ECHINODERMATA.—*By Edgar A. Smith, F.Z.S., Senior Assistant Zoological Department, British Museum.*

(Plates XVI. and XVII.)

Opportunity was taken some pages back of exhibiting the relations of the Molluscan-fauna of Kerguelen Island to that of the Falklands and Patagonia; and it was pointed out that representatives of boreal types entered into its composition. Materials for similar comparisons between the Echinodermata indigenous to the same regions scarcely exist, but such as there are, make it apparent that what obtains in the Mollusca holds good also in the Echinodermata with respect to geographical distribution.

The sources of information relating to the animals of this class inhabiting the vicinage of Kerguelen Island, are at present limited to a few relics of the collections made there by the Antarctic Expedition in 1840; the collection made in 1874 by Dr. Kidder of the American Transit of Venus Expedition, part of the Challenger's collections, and Mr. Eaton's specimens. The remaining portion of the *Echinodermata* obtained by the Challenger Expedition is still in course of investigation; and the collections of the German Transit and Surveying Expedition are likewise not yet worked out. This will account for the fewness of the species at present known from the island, which altogether amount in number to 15. Two of them were obtained by the Antarctic Expedition, one by the Challenger, four others by Dr. Kidder; besides five out of the preceding seven, eight others were obtained at Observatory or Swain's Bay. The species not found by Mr. Eaton are *Asterias rupicola*, which was common on the beach near Dr. Kidder's station, and *Cidaris nutrix*: those which he did get were procured almost exclusively from the Laminarian zone. This will suffice to show how far dependence can be placed upon the following summary of the geographical relations of the little known fauna.

The species hitherto recorded from Kerguelen Island comprise 1 Holothurian, 2 Echini, 9 Asteriidæ, and 3 Ophiuridæ,—in all 15 species referable to 12 genera.

From Patagonia are known 1 Holothurian, 1 Echinoid, 3 or 4 Asteriidæ, and 5 Ophiuridæ,—in all, 10 or 11 species comprised in as many genera. Of these the Holothurian, the Echinoid, one of the Asteriidæ, and one of the Ophiuridæ,—that is 4 species, are indigenous also to the coast of Kerguelen Island.

A similarity to certain boreal terms is exhibited by some of the species. Thus *Porania antarctica* strangely resembles *P. pulvillus* of the northern seas of Europe; the *Pedicellaster* represents another septentrional genus; *Pteraster affinis* imitates closely *Pt. militaris* of boreal waters. The genera *Ophioglypha* and *Ophiacantha* are almost cosmopolitan in distribution; yet the Kerguelen Island representive of

the former, *O. hexactis*, in colour and in *tout ensemble* approaches *O. Sarsii* of the Greenland coast.

The new form *Leptoptychaster* has been found only at Kerguelen Island.

Holothuriidæ.

Pentactella lævigata.

Verrill, Bull. U. S. Nat. Mus. 1876, iii., p. 68.

Hab.—"Kerguelen Island, twelve fathoms" (Kidder). Very common on the laminæ of *Macrocystis* in Royal Sound and Swain's Bay (Eaton). Also Patagonia (Antarctic Exped.).

The colour of this species during life is dull whitish; the body is somewhat opaque, but the distended tentacles are semi-transparent white, tinged very faintly at the tips of their ultimate ramifications with pale rose colour. Owing to their whiteness, specimens can be seen on the kelp, sometimes at a considerable depth below the surface, appearing to be much larger than their real size through the refraction of the light.

Echinidæ.

[Cidaris nutrix.

Wyville Thomson, Journ. Linn. Soc. 1876, vol. xiii., p. 62, fig. 4.

Hab.—Balfour Bay, Royal Sound, 50–70 fathoms. This most interesting species forms part of the collection of the Challenger.]

Hemiaster cavernosus.

Tripylus cavernosus, Philippi, Wiegm. Archiv. f. Naturgesch. 1845, p. 345, pl. xi., f. 2.

Brissopsis cavernosa, Agassiz, Ann. Sci. Nat. 1847, viii., p. 5.

Hemiaster cavernosus, Id., Revision of the Echini, 1873, part iii., p. 587, pl. xxi^{c}., fig. 1, 2.

Tripylus australis, Philippi, op. supra cit., 1845, p. 347, pl. xi., fig. 3.

Brissopsis australis, Agassiz, Con. R. Ann. Sci. Nat. viii., p. 5.

Faorina australis, Gray, Ann. & Mag. of Nat. Hist. 1851, vii., p. 132.

Hemiaster australis, Agassiz, *l. c.* 1873, part iii., p. 586, pl. xxi^{c}., fig. 3.

Faorina antarctica, Gray, op. supra. cit., 1851, vii. p. 132; idem, Cat. Rec. Echin. 1855, p. 57.

Hemiaster cordatus, Verrill, Bulletin U. S. Nat. Mus. 1876, iii., p. 69.

Hemiaster sp. Wyville Thomson, Journ. Linn. Soc. 1876, xiii., p. 67, fig. 6.

The spines when first observed were greenish olive in colour, but are gradually acquiring in spirit a brownish olive hue.

Hab.—Swain's Bay and Royal Sound, on mud, in 5–10 fathoms. Extremely

common; Accessible Bay, 20–50 fathoms (*Wyville Thomson*); also Patagonia (*Philippi*).

A comparison of the types of *Faorina antarctica* with the *Hemiastri* collected by Mr. Eaton at Kerguelen Island, shows that the species are identical with one another. Dr. Gray in 1855 says, in reference to this species and the two forms described by Philippi, cited above,—"Perhaps these three are only one species." Mr. Verrill, in a footnote at op. cit. p. 71, states that M. A. Agassiz is of the same opinion, viz., that the Kerguelen species is identical with Philippi's. After a careful study of Philippi's figures and descriptions, Dr. Gray's types, and Mr. Eaton's specimens, I thoroughly concur in believing them to be all of one species (the form with deep ambulacral furrows the female; that with shallower furrows the male).

