; *Gray, Ann. Phil.* x. 1825, 8; *Blainv. M. Act.* 202, t. 14, figs. 1, 2, 3; *Forbes, Brit. Starf.* 182, figs. 182, 186; *Duben & Koren, Zool. Bidrag.* 285, 47; *Agassiz & Desor, Ann. Sc. Nat.* 1847, 6; *Blainv. Dict. Sc. Nat.* lx. 184; *Philippi, Erichen. Arch.* 1845, 350.
Hab. European Seas.
a, *b*. Adult. Coast of England.
c. Half-grown. Irish Sea. Presented by E. Forbes, Esq.

2 Spatangus spinosissimus.

Depressed; dorsal tubercles very numerous.

Spatangus spinosissimus, *Agassiz & Desor, Ann. Sci. Nat.* viii. 1847, 6.
Hab. European seas.

3. Spatangus meridionalis.

Swollen; hinder interambulacral area keeled.

Spatangus meridionalis, *Risso Eur. Mered.* v. 280; *Ginnani Adr.* li. t. 29, f. 174; *Agassiz & Desor*, l. c. 1847, 6.
Spatangus siculus, *Agassiz & Desor*, l. c. viii. subfossil; *Pask, Org. Rem.* iii. t. 3, f. 9.
Hab. Mediterranean. Red Sea. Mus. Paris.

4. Spatangus Reginæ.

Large, rather ventricose; back convex; larger dorsal tubercles few, far apart, scattered; ambulacral petal broad.

Spatangus Reginæ, *Gray, Ann. & Mag. N. H.* 1851.
Hab. Malta.
a, b. Malta. Presented by Miss Emilie Attersol.

This species is very like S. purpureus of our coast in size and appearance; but the back is higher and more convex, and there are not half the number of dorsal tubercles. It was collected at Malta by Miss Attersol, who formed one of the suite to Queen Adelaide during her Majesty's visit to that island.

** *Ambulacra narrow and elongated; plastron smooth, without spines.* Maretia.

5. SPATANGUS PLANULATUS.

Flat; large tubercles numerous, regularly scattered, extended to the ends; the plastron smooth, as if worn; mouth crescent-like.

Spatangus planulatus; *Lamk. Hist.* iii. 327; *Deslong. Ency. Meth.* ii. 687; *Desmoul. Echin.* 378; *Agassiz & Desor*, l. c. 7.
Brissus planulatus, *Agassiz, Prod.* 184.
Hab. South Sea, *Peron.* Java, *Quoy.*
a, b. Large, rather elongate, produced behind, without spines. Isle of Masbate.
c. Broad, expanded on the sides.
d, e, f. With spines. Borneo. Presented by the Admiralty.

b. Ambulacra sunken, short, definite; internal fasciole none.

5. KLEINIA.

Shell ovate, elongate, ventricose, subcordate; vertex subcentral; centre of back with rather larger perforated tubercles; lateral ambulacra sunken, ovate, linear, confluent near the vextex, where the inner series of twin pores are nearly obliterated; the anterior pair diverging; the hinder pair nearly parallel, diverging at the end; the anterior odd one in a rather deep groove, with only rudimentary pores; all surrounded by a broad, rather sinuous, peripetalous fasciole; subanal fasciole surrounding the oblong subanal plate, which is covered with radiating series of tubercles, and transversely divided in half by a subcentral fasciole; ovarial pores four, hinder largest; mouth anterior; vent on the upper part of the high hinder

extremity, covered with small irregular plates; spines of the crown elongate, subulate, of the plastron and subanal plate larger, stronger, rather dilated at the end.

Kleinia, *Gray, Ann. & Mag. Nat. Hist.* 1851.

This genus differs from *Brissus* in the peculiar form of the ambulacra, and in the larger size of the dorsal spines and tubercles; and from *Plagionotus*, in the form of the subanal plate and ambulacra.

1. Kleinia Luzonica.

Shell ovate, ventricose; ambulacra confluent near the vertex; inner series of pores nearly obliterated; lateral ambulacra ovate, petaloid; the hinder pair shorter, nearly parallel; anterior pair divergent; vent in the upper part of the high hinder extremity.

Kleinia Luzonica, *Gray, Ann. & Mag. N. H.* 1851.

Hab. Philippines. Isle of Lucon.

a, *b*, *c*, *d*. With spines. Isle of Lucon. Mr. Cuming's Collection.

II. *Ambulacra continued perfect to the vertex; internal fasciole none; peripetalous fasciole distinct.*—Brissina.

c. Lateral ambulacra similar, generally sunken; lateral fasciole none.

* *Subanal fasciole ring-like.*

6. Eupatagus.

Shell thin, elliptical, more or less depressed; ambulacral petaloid, anterior pairs broad, anterior odd one in a broad groove; interambulacral area with scattered large crenulated tubercles; peripetalous fasciole surrounding the ambulacra and larger tubercles; the subanal fasciole surrounding the cordiform shield; mouth large, semicircular, with indistinct oral perforations; lower surface with a broad naked band, corresponding with the hinder ambulacra, and with cup-like tubercles in the interambulacral area.

Eupatagus, *Agassiz & Desor, Ann. Sci. Nat.* series 3, viii. 9, 1847, R.

1. Eupatagus Valenciennesii.

Ovate, the large tubercles few, and near the peripetalous fasciole.

Eupatagus Valenciennesii, *Agassiz & Desor, Ann. Sci. Nat.* viii. 9, vi. t. 16, f. 13.
Hab. Australia. *Verreaux.*

Var. 1. Dorsal tubercles rather more numerous.
Hab. Van Diemen's Land.
a, b, c, d. With and without spines. Van Diemen's Land. Presented by R. Gunn, Esq.

