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XI.—*Descriptions of Species of Asteriidæ and Ophiuridæ from Kerguelen's Island.* By EDGAR A. SMITH, F.Z.S., Zoological Department, British Museum.

THIS is the first account of any starfish from the above locality; and consequently the very large proportion of new species among the eleven here enumerated is not altogether surprising. The specimens now described form part of the collections made by the Rev. A. E. Eaton, the naturalist sent by the Royal Society with the British expedition for observing the Transit of Venus in the early part of last year. The Asteriidæ were all dredged in Royal Sound, at a depth of from 5 to 10 fathoms. Further remarks on their similarity to boreal types and their relation to other faunas will be made in a subsequent paper.

Asteriidæ.

Asterias meridionalis, Perrier, Ann. & Mag. Nat. Hist. 1876, vol. xvii. p. 36.

Body six-rayed, reddish brown above, pale buff beneath. The rays thickish, taperingly conical, convex above, rather more than twice as long as the width of the disk. Ambulacral spines in two series: the lower margin of the rays with a double or triple series of short spines; dorsal margin with a similar row. Upper surface of the body and arms covered with numerous short, blunt, irregularly disposed spines.

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Diameter between extremities of opposite arms 6 inches ; diameter of disk $1\frac{5}{12}$ inch.

Var. With the spines on the upper surface longer and acute.

Hab. Royal Sound, Kerguelen's Island.

The specimens which I associate with this species differ from the type of it described by M. Perrier in a few particulars. In one example the ambulacral spines are not constantly in a double row ; towards the mouth they are in but a single series, and only become double at intervals up the rays. This specimen has the spines on the upper surface blunt and short, as in the type ; but another example differs, being covered with longer conically acute mobile spines.

Asterias Perrieri, sp. nov.

Radii sex, cylindraceo-attenuati, ad latera supraque rotundati, inferne anguste complanati ; discus mediocriter magnus, diametri maximæ circiter $\frac{2}{7}$ æquans ; sulci ambulacrales haud latissimi ; spinæ ambulacrales serie unica (in exemplo maximo longitudine circiter 3 millim.), subgraciles, latitudine æquales, ad apicem haud clavatae, modo rotundatae ; spinæ ventrales serie duplici, prope spinas ambulacrales sitæ, in paribus divergentibus (vel magis infrequenter spinis tribus), spina intima quam cæteræ majore, atque quam ambulacrales brevior sed crassior, aliquantoque acuminata ; superficies dorsalis et lateralis spinis minutis brevissimis, paulo conicis, irregulariter sparsis munitæ, interque spinas papulis innumerabilibus instructæ ; tessella madreporiformis parviuscula, ad medium inter disci centrum et marginem sita. Color saturate fusco-rufus. Diam. extrema (6 poll.) 150 millim.

The ventral spines are in pairs (except near the base of the arms, where there are three or four single ones), the two spines diverging from their bases, where they are adjacent ; they are rather thick and conical, the inner one being somewhat the larger. The spines on the sides and dorsal surface are very minute, very numerous, and irregularly disseminated, except along the side of the arms near the base, where there appears to be a single continuous series ; and all the spines of this species are granulously roughened.

The largest specimen has a cluster of some hundreds of young ones clinging to the ventral disk. They are all invariably six-rayed, have only two rows of ambulacral tentacles and a single series of spines bordering them. The rays are very short and broad, nearly as broad as long, the lateral dorsal margins with a single row of large spines, and a similar series down the centre of the rays.

A. rugispina of Stimpson is allied to this species, with which I feel much pleasure in associating the name of M. Edmond

Perrier, of the Jardin des Plantes at Paris, who very recently identified many species of Asteriidæ in the British-Museum collection.

Pedicellaster scaber, sp. nov.