If it should hereafter be discovered that the Patagonian species is, on the contrary, distinct from the Kerguelen Island species, the name proposed by Gray (*antarctica*) will still have to be retained.

Asteriidæ.

Asterias meridionalis.

(Plate XVI., fig. 1.)

Perrier, Revision d. Stell. 1875, p. 76; idem, Ann. & Mag. of Nat. Hist. 1876, xvii., p. 36.

The specimens from Kerguelen Island exhibit, in certain particulars, inconstant variations from the type of this species, and also from one another. The following remarks. however, are not confined to these aberrations and differences.

Body 6-rayed; rays rather stout, gradually tapering, convex above, rather more than twice as long as the disk is wide. Ambulacral spines irregularly biserial, but not constantly so, rather stouter than in the type; in one example they are at irregular intervals uni-serial, and towards the inter-radial angles of the mouth they are also in single series. Next to the ambulacral spines succeeds a series of tentacular pores; and then the lower or ventral margin of the ray bears a double (rarely triple) series of short stout spines. Above these extends a naked band with small groups of papulæ in it; and above this naked band, limiting the dorsal area, is a row of isolated spines similar to the spines in the other series. The dorsal spines of the disk and rays are numerous, irregularly scattered, short, blunt, scabrous to the touch, and striated; and among them are interspersed numerous small groups of papulæ: one example has the spines of the upper and lateral surfaces conformable to those of the type; but another example bears spines which are acute and shortly conical, particularly so on the disk and thickest portion of the arms; and in this specimen they are also disposed more regularly than is usual, tending to arrange themselves in longitudinal series down the arms. These spines are about 2 mm. long

in the disk of the example last mentioned, but become shorter and less regular in arrangement towards the extremities of the rays. The madreporic plate is placed in an angle of the rays, and about midway between the centre of the disk and the margin. Colour reddish brown above, pale buff beneath.

Dimensions.—Length of arm, 3 inches; width of arm at the base, 7 lines; width of disk nearly $1\frac{1}{2}$ inches.

Hab.—On roots of *Macrocystis* in Observatory Bay. Also obtained by the Antarctic Expedition.

M. Perrier in his earlier description likens this species to *A. cuninghami*, to which he accidentally ascribed 6 rays instead of 5. This might have been misleading, had he not subsequently in the Annals and Magazine of Natural History (loc. cit.) corrected the mistake.

Asterias perrieri.

(Plate XVI., fig. 2, 2a–b.)

Smith, Ann. & Mag. Nat. Hist. 1876, xvii., p. 106.

Discus sex-radiatus, modice amplus, in latitudine ad spatium maximum inter radiorum oppositorum apices circiter $\frac{2}{7}$ æqualis; radii cylindraceo-attenuati inferne anguste planati. Sulci ambulacrales haud latissimi; spinæ ambulacrales subgraciles, subcylindricæ, non clavatæ, in serie unicâ positæ, in exempl. maxim. circiter 3 mm. longæ; spinæ ventrales in serie duplici spinis ambulacralibus adjacentes, binatæ (nisi rarissime ternatæ), divergentes, spinarum intima subacuminata, major intermediâ, sed minor et crassior ambulacrali. Dorsum lateraque spinis brevissimis minutis subconicis diverse aspersis, papulis innumeralibus interpositis. Tessella madreporiformis parviuscula, inter centrum marginemque disci intermedia. Color saturate fusco-rufus.

Disci diam. 45; radiorum longit. 150; ad bases crass. 19 mm.

(*Young.*) Six-rayed; the rays very short, nearly as broad as long, with only two rows of ambulacral tentacles bordered by a single series of spines; the latero-dorsal margin with a single row of large spines, the dorsal area with a similar longitudinal series down the middle of the ray.

Hab.—Common on the roots of *Macrocystis*, and also taken in shrimp pots, at Observatory Bay. The largest specimen has a cluster of some hundreds of young ones clinging to its ventral disk.

A. rugispina of Stimpson is allied to this species, with which I have had much pleasure in associating the name of M. Edmond Perrier of the Jardin des Plantes, who has recently identified many species of the Asteriidæ in our national collection.

Pedicellaster scaber.

(Plate XVI., fig. 3.)

Smith, Ann. & Mag. Nat. Hist. 1876, xvii., p. 107.

Discus quinque radiatus, in latitudine ad radii longitudinem circiter semiæqualis; radii subcylindrici, sensim attenuati, modice acuti. Spinæ ambulacrales graciles æquilongæ, in seriebus tribus positæ, duplo longiores dorsalibus; anguli oris interradiales spinis parvis ad apices binis. Spinæ dorsales disci radiorumque brevissimæ, obtusæ, scabræ, distantes, in substructuram quasi clathratam diverse dispositæ, eæ prope ambulacra paulo longiores cæteris; maculæ reticuli nudæ. Anus subcentralis; tessella madreporiformis subrotunda, prope marginem in angulo interradiali sita.

Disci diam. 9, crass. 6; radiorum longit. 18, ad bases crass $5\frac{1}{2}$ mm.

Hab.—On roots of *Macrocystis*, Observatory Bay.

This species appears to agree very fairly with Sar's description of his genus *Pedicellaster*, excepting that the ambulacral furrows cannot be said to be "broad," and that the ambulacral spines are in three rows instead of two. But these differences are more specific than generic; and therefore I think that this may, notwithstanding them, be properly considered a second species of that northern genus.