7. PLAGIONOTUS.

Shell thin, depressed, elliptical; summit excentric, anterior; lateral ambulacra narrow, linear, rather sunken, the front pair rather transverse, elongate, the hinder pair rather longitudinal. anterior odd one on the crown of the shell; back with large mammillonated tubercles placed in cross series, bearing long spines, and circumscribed by the slightly sinuated peripetalous fasciole; anal fasciole very near the vent; mouth anterior; vent large, in the middle of the hinder edge; ovarial pores four; the hinder larger and far apart, with the madreporiform plate between them; ocellar pores placed in front, and alternating with the ovarial pores; the plastron linear, elongate; subanal disk cordate, with a central groove, and series of pores on each side in the grooves from the centre.

Brissus, § 1, Plagionotus, *Agassiz & Desor, Ann. Sci. Nat.* viii. 1847, 13.
Brissus, sp., *Van Phelsum*, 39.
Spatangus, sp., *Lamk.*

1. PLAGIONOTUS PECTORALIS.

Dorsal tubercles numerous, in six or more rows.

Echinospatangus, *Seba, Mus.* iii. t. 14, f. 5, 6.
Brissus magnus, *Van Phelsum*, 39, 48.
Brissus pectoralis, *Agassiz, Prod.* 184.
Spatangus pectoralis, *Lamk. Hist.* iii. 333; *E. M.* t. 159, f. 2, 3; *Deslong. E. M.* ii. 686; *Desmoul. Echin.* 380.
Echinus spatangus, var., *Gmelin, S. N.* 3200.
Hab. Bahia. Mus. Paris.
b. Moderate sized, part covered with spines; dorsal tubercles rather more numerous.
c. Large, without spines; dorsal tubercles more numerous, in six rows, on the hinder half of the lateral interambulacral area; the hinder part of the fascioles on right side not angularly bent up as on the other side.

2. Plagionotus Desorii.

Dorsal tubercles rather fewer, in only five rows, on the hinder half of the lateral interambulacral area.

Plagionotus Desorii, *Gray, Ann. & Mag. N. H.* 1851.

Plagionotus pectoralis, *Agassiz & Desor, Ann. Sci. Nat.* viii. 1847, 13, vi. t. 16, f. 15.

Hab. ——— ?

a. Moderate sized, without spines.

8. Brissus.

Shell thin, ovate, convex; summit excentric, anterior; ambulacra narrow, sunk in rather deep grooves, the anterior lateral pair rather transverse, the hinder pair longitudinal, the anterior odd ambulacra on the crown of the shell reduced to a very obscure series of very small roundish twin pores; back with nearly uniform small tubercles; peripetalous fasciole very sinuous; subanal fasciole surrounding the subanal disks, with a series of small pores on each side, without any lateral fasciole; mouth anterior; vent large, in the middle of the edge; ovarial plates four, the hinder large and far apart, with the madreporiform plate between them; ocellar pores placed in front, and alternating with the ovarial pores.

Nuces, *Van Phelsum.*

Brissus, *Klein; Gray, Ann. Phil.* 1825, 9; *Agassiz & Desor, Ann. Sci. Nat.* viii. 1847, 12, vi. t. 16, f. 9.

Spatangus, d., Brissus, *Blainv. D. S. N.* lx. 184.

* *Subanal area heart-shaped, edged by a broad subanal fasciole; the disk radiated, striated, with a series of many marginal pores, and with a short fasciole, branched up and edging the sides of the vent; the hinder part of the peripetalous fasciole slightly bent, but not margined to the hinder edge of the hinder ambulacra; spines on the side of the ambulacra larger, elongate.* —Metalia.

1. Brissus sternalis.

Convex; vertex, gibbosus; subanal area heart-shaped and radiately striated.

Echinospatangus, *Gualtier*, t. 109, f. b. b.; not good; subanal area too round.

Spatangus sternalis, *Lamk. Hist.* iii. 326; *Deslong, E. M.* ii. 687; *Desmoul. Echin.* 388.

Brissus sternalis, *Agassiz, Prod.* 184; *Agassiz & Desor*, l. c. 13.

Hab. Southern Ocean, *Peron.*

a. Without spines, broken.

b. and *c.* With and without spines. Mauritius. Presented by Lady Frances Cole.

** *Subanal area oblong, transverse, edged by a distinct subanal fasciole, bent in under the vents, without any fasciole extending up the side of the vent, with a series of four or five small pores up each side; spines and tubercles subequal, of the front half of the body rather largest; front of fasciole far from vertex, with a distinct inflection near anterior lateral ambulacra, and bent up nearly to the vertex of the interior ambulacral area.*—Brissus.

The species of this section are most difficult to distinguish; they present several variations, which at first sight appear characters, as for example: 1. The size and form of the subanal disk, as regards itself, as regards its size compared with the thoracic disk, and in the position, number, and size of the lateral pores. 2. The form and size of the thoracic disk, and the position of the centre and its hinder band. 3. The comparative length of the ambulacra with each other, and with the size of the shell. 4. The outline of the peripetalous fascia, its approach to the centre of the back. 5. The roundness or keeled form of the hinder central dorsal line; but these variations do not appear to be permanent in the specimens of the same habitat, but this fact requires verification with a larger series; the form of the fasciole is often different on the two sides of the same specimens.

* *Anterior part of fasciole single.*

1. Brissus Scillæ.

Shell depressed; hinder edge vertical (not oblique, as in *A. carinatus*), anterior lateral ambulacra bent forwards.

Brissus Scillæ, *Agassiz, Prod.; Agassiz & Desor*, l. c. 13.
Spatangus ovatus, *β*, *Lamk. Hist.; Ency. Meth.* t. 158, f. 7.
Spatangus Brissus placenta, *Philippi, Erich. Arch.* 1845, 349.

Hab. Mediterranean. Palermo.

a. High in middle of back covered with spines. Mediterranean. Presented by H. Cuming, Esq.
b. Ovate, moderately rounded, keeled behind. Mediterranean. Presented by H. Cuming, Esq.
c, d. Without spines; ———?