Discus 5-radiatus, latitudine circiter radii longitudinis $\frac{1}{2}$ æquans; radii sensim attenuati, cylindricei, haud acutissimi, spinis brevissimis singularibus, obtusis, scabrosis, modo irregulari aliquanto reticulato ordinatis muniti, iis prope ambulacra quam cæteris paulo longioribus; interstitia inter reticulationes nuda, pedicellarias magnas gerentia; spinæ ambulacrales in seriebus tribus, graciles longitudinisque æqualis, quam dorsalibus duplo longiores; oris anguli interradales spinis duabus parvis terminati; anus fere centralis; tessella madreporiformis in angulo interradales prope marginem sita.

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

This species appears to agree very fairly with Sars's description of his genus *Pedicellaster*, except that the ambulacral furrows cannot be said to be "broad," and the ambulacral spines are not in two rows but three. But these are more specific than generic characters; and therefore I think this may safely be regarded as a second species of that northern form.

The spines are roughened with minute prickles, those of the dorsal surface being about twice as long as thick, and blunt at the tips; and a row or two near the ambulacral spines are rather longer, and the latter are still more elongated. The spines on the back of the disk and arms do not display any regular arrangement, but are disposed in an irregularly and rather closely reticulating manner.

Othilia spinulifera, sp. nov.

Discus 5-radiatus, latitudine circiter radii longitudinis $\frac{1}{2}$ æquans, mediocriter crassus, superne leviter rotundatus; radii cylindraceo-attenuati, spinas numerosas, brevissimas scabrosas irregulariter dispositas sed modo aliquanto reticulato gerentes; tamen prope spinas ambulacrales, spatium est lineare fere nudum, iis parallelum, versusque radiorum basim sensim latius, spinarum minutarum quam ambulacrales longe minorum serie unica munitum; spinæ ambulacrales supra quamque tessellam quatuor, transversim sitæ, divergentes, intimis 2 quam aliæ paulo longioribus, et ad intimæ basim spina gracillima parva sita est; oris anguli interradales spinis duabus parvis terminati; anus subcentralis; tessella madreporiformis submarginalis, in radiorum angulo.

Radiorum longit. 14 millim., diam. ad basim $4\frac{1}{2}$; disci diam. 7, crass. 6.

This curious little species does not display any particular

arrangement of spines on the dorsal surface; but towards the ambulacral furrow there is, first of all, parallel with the spines which border it, a series of very small spines, only one on each plate, so that a narrow bare space is seen; above this the spines are two or three on a plate.

Pteraster affinis, sp. nov.?

Discus magnus, 5-radiatus, inferne planus, supra convexus, medio-criter crassus, latitudine radiorum longitudinem adæquans; radii breves, ad basim lati, versus extremitates recurvatas sulcos ambulacrales exponentes rapide angustantes; eorum superficies infera utrinque membrana tenui spinis circiter 30 gracilibus munita (quarum apices vix extra membranam projiciunt) obtecta; tessellæ interambulacrales spinas quatuor graciles, membrana tenuissima fere ad earum apices extendente connexas gerentes; oris angulus quisque interradians spinas 8 similes, membrana pariter connexas gerens, extremis duabus quàm cæteræ maxime brevioribus, medianis duabus longissimis; illas supra sunt spinæ duæ crassæ, altera alteræ parallela, medio leviter concavæ, longitudine spinarum 30 lateralium elongatissimam æquantes, et versus apices leviter acuminatæ; superficies dorsalis et laterales projecturis minimis spiniferis munitæ, et inter has poris minutis haud numerosis perforatæ; spinæ supra projecturas scabræ 4-10, membrana præter ad apices amictæ; foramen centrale mediocre, circulare, lacinia spinarum brevium membrana connexarum circumdatum.

Exempli maximi disci diam. 15 millim., crass. 7; radiorum longit. 17, diam. ad basim 8. Exempli minoris disci diam. 10 millim., crass. 5, radiorum longit. 9.