Echinaster spinulifer.

(Plate XVI., fig. 4.)

Othilia spinulifera, Smith, Ann. & Mag. Nat. Hist. 1876, xvii., p. 107.

Discus quinque radiatus, ad radii longitudinem in latitudine semiæqualis, modice crassus, superne leviter rotundatus; radii cylindraceo attenuati, breves, spinis scabris brevissimis numerosis in substructuram quasi clathratam diverse dispositis, intervallis clathrorum nudis; prope spinas ambulacrales iisque parallele spatium lineare fere nudum, radii basin versus sensim latius, serie solum unicâ spinarum minutarum (longe minorum etiam spinis ambulacralibus) munitum adjacet. Spinæ ambulacrales divergentes, transverse super tessellas singulas quaternis dispositæ, duæ interiores paulo longiores; spina gracillima parvâ recta est intimæ harum apud basin. Anguli oris interradiales spinis parvis duabus terminantur. Anus subcentralis; tessella madreporiformis in angulo interradiali submarginalis.

Disci diam. 7; crass. 6; radiorum longit. 14, diam. apud basin $4\frac{1}{2}$ mm.

Hab.—Observatory Bay.

This curious little species is remarkable for the shortness of the rays, and for the minute slender spine within the ambulacral groove at the base of the innermost spine being straight, instead of being curved or hooked as the homologous spine is in the normal species of the genus. The spines on the dorsal and lateral surfaces display no regularity in their arrangement; but parallel with the ambulacral spines in the almost naked narrow space adjacent to them, the series of very small spines is disposed definitely, one spine on each plate, and above this the spines are placed two or three on a plate.

Pteraster affinis.

(Plate XVI., fig. 5.)

Smith (sp. nov. ?) Ann. & Mag. Nat. Hist. 1876, xvii., p. 108.

Discus magnus, quinque radiatus, subtus planus, supra convexus, modice crassus, ad radii longitudinem in latitudine æqualis. Radii breves, e basibus latis statim ad apices angustati, ibique ita recurvati ut sulcos ambulacrales exponant; subtus utrinque extra sulcos membranâ tenui spinis gracilibus circiter 30 apicibus vix ultra marginem membranæ projicientibus induti; tessellæ inter-ambulacrales spinas graciles quatuor in membranâ tenuissimâ fere ad apices producta gerentes, intimâ harum paulo cæteris breviori; anguli oris interradiales spinis similibus octonis, pariter membranâ conjunctis, duabus extimis longe brevissimis, duabusque intimis longissimis, spinis atque supra illas crassis duabus sibi parallelis, leviter in medio concavis et apices versus acuminatis, longissimæque spinarum 30 lateralium in longitudine æqualibus. Dorsum lateraque supra projecturis spiniferis minimis, foraminibus minutis haud numerosis interpositis; illæ spinis scabris in membranâ connexivâ pæne apicium tenus conditis diverse a quaternis usque ad denas munitis; foramen centrale modice amplum, fimbriâ spinarum brevium membranâ conjunctarum circumdatum. Color (in spiritu vini) sordidus, pallide ochraceus.

Exempl. max. disci diam. 15, crass. 7; radii longit. 17, diam. ad basin 8 mm.

Exempl. minor. disci diam. 10, crass. 5; radii. longit. 9 mm.

Hab.—On roots of *Macrocystis*, Observatory Bay.

This species approaches very closely to *P. Danæ* of Verrill,* which is supposed to have been found at Rio Janeiro. It appears, however, to possess longer arms (though the smaller specimen, it will be noticed, is considerably shorter in the rays than the larger); the spines of the dorsal fascicles are everywhere uniform and scabrous; there are only eight spines at each of the inter-radial angles of the mouth, and the two larger spines above them are not very long, but are stout. In these respects chiefly it differs from Mr. Verrill's species.

Porania antarctica.

(Plate XVII., fig. 1.)

Smith, Ann. & Mag. Nat. Hist. 1876, xvii., p. 108.

Discus quinque radiatus, radiis sub-breviter conicis apices versus acuminatis, modice crassus, ad radii longitudinem in latitudine æqualis, subtus planus, supra convexus, ubique indutus cutem crassam carnosam, infra transverse inter margines sulcosque ambulacrales lineariter sulcatam, superne lævem, nisi apud medium disci et etiam super radios spinis tuberculariibus parvis sparsim ornatam; margines laterales inferne spinis brevibus compressis ad apices latis et truncatis fimbriatæ, spinâ unicâ super tessellam singulam sulcis linearibus jam supra dictis

* Described in Proc. Boston Soc. Nat. Hist. 1869, vii., pp. 386, 387.

definitam; spinæ ambulacrales biseriatæ, exteriores duplo longiores multoque robustiores interioribus, latæ, ad apices abrupte truncatæ neque angustatæ, extus leviter sulcatæ ita ut duplices esse videantur; tessella madreporiformis rotunde ovalis, paulo ad centrum propior quam marginem; anus centralis, papillis brevissimis spiniformibus circiter 12 circumjectis. Color carneus vel sanguineus.

Diam. max. 90, minim. 48 mm.

Hab.—Dredged in a retired inlet of Swain's Bay, in about 10 faths. of water, and outside the belt of *Macrocystis*.

The furrows on the outside of the exterior ambulacral spines are formed chiefly by the skin which clothes them. The minute tubercles on the back exhibit no regularity in their arrangement; there are about a dozen of them on the middle of the disk and a few on the short conical arms.

This species may be distinguished from the rather closely related northern *Porania pulvillus*, Müller, by differences in the ambulacral spines, and in the number and character of the marginal spines. *P. pulvillus* has 3 or 4 spines on each of the marginal plates, which are much smaller than the single spines in *P. antarctica*.