2. Brissus dimidiatus.

"High, carinated (like *B. carinatus*); hinder end vertically truncated; the tubercles of the anterior half of the body larger than those of the hinder."

Brissus dimidiatus, *Agassiz & Desor*, l. c. 13.
Hab. Canaries, *D'Orb.* Mus. Paris.

Probably only a variety of the preceding, as one of our specimens of it is high and keeled behind.

3. Brissus carinatus.

The hinder odd interambulacral area keeled, and obliquely truncated at its hinder edge; subanal disk rather small.

Echinospatangus, *Gualt. Ind.* t. 108, f. G. G.; *Seba, Mus.* iii. t. 14, f. 3, 4.
Spatangus brissus, late carinatus, *Leske ap. Klein*, 249, t. 48, f. 4, 5.
Spatangus carinatus, *Lamk. Hist.* iii. 325; *E. M.* t. 148, f. 11, t. 159, f. 1; *from Seba; Deslong. E. M.* ii. 685; *Blainv. Zooph.* 203; *Resso, Eur. Merid.* v. 279; *Desmoul. Echin.* 380.
Brissus carinatus, *Gray, Ann. Phil.* 1825, 9; *Agassiz, Prod.* 184; *Agassiz & Desor*, l. c. 13.
Oursin spatangus, *Bosc. D. H. N.* xxiv. 282, t. 9, 25, f. 6.
Hab. Isle of France.
a, b. Without spines (one broken). Mauritius. Presented by Lady Frances Cole.
c, d. Without spines; ————?

Var. Subanal disk rather larger; hinder end more erect.
e. Without spines; ————?

4. Brissus compressus.

Spatangus compressus, *Lamk. Hist.* iii. 326; *Deslong. E. M.* ii. 687; *Desmoul. Echin.* 388.
Brissus compressus, *Agassiz, Prod.* 326; *Agassiz & Desor*, l. c. 13.
Hab. Isle of France, *Matthieu.*

Variety of the preceding?

5. Brissus areolatus.

Oblong edges of the coronal plates smooth; the anterior lateral ambulacra often sensibly bent in front; subanal disk large, broad.

Brissus areolatus, *Valenc. in Agassiz & Desor*, l. c. 13.
B. sternalis, var.? *Agassiz*, l. c. 13.
Hab. South Seas, *Peron.*
a. Without spines. Raines Islet. Presented by J. B. Jukes, Esq.
b, c. With spines. Reefs of Attagor. Presented by J. B. Jukes, Esq.
d, e, f. With spines, young. Reefs of Oamaga. Presented by J. B. Jukes, Esq.

g. Without spines. Port Essington.
h.? With spines, young. Isle Luzon. Mr. Cuming's Collection.

6. Brissus columbarius.

Ovate; end truncated; posterior ambulacra gradually diverging; subanal disk large; anterior lateral ambulacra bent rather backwards.

Echinus, *Seba*, *Thes.* iii. t. 10, f. 19 (t. 15, f. 31, 32?); *Sloane*, *Jam.* ii. t. 242, f. 3, 45: *Gualtier*, t. 109, f. *a*.
Echinus spatangus, var. c., nidosus, *Gmelin*, *S. N.* 3199.
E. spatangus, var. f., ovatus, *Gmelin*, *S. N.* 3200.
Spatangus brissus, var. 3, ovatus, *Leske ap. Klein*, 249, t. 38, f. 21.
Spatangus columbaris, *Lamk. Hist.* iii. 325; (*E.M.* t. 158, f. 9–10;) *Blainv. Zooph.* 203; *Desmoul. Echin.* 284.
Brissus columbaris, *Gray*, *Ann. Phil.* 1825, 9; *Agassiz*, *Prod.* 185; *Agassiz & Desor*, l. c. 13.
Hab. Cuba, *D'Orbigny*. Mus. Paris.
a, *b*. Half grown, without spines. West Indies. Mr. Scrivener's Collection.
c. Larger, without spines; ———?
d, *e*, *f*. Smaller, without spines; ———?

7. Brissus ventricosus.

Large; apical summit nearly medial.

Brissus ventricosus, *Leske ap. Klein*, 29, t. 26, f. *a*.; *Rumph. Mus.* t. 14, f. 1; *Gray*, *Ann. Phil.* 1825, 9; *Agassiz*, *Prod.* 184; *Agassiz & Desor*, l. c. 13.
Spatangus ventricosus, *Lamk. Hist.* iii. 323; *Blainv. Zooph.* 203; *Deslong. E. M.* ii. 686.
Spatangus maculosus, *Desmoul. Echin.* 382; *Blainv. Zooph.* 203.
Echinus spatangus, var. maculosus, *Gmelin*, *S. N.* 3199.
Hab. West Indies. Mus. Paris.

M. Agassiz refers, *Ency. Meth.* t. 158, f. 11, and *Gualt*, t. 109, f. B., to this species; the first is a copy of Seba's figure of *B. carinatus*, and the second *B. sternalis*. *Rumph.* t. 14, f. 1, referred to by Lamarck, appears to be the adult of the preceding.

Spatangus brissus unicolor, *Seba*, *Thes.* iii. t. 10, f. 22; *Leske ap. Klein*, 248, t. 26, f. B, c.; hence
Spatangus ovatus, *Lamk. Hist.* iii. 324; *E. M.* t. 158, f. 7, 8; *Deslong. E. M.* ii. 686. Not *Gratel.*
Spatangus unicolor, *Blainv. Zooph.* 203; *Desmoul. Echin.* 382.

Echinus spatangus, var. unicolor, *Gmelin, S. N.* 3200.
Brissus unicolor, *Van Phelsum*, 39: *Gray, Ann. Phil.* 1825; *Agassiz, Prod.* 189.