This species approaches very closely to *Pt. Danæ* of Verrill, described in the 'Proceedings' of the Boston Society of Natural History, 1869, vol. vii. pp. 386 & 387, and which is supposed to have been found at Rio Janeiro. It appears, however, to be provided with longer arms; the spines of the dorsal fascicles are everywhere similar and scabrous; the spines at the inter-radial corners of the mouth are only eight in number; and the two larger spines above them are not very long, but stout. In these respects it chiefly differs from *Pt. Danæ*. The smaller specimen, it will be noticed, is considerably shorter in the rays.

Porania antarctica, sp. nov.

Discus 5-radiatus, mediocriter crassus, latitudine radiorum longitudinem æquans; superficies infera omnino plana, supera convexa; radii aliquanto breviter conici, versus apicem acuminati; totum animal cute crassa carnosa amictum, inferne a marginibus ad sulcos ambulacrales lineariter radiatim sulcata, superne lævi spinis paucis tubercularibus parvis prope medium supraque radios sparsim or-

nata; margines ventrales laterales spinis brevibus compressis ad apices truncatis, una supra quamque tessellam (quæ sulcis linearibus notatæ) laciniati; spinæ ambulacrales biseriatae; exteriores interiorum longitudinem duplam æquantes, latæ, ad apices quadrate truncatæ, extra sulco parvo, aspectum ipsis duplicem præbente, insculptæ; spinæ interiores exterioribus porro longe breviores, multo quoque graciliores; tessella madreporiformis rotundato-ovalis, paulo propius a centro quam a margine sita; anus centralis, papillis spinæformibus circiter 12 brevissimis circumdatus. Color carneus vel sanguineus.

Diam. maxim. 90 millim., minim. 48.

This species is rather closely related to the northern *Porania pulvillus* of Müller. From this, however, it may be distinguished by the different number and character of the marginal spines; and also the ambulacral spines offer some distinctions: *P. pulvillus* has three or four spines on each of the marginal plates; and these are much smaller than the single one found in the present species. The furrow on the exterior of the outer ambulacral spines exists chiefly in the skin which clothes them. The minute tubercles on the back do not display any regular arrangement; there are about a dozen on the central portion of the disk, and a few on the short conical arms.

Astrogonium meridionale, sp. nov.

Discus 5-radiatus, latitudine radiorum longitudinis $\frac{4}{5}$ adæquans, depressus, superne infraque leviter convexus; radii ad basim lati, versus apicem aliquanto rapide attenuati; spinæ ambulacrales quadriseriatae, intimis ad apices quam basi latioribus, quadrateque truncatis, cæteris longitudinis æqualis, simplicibus, cylindricis, ad apices rotundatis; anguli oris interradales spina unica crassa conica, et eam infra lacinia spinarum 6-8 parvarum intus directarum muniti; radiorum et disci superficies inferior fasciculis spinarum brevium aliquanto acuminatarum ornata, fasciculis in seriebus a sulcis ambulacralibus usque ad margines radiantibus; latera seriebus duabus angustis spinarum in fasciculos parvos quadratos confertos dispositarum (20 supra radium) marginata; spinæ seriei inferioris iis superficiei inferioris similes, seriei superioris iis dorsi; superficies dorsalis fasciculis numerosissimis fere contiguis spinarum circiter 10-20 munita, spinis tubercularibus, obtusis, pedunculatis; interstitia inter spinarum fasciculos supra et infra nuda, pedicellarias numerosas magnas gerentia; radii tuberculo unico magno superne terminati; tessella madreporiformis circularis, prope medium inter centrum et marginem lateralem sita; anus subcentralis.

Disci diam. 24 millim., crass. 10; radiorum longit. 29.

This species belongs to that section of *Astrogonium* which includes *A. paxillosum* as described by Gray, Proc. Zool. Soc. 1847, p. 79, but it is not so flat either above or beneath.

LEPTYCHASTER, gen. nov.

Discus 5-radiatus, compressus; radii mediocriter elongati; superficies dorsalis fasciculos pedunculatos confertos spinarum minutarum gerens; radiorum latera serie unica tessellarum tenuium transversarum lamellarium, ad ambulacra haud productarum munita; interstitia inter tessellas et ambulacra spinarum parvarum fasciculis ordinatim cum tessellis dispositis ornata; tessella madreporiformis marginalis, in angulo interradiali sita.