Asteropsis is the name usually adopted by authors for the genus to which Müller's species belongs. The genus thus designated was founded by Müller and Troschel for the reception of *Asterias carinifera*, Lamk. (see Wiegm. Archiv. 1840, p. 323); and in their System der Asteriden, 1842, pp. 62–4, they include in the same genus *A. ctenacantha*, *A. pulvillus*, and other species in addition to the one just mentioned.

Porania is the appellation given to Müller's *A. pulvillus* by Gray, who described it as *Porania gibbosa*, Leach, in the Ann. & Mag. of Nat Hist., 1840, December, p. 288.

It has appeared advisable, to me, to restrict *Asteropsis*, (Mül. & Trosch. (of which *Gymnasteria*, Gray, is a synonyme) to *A. carinifera*, Lamk., *inermis*, Gray, &c., and to retain *Porania*, Gray, for *P. pulvillus* and *antarctica*.

Pentagonaster meridionalis.

(Plate XVI., fig. 6, 6a.)

Astrogonium meridionale, Smith, Ann. & Mag. Nat. Hist., 1876, xvii., p. 109.

Discus quinque radiatus, ad radii longitudinem in latitudine circiter $\frac{4}{5}$ æqualis, depressus, subtus supraque leviter convexus. Radii modice longi, apud bases lati, apices versus sub-repente attenuati, spinis ambulacralibus in seriebus quatuor dispositis, interioribus compressis apices versus dilatatis tandemque truncatis, exterioribus teretis ad apices rotundatis in longitudine subparibus. Anguli oris interradiales singuli spinâ unicâ conicâ robustâ exstante super angulum inter-ambulacralem (similiter ac in *Pterastro*) et infra hanc spinis parvis 6—8 in serie reclinantibus. Discus radiique subtus fasciculis spinosis in seriebus ex sulcis

ambulacralibus ad margines laterales excurrentibus, fasciculis ipsis ex spinis parvis cylindricis subacutis, multo quam spinis ambulacralibus brevioribus, compositis: latera angusta, fasciculis parvis spinosis quadratis (circiter 20 super radios singulos) confertim in seriebus angustis duabus margini appositis, iis in serie inferiore cæteris super superficiem ventralem, iisque in serie superiore cæteris super superficiem dorsalem consimilibus. Fasciculi dorsales numerosi, breviter pedunculati et fere contigui, singuli ex spinis brevissimis ad apices obtuse rotundatis 10—20 constructis; interstitia fasciculorum omnia nuda, pedicellariis magnis multis munita. Radii ad apices supra tuberculo magno, unico; tessella madreporiformis rotunda, elevata, fere in medio inter centrum marginemque, posita; anus subcentralis.

Disci diam. 24; crass. 10; radiorum long. 29 mm.

Hab.—Dredged in Observatory Bay in 5–10 faths. on mud.

This species apparently belongs to the section of the genus *Astrogonium* defined by Gray for the reception of a form from Port Essington (Proc. Zool. Soc. 1847, p. 79). For it differs from Dr. Gray's short divisional description in no respects excepting that the ventral surface is not *entirely* covered with granules (or spines), and that the disk is not *flat*. Probably this last distinction is due to Dr. Gray's example having been dried, whereby it very likely had become shrunken and more depressed than it would have been had it been preserved in fluid like the Kerguelen Island example. This species, *A. paxillosum*, Gray, is now placed in the genus *Pentagonaster*, by M. Perrier.

Leptoptychaster.

Leptychaster, Smith, Annals & Mag. Nat. Hist. 1876, xvii., p. 110.

Derivation (Gr.) λεπτός *narrow*, πτύξ *a plate*, and ἀστήρ *star*; in reference to the narrowness of the ventral plates.

Discus quinque-radiatus, depressus; radii modice longi; superficies dorsalis fasciculis spinularum minutarum pedunculatis confertim obsita; radii serie unicâ laterali tessellarum tenuium transversarum lamelliformium usque ad ambulacra vix productarum muniti, serieque alterâ fasciculorum spinarum minutarum (fasciculis unicis cum tessellis ordinate dispositis) inter tessellas et ambulacra interpositâ; tessella madreporiformis super marginem in angulo interradiali locata.

This remarkable form of Starfishes is perhaps more nearly related to the genus *Luidia* than to any other. It differs from that genus, however, in the lateral spinulose narrow plates not reaching quite to the ambulacra, but leaving a narrow intermediate space occupied by groups of spines in line with the plates, which gradually becomes wider towards the base (in *Luidia* the plates extend to the ambulacra); and also it has no elongated spines, and the body is larger in proportion to the rays than it is in that genus.

Leptoptychaster kerguelenensis, *Smith.*

(Plate XVII., fig. 2.)

Leptychaster kerguelenensis, Smith, Ann. & Mag. Nat. Hist. 1876, xvii., p. 110.

Archaster excavatus, Wyville-Thomson, Journ. Linn. Soc. 1876, xiii., p. 72, fig. 10.