Seba's figure, to which these synonyma have been appended, differs, in the form of the peripetalous fasciole, from any specimen I have seen: it has more resemblance to the genus *Desoria* than *Brissus;* but it does not represent *D. australis.*

** *Anterior part of fasciole double.*

8. Brissus bicinctus.

The fasciole double on the anterior ambulacral area, single on the hinder edge of the area of the lateral ambulacra.

Brissus bicinctus, *Valenc. in Agassiz & Desor*, l. c. 13.
Hab. Red Sea, *Botta.* Mus. Paris. Perhaps a monstrosity, or is it a *Faorina?*

9. Brissiopsis.

Shell elongate, subcylindrical; apex submedial; tubercles crenulated: ambulacra short, broad, converging nearly to the summit of the shell: the apical part of the odd anterior ambulacra with large pores, nearly surrounded by the flexuous peripetalous fasciole; subanal fasciole niched, and distant from the vent: mouth surrounded with very large ambulacral pores; vent far apart from the subanal shield; ovarial pores three or four: ocellar pores in a pentagon round the ovarial ones; hinder ovarial larger.

Brissiopsis, *Agassiz; Agassiz & Desor, Ann. Sc. Nat.* viii. 14; *Bronn, Gesch. d' Nat.* 201; *Gray, Cat. Brit. Rad. B. M.*
Brissus, sp., *E. Forbes, Brit. Starf.* 187.
Tripylus, sp., *Philippi, Erich. Arch.* 1846.

1. Brissiopsis lyrifera.

Swollen; peripetalous fasciole scarcely sinuous, transversed by the two hinder ambulacra; lower surface with very large hinder ambulacra separated by the narrow shield.

Brissus lyrifer, *Forbes, Brit. Starf.* 187, fig. 187; *Duben & Koren, Zool. Bidrag.* 280, t. 10, fig. 46.
Brissiopsis lyrifera, *Agassiz & Desor, Ann. Sc. Nat.* viii. 1847, 15; vi. t. 16, f. 12; *Gray, Cat. Brit. Rad. B. M.*
Hab. North Sea.
a. Adult. Rothsay Bay, Isle of Man. Presented by Edward Forbes, Esq.
b. In spirits. Shetland. Presented by A. G. Melville, M.D.

*** Subanal fasciole imperfect.*

10. Meoma.

Shell thin, heart-shaped; vertex subcentral; ambulacra sunk in a deep groove, the anterior and posterior lateral pairs nearly equal; odd anterior ambulacra entirely obliterated, only marked by a shallow anterior groove; surrounded by a very sinuous peripetalous fasciole, without any lateral fasciole; the under side of the subanal disk edged beneath by a half subanal fasciole, only extending up to the level of the lower edge of the vent, and with the subanal pores in the fasciole.

Meoma, *Gray, Ann. & Mag. N. H.* 1851.

1. Meoma grandis, t. 5, f. 2.

Shell heart-shaped, rather convex; the anterior part of the peripetalous fasciole straight, with a distinct inflection towards the vertex, near the anterior edge of the anterior lateral ambulacra, and bent up between the lateral and anterior ambulacra.

Meoma grandis, *Gray, Ann. & Mag. N. H.* 1851.

Hab. Australia.

a. Without spines. Australia. Presented by Capt. Edward Belcher, K.C.B., R.N.

b, c. With spines. Australia.

**** Subanal fasciole none.*

11. Faorina.

Shell ovate, subglobose, subcordal, ventricose; vertex central, hinder end truncated, without any distinct subanal disk; with a smooth band to the mouth, over the suture, between the anterior ambulacral area; covered with small equal tubercles; ambulacra sunk into a groove; the lateral one regularly diverging, the anterior largest; each with two rows of double pores; anterior odd one almost entirely obliterated, except a few rudimentary pores near the vertex; surrounded by a broad, rather sinuous peripetalous fasciole, which is double on the front sides, without any lateral or subanal fasciole; mouth small, anterior; vent in the upper part of the hinder end covered with small scales; ovarial pores two, three, or four, the hinder most permanent.

Faorina, *Gray, Ann. & Mag. N. H.* 1851.

Tripylus, sp., *Philippi, Erich. Arch.* 1845, 345.

Like *Brissiopsis*, without any subanal fasciole.

* *Ambulacra slightly sunken.*

1. Faorina Chinensis, t. 6, f. 1.

Purple; posterior end very high.

Spatangus Chinensis, *Gray, Mss. B. M.* 1836.
Faorina Chinensis, *Gray, Ann. & Mag. N. H.* 1851.
Hab. China.
a. Adult; without spines. China. Presented by J. Russell Reeves.
b, c. Small; without spines. China.

** *Ambulacra wide, deeply sunk, forming a broad internal rib.*

2. Faorina antarctica.

Subcordate; rather depressed; lateral ambulacra very deep, forming very distinct ribs in the inner surface; peripetalous band wide, sinuous; hinder end rounded, not very high.

Faorina antarctica, *Gray, Ann. & Mag. N. H.* 1851.
Hab. South Polar Seas.
a, b, c, d. Partly with spines. South Polar Seas. Capt. Sir James Ross.

3. Favorina cavernosa.

Ovate, subrotund; base convex; lateral ambulacra very deeply concave, ovate, oblong, the odd one deeply concave.

Spatangus (tripylus) cavernosus, *Philippi, Erich. Arch.* 1845, 345, t. 11, f. 2.
Brissiopsis cavernosa, *Agassiz & Desor*, l. c. i. 5.
Faorina cavernosa, *Gray, Ann. & Mag. N. H.* 1851.
Hab. South America, Statten Land.

4. Favorina Australis.

Body ovate, cordate; base rather convex; sides rounded.