This genus shows more affinity to *Luidia* than to any other. It differs from it, however, in the lateral lamellar plates being covered with minute spines not extending to the ambulacra, in the absence of elongated spines, and the body being proportionally larger than in that genus.

Leptychaster kerguelenensis, sp. nov.

Discus 5-radiatus, mediocriter magnus, compressus, supra infraque planus, latitudine radiorum longitudinis circiter $\frac{3}{5}$ æquans; radii sensim attenuati, basi haud latissimi; spinæ ambulacrales graciles, quaternis vel quinis sulcis transversæ, intimis duobus longissimis, cæteris sensim brevioribus; oris anguli interradiales acuti, spinis 4-5 utrinque muniti; radiorum latera et superficies inferiores tessellis transversis, angustis, lamellaribus (quæ versus radiorum apicem fere ad spinas ambulacrales productæ, sed basim versus ab illis, spatium triangulare in angulo interradiali relinquentes, recedunt) instructa; hæ tessellæ spinis minutis scabris amictæ, ad angulos interradiales longissimæ, et versus radiorum apices sensim decurtatæ; inter eas spinasque ambulacrales fere per radiorum longitudinem totam series est unica fasciculorum parvorum spinarum brevium, sed versus radiorum basim sunt sensim series secunda, tertia et quarta, omnes ordinatim cum tessellis dispositæ; superficies dorsalis fasciculos pedunculatos confertos spinarum brevium gerens; tessella madreporiformis mediocriter magna, subovalis, marginalis, in angulo interradiali sita, et spinarum fasciculis oblecta.

Disci diam. 23 millim., crass. 8; radiorum longit. 38, diam. ad basim 13.

The fascicles of little spines on the dorsal surface are raised on short fleshy peduncles, and are very closely packed; and the madreporic plate is concealed by similar groups of spines.

Ophiuridæ.

Ophiacantha vivipara?, Ljungman.

The specimens from Kerguelen's Island appear to differ slightly in a few respects from those described by Ljungman, in the 'Öfversigt af Kongl. Vetenskaps Akad. Förhandl.' 1870, p. 471. The habitat given (Altata, on the west coast of Mexico)

is probably an error, as suggested by Lütken, 'Zoological Record' for 1872, p. 448, who gives Patagonia as the home of this species. The Kerguelen examples at hand are rather smaller, the diameter of the disk being 12 millims.; but this may be accounted for by age. The conical scabrous tubercles on the disk are similar to those described by Ljungman; the oral shields are about as long as broad; the adorals more quadrangular than triangular, the angles being rounded, and they are not a great deal smaller than the oral shields, the oral sides being broader than the aboral, and the lateral margins consequently converging slightly outwardly. The lower and side arm-plates agree with the description of those of the typical form, and the spines and ambulacral papillæ also; but the dorsal ray-shields are not so broad as described by Ljungman.

Thus it will be seen that a few slight differences are found in the specimens from Kerguelen's Island, but not sufficient (at all events without comparison with the types) to warrant the separation of this variety from the Patagonian species.

Ophioglypha hexactis, sp. nov.