Discus quinque-radiatus, modice amplus, depressus, supra et infra planus, in latitudine ad radii longitudinem circiter $\frac{3}{5}$-æqualis; radii apud bases haud admodum lati, apices versus sensim attenuati, spinis ambulacralibus gracilibus, transverse (ratione ad sulcos habitâ) quaternis vel quinis positis, duabus interioribus longioribus, cæterisque gradatim brevioribus; iidem ad latera subtusque, tessellis minute spinulosis (spinulis ipsis scabris et apud radiorum bases longissimis, indeque apices versus paulatim abbreviatis) angustis, transversis, lamelliformibus, obtecti; aliqui ex his apices radiorum versus usque ad sulcos ambulacrales pæne attingent, bases vero versus ita gradatim ab his recedunt ut apud angulos interambulacrales aream trigonalem utrinque relinquant; inter tessellas et spinas ambulacrales fere per totam radii longitudinem, in serie unicâ, fasciculi parvi spinarum brevium interponuntur, et præter hanc juxta basin, in areis trigonalibus supradictis, series aliæ quatuor singulatim per vices intercalantur, omnes fasciculi cum tessellis ordinibus collocantes; anguli oris interradiales acutis spinis utrinque quaternis vel quinis muniti. Superficies dorsalis fasciculis pedunculatis spinarum brevium confertim serta; tessella madreporiformis modice magna, subovalis, fasciculis spinarum obsita, ad angulum inter-radialem super marginem posita.

Disci diam. 23, crass. 8; radiorum longit. 38, ad bases lat. 13 mm.

Hab.—On roots of *Macrocystis*, Observatory Bay; also obtained in the island by the Antarctic Expedition; and "Off Cape Maclear, south-east coast of Kerguelen Land, from a muddy bottom at a depth of 30 fathoms" (*Wy. Thomson*).

The small fascicles of little spines on the dorsal surface are borne on short peduncles of skin, and are so closely packed together that their apices constitute an even surface; and the madreporic plate being covered with spines similar to those of the rest of the surface is concealed from view.

OPHIURIDÆ.

Ophiacantha vivipara.

(Plate XVII., fig. 3 a–c.)

Ljungman, Öfvers. K. Vetensk. Akad. Forhandl. 1870, p. 471; Smith, Ann. & Mag. Nat. Hist. 1876, xvii., p. 110.

Ophiocoma didelphys, Wyville Thomson, Journ. Linn. Soc. 1876, xiii., p. 78, fig. 13.

Examples from Kerguelen Island differ slightly from specimens of *O. vivipara* found at Patagonia, in the oral shields, the adorals, the upper arm-plates, and the uppermost arm-spine.

(Kerguelen Island form).—Disk covered on both sides with conical scabrous granules (as described by the author); oral shields only slightly longer than broad; adorals *quadrangular* (not trigonal), about $\frac{2}{3}$ as large as the orals, almost touching one another on the inner side, their lower margins the longest; 3 or 4 oral papillæ on each side of an angle, of which the outermost one (or sometimes two) is broad and flattened; arms, side and lower arm shields normal (*i.e.* according well with Ljungman's description); arm-spines slender, 9 or 10 in number, the uppermost one is shorter than the next spine, and after this the remaining spines gradually diminish in length; the upper arm-plates are not so wide as in the typical form.

Diam. disk 12; length of the longest arm-spine $3\frac{1}{2}$ mm.

Hab.—Common on the roots of kelp in Observatory and Swain's Bays (*Eaton*); entrance to Royal Sound (*Wyville Thomson*); also Patagonia.

The differences pointed out above are hardly of sufficient importance to constitute specific distinction between the Kerguelen Island and the Patagonian forms. Patagonia, as Lütken suggested (Zoological Record 1872, p. 448), is most probably the true habitat of the typical specimens, and not Altata on the W. coast of Mexico (the locality cited by Ljungman), which is doubtless erroneous.

The geographical range of *Ophiocantha* is very extensive: 5 of its species are from the northern seas, 1 from the Mediterranean, 1 is Portuguese, 1 West Indian, 1 Javanese, and lastly there is this 1 from Patagonia and Kerguelen Island.

Ophioglypha hexactis.

(Plate XVII., fig. 4 a–c.)

Smith, Ann. & Mag. Nat. Hist. 1876, Feb., xvii., p. 3; Verrill, Bulletin U. S. Nat. Mus. 1876, May, iii., p. 72.

Discus hexagonalis, angulis propter radios interruptis, lateribusque leviter concavis, depressus; papillæ orales apud angulos septenæ vel octonæ, acute conicæ, una ad apicem longissima, cæteræ utrinque gradatim breviores; scuta oralia palivel ligoni-formia, parva, manubrio latissimo brevissimo ab ore remoto, et laminâ cordatâ ad latera utrinque leviter concaviusculâ; scuta adoralia angustissime linearia, oralibus adjacentia; intra angulos orales prope bases sunt scuta subovalia-oblonga bina, et pone hos alterum minus transversum apud angulorum apices situs. Radii sex, graciles, circiter triplo-longiores latitudine disci; *scutorum inferiorum* sextum post basin transversum, latissimum, margine externâ in medio levissime angulatâ, lateribus brevissimis rotundato—truncatis, et margine orali externæ simillimâ, nisi angulo magis prominenti; *scuta lateralia* subtus conjuncta, commissuris apicem radii versus gradatim in longitudinem excrescentibus; *scutorum superiora* aliqua circiter radii medium subquadrata, paulo ab apicibus bases versus angustata, postice arcuata, ad latera recta, antice concava; aliqua ad discum propiora subovalia, et his valde disparia, gradatim minora breviora atque latiora, scutellis parvis multis formâ et amplitudine diversis, ad scuta lateralia conjuncta; *scuta radialia* subparva, anguste

subovalia, sese longe remota; papillæ ad latera inscisuræ disci per-minutæ atque numerosæ (circiter 40), supra que juxta basin brachii aliæ sex adversus sex illorum in ordine obstant ita ut fimbria faciant. Spinæ brachiales tres, breves, crassiusculæ, haud per-acutæ, pallidæ, æquilongæ (nisi supremâ sæpe paulo longiori); papillæ ambulacrales super foramina ultima (infra-brachialia) et fissuris oris conjunctæ, quatuor, super foramen penultimum tres; super pauca sequentium binæ, et super cætera unicæ, omnes diverse formatæ, aliæ breves, compressæ et squamuli- vel scuti-formes, aliæque spinis brachialibus subsimiles nisi paulo breviores. Discus diverse minuteque squamulosus. Color supra ubique purpureo-niger, subtus sordide albidus.