Tripylus Australis, *Philippi, Erich. Arch.* 1845, 347, t. 11, f. 3.
Brissiopsis Australis, *Agassiz & Desor*, l. c. 15.
Faorina Australis, *Gray, Ann. & Mag. N. H.* 1851.
Hab. South America, Statten Land.

Perhaps these three are only one species.

d. Lateral ambulacra similar, petaloid sunken; lateral fasciole extending under the vent; subanal fasciole none.

12. Desoria.

Shell ovate, thin, convex; vertex excentric, anterior; ambulacra narrow, sunk into a rather deep groove; the anterior lateral pair rather transverse, the posterior longitudinal; the anterior odd ambulacra not so much sunk, each line formed of only one series of small double pores; surrounded by a very sinuous peripetalous fasciole, giving a lateral fasciole which extends under the vent, without any distinct subanal fasciole or subanal disk; mouth anterior; vent moderate, covered with small scales; ovarial pores four, in front of the madreporiform plate.

Desoria, *Gray, Ann. & Mag. N. H.* 1851.

Shaped like *Brissus*, but distinguished by the presence of the lateral fasciole, and the absence of the subanal fasciole and disk; and from *Agassizia* by the sunken ambulacra.

1. Desoria Australis.

Ovate; pink.

Desoria Australis, *Gray, Ann. & Mag. N. H.* 1851.

Hab. Australia. Flinder's Island.

a, b. Pale pink; without spines. Van Diemen's Land. Presented by R. Gunn, Esq.

c, d. Pale pink; without spines. Presented by Joseph Millington, Esq.

Var. 1. Vertex high, oblique; areolated, brown, with pale reddish edges to each of the tessera; like *Rumph. Amb.* t. 24, f. 1? t. 6, f. 2.

e. Van Diemen's Land. Presented by Joseph Millington, Esq.

f. Oblong, with spines. Island of Musbate. Mr. Cuming's Collection.

13. Tripylus.

Shell cordate, rather depressed; tubercles equal; apex central; ambulacra sunken; the lateral radiating, the anterior pair elongated, the hinder pair short; the odd anterior one deep, forming a distinct anterior groove, with a series of small double pores on each side; surrounded by a very flexuous peripetalous fasciole, with a lateral fasciole separating from it and descending under the vent; ovarial pores three or four.

Tripylus, *Gray, Ann. & Mag. N. H.* 1851.
Tripylus, sp., *Philippi, Erich. Arch.* 1845, 344 (not characterized).
Agassizia, sp., *Agassiz & Desor, Ann. Sci. Nat.* 1847, 20.

This genus chiefly differs from *Desoria* and *Schizaster* in the regular cordate form and central vertex: it differs from *Brissiopsis* in the absence of the subanal fasciole.

1. Tripylus excavatus.

Cordate, suborbicular; ambulacra oblong, linear: posterior lateral pair two-thirds the length of the anterior lateral ones; the sides of the hinder part of the peripetalous fasciole rather diverging.

Tripylus excavatus, *Philippi, Erich. Arch.* 1845, 342, t. 11, f. 1.
Agassizia excavata, *Agassiz & Desor*, l. c. 20.
Hab. Southern extremity of America.
a. Covered with spines. South America. Presented by Capt. P. Parker King, R.N., 1832.

2. Tripylus Philippii, t. 5, f. 1.

Cordate, rather depressed; lateral ambulacra oblong, linear, the hinder pair not half the length of the anterior ones: the sides of the hinder part of the peripetalous fasciole parallel.

Tripylus Philippii, *Gray, Ann. & Mag. N. H.* 1851.
Hab. ———?
a. Without spines, broken. S America. Presented by Captain P. Parker King, R.N., 1832.

14. Schizaster.

Shell broad, depressed in front, high and narrow behind, with the apex very near to the hinder edge; ambulacra very deep; the front lateral nearly parallel to the odd anterior one, and much larger than the hinder; the odd anterior very broad and deep, surrounded by a broad very flexuous peripetalous fasciole, with a second lateral fasciole separating from it, and directed behind, under the vent; spines of the plastron larger, longer, cylindrical, dilated at the end, spade-like; ovarial pores two, rarely three or four, the posterior being the most permanent; ocellar pores five.

Ova, *Van Phelsum; Gray, Ann. Phil.* 1825.
Brissoides, *Klein.*

Schizaster, *Agassiz, Prod.*; *Agasssiz & Desor, Ann. Sci. Nat.* series 3, viii. 1847, 20, vi. 1846, t. 16, f. 6.
Micraster, sp., *Agassiz, Prod.* 184.
Spatangus, B. and C., *Blainv. D. S. N.* lx. 183.

* *Odd anterior ambulacra, in a very deep groove; ovarial pores two; front lateral ambulacra very close to the odd anterior one; hinder lateral ambulacra one-third the length of the anterior pair.*—Nina.

Ovum, *Blainv. D. S. N.* lx. 154.
Ova, *Gray, Ann. Phil.* 1825; *Blainv.*

1. SCHIZASTER CANALIFERUS.

The upper part of the hinder end rather produced behind over the vent, rather more raised in the middle; the hinder part of the peripetalous fasciole straight between the two lateral ambulacra.

Spatangus, *Leskeap. Klein*, t. 27. f. *a.*; *Gualt.* t. 109, f. *c.*; *Scylla*, t. 25, f. 2.
Echinus lacunosus, var. *a.* and *b.*, *Gmelin, S. N.* 3196.
Oursin lacuneux, *Bosc. D. H. N.* xxiv. 282.
Spatangus canaliferus, *Lamk. Hist.* iii. 327; *E. M.* t. 136, f. 1–3; *Deslong, E. M.* ii. 688: *Blainv. Zooph.* 202; *Desmoul. Echin.* 386.
Spatangus micraster canaliferus, *Philippi, Erich. Arch.* 1845, 351.
Schizaster canaliferus, *Agassiz & Desor*, l. c. 20, vi. t. 16, f. 6.
Micraster canaliferus, *Agassiz, Prod.* 184.
Ova canalifera, *Gray, Ann. Phil.* 1825, 9.