Discus hexagonalis, angulis radiis interruptis, ad latera leviter concavus, depressus; papillæ orales (ad quemque angulum) 7, apicalis longissima, tres utrinque sensim breviores, omnes conicæ, acutæ; scuta oralia parva, ligoniformia, manubrio brevissimo latissimoque aboraliter sito, apice ad os verso, manubrio ipso cordiformi, lateribus inferioribus convergentibus, leviter concaviusculis; scuta adoralia præcedentibus contigua, angustissima, linearia; infra illa et iis transversa oris angulos occupantia sunt scuta duo similia, oblonga, subovalia, et eorum basi unicum parvum apicali transverse situm; radii 6, elongati, longitudine quam disci latitudo duplo vel triplo majores; scuta inferiora—sextum a basi transverse latissimum, breve, margine aborali medio leviter angulato, lateribus brevissimis, rotunde truncatis, marginibus oralibus aboralibus fere similibus, sed angulo medio productiore; scuta brachialia lateralia inferne adjuncta, juncturæ lineis versus brachiorum apicem sensim longioribus; scuta superiora (prope brachii medium) subquadrata, extra quam versus discum latiora, margine exteriori arcuato, interiori concavo, marginibus lateralibus rectis, versus discum leviter vergentibus; scuta aliqua propius discum forma longe diversa, sensim decrescentia, brevia, transverseque lata, subovalia, ad scuta lateralia scutulis aliis parvis irregularibus juncta; disci squamæ minutæ, numerosæ, forma et digestionem irregulares; scuta radialia parva, elongato-subovalia, longe distantia; papillæ ad latera incisuræ disci minimæ numerosissimæ (circiter 40), et ad basim brachiorum superiorum est lacinia papillaris sex superioribus seriei aliæ opposita; spinæ brachiales 3

breves, crassiusculæ, haud multo acuminatæ, suprema generaliter earum longissima, infima brevissima; papillæ ambulacrales supra poros ultimos (infrabrachiales) fissuræ oris junctos 4, supra penultimum 3, paucos sequentes supra 2, et reliquos supra 1, forma diversæ, aliquæ scutis brevibus compressis similes, aliæque fere spinis brachialibus similes sed aliquanto breviores. Color superne purpureo-niger, inferne sordide albidus.

Disci diam. 21 mill.

Hab. Kerguelen's Island.

This species cannot be confounded with any which have hitherto been described; the number of the rays, the spade-like form of the oral shields, and the peculiarities of the ray-shields and spines at once distinguish it. The portion of the disk which is visible on the lower side between the arms is large, and the oral shields are only as long as the space between them and the sides of the disk.

Ophioglypha brevispina, sp. nov.

Discus latitudine radorum longitudinis circiter $\frac{1}{3}$ æquans, compressus, ad margines leviterque supra rotundatus; papillæ orales 7-8 ad quemque oris angulum, extrema cæteris latior, his brevibus, crassis, et conicis, earum centrali ad anguli apicem longissima; dentes 4, compressi, hastulæformes, lateribus curvatis; scuta oralia longiora quam lata, triangulariter cordiformia, angulis duobus superioribus et margine rotundatis, lateribus leviter, apice orali aliquanto acute acuminatis; scuta adoralia angustissima, oraliū lateribus inferioribus adjuncta, latiora intus, ubi contigua; radii 5, mediocriter elongati, paulo latiores quam crassi; scuta inferiora—sextum a basi latius quam longum, margine aborali curvato sed medio leviter acuminato, marginibus lateralibus brevissimis rectiusculis, marg. oralibus paululum excavatis, apice acuto convergentibus; scutum basale cæteris dissimile, superne sinuatum vice anguli levis, basique haud acuminatum secundum sequente majus, cæteraque versus radorum apices sensim minora, denique minutissima; scuta brachialia lateralia inferne haud usque ad scutum quartum vel quintum adjuncta (juncturæ linea inde versus brachiorum apicem sensim longiore), superne haud usque ad scutum 17^{um} contigua; scuta brachialia dorsalia—sextum a basi quam longa paulo latius, arcuatum, margine exteriori rotundato, lateribus versus discum recte vergentibus; marg. interiore concavo-truncato; scuta cætera versus brachiorum apices sensim angustiora, margine interiore præsertim, et denique angulo acuto producto; disci squamæ forma et magnitudine irregulares, una centralis, et 5-6 ab illa paululum remotæ mediocriter magnæ; scuta radialia æque magna ac præcedentia, forma irregularia, contigua; papillæ ad latera incisuræ disci (in exemplo maximo) 22, (in minoribus 16-17), supremæ 6-7 cæteris majores; spinæ brachiales ternæ, brevissimæ, crassæ, paululum tantum longiores squamis



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