Disci diam. 21 mm.

Hab.—Very common on roots of *Macrocystis*, Observatory Bay; also Patagonia. They require to be killed as soon as they are taken out of the sea, as otherwise they rapidly break themselves up.

O. hexactis cannot be confounded with any other species hitherto described. The number of arms, the peculiar shape of the oral shields, and the peculiarities of the ray-shields and spines distinguish it at once. The ventral portion of the disk visible between the arms is rather large; and the oral shields are only half as long as the space between them and the sides of the disk. In colour and general appearance it approaches *O. Sarsii*, Lütken, of the Greenland coast, which seems to be its nearest ally; but these species are so different from one another in detail, that it is needless to specify their distinctions.

The genus *Ophioglypha* is very widely distributed; 2 of its species are from arctic or the northern seas, 4 from the Mediterranean, 2 from between Cuba and Florida, 1 from China, 1 from Puget Sound, 1 from Patagonia, 2 from Kerguelen Island, and 2 from Sydney.

Ophioglypha brevispina.

(Plate XVII,., fig. 5 a–c.)

Smith, Ann. & Mag. Nat. Hist. 1876, xvii., p. 112.

Discus in latitudine ad radii longitudinem circiter $\frac{1}{3}$ æqualis, depressus, ad latera rotundatus; papillæ orales ad angulos oris septenæ vel octonæ, quarum unæ ad apices cæteris longiores, et extremæ cæteris latiores; dentes compressi, hastati, ad latera curvati, quatuor; scuta oralia paulo longiora quam lata, trigono-obcordata, angulis exterioribus rotundatis, et apice subacuto; scuta adoralia per-angusta, intus scutis oralibus subtus conjuncta, ad juncturas latiora quam extus; infra scuta adoralia alia duo eis paulo ampliora (duplo quidem latiora) fiunt anguli oris. Radii quinque, modice longi, paulo latiores quam crassi; scutorum inferiorum sextum post basin transversum, margine externâ leviter curvatâ atque in medio parum acutâ, marginibus lateralibus rectis per-brevibus, marginibus interioribus leviter excavatis atque apicem acutum versus convergentibus; scutorum primum (*i.e.*, basale vel intimum) aliis major et dissimile, margine posticâ excavatâ in loco anguli levis, et

margine anticâ haud acuminatâ,—secundum tertio amplius, cæteraque usque ad apicem gradatim minora tandemque ibi per-minuta; scutorum lateralium subtus quinque vel sex priora disjuncta, cætera tamen per transversum conjuncta, commissuris apicem radii versus gradatim in longitudinem excrescentibus,—supra septendecim priora disjuncta, cætera super dorsum conjuncta; scutorum superiorum sextum post basin parum transversum, margine externâ rotundatâ, lateribus antice recte convergentibus, et margine anticâ concavi-truncato,—cætera radii apicem versus gradatim angustata, præsertim a fronte, itaque tandem quodque in angulo acuto ante producitur; squamæ disci diversæ et impares, unâ in medio aliisque paucis parum remotis circumpositis quam cæteris majoribus; scuta radialia diversa, contigua, præcedentibus subæqualia; papillarum ad latera inscisuræ disci (in exempl. max. 22, in exempl. minoribus circiter 16–17) sex vel septem superiora cæteris ampliora; spinæ brachiales tres, incrassatæ, per-breves, paulo tantum squamis ambulacralibus longiores, quarum binæ sunt tertio, quarto, atque interdum quinto scutorum, atque cæteris unicæ; papillæ super margines primi foraminum ambulacralium (infra-brachiale) utrinque quatuor vel quinque. Color albidus.

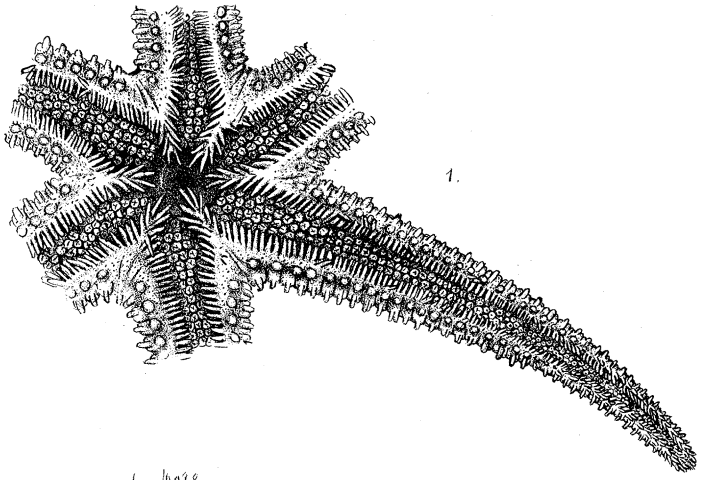
Disci diam. 9 mm.

Hab.—Observatory Bay.

Several species inhabiting the seas of the North bear a superficial resemblance to this form:—such are *O. albida*, Forbes, *O. robusta*, Ayres, and *O. nodosa*, Lütken. And besides these *O. Lymani*, Ljungman, from Patagonia, is very like it. *O. brevispina* resembles this last species in having very short arm-spines scarcely longer than the ambulacral papillæ; but differences in their size, and in the relative length of their arms, and in the form of their radial shields, &c., afford good specific characters for their distinction from one another.