Hab. Mediterranean.

a. Large, without spines. Mediterranean.
b. Smaller, covered with spines. Sicily. Presented by J. E. Gray, Esq.

2. SCHIZASTER VENTRICOSUS.

Hinder part of the body very high; hinder end nearly vertical, ventricose, regularly rounded above over the vent; the hinder part of the peripetalous fasciole straight between the two lateral ambulacra.

? *Rumphius Amb.* t. 14, f. 2.
? Echinus lacunosus, part., *Gmelin, Syst. Nat.*
Spatangus canaliferus, part., *Lamk. Hist.* ii. 11.
Schizaster ventricosus, *Gray, Ann. & Mag. N. H.* 1851.

Hab. Australia.

a. Partly covered with spines; upper part broken. Australia.

3. SCHIZASTER JUKESII. t. 3, f. 4.

The vertex subcentral; crown strongly keeled between the two hinder ambulacra; the part of the peripetalous fasciole between the anterior and posterior lateral ambulacra angularly bent up towards the vertex; the hinder end vertical, regularly rounded above over the vent.

Schizaster Jukesii, *Gray, Ann. & Mag. N. H.* 1851.
Hab. N. Australia.
a. Covered with spines. Cape York. Presented by J. B. Jukes, Esq.

** *The anterior odd ambulacra slightly impressed.*—Brisaster.

4. SCHIZASTER FRAGILIS.

Brissus fragilis, *Düben & Kor. Zool. Bidr.* 280, t. 10, f. 47, 49.
Schizaster fragilis, *Agassiz & Desor*, l. c. viii. 22.
Hab. Shores of Finmark. Mus. Stockholm.

5. SCHIZASTER GIBBERULUS.

Shell small, swollen; ambulacral grooves rather shallow, short, broad, ovate, oblong; genital pores four, the anterior very small; the front ocellar pores in front of the anterior ovarial pores; the front lateral ambulacra rather diverging; the odd anterior ambulacra with a pair of regular oblique pores on each side of the groove.

Spatangus, *Savigny, Desc. Egypt. Zooph.* t. 7, f. 6.
Schizaster gibberulus, *Agassiz & Desor*, l. c. viii. 22.
Hab. Red Sea.
a. With a few spines. Red Sea. Mr. Eling's Collection.

6. SCHIZASTER CUBENSIS.

Ambulacral groove rather deep; lateral fasciole very narrow, arising near the middle of the anterior lateral ambulacra.

Schizaster Cubensis, *D'Orbigny; Agassiz & Desor.* l. c. viii. 22.
Hab. Cuba, *D'Orbigny.*

*** *Ambulacra all deeply impressed; the peripetalous fasciole very sinuous, circumscribing nearly the whole ambulacra.*—Schizaster.

7. SCHIZASTER ATROPOS.

Ambulacra in very deep grooves; the anterior odd groove

with only a single pair of pores; ocellar pores anterior, and more visible than the posterior ovarial pores.

Knorr. Delic. 96, t. D. 111, f. 3.
? Spatangus lacunosus, *Leske a Klein*, t. 24, f. *a. b.*
Echinospatangus ovatus, *Müller.*
Spatangus atropos, *Lamk. Hist.* iii. 327; (*E. M.* t. 155, f. 9, 11;) *Deslong. E. M.* ii. 688; *Blainv. Zooph.* 202; *Desmoul. Echin.* 384.
Echinocardium atropos, *Gray, Ann. Phil.* 1825, 8.
Schizaster atropos, *Agassiz, Prod.* 185; *Agassiz & Desor*, viii. 22, vi. t. 16, f. 10.
Hab. South Carolina.

a, b, c. With some spines. Texas. Presented by Dr. A. Gould.

E. *Anterior lateral ambulacra elongate, linear, continued to the margin, rudimentary; hinder short, petaloid, sunken, perfect. Intermediate between* Spatangidæ *and the fossil* Anachitidæ.

15. AGASSIZIA.

Shell ovoid, very thin; ambulacra radiating; anterior lateral pair very long, linear, and only formed of two rows of pores; the hinder pair short, ovate, with four series of perforations, surrounded by a very flexuous peripetalous fasciole, and accompanied by a posterior fasciole, which passes under the vent, as in *Schizaster;* lower side convex; plastron distinct; vent in upper part of high hinder end, oblong, transverse; ovarial pores very close together; the madreporiform plate with an internal tube, directed obliquely back towards the vent.

Agassizia, *Valenc. Voy. Venus, Zool.*; *Agassiz & Desor, Ann. Sci. Nat.* series 3, viii. 1847, 20.

1. AGASSIZIA SCROBICULATA.

Ovate; back gibbous; sides subtubercular; anterior lateral ambulacra rather rudimentary, with one or two rows of pores; posterior short, sunken; vent surrounded with a series of rather distant tubercles.

Agassizia scrobiculata, *Valenc. Voy. Venus, Zool.* t. 1, f. 2; *Agassiz & Desor*, l. c. 20.
Hab. Peru.

2. AGASSIZIA SUBROTUNDA. t. 3, f. 2.

Ovate, subglobose, regular, even, without any tubercles on the side or round the vent; the odd anterior groove with two lines of minute tubercles.

Agassizia subrotunda, *Gray, Ann. & Mag. N. H.* 1851, Feb.
Hab. Australia. Captain Sir Edward Belcher.
a. Broken. Australia? Presented by Captain Sir Edward Belcher.
b, c, d, e. Two with spines. Australia?

Fam. 7. LESKIADÆ.