Note on the Actinozoa.—*By the Rev. A. E. Eaton.*

At Kerguelen Island, as in all cold seas, *Actiniidæ* are not usually found between tide-marks, but occupy sites constantly under water. In high northern latitudes they seldom occur in situations less than a fathom in depth, and are usually of a red colour. At Kerguelen Island the genus *Actinia* was represented by one if not by two red species frequenting rocks in shallow water just below the lowest limits of the tide, and on the roots of *Macrocystis* in four or five fathoms. They did not seem to be identical with any of the species figured by Gosse in his History of British Sea Anemonies. An *Ilyanthus* was obtained sparingly by the dredge on mud in Observatory Bay; but the specimens unfortunately perished during my temporary absence from the station at the time of the Transit.



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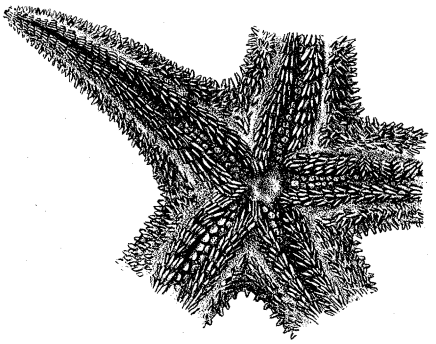

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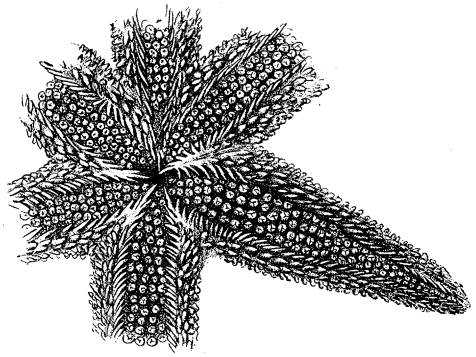

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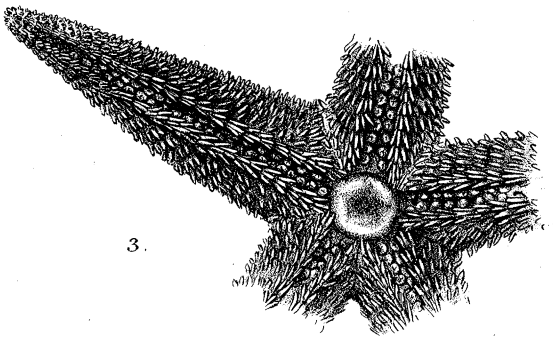

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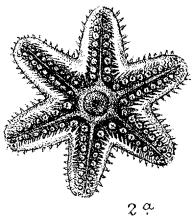

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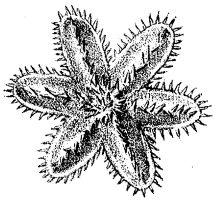

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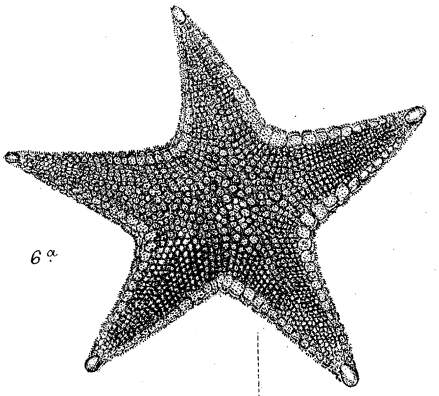

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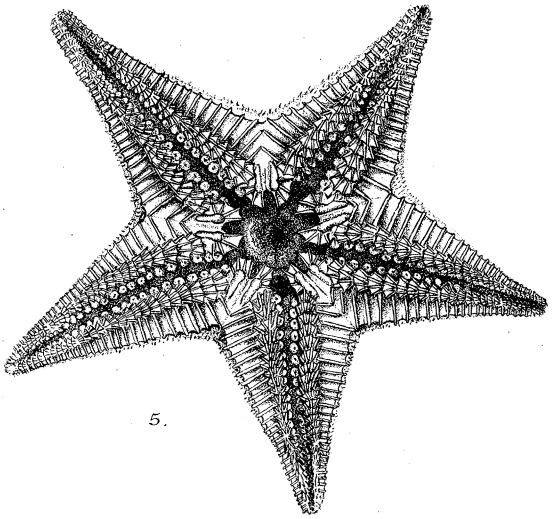

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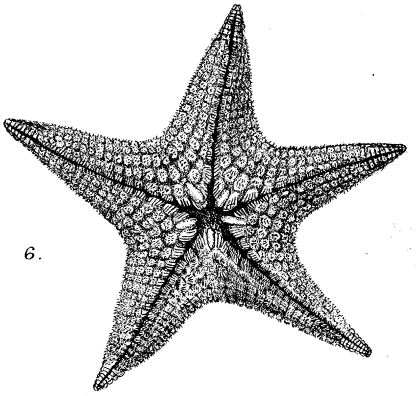

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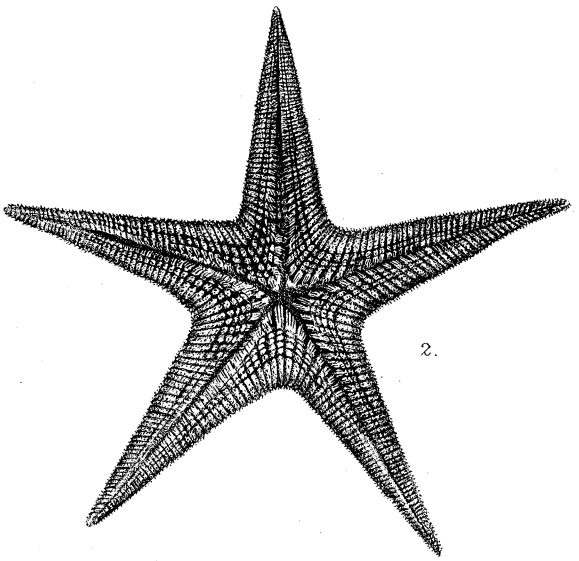