Shell ovate, subglobose, thin; vertex central; lateral ambulacra broad, petaloid, rather sunken, and separate from each other; the hinder lateral pair rather the shortest; the odd anterior ambulacra in a rather broad sunken groove; rudimentary, with only a single series of pores on each side, all surrounded by a broad, rather sinuous, peripetalous fasciole; lateral and subanal fasciole none; mouth anterior, round, on a level with the rounded under surface, and covered with five triangular converging valves; plastron and subanal plate not distinctly defined; anus round in the upper part of the rounded posterior end, and covered with five triangular converging valves, forming a cone, with some small specula in the centre; ovarial pores two, very large; spines and tubercles subequal, subulate, those of the back being rather the largest.

1. LESKIA.

Character of family.

Leskia, *Gray, Ann. & Mag. N. H.* 1851.

This genus agrees with *Brissus* in form of the peripetalous fasciole, but differs from it and all the other Spatangidæ in the form of the mouth and vent. In this respect it has considerable affinity with the fossil *Cystidea* of Von Buch, as especially the genera *Echinosphœrites.*

1. LESKIA MIRABILIS. t. 4, f. 4.

Shell ovate, subglobose.

Leskia mirabilis, *Gray, Ann. & Mag. N. H.* 1851.
Hab. Isle of Lucon.
a, b, c, d. Isle Lucon. Mr. Cuming's Collection.

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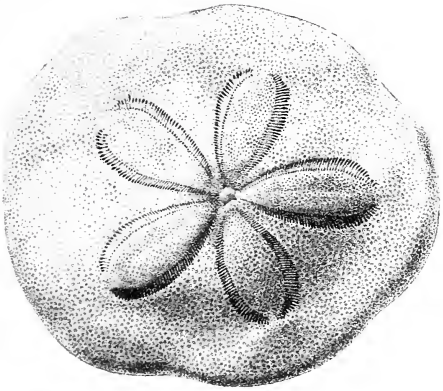

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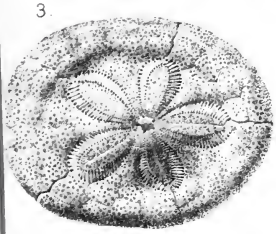

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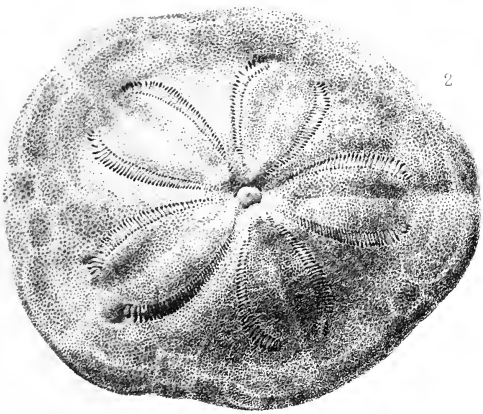

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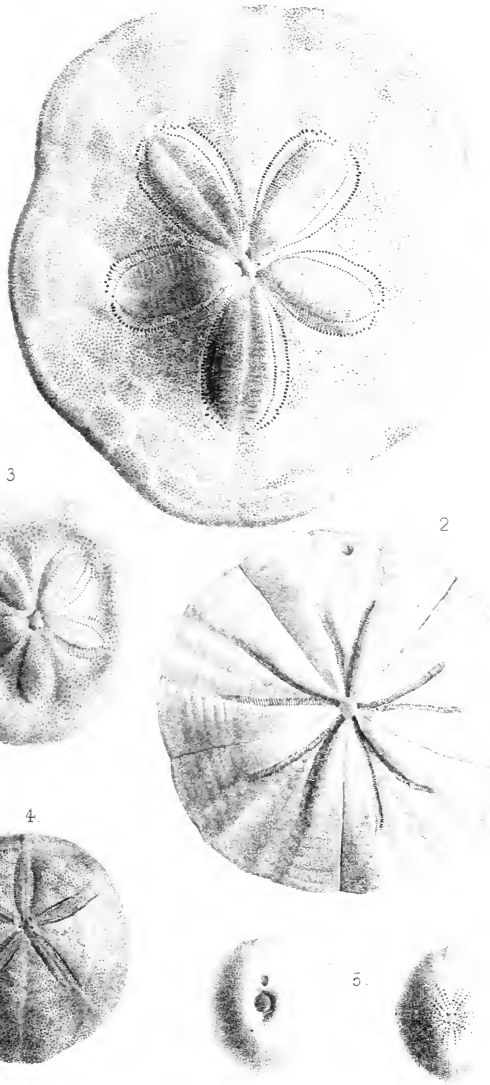

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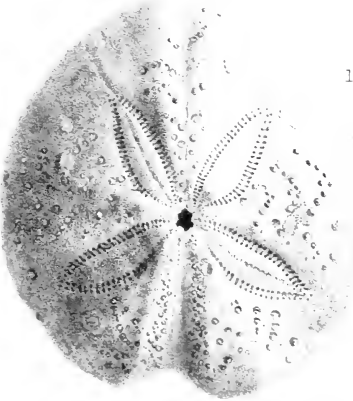

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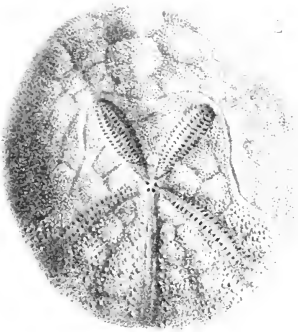

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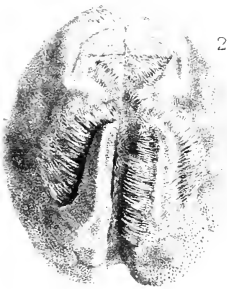

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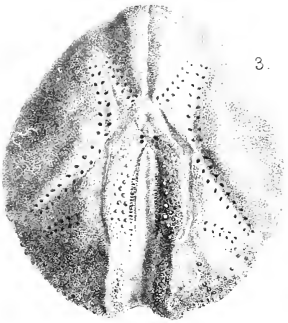