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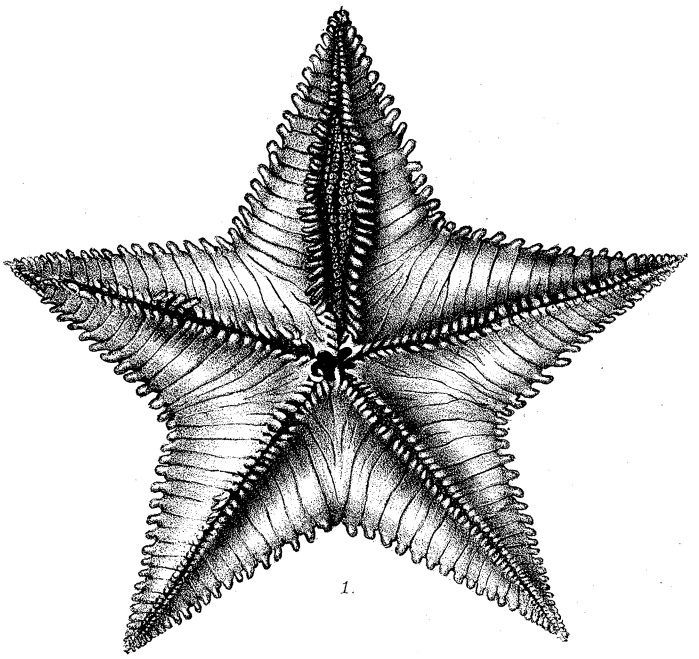

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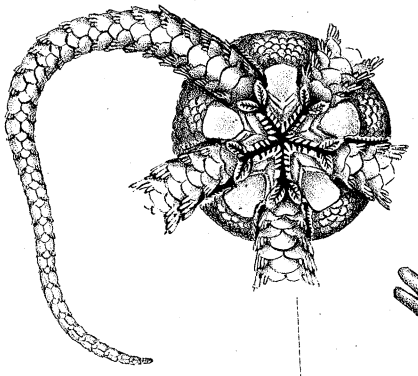

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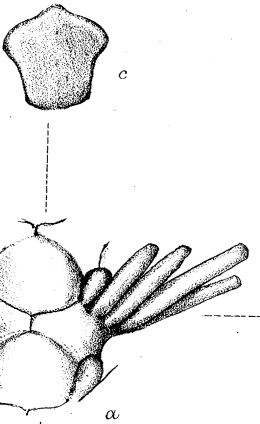

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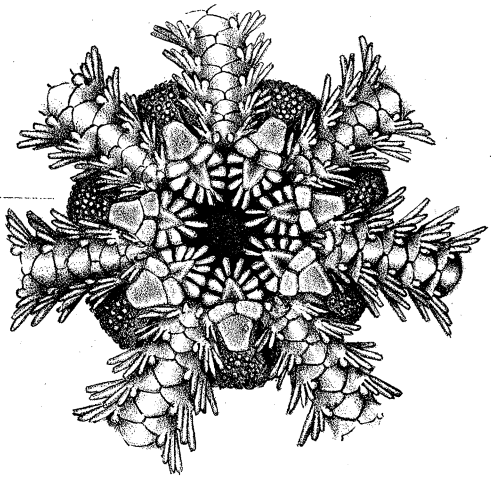

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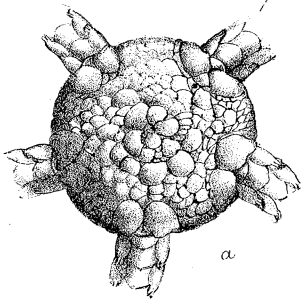

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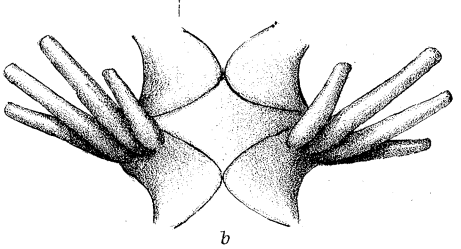

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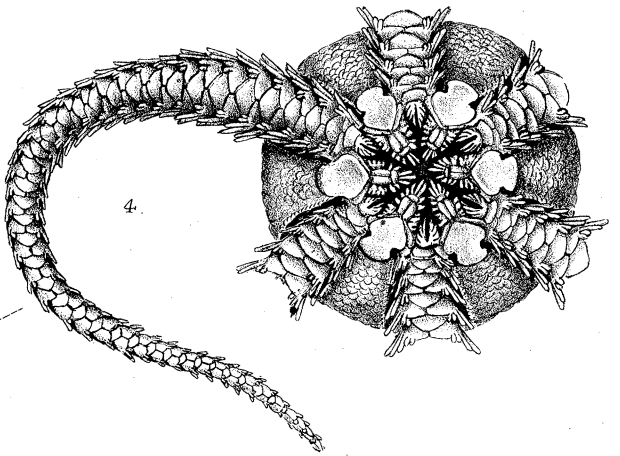

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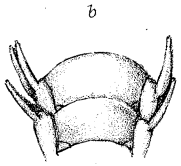

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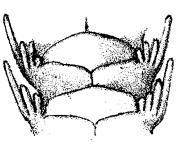

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