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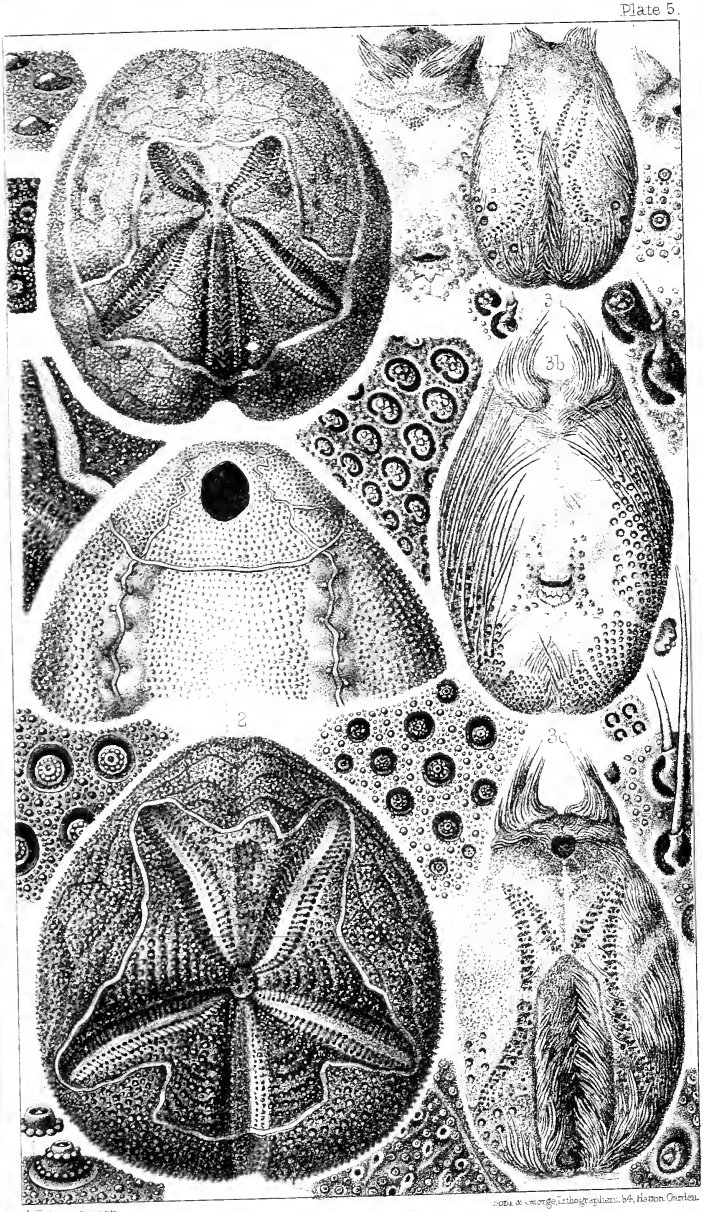

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1 Tripylus Philippii n s.
2 Meoma grandis ½ n s
3 Lovena subcarinata n s


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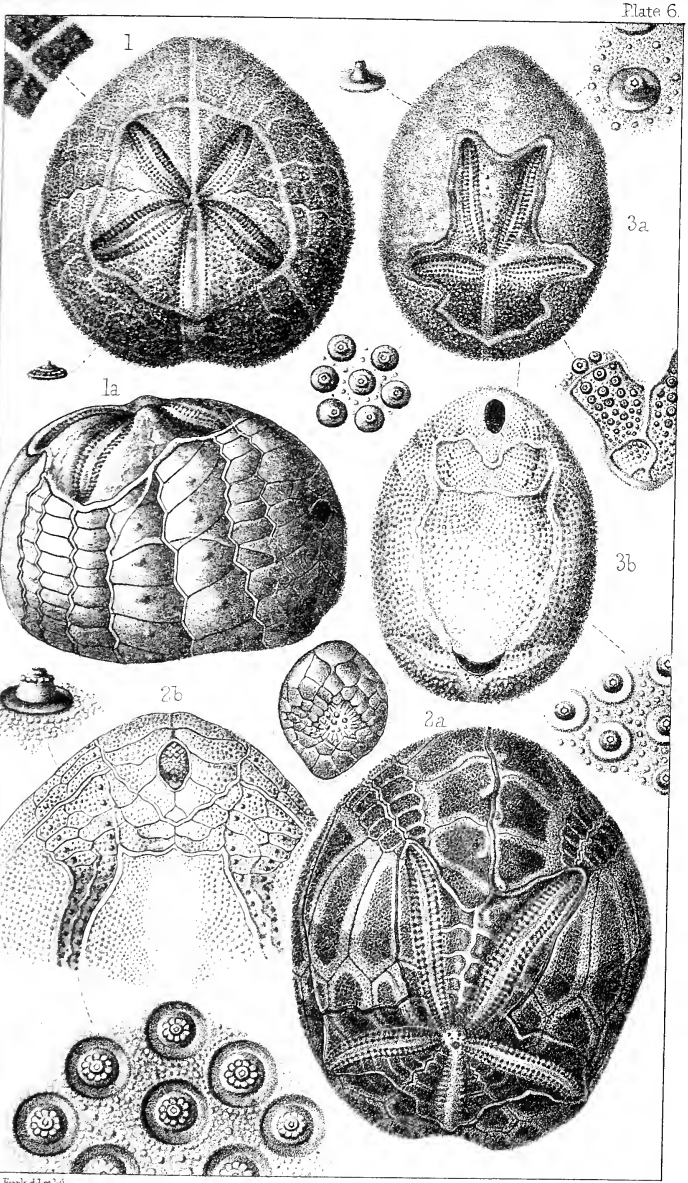

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1 Faonna, Chinensis n s
2 Desoria, Australis var. ½ n s
3 Brissus, Columbarius. ½ n s.